chapter seventeen

Estonia: Developing NordDRGs within social health insurance

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17.1 Hospital services and the role of DRGs in Estonia

17.1.1 The Estonian health care system

The Estonian health care system is built on a platform of compulsory, solidarity-based insurance and universal access to health services made available by providers that operate under private law (Koppel et al., 2008).

In 2008 Estonia had one of the lowest shares (6.1 per cent) of expenditure on health care relative to gross domestic product (GDP) in Europe (NIHD, 2008). Estonian health expenditure has remained stable over time, with only small variations due to changes in the economic environment. As its main system-level input and output characteristics are comparable with more affluent countries, Estonia is often described as a country with a very cost-efficient health care system (Björnberg et al., 2009).

Since the country's independence in 1991, the Estonian health system has undergone two major shifts: first, from a centralized, state-controlled system to a decentralized one; and second, from a system funded by the state budget to one funded through social health insurance (SHI) contributions (Koppel et al., 2008). In 1992, following the introduction of health insurance and the establishment of autonomous providers, health care professionals ceased to be public employees, lost their civil service status and began to work under private labour regulations. The restructuring of the health system has taken place in several phases. The current organizational and management principles were

established between 1999 and 2002 by legislation intended to re-centralize some health system functions.

The Ministry of Social Affairs and its agencies – the State Agency of Medicines (SAM), the Health Board and the National Institute for Health Development (NIHD) – are responsible for the general stewardship and management of the health care system, as well as for health policy development.

The State budget contributes about 11.5 per cent of total health expenditure, mainly for the financing and management of public health services, emergency medical care of uninsured people and emergency ambulance services. Local municipalities have a minor, somewhat voluntary role in organizing and financing health services (Koppel et al., 2008). This means that local municipalities have no defined responsibility to cover health care expenditure and, therefore, financing practices vary widely. Some local governments provide primary care providers with financial support, while some partially reimburse pharmaceutical expenses and nursing care costs for low-income households and for the elderly. In addition, health care providers that treat uninsured people might receive some reimbursement from local municipalities for certain expenditures, to varying degrees depending on the municipality. The majority share of financing for health care services is contributed by the public independent legal body, the Estonian Health Insurance Fund (EHIF), which contributes about 64.8 per cent of total health expenditure (NIHD, 2008). EHIF revenues are pooled from earmarked payroll taxes. Being effectively a single purchaser of care for most providers, the EHIF has gradually become one of the main actors driving developments in the health system. Private spending comprises about 20 per cent of total health expenditure, mostly in the form of co-payments for pharmaceuticals and dental care. Private insurance is almost non-existent in Estonia (0.3 per cent) (NIHD, 2008).

All actors in the Estonian health care market are public or private organizations operating under public or private law, which indicates that direct responsibility for provider performance has been delegated by the Ministry of Social Affairs and the municipalities to the hospital supervisory boards. With regard to purchasers of health care, the main actors are public organizations, such as the EHIF, the Health Board, and the NIHD. The latter two bodies are agencies of the Ministry of Social Affairs. The Health Board acts as a public purchaser of ambulance service providers and ensures sufficient national coverage. The NIHD is the main purchaser of public health services and is responsible for the implementation of all national public health programmes and strategies. However, the planning and coordination of the programmes is carried out by the Ministry of Social Affairs.

The EHIF is the main purchaser of health services. EHIF contracts evolved over a decade of well-established relationships on an equal footing with the service providers. At the beginning of the 1990s the contract content was rather unsophisticated and only the capped total costs were agreed. Currently, the contracts include agreements on rights and obligations of the parties concerned, service quality and access, as well as financial reporting requirements and a detailed cost- and volume-based financial component.

17.1.2 Hospital services in Estonia

An important characteristic of the Estonian hospital system is that since 2001 all hospitals operate under private law in the form of limited liability companies or foundations (Koppel et al., 2008). All hospitals own their capital assets and they are independent in their management decisions. Personnel who work in hospital-based departments have contracts with the hospital and are therefore salaried employees. Between 1991 and 2000 the number of doctors fell by 24 per cent, from 5500 to 4190, and the number of nurses by 14 per cent, from 9900 to 8500 (Jesse et al., 2004). Although the number of doctors and nurses continued to decrease after 1998, the ratio per 1000 inhabitants slightly increased, due to a parallel reduction in the size of the population (Koppel et al., 2008).

However, most hospitals are owned (or founded) by the state, local governments or public legal bodies, and thus effectively act as public hospitals. Estonia has therefore preserved public ownership of the hospital network, but has introduced management concepts specific to the private sector. This has created a framework in which public hospitals are run as networks or integrated providers and as true business entities, with management incentives geared at efficient financial performance.

In many instances, the hospital has multiple owners, for example a number of municipalities, or the state and municipalities jointly owning one hospital. A few hospitals owned by private entities provide specific services (such as gynaecology, obstetrics, rehabilitation, plastic surgery, and so on). The relationship between the EHIF and all hospitals is based on contracts. Owners (including public ones) can influence hospital activity through supervisory bodies or capital investment decisions.

In 2003 the Government approved the Hospital Network Development Plan (HNDP), which drew up a list of hospitals that serve the public interest and are therefore eligible for state aid. The Plan stipulated that hospitals are divided into regional, central, general, local, special, rehabilitation care and nursing care hospitals. Regional, central, general and local hospitals are acute care hospitals providing treatment for acute diseases requiring active medical intervention. Special care hospitals provide inpatient services in orthopaedics, vascular surgery, plastic surgery, psychiatry, obstetrics, gynaecology and otorhinolaryngology.

All hospitals need to be licensed by the Health Board. Differences in requirements according to hospital levels are mainly in the form of a minimum set of medical specialties that certain levels of hospitals must represent.

Each acute care hospital covers a certain area or region. The location has been chosen so that acute care services are available to everyone at a distance of 70 km or 60 minutes' drive; the Government approved the HNDP based on this principle. In order to ensure equal availability of specialist medical services, the HNDP foresees the existence of 19 acute care hospitals, including 11 general, 4 central, 3 regional and 1 local hospital (see Figure 17.1).

In the period 2000–2006 the number of hospital beds decreased by 20 per cent, from 9828 to 7588 beds, and the structure of beds by specialty changed

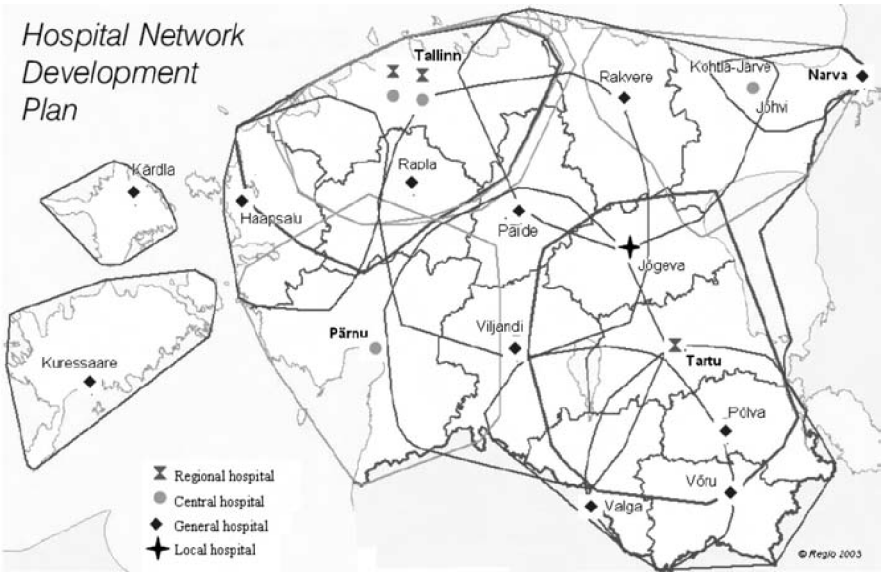

Figure 17.1 Overview of areas served by the Estonian hospital network

Source: Koppel et al., 2008.

significantly; that is, the proportion of nursing care beds increased remarkably, while the proportion of acute care beds decreased (see Table 17.1).

At the end of 2006 there were 55 hospitals in Estonia: 3 regional, 4 central, 12 general, 6 local, 7 special, 3 rehabilitation care and 20 nursing care hospitals, with a total of 7588 beds.

The reduction of acute beds has been related to the establishment of a hospital licensing system. As a result, small hospitals – hitherto predominantly providing long-term care – have lost their licence to provide acute care and have been turned into nursing homes. Other hospitals have been transformed into outpatient care centres providing specialist ambulatory care (Koppel et al., 2008).

In Estonia the range of activities and services in the hospital sector includes specialized outpatient care (including day care and day surgery) and inpatient care (including acute care, follow-up care, nursing care and rehabilitation). The total number of discharges, outpatient contacts, and insured individuals that used specialized medical care services during 2006 and 2009 are shown in Table 17.2.

17.1.3 Purpose of the DRG system

In 2001 the EHIF decided to introduce a DRG-based payment system. Stringent financial constraints exist for Estonian hospitals and the EHIF is not entitled to spend more than its budget (including reserves), since it is not able to raise health insurance contributions to cover the deficit. Therefore, the main motivation

Table 17.1 Hospital indicators, 1998–2008 (selected years)

	1998	*2000*	*2002*	*2004*	*2006*	*2008*
Structure of hospital beds by specialty (%)						
Acute care beds	n/a	77.3	74.2	73.2	69.7	n/a
Psychiatric beds	n/a	11.0	10.7	9.0	9.8	n/a
Beds for TB	n/a	3.2	3.5	3.8	3.6	n/a
Nursing care beds	n/a	8.4	11.6	13.9	17.0	n/a
General indicators of hospital beds						
Number of hospital beds rate per 1000	7.62	n/a	n/a	5.8	5.65	5.7
Acute care beds rate per 1000	5.84	n/a	n/a	4.26	3.94	3.85
Psychiatric beds rate per 1000	0.89	n/a	n/a	0.52	0.55	0.56
Hospital admissions per 1000	204.1	n/a	n/a	n/a	188.3	n/a
ALOS	10.3	9.2	8.4	8.0	7.8	7.9
Bed turnover	26.8	27.7	29.5	33.2	34.6	34.6
Bed occupancy rate (%)	74.6	69.9	67.7	72.6	74.1	74.3
Number of treatment cases						
Ambulatory care per 1000 insured	n/a	n/a	1876	1845	2000	n/a
Day care per 1000 insured	n/a	n/a	n/a	26	35	n/a
Inpatient care per 1000 insured	n/a	n/a	200	197	195	n/a

Source: Koppel et al., 2008.

Note: n/a: not available.

for introducing the DRG system was financial in nature, bearing in mind the particularly strict financial constraints of the EHIF budget. The consequences of these expense limits were particularly serious following the Russian economic crisis that affected the Estonian economy in 1999, driving the EHIF's reserves to zero. During the years that followed, the EHIF's budget revenues slowly increased, while pharmaceutical expenditure also increased rapidly, resulting in serious cost pressure on the EHIF. Thus, the DRG system was mainly seen as a tool to increase productivity and efficiency, rather than to increase the transparency of hospital output.[1] Another motivation for introducing a case-based payment system was

Table 17.2 Overview of discharges, outpatient contacts and insured individuals used specialized medical care services

Indicator	*2006*	*2007*	*2008*	*2009*
Discharges	249 398	248 711	249 784	240 227
Outpatient (excluding family practitioner) contacts	3 481 857	3 624 744	3 722 259	3 573 286
Number of insured individuals that used health care services during one year	796 815	810 834	819 055	800 578

Sources: EHIF, 2008, 2010b.

that the previous fee-for-service and per diem payment systems had led to inflation in the average reimbursement rate per case: inflation reached about 30 per cent between January 2000 and September 2002, while the official price increase was only 13 per cent (Koppel et al., 2008).

The importance of the DRG system has increased gradually with the increase (from 10 per cent up to 70 per cent since July 2009) in the share of the DRG payment system since the introduction of the system. In addition, over time the DRG system has became a tool for benchmarking and analysis. Since 2005, the EHIF provides hospitals with regular information updates regarding average length of stay, casemix index (CMI) (since 2008), use of some DRGs, share of outliers and so on, in order to give them the opportunity to compare with other hospitals, as well as to follow the trend of certain indicators across time.

17.2 Development and updates of the DRG system

17.2.1 The current DRG system at a glance

One DRG system has been in place in Estonia since 2003. No differentiation by region, purpose, or health care provider is applied. The decision to use one DRG system for the whole country was made early in the implementation planning process, and the question of whether to implement more than one system was not under consideration. Before the implementation of the current DRG system, several DRG systems were compared in order to find the best option for Estonia. The final decision was made in favour of the Nordic patient classification system (NordDRG).

The NordDRG system was adopted in 2003, along with the system's DRG grouping logic. In 2011 the grouping logic was updated and the NordDRG 2010 version was implemented. The total number of DRGs in the NordDRG Estonian 2010 version is 786 (496 in the 2003 version), 655 of which (489 in 2003) are used for reimbursement (see Table 17.3). The rest of the DRGs are 'empty'; that is, no cases are assigned to them.

The assignment of cases is based on diagnoses, procedures performed, age, gender, length of stay and status at discharge. DRGs apply only to inpatient care and day surgery, with the exception of long-term care, such as psychiatry, tuberculosis (TB) and nursing care, as well as expensive drugs and inpatient cases which include treatment with cytostatics (see subsection 17.5.1).

17.2.2 Development of the DRG system

The DRG implementation plan in Estonia was prepared in 2001 by the EHIF. It was initially planned for DRG-based reimbursement of hospitals to start in 2002. However, during the preparatory process it became clear that the plan was unrealistic and more time was needed for technical preparation. It was therefore decided that in 2003 the DRG system would be used only as a grouping tool and in 2004 the DRG system would start to be used as a payment tool.

Table 17.3 Summary description of the DRG system

Date of introduction	2003
(Main) purpose	2003 as a grouping tool since April 2004 as a reimbursement tool
DRG system	NordDRG
Data used for development	Database of EHIF
Number of DRGs	496 (until 2010) 786 (since 2011)
Applied to	Health care providers contracted with EHIF, acute inpatient cases and those outpatient cases involving surgical procedure(s)
Proportion of DRG/fee-for-service payments	2004: 10/90 2005: 50/50 2009 July: 70/30
Introduction of NCSP	2003
NCSP update	2010
Introduction of Estonian cost weights	2008
Update of DRG version	2011, NordDRG 2010 Full version

Before the implementation of the DRG system in Estonia, several DRG systems were compared to find the best option. The alternatives under consideration were the Australian Refined (AR)-DRG system, the Nordic NordDRG system and the Estonian case-based system. Various criteria were used to evaluate the available systems, such as other clinical classifications in use, clinical practice, clinical cases, cost of implementation, and technical support. Once the NordDRG system was chosen, work on adaptation began. The Nordic Casemix Centre produced an Estonian NordDRG version that was implemented in 2003.

For DRG weight calculation, two alternatives were considered. First, Estonia would calculate its own DRG weights according to the available historical billing information based on fee-for-service payments. The second alternative was to carry over Health Care Financing Administration (HCFA) weights and the DRG prices would be calculated based on the average reimbursement rate of each case. It was evident that hospitals would not be able to provide DRG-based cost information to use as an input for DRG weights calculation. The fact that Finland had tended to use HCFA weights from the outset without any problems encouraged the EHIF to choose this option. It was thought that starting with the United States HCFA weights system would provide a good basis for further development. In any case, the weight proportions tend to be analogous in different countries (EHIF, 2009). However, health care providers were more supportive of the Estonian national weights idea, as these were seen to better reflect the Estonian context. The decision was therefore made to use a 'home-made' mix of Estonian data and HCFA weights. In 2006 the project of developing Estonian national cost weights began and since 2008 the Estonian cost weights are used in the DRG price calculation. The adjustment of cost weights is in line with the recalculation of the prices of health care services.

Responsibility for developing and updating the DRG system in Estonia lies with the EHIF and it is carried out according to the DRG development plan.

17.2.3 Data used for development and updates of the DRG system

For developing the DRG system (including the grouping logic, cost weights, prices, and so on), the data mainly originate from the EHIF's electronic billing system. The data used for DRG grouping consist of different patient characteristics, such as age, gender, diagnoses, surgical procedures, the way patients arrived at the hospital, their status at discharge, and so on. For the development of the DRG system, other characteristics are used, such as the level of the hospital (regional, central, general hospital), average length of stay, CMI, average cost per case, and so on. Resource-consumption data are used for calculation of cost weights and DRG prices.

According to their contractual obligations with the EHIF, every health care provider must transfer the patient-level data (services provided, length of stay, diagnosis, and so on) to the EHIF database in order to be reimbursed. Thus, the main source used to develop the DRG system is the EHIF database. Expertise from medical professionals' associations and health care providers is also used as an input for system development, but the contribution of these actors to developing the DRG system has remained relatively modest.

17.2.4 Regularity and method of system updates

Since Estonia incorporated the NordDRG system, the regularity and methodology of system updates is steered by the Nordic Casemix Centre (see Chapter 16).

NCSP update

The first NOMESCO (Nordic Medico-Statistical Committee) Classification of Surgical Procedures (NCSP) version in Estonia was the generic classification Version 1.6 that was introduced in 2003. In practice, the NCSP has generic and country-specific versions that can be updated on an annual basis to introduce/change coding. In Estonia, a new updated NCSP version was introduced at the beginning of 2010.

Countries using the NCSP can further develop their own national versions of the classification. However, before proposing updates, local capacities need to be developed at country level and panels convened to facilitate discussions between administrators and medical doctors. Until recently this has not been implemented well in Estonia.

Cost weights and DRG prices update

Updating cost weights and DRG prices is the responsibility of the EHIF. As the calculation of cost weights and DRG prices is based on prices for fee-for-service health services, not on the actual resource need, the updating process is carried out as often as the prices of health services are updated. This update occurs annually (see subsection 17.5.2).

17.3 The current patient classification system

17.3.1 Information used to classify patients

Data used to classify patients (cases) are transmitted electronically by health care providers to the EHIF database. The regularity and frequency of data transmission, content of data and so on are regulated by legislation and by contracts. The information needed for grouping consists of the following information: principal diagnoses (in some cases diagnoses of co-morbidities and complications (CCs)), procedures performed, age, gender, length of stay and status at discharge. Resource-consumption data are not used for grouping. The primary classifications used in the NordDRG system are International Classification of Diseases 10th revision (ICD-10) for diagnoses and the NCSP for surgical procedures.

17.3.2 Classification algorithm

The overview of the DRG assignment process is depicted in Figure 17.2. It starts from a set of 'Pre-MDC' (major diagnostic category) assignment rules. Pre-MDC definitions refer to the group of DRG assignment rules that ignore the MDC indicated by the principal diagnosis of the patient. This includes DRGs for highly

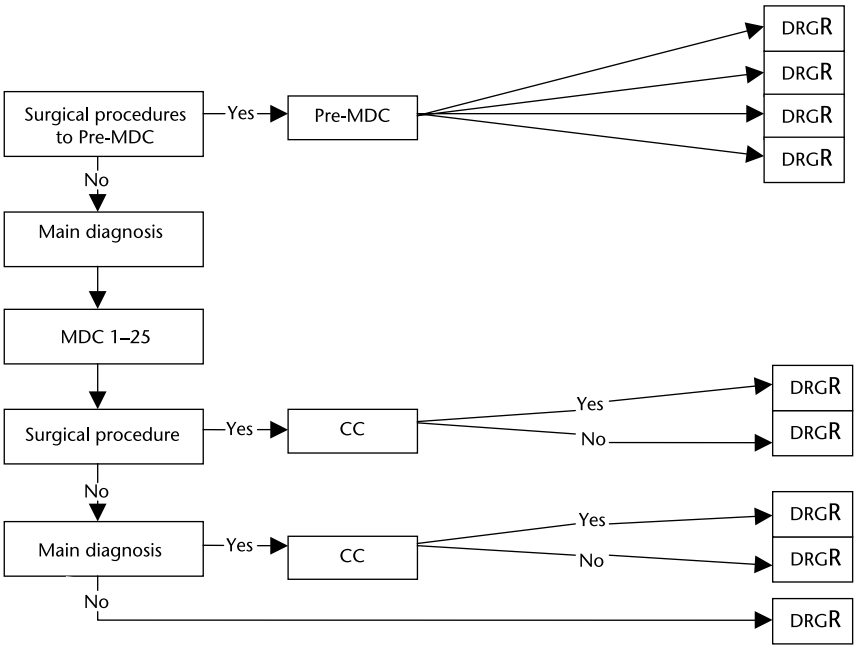

Figure 17.2 Main logic of the NordDRG system

Source: Nordic Casemix Centre, 2003.

specialized and expensive care. Examples of these are lung transplantation and bone marrow transplantation. Second, the Pre-MDC category is needed to avoid misclassification due to some differences between ICD-10 and ICD-9-CM (9th revision, Clinical Modification). Patients with multiple traumas, HIV-related problems, obstetrics and neonatology might entail a principal diagnosis that originally indicates specific MDCs. However, subsequent information may require the cases to be reallocated.

After the Pre-MDC is interpreted, the principal diagnosis of the case indicates the MDC. MDCs are mainly determined by organ systems, such as nervous system, digestive system, ear, nose, mouth and throat, and so on. Some MDCs are related to the etiology of the disease, for example infectious and parasitic diseases, injuries, poisonings and toxic effects of drugs, burns, and so on. There are 26 MDCs in the NordDRG 2010 version used in Estonia (there were 27 in 2003).

For each MDC a decision tree is designed with branching nodes, requiring information relating to the surgical procedure (which needs an operating room (OR)),[2] diagnoses of CCs, age, length of stay, status at discharge, and whether the patient is discharged to home or to another institution, whether the patient died or discharged her/himself against medical advice. At each branching node, the condition at the node is processed by identifying the information needed and comparing it to lists of codes or rules, determining which of the alternative routes to follow. The process is continued until the case ends up in one appropriate DRG.

17.3.3 Data quality and plausibility checks

Different means are used by the EHIF for assessing and improving data quality. All information in the EHIF database is gathered by using the electronic data transmission system. Health care providers complete their medical bills by inputting different patient and provider characteristics, as well as details of services carried out according to the fee-for-service health care service list. Completed bills are gathered together as 'electronic packages' and transmitted to the EHIF.

In the initial stage of data quality checks, format controls are carried out in the electronic system before the electronic packages enter the EHIF database. During format controls, different patient and provider characteristics are checked to determine whether they meet certain requirements, for example those set by legislation or under contract. The format of diagnoses and procedure codes described on medical bills is also checked. All medical bills with mistakes are returned to health care providers, giving them the opportunity to correct the inaccurate information. The health care provider can then transmit the electronic package again. Those bills that contain no mistakes are passed to the provider for final acceptance before payment.

In addition to format controls in the electronic system, some other methods are used for checking data quality. For instance, randomized controls of medical records are carried out by teams of EHIF 'trustee doctors'. These checks aim to compare the ICD-10 and NCSP codes described in the medical records with

those on the reimbursement claims and to detect inappropriate use of primary classifications which could lead to the change in assignment of cases into DRGs. On a randomized basis the trustee doctors are sent to the hospitals to check the medical records or the medical records are brought to the EHIF office upon request. The percentage of the medical records checked in order to verify the coding quality amounts to about 4–5 per cent of the total number of records collected.

For most of the cases in which errors are found no financial sanctions are applied, unless fraud or abuse is detected. However, in detecting problems in coding quality, the trustee doctors provide feedback to health care providers, informing them of any inappropriate coding.

17.3.4 Incentives for up- or wrong-coding

There is no clear evidence of up- or wrong-coding. Instead, the results of randomized controls carried out by the EHIF show under-coding by health care providers, mainly due to the lack of accurate reporting of relevant information among medical doctors.

17.4 Cost accounting within hospitals

Cost accounting within hospitals in Estonia can be described as operating on two levels. For reimbursement purposes, hospitals must carry out service volume accounting per patient for all the services listed in the EHIF price list, and they must issue a relevant invoice per patient (volume of services delivered multipled by service prices). In the case of inpatient care and day care, the majority of invoices are recalculated by the EHIF and 70 per cent of the value is replaced by the relevant DRG price (see subsection 17.5.1).

This chapter deals with another level of cost accounting in hospitals, relating to the cost of providing services. This information is an input for fee-for-service pricing, and billing information relating to fee-for-service pricing is an input for DRG pricing (on an annual basis) (see subsection 17.5.2).

Cost accounting in hospitals in Estonia is not regulated in a specific way, as there is no requirement to report costs to health care authorities. Hospital steering and financial control is carried out by hospital supervisory board, and the Ministry of Social Affairs receives hospitals' annual reports (including financial reports). The only cost item monitored by the Ministry of Social Affairs is the average salaries of medical professionals, such as doctors, nurses and assistant nurses. That said, in the case of approving new health care services or updating prices of existing services, there is a regulated process for presenting relevant information to the EHIF (see subsection 17.4.1).

17.4.1 Regulation

The service costing process is regulated by ministerial decree and is an integral part of the benefits package (service list) update process, which is regulated

by law (Health Insurance Act) and by governmental decree. According to the content of the regulation, the Government approves services and the DRG pricelist, the EHIF is responsible for expertise relating to cost-efficiency analyses of services within the benefits package and all applications for new services. Updating of existing services or elimination of services is processed in collaboration with the EHIF and professional associations or providers' associations (see subsection 17.6.1).

According to regulation, applications for new or updating existing services must include relevant cost information. In order to process applications, the EHIF needs to receive actual cost data from at least one hospital from each category of hospitals (regional, central and general). The regulation of costing (and pricing) of hospital services in Estonia can therefore be described as centralized and 'top-down' in approach.

17.4.2 Main characteristics of the cost-accounting system(s)

For the costing process of services in specialized medical care, the EHIF has set up a standard costing model which – according to regulations – comprises an activity-based costing methodology, whereby each service is described through certain activities and those activities are related to the costs of resources.

Recourses are allocated to direct and indirect resource categories , including, for example, drugs; single-use medical devices; multi-use medical devices; labour, including training and administration,; infrastructure-related costs, including investment (loan interest not included); and auxiliary services. From July 2003, infrastructure costs have been included in the prices paid to providers by the EHIF, in order to ensure geographical consistency and fairness in infrastructure development. The infrastructure costs in health service prices include the facilities' depreciation costs based on the market price of buildings, and a 36-year depreciation period. The mark-up has been calculated according to providers' optimal capacity per bed (which includes a standard number of square meters per bed that will produce an optimal occupancy rate). Since 2008, infrastructure cost expenditures were covered by the state budget as an earmarked allocation to the EHIF's budget, and will still be allocated to providers through the service prices. In 2009 the state stopped allocating infrastructure costs to the EHIF due to the economic downturn and therefore the EHIF must cover these from the regular health insurance budget.

Within all resource categories (except drugs and single-use medical devices), annual costs and effective utilization of resource units (in minutes or usage frequency) are determined, along with unit costs per utilization unit. Annual costs of resources are established by regulating degree (for doctors', nurses' and assistant nurses' salaries), expert opinion (for infrastructure investment costs) and all other resources are determined based on actual cost data presented by hospitals. The level of effective utilization is determined by the EHIF; usually 8 hours per working day (minimum one shift effective utilization).

Utilization of resource units by activity and by service is based on the expert opinion of professional associations, but this is checked by the EHIF

against actual unit data from hospitals and often negotiated in the event of discrepancies.

Cost and resource-utilization data presented by hospitals should represent the total cost of the previous year's audited financial statements. As costs in hospitals are recorded mostly at the department or hospital level, and not at the service level (top-down approach), cost data presented by hospitals are aggregated only by medical specialty or at hospital level. This creates some uncertainty and results in an averaging approach within the EHIF cost model (costs defined at service level) in terms of checking pre-calculated costs against actual data presented.

Although there are several hospitals where costs are recorded at the level of service(s) delivered to the patient, the generated information is not comparable due to a lack of standardization of hospital information systems.

17.5 DRGs for hospital payment

17.5.1 Range of services and costs included in DRG-based hospital payments

How applicable the DRG system is to health care providers depends on the existence of a contract with the EHIF, regardless of the ownership, geographical location, teaching status, size, and so on, of health care providers. It means that the DRG system is applied to all specialized medical care providers contracting with the EHIF. The health care providers working without an EHIF contract are mainly financed on the basis of fee-for-service payments paid out of pocket.

The DRG system is used in combination with the fee-for-service payment method. To minimize any financial risk in the new system, the share of DRG payment applied upon submitting a reimbursement bill was initially (in 2004) set as low as 10 per cent. In 2005 the share of DRG payment was raised to 50 per cent and since July 2007 it amounts to 70 per cent. The share of fee-for-service payment applied upon submitting a reimbursement bill has decreased accordingly, from 90 per cent in 2004 to 30 per cent in 2009.

In practice, every bill lists the health care services delivered to the patient during their hospital stay. The bill is calculated by adding together the fee-for-service prices of each of the services. In addition, every bill is assigned to one DRG with its respective price. The combination of DRG and fee-for-service reimbursement means that the total sum of the medical bill is calculated as follows: (1) the fee-for-service element of the bill is multiplied by 0.3 (since July 2009); (2) the corresponding DRG price is multiplied by 0.7; (3) the latter is added to the fee-for-service sum.

DRGs are used for reimbursement in acute inpatient cases and for those outpatient cases involving surgical procedure(s). However, the DRG payment system does not apply to all assigned cases. A system of DRG outliers (rules to detect cases that do not come under the DRG-based reimbursement system) exists in Estonia. The outliers can be divided into two groups, as detailed here.

1. Cases with certain characteristics (types of care), such as psychiatry, rehabilitation, TB and follow-up cases. This same group of outliers also contains cases determined according to their principal diagnosis (for example, Z51.1 and Z51.2 – chemotherapy; and Z76.3 – healthy person accompanying ill person), as well as some referred cases (for example, while referring the patient from a higher level hospital to a lower level one, the patient is considered an outlier).
2. Cost-outliers; that is, cases that are too low cost or too high cost.

All above-mentioned cases are treated as DRG outliers and are reimbursed fully through fee-for-service payment(s). Pricing of DRGs is based on prices and casemix (according to reimbursement information) of the health services provided, rather than on the explicit cost information (see subsection 17.5.2). DRG prices – along with health service prices – are equal for all providers and there are no higher rates for teaching hospitals or for other higher level or specialized hospitals. Health service prices cover all costs related to providing services, except those related to scientific and teaching activities, which are funded separately. All prices approved are maximum prices and providers and the EHIF can agree on lower prices for specific contracts.

17.5.2 Calculation of DRG prices/cost weights

DRG price calculation is conducted by the EHIF and alongside updating the prices of health services; that is, when the prices of health services are going to change, current DRG prices need to be recalculated and the cost weights adjusted accordingly. The DRG price calculation is carried out at patient level and is based on fee-for-service billing information, taking into account the latest available data from all health care providers. DRG prices are equal for all health care providers.

The calculation of DRG prices can be divided into separate steps, as detailed here.

- The process starts with data quality analysis, in order to detect and eliminate data of poor quality.
- Second, the coefficient of volume inflation is calculated, in order to take into account the changes in the structure of health services by comparing specified periods of time.
- Third, the impact of change of health service prices is calculated by comparing current DRG prices with the new average price *per* DRG, calculated on the basis of new fee-for-service prices. For calculation of the average price *per* DRG, two-phase trimming is used in order to eliminate the impact of outliers (see Figure 17.3). In the 1st phase of trimming, the outlier cases with costs outside 3 standard deviation are excluded and in the 2nd phase, outlier cases with costs outside 2 standard deviation are excluded.
- The correction of the average price per DRG is carried out by applying to the current DRG price the above-mentioned coefficients of volume inflation and impact of change of health service prices.

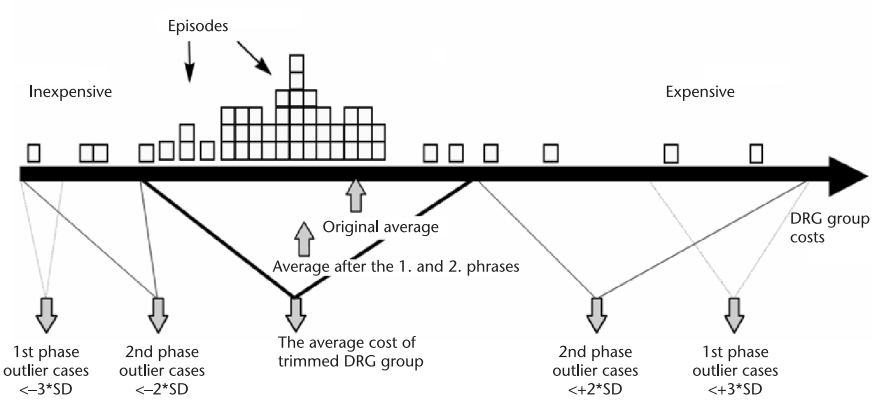

Figure 17.3 Trimming method used in the calculation of the DRG price

Source: Compiled by Jorma Lauharanta.

- For calculation of the base rate, all bills remaining after two phases of trimming are taken into account. The base rate is calculated by dividing the total sum of fee-for-service prices by the total number of bills.
- Cost weights *per* DRG are calculated by dividing the corrected DRG price by the base rate. Cost weights are compared with current ones and adjusted if necessary;
- The limits of each DRG are set up – the upper and lower limits are identified according to the last trimming points (see Figure 17.3). In many cases the lower limit is a negative value and therefore the lower limit is set equal to the lowest per diem rate.
- Finally, the calculation of the price for each DRG is carried out by multiplying the base rate by the cost weight of the corresponding DRG.

17.5.3 Use of DRGs in hospital payment

As already mentioned, three different payment methods are used for inpatient care – DRGs, fee-for-service payments and per diem payments. As the share of DRG payments has increased throughout the years (see subsection 17.5.1), the utilization of the DRG-based payment method has increased accordingly and in 2009 it accounted for 39 per cent of total hospital expenditure for inpatient care (see Table 17.4).

Table 17.4 Proportion of different payment mechanisms for inpatient care in acute care hospitals, 2006–2009

Payment method	*2006*	*2007*	*2008*	*2009*
Fee-for-service (%)	35	36	37	33
DRG (%)	36	34	33	39
Per diem (%)	29	30	30	28

Source: EHIF, 2010a.

17.5.4 Quality-related adjustments

Although introducing the pay for performance (P4P) initiative has been considered, no quality-related adjustment reimbursement mechanism is applied to hospitals in Estonia thus far.

The implementation of new payment methods and any changes in payment methods – together with the processes by which care is commissioned – should be undertaken carefully and with emphasis on making the most of available evidence and contributing to the body of evidence on how trading incentives affect the efficiency of health care delivery (Maynard, 2008).

17.5.5 Main incentives for hospitals

Not many incentives exist to set up DRG systems for hospitals. The main argument of the EHIF in favour of setting up such a system was that hospitals could control the increase of services in the casemix. However, in the current approach to DRG pricing, the change in the average reimbursement rate for the casemix is taken into account. The only incentive for hospitals is to maximize outpatient and day-care services, for which DRGs are not applicable.

17.6 New/innovative technologies

17.6.1 Steps required prior to the introduction of new/innovative technologies in hospitals

Estonia has no systematic programme for health technology assessment (HTA), mainly due to a lack of interest on the part of policy-makers and a lack of trained human resources. The main activities in this field include assessing new services to be added to the benefits package and prescription drugs to the positive list; evaluating the need for high-cost technologies; and ensuring the safety of medical equipment. These activities are carried out at national level and there is no evidence on the use of HTA at the organizational level. However, hospitals conduct some cost-analysis studies when high-cost technologies are purchased (such as magnetic resonance imaging (MRI) or computerized tomography (CT) scanners) (Koppel et al., 2008).

During the 1990s, the inclusion and exclusion of services from the benefits package was decided by the Ministry of Social Affairs, following evaluation by a ministry committee made up of provider and sickness fund representatives. Evaluations were based on treatment effectiveness criteria and, where possible, proposals for adding new treatments were weighed against existing treatments.

Since 2002, there have been clearer and more explicit rules for adding new services to the benefits package and establishing the appropriate level of cost-sharing. In 2002, when the EHIF was established as an independent public body, it was tasked with the responsibility for defining the benefits package in collaboration with other stakeholders. The benefits package is agreed by the EHIF and the Ministry of Social Affairs, and a final decision is made by the

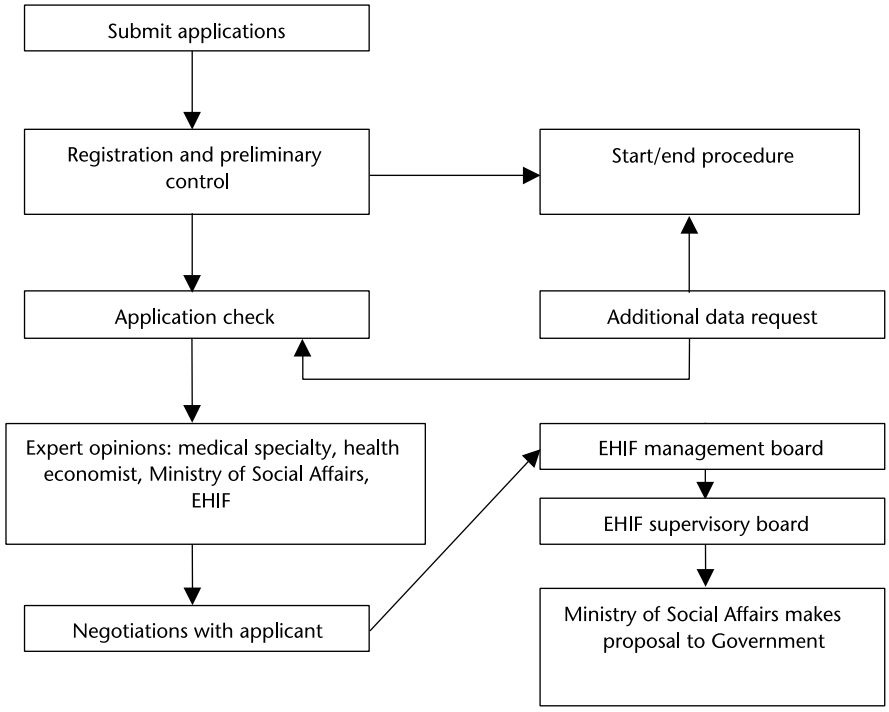

Figure 17.4 Procedure for amending the benefits package

Source: EHIF, 2008, 2010b.

Government, which endorses the price list. The procedure for amending the benefits package is presented in Figure 17.4.

17.6.2 Payment mechanisms

The funding of new technologies included in the benefits package does not differ from the funding of any other services within the package and there is no specific or separate funding for innovative technologies before they are included.

17.6.3 (Dis-)incentives for hospitals to use new/innovative technologies

No straightforward system of incentives exists for the utilization of new or innovative technologies in Estonia. The driving force is the interest and initiative of clinicians and leadership of medical groups in certain hospitals or at country level. However, due to some historical decisions, utilization of some technologies (high-end radiology, interventional radiology and cardiac surgery,

for example) is increasing, as these are overpriced relative to the actual costs of providing the service(s).

17.7 Evaluation of the DRG system in Estonia

17.7.1 Official evaluation

Evaluation of the NordDRG system relies on the Nordic Casemix Centre. The NordDRG expert network is the main advisory group and platform for discussions relating to the maintenance, performance evaluation and development of the NordDRG system. The suggestions for annual updates of the common NordDRG are based on expert network recommendations.

In addition, the Nordic Casemix Centre carries out evaluation, testing and certification of DRG groupers to ensure compatibility with the NordDRG definitions. The Centre also cooperates with the main NordDRG software provider(s) in delivering the common NordDRG version (as well as national versions based on national codes) to the NordDRG users, as appropriate.

In terms of evaluation at national level, there has not been any official evaluation of the DRG system. However, the EHIF has conducted various analyses in order to assess the data quality (mainly the use of primary classifications), DRG pricing methodology, preparedness for and impact of shifting to new NCSP and DRG grouper versions, as well as the impact of increasing the share of DRG-based payment in reimbursement, and so on. The results of the analyses have been used to further develop and fine-tune the DRG system in Estonia.

17.7.2 Authors' assessment of successes and problems

One of the central arguments for the introduction of the DRG system was to increase efficiency and contain the health insurance expenditure. From the purchaser point of view, during the initial years of the adoption of the DRG payment system in Estonia the set objective was met; namely, the DRG system has contained the average cost per case compared to the situation that would have arisen if only a fee-for-service and per diem-based payment system had been used (as it was before the implementation of the DRG system).[3] However, the results show the differences between various hospitals. Therefore, bearing in mind the strategic goal of the DRG system, the further development and fine-tuning of the system is carried out according to the four-year DRG development plan.

The use of the DRG system as a benchmarking tool began in 2005 and has developed over time. Since 2009 the range of indicators has broadened and hospitals listed in the HNDP are provided the data via a web page of EHIF. This provides the opportunity to compare and assess different performance indicators. Until recently, hospitals in Estonia were benchmarked (length of stay, use of some DRGs, percentage of outliers, and so on) mostly at the specialty level, without standardizing for case structure and severity. The introduction of the

CMI since 2008 affords hospitals (and other authorities) additional dimensions for more objective comparison of performance results.

Comparisons are a powerful way of driving performance improvement. However, there is a great deal of potential in Estonia to use this information in order to locate and pinpoint the strengths and weaknesses of hospital performance and to use the data to support decision-making processes.

17.8 Outlook: Future developments and reform

17.8.1 Trends in hospital service (or general health care) delivery

The most fundamental changes for building a functioning health system in Estonia were made in the early stages of reform, during the early 1990s. The incremental arrangements that followed were implemented to support the public health, primary health care and hospital sector reforms and to strengthen the EHIF's purchasing function. Therefore, the attention has shifted to improving and monitoring performance of the system as a whole.

In terms of service delivery, the main challenge is presented in the need to optimize the system. The strength of the current delivery system is in family medicine-centred primary health care. This system covers a wide range of services, without co-payments and with minimal waiting times. It is complemented by the ambulance (emergency) services for care outside normal working hours. The challenge lies in making the delivery system more patient-centred and coordinating care at the primary care level, with the development of additional nursing and rehabilitation services.

17.8.2 Trends in DRG application/coverage

The EHIF is responsible for the development of the DRG system in Estonia. This is carried out in line with the four-year DRG development plan approved by the management board of the EHIF.

The strategic goal of the DRG system is to contribute to increased efficiency in the use of health insurance resources. In order to achieve this goal, the EHIF will implement the following measures:

- improve the quality of coding
- develop DRG-based analysis and feedback
- develop transparent pricing and funding principles.

Improving coding quality involves, *inter alia*, the correct and unified use of primary classifications (ICD and NCSP) by health care providers, and the improvement of coding quality assessment. The development of methods of analysis and benchmarking is related to improvement in technical resources, together with the respective competences of the staff of the EHIF. Actions to develop transparent methodology of DRG pricing and funding principles include, *inter alia*, the regular updating of the current DRG grouping version.

17.9 Notes

1 Due to the former fee-for-service payment structure and well-developed electronic data transmission systems, Estonia already had a relatively transparent overview of hospital output.
2 Cases with an OR procedure are assigned to the 'surgical' DRGs and those without an OR procedure are assigned to the 'medical' DRGs.
3 More details are available at the EHIF web site (www.haigekassa.ee, accessed 1 August 2011).

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