

PAYMENT METHODS FOR HOSPITAL STAYS WITH A LARGE VARIABILITY IN THE CARE PROCESS



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LIST OF ABBREVIATIONS

ABBREVIATION	DEFINITION
ABC	Activity Based Costing
ACA	Affordable Care Act
APCs	Ambulatory Payment Categories
ARS	Agence Régionale de santé (Regional Health Agency)
ATIH	Agence Technique de l'Information sur l'Hospitalisation (Technical Agency for Hospitalization Information)
CAH	Critical Access Hospital Program
CC	Complications and Comorbidities
CCG	Clinical Commissioning Groups
CMS	Centers for Medicare and Medicaid Services
DAGS	Danish Ambulatory Grouping System
DFG	Dotation Forfaitaire Garantie (Lump Sum Warranty)
DGOS	Direction Générale de l'Offre de Soins (General Direction of the Care Package)
DMI	Medical Device Implants
DRG	Diagnosis Related Groups
DSS	Direction de la Sécurité Sociale (Directorate of Social Security)
EHIF	Estonian Health Insurance Fund
ENCC	French hospital cost database
FAU	Emergency Hospitality Package
FFS	Fee For Service
GB	Global Budget
G-DRG	German DRG
GHM	Groupes Homogènes des Malades (French DRG classification)
HAS	High Authority of Health
HRG	Healthcare Resource Groups
ICD	International Classification of Diseases



InEK	Institut für das Engelsystem im Krankenhaus (German Institut for Hospital Payments)
IPPS	Inpatient prospective payment system
LFSS	Social Security Financing Act
LOS	Length-of-Stay
MDC	Major Diagnostic Categories
MS-DRG	Medicare Severity – Diagnosis Related Group
NCSP	NOMESCO Classification of Surgical Procedures
NHS	National Health Service England
ONDAM	Objectif National des Dépenses d'Assurance Maladie (National Health Insurance Expenditure Objective)
OPCS	Office of Population Consensus and Surveys
OPPS	Outpatient PPS
OPS	Operationen- und Prozedurenschlüssel (German classification system for surgeries and procedures)
PbR	Payment by Results
PCS	Procedure Coding System
PD	Per-diem
PET/CT	Positron emission tomography and computerised tomography
PMSI	Patient Classification System
PPS	Prospective Payment System
PRG	Procedure Related Groups
RC	Reference Costs (England)
TAVI	Transcatheter Aortic Valve Implantation



■ SCIENTIFIC REPORT

1 INTRODUCTION AND BACKGROUND

How to use this document?

This Scientific Report is not intended to be read as a stand-alone document, but as a complement to the [Short Report](#) of this study. It gives a detailed account of the methods and results of each of the scientific building blocks underpinning the messages rendered in the Short Report.

The background, problem description, as well as the discussion of the results, the conclusions and policy recommendations are to be found in the Short Report.

The Short Report is published as a separate document on our website. It can be accessed from the same referral page as the current document.

Scope of the study and research questions

In April 2015, the minister of Social Affairs and Public Health published a comprehensive plan to reform the Belgian hospital landscape.¹ One of the central elements in this Action Plan is the idea to classify hospital stays in three clusters and to apply a different payment system to each of the clusters. The plan explicitly mentions that the payment system applied to each cluster should be determined in terms of the financial risk sharing between the payer and the hospital, with the delineation between the clusters to be based on the predictability of the care process.

KCE was asked by the minister of Social Affairs and Public Health to **review international payment models for hospital stays with a large variability in the care process** and to **assess the feasibility of using these payment models in the Belgian healthcare context**.

The main research questions for the international comparison are:

- For which patient groups, hospital stays or services/products do hospitals outside Belgium receive other (additional) payments besides DRG-based payments?
- What are the criteria to determine which patient groups, hospital stays or services/products are outside the scope of DRG-based payments?



- How are hospitals reimbursed for these patient groups, hospital stays or services/products?
- Do specific mechanisms exist that support the centralisation of specific services at particular providers?
- How are outliers defined and what mechanisms for reimbursement exist?

In most countries outpatient care, mental care, long-term care, rehabilitation and ambulatory emergencies are not financed through DRG-based hospital payments. Therefore they are outside the scope of this study which has a **focus on acute care**. The same applies to payments for non-patient related hospital activities such as research or training. Finally, an evaluation of whether differences in physician fees or salaries (sufficiently) take into account variability in the care process is outside the scope of the current study. The focus is on methods to pay hospitals, but it will be indicated whether specialist fees are included or not in the hospital payment.

The ultimate goal of the study is to identify lessons that can be learned from international experience and that may guide a possible reform of payment methods for Belgian hospitals. In the current reform plans, this concerns hospital stays in the third cluster. It should, however, be kept in mind that a simulation of the financial impact at the national or hospital level of possible payment reforms is outside the scope of this study.

Research methods and overview of the report

The recommendations (see Short Report) are based on

- an analysis of exclusions and payment methods, besides the regular DRG-based payments, in selected countries;
- a description of payment methods for complex, rare or difficult to standardise care in the current hospital payment system in Belgium and a comparison with international practice (in Short Report).

The study follows a mixed-methods approach. The main steps are summarized in Table 1. A detailed description is provided in Chapter 1.



Table 1 – Mixed-methods approach

What?	How?
Horizon scanning exercise	• Review of the literature • Identification of a long list of countries (Denmark, England, Estonia, France, Germany, USA-Medicare Part A, Sweden, Switzerland, Austria, Finland, Israel, Italy, the Netherlands), where DRG-based payments are supplemented by other payment mechanisms • Collection of information on the structure of the DRG systems • Selection of six countries for full inclusion on the basis of the following criteria: use of complementary payment mechanisms, uniform DRG-based payment system across the country, availability of contacts/DRG-experts, and other aspects such as recent developments/reforms
Description and analysis of the current Belgian payment system	Review of existing literature: grey literature, legal documents, policy papers
International comparison of exclusion mechanisms applied in six countries (Denmark, England, Estonia, France, Germany, USA-Medicare Part A)	• Development of a questionnaire asking about what is excluded from the DRG-based payment systems, why it is excluded and how it is reimbursed • Completion of the questionnaire by national experts and review of completed questionnaires by TU Berlin (<i>Technische Universität Berlin</i>) researchers; experts answered additional questions about points that had remained unclear in their original responses • Review of existing literature: technical reports and studies mentioned by national experts
Scientific validation	Review of the scientific report by independent scientific experts



2 METHODOLOGY AND FRAMEWORK

A horizon scanning exercise was conducted to identify a long list of countries/regions/programmes, where DRG-based payments for hospitals are supplemented by other payment mechanisms for specific patient groups, hospital stays or services/products (pharmaceuticals, implants, invasive medical devices and other medical consumables). Information was collected on the structure of the DRG system, the use of supplementary payment mechanisms, the fragmentation of DRG-based payments (e.g. among the regions of the country), the availability of contacts/DRG-experts, and other aspects such as recent developments/reforms. Based on these criteria, countries on the long list were ranked (see Table 2). The first six countries in the table were included in the short list:

- Denmark
- England
- Estonia
- France
- Germany
- USA (Medicare Part A)

A common reason for exclusion of countries was the degree of fragmentation of the payment system. In Austria, Finland, Italy or Israel, payment systems for hospitals vary by state, region, hospital district or by insurer.²⁻⁵ Focusing on one specific region would have been too much related to specific regional and cultural characteristics. Also in Switzerland, a fragmented system with several insurers leads to non-transparent DRG-tariff negotiations.⁶

In general, countries were excluded if the payment system was (a) characterized by a wide degree of in-country variation and/or (b) payments were determined in an intransparent process of negotiations.

France was included because of its similarities to the Belgian system concerning hospital payments and fee-for-service payment in private hospitals. Denmark was included due to its recent large-scale changes in the hospital infrastructure which centralised the system and its ongoing payment reforms to support infrastructural changes.⁷ Estonia was chosen because of its mixed reimbursement system of DRG-based payments combined with fee-for-service payments. Germany and England were selected because of a transparent access to information about their DRG systems. It was also assumed that these countries utilize a data-driven approach for excluding products/services and other elements from the DRG-based payment system. The USA Medicare Part A health coverage was included due to the separately paid physician fees and the long experience with DRGs.

Because detailed information on hospital payment systems is often not available and fragmented in the international literature, a questionnaire was developed (Appendix 1), and experts in each country on the short list were asked to complete the questionnaire. All experts have worked on previous projects about national DRG systems and have demonstrated their expertise in this field, or they were recommended by collaborators from previous projects (list of names in Appendix 2). Completed questionnaires were reviewed and national experts answered additional questions about points that had remained unclear in their original responses. Technical reports and studies that were mentioned by national experts or identified by searching the available literature (grey and peer-reviewed) were assessed in detail.



Table 2 – Long list of countries with reasons for inclusion/exclusion

Country	Payers (multiple/single)	DRG-based payment combined with ...	Reason for inclusion / exclusion
Included			
Denmark	Common payment system (with adjustments)	Global Budgets	Recent large-scale changes in hospital-structure, systematic pathways for stroke patients
England	Single payer	Global budget (GB), additional payments	Transparent DRG system, no language barrier
Estonia	Single payer	Fee for Service (FFS) (33%), per diems (28%)	Combination of FFS and DRG-based payments
France	Multiple payers, common payment system	GB, additional payments	Similarity to Belgian system concerning private hospitals (e.g. FFS-payments for doctors)
Germany	Multiple payers, common payment system	GB, additional payments, per diems	Transparent DRG system, no language barrier, data-driven exclusion of services and patient-groups
USA-Medicare Part A	Multiple payer, common payment system	Depends on hospital	Separate FFS payments for physicians and FFS adjustments
Excluded			
Sweden	Multiple payers, multiple (regional) payment systems	Differs by council	Exclusion list varies widely between counties.
Switzerland	Multiple payers, common payment system, negotiated prices	Additional payments	Non-transparent negotiations about prices
Austria	Multiple payers, common payment system	Differs by state, budgets, per diems	DRG-based payment differs by states
Finland	Multiple payers, multiple payment systems	Differs by district	DRG-based payment differs by hospital districts
Israel	Multiple payers, common payment (possibly with adjustments)	DRGs, per diems and FFS	Payment system varies by insurer
Italy	Single payer, common payment (with regional tariffs)	Per diems (for long stay outliers), global budget, additional payments	Very fragmented system with great variation between regions
The Netherlands	Multiple payers, common payment system, negotiated prices	Global budget, additional payments	DRG-like payment system is too different from other DRG-based payment systems



3 BACKGROUND ON THE HOSPITAL PAYMENT SYSTEM

The first country using a DRG-based payment system was the USA. European countries followed later, most of them started in the early 2000s.⁸ Since then, DRG systems have been further modified and developed, and the number of DRGs generally increased, as more subgroups have been created. Today, there is a variety of systems, with each system having its unique characteristics.

This chapter gives a brief overview of the most important characteristics that are relevant for the subsequent analysis. Table 3 provides an overview to costs and services covered by national DRG-based hospital payment systems.

Table 3 – Range of services and costs included in the DRG systems

Country	Range of hospital services included	Range of costs included
Denmark	Inpatient care	The payment covers all hospital costs except education & research, depreciation and capital costs
England	Acute inpatient care and outpatient care	Tariff reflects the full cost of provision and includes all operating expenses, staff costs and capital costs (both interest and principal), but excludes the costs of education & research
Estonia	Acute inpatient care and surgical outpatient care	The payment covers all hospital costs except education & research and fee for service
France	Acute inpatient care	Payments for physician fees (excluded for private, for-profit hospitals), other medical staff, investment in technical equipment, medical material/devices/drugs, infrastructure/overhead. Education & research costs are excluded
Germany	Acute inpatient care	All costs except costs for investing in/maintaining infrastructure and education & research
USA	Acute inpatient care	All costs except fees for physicians and education & research



3.1 Denmark

Context: DRG-based hospital payment was introduced in 1999. It started with 10% of the budget that was determined in relation to DRGs and this proportion has progressively increased to 60%. The remaining 40% are distributed with negotiated global budgets. Prior to the introduction of DRG-based payment, global budgets (mainly based on past performance) were exclusively used to allocate resources to hospitals.^{7, 9} The total number of DRGs has increased from 599 in 2006 to 743 in 2017. This number includes two severity levels for most base-DRGs (with complications and without).

Services and costs covered by DRG-based payments: DRGs are applied to all inpatient cases. Outpatients are reimbursed based on the Danish Ambulatory Grouping System (DAGS). All hospital costs, except education & research, depreciation and capital costs are covered.¹⁰

DRG-system updates: Each year, all public hospitals deliver their accounting information to the National Health Data Association, which is responsible for price setting and updates. Tariffs are calculated using cost-data of two years (instead of using only one year), which doubles the number of analysed cases. The time lag between data collection and the tariff updates is two years.

Private versus public hospitals: DRG payments are only applied to public hospitals (90%) and not to private hospitals, where the payment is based on negotiations with the regions.¹¹

3.2 England

Context: Healthcare Resource Groups (HRGs), the English version of DRGs, were launched in 1991 and HRGs have been used for hospital payment since 2004. Paying hospitals via HRGs is known as payment by results (PbR). Beforehand hospitals were mainly paid using a system of annual block contracts with an agreed sum of money for a given amount of activity.¹² The current version HRG4+ defines around 2 300 HRGs. This number includes HRGs which are split in up to six levels of severity based on aggregate complexity of patients with multiple complications and comorbidities (CCs).^{13, 14} National Health Service (NHS) England and NHS Improvement (formerly Monitor) are jointly responsible for the pricing system. Furthermore, Clinical Commissioning Groups (CCGs) are responsible for local commissioning of health services (e.g. setting prices for services where there is no national price available or agreeing on local variation to the payment system). Local price setting must comply with the rules set by NHS England and NHS Improvement. An extensive description of this process can be found in their report for tariff setting in 2017/18 and 2018/19.¹⁵

Services and costs covered by DRG-based payments: All inpatient cases except psychiatric services, community and ambulance services are covered by the HRG tariffs. Hospitals need to pay expenses for labour, equipment and capital cost with it. Costs of education & research are excluded.¹⁶

DRG-system updates: Submission of costs to the reference cost database is mandatory for all NHS trusts in England. The system is yearly revisited. NHS England and NHS Improvement are jointly responsible for the pricing system. The time lag between data collection and the tariff updates is three years. There is an increasing tension to move towards the 2-years tariff, where the tariff would not be updated on a yearly basis, but in longer time intervals to allow for better budget planning by the providers.

Private versus public hospitals: The HRG-based payment system is mainly applied to public hospitals. In order to supplement the provided care, additional capacity is brought in from some private providers via treatment



centres.¹⁷ It is estimated that treatment centres provide care to approximately 300 000 – 350 000 patients per year.¹⁶

3.3 Estonia

Context: The DRG system was initially introduced as a patient classification instrument in 2003 and from 2004 onwards used as a reimbursement tool. The DRG system is used in combination with FFS payments. The total reimbursement for hospitals is 70% based on DRG prices and 30% based on FFS. Today, the DRG system contains nearly 800 groups (including DRGs with two severity levels).

Services and costs covered by DRG-based payments: All inpatient care (except long-term term care like psychiatry) and outpatient-surgery cases (triggered by NOMESCO Classification of Surgical Procedures (NCSP) codes) are reimbursed with DRGs. The payments cover all hospital costs except education & research.

DRG-system updates: All acute care hospitals provide data used for updating the system. The Estonian Health Insurance Fund (EHIF) is responsible for the DRG catalogue. During the earlier years, DRGs were updated irregularly, sometimes more than once a year. From 2011 onwards there have been annual updates. The time lag between data collection and the tariff updates is two years.

Private versus public hospitals: The DRG system applies to all hospitals, irrespective of ownership status.

3.4 France

Context: The DRG system called T2A, '*Tarification à l'activité*', was introduced in 2004/2005 for payment of acute care services in all hospitals. Before the DRG system, funding was complex with global budgets (based on historic costs) for public hospitals and itemized billing system with FFS payments for private-for-profit hospitals.¹⁸ Today, T2A incorporates over 2 300 groups (including up to four levels of severity) named '*Groupes Homogenes des Malades*' (GHMs). The Ministry of Health sets the final payments, based on the reference costs in combination with global expenditure targets.

Services and costs covered by DRG-based payments: All inpatient cases except psychiatric services and emergency care are reimbursed by DRGs. Payments for public hospitals cover all costs linked to a stay including medical fees. Tariffs for private hospitals do not cover medical fees paid to doctors. Public hospitals get additional payments for education, research activities, activities of general public interest ('*Missions d'intérêt général et d'aide à la contractualisation*' (MIGAC)) and some investments contracted with the Regional Health Agencies (private hospital payments are approximately 80% of the public hospital payments). Emergency care is also paid separately by fixed budgets.¹⁸ In 2010 56% of total hospital expenditures were covered by the DRG-based payment.¹⁹

DRG-system updates: Two databases are used to update the DRG system: The PMSI (patient classification system) and the ENCC (hospital cost database). The information for the ENCC comes from 70–100 voluntary hospitals and it is yearly updated. Information for the PMSI database is provided by all hospitals. The ATIH ('*Agence Technique de l'Information sur l'Hospitalisation*') is responsible for updating the system. The time lag between data collection and the tariff updates is two years.

Private versus public hospitals: While providers of outpatient care are largely private, hospital beds are predominantly in public or private non-profit facilities.²⁰ Costs are calculated separately for public and for private hospitals. Payment for physicians including social charges are excluded from the DRG-based payments in private for-profit hospitals. Also, 25% of



investment in technical equipment is reimbursed with DRGs for private for-profit hospitals.¹⁸

3.5 Germany

Context: The national G-DRG system (within negotiated case-mix budgets) was introduced in 2003 and replaced the old reimbursement system based on per diem payment related budgets.²¹ The system has evolved to 1 255 groups in 2017 (including subgroups). DRGs can be unlimitedly subdivided based on their resource intensity. In 2016 there were 590 base DRGs of which 310 were split resulting in 280 base DRGs and 940 non-base DRGs.

Services and costs covered by DRG-based payments: All acute inpatient cases are reimbursed with DRG-based payments. They cover all operating costs. Investing and maintaining infrastructure as well as research & education is financed separately by the states ('Länder').²²

DRG-system updates: The database for the DRG system is updated on a yearly basis. 244 voluntary hospitals provided cost data in 2016. From 2017 on, the number of hospitals will be increased in order to make the sample more representative. Main responsible organization for the DRG system is the InEK ('*Institut für das Entgeltsystem im Krankenhaus*'). The time lag between data collection and the tariff updates is two years.

Private versus public hospitals: The DRG system applies to all hospitals, irrespective of ownership status.

3.6 USA – Medicare Part A

Context: Healthcare in the USA is financed by a mixed system of private and public insurance. Currently, about 4 800 out of approximately 5 000 hospitals are getting paid by the Medicare program for American citizens older than 65 or with some disability status. The Medicare program accounts for about 30 percent of payments to acute care hospitals for inpatient care. Acute care hospitals also receive substantial payment from other sources such as private health insurance plans or (the other public) Medicaid program. The Medicare DRG system, the so-called prospective payment system (PPS) was introduced in 1983 and replaced a per diem cost-based system. Nowadays, the system contains 756 groups, including DRGs with three levels of illness-severity.

Services and costs covered by DRG-based payments: Medicare covers all acute inpatient care. All expenditures are covered, except physician fees and education & research payments.²³

Maintenance of the system: The Centers for Medicare and Medicaid Services (CMS), which administers the Medicare program, annually standardizes the reported charges on the inpatient claims for the most recent year to remove the effects of geographic differences in input price levels and the effects of graduate medical education activity and service to low-income patients. All participating hospitals (about 4 800) are required to submit a cost report annually. The time lag between data collection and tariff update is three years (because hospital fiscal year end dates vary across the calendar year, a complete national file of cost reports for all acute care hospitals is available about two years after the close of the earliest hospital's fiscal year).

Private versus public hospitals: Public and private-non-for-profit hospitals are paid through DRG payments, while private-for-profit hospitals receive procedure service payments.²⁴



4 DEALING WITH HIGH VARIABILITY

In this core chapter of the report various options for hospital payment systems to deal with high variability of costs are presented. These always involve the exclusion of certain things from the calculation of DRG-based payment and the separate reimbursement of the related costs through other payment mechanisms. The four main mechanisms include the exclusion of:

- Certain patient groups (e.g. patients with major burns)
- Certain services and products (e.g. high-cost drugs)
- Certain hospitals or hospital departments (e.g. highly specialised departments)
- Outliers with considerably higher/lower costs than other patients in the same DRG.
- In addition, some countries apply other exclusion mechanisms (e.g. combinations of mechanisms).

Section 4.1 provides an overview about whether and how any of these mechanisms is used in each country. The subsequent sections (4.2. – 4.6) analyse every exclusion category in more detail.

Section 4.2 shows which countries exclude certain **patient groups** (triggered by a diagnosis) from the DRG-based payment and how hospitals are reimbursed for these groups. One example are patients with heavy burn injuries, who are known for unpredictably high costs. In order to guarantee a state of the art treatment for each patient, they are sometimes excluded from the DRG-based payment system and paid separately.²⁵

Besides the exclusion of patient groups, hospitals can also receive additional payments for certain **products or services** (triggered by a procedure): for example cancer therapy drugs. Since some prices typically exceed the DRG rate,²⁶ most countries (e.g. Germany) have lists of drugs and services that are paid separately and reimbursed based on other tariffs. This exclusion mechanism is analysed in section 4.3.

In many countries, certain types of **hospitals are excluded** from DRG-based payments. A common example are psychiatric hospitals, because costs of treatment against mental diseases are more difficult to predict than costs for other conditions due to a high variation in length of stay.²⁷ In this study, we focus on acute care hospitals, therefore psychiatric, rehabilitation and other hospitals are not part of the analyses. However, section 4.4 shows that all analysed countries also exclude certain acute hospitals or departments.

Although one would expect that patients in a DRG have in principle a similar resource use, a DRG sometimes contains patients whose costs are much lower or higher than those of other patients grouped into the same DRG. Patients at the upper and lower extreme ends of the distribution of the costs of all patients within the same DRG, are termed **outliers**. Cases within an extreme resource use are excluded and reimbursed separately from their DRG group. Therefore, trimming methods exist in order to define thresholds for extreme resource use. Section 4.5 presents various definitions of outliers and how they are reimbursed.

In case the observed countries utilize **other exclusion mechanisms** (often combinations), these are presented in a subsequent section (4.6).

The last section (4.7) deals with **recent challenges, debates and reforms** of the DRG-based hospital payment systems and whether there have been any evaluation studies on the impact of reforms that excluded patients/services/hospitals from the system.

4.1 Overview of exclusion mechanisms

Table 3 presents a brief overview on the main exclusion mechanisms used in the selected countries.



Table 4 – Overview of exclusion mechanisms

Exclusion of					
Country	Patient groups	Products/services	Departments/hospitals	Other	Outliers based on
Denmark	-	-	-	'Complex patients', i.e. those receiving specialised services (n=1 100) are treated at specialised institutions	LOS
England	130 out of 2 782 Healthcare Resource Groups (HRGs) do not have a national tariff, 33 HRGs have a non-mandatory tariff (2016)	High-cost drugs (n=359), devices (n=28), services (n=5), unbundled HRGs (n=214)	Decentralised system: the exclusion of hospitals depends on the local Clinical Commissioning Group	Specialised departments providing 'highly specialised services' to patients	LOS
Estonia	Chemotherapy patients	High-cost drugs, devices, services, organ transplantation	Departments for occupational disease / tuberculosis	-	LOS
France	-	Organ management, harvesting and transplantation, high-cost drugs (n=3 649)*, devices (n=68) and services (n=16)	Local hospitals / special institutions (n=166, 8.4% of all acute care hospitals)	-	LOS
Germany	45 out of 1 255 DRGs (in 13 major diagnostic categories) do not have a cost weight (2016)	Organ management, harvesting and transplantation, high-cost drugs, devices, services (total n=191)	Special institutions (n=153 in 2016)	-	LOS
USA (Medicare Part A)	-	Organ acquisition for transplant cases	Children's hospitals (n=11)/ cancer hospitals(n=60) / some hospitals in Maryland / Critical access hospitals (small, rural hospitals; n=1 300)	-	Cost

LOS = length of stay

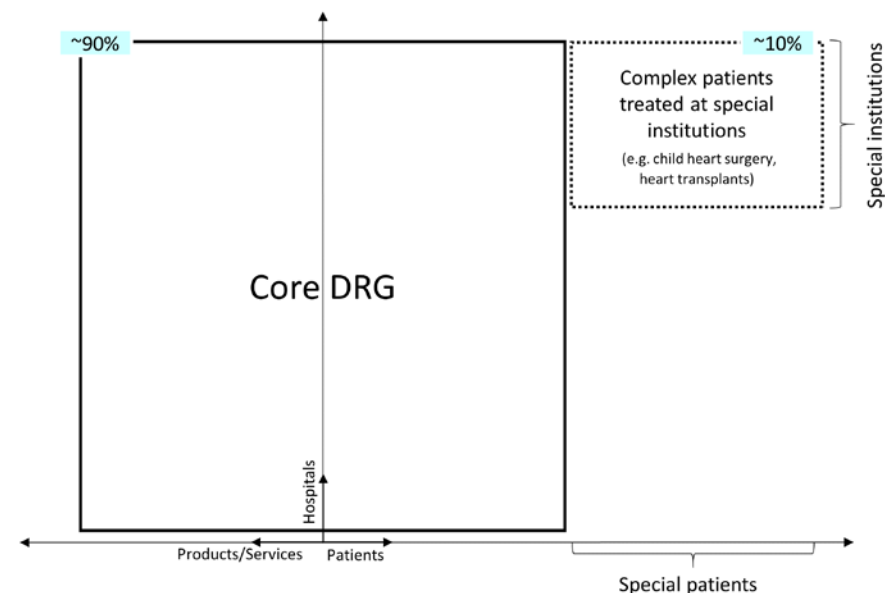


The exclusion mechanisms used in **Denmark** are depicted in Figure 1: all *main acute* hospital services (approximately 90% of all acute inpatient cases) are reimbursed by the DRG system. The remaining 10% are paid separately and are classified as 'specialised services' or 'highly specialised services'. These services can only be offered by some certified providers, named special institutions.²⁸ Currently there are around 1 100 specialised services among 36 medical specialties. Examples include transplantations or fetal surgeries.²⁹

Specialised hospital services have to prove their level of complexity, rarity or resource-intensity. Hospitals can apply for providing these services and the Danish Health Authority decides which institutions are eligible.²⁴

Each region has a pre-payment of 25% of last years' total payment for specific highly specialised patients to the departments where the functions are undertaken. The total payment for each specific patient is settled later – e.g. at the end of the year. The treating hospital calculates the costs per treatment/patient using its own local cost data.

Figure 1 – Exclusion mechanisms used in Denmark



Dotted lines represent payments outside the DRG-based payment

In **England** several ways exist to exclude elements from the DRG-based payment (see Figure 2). 265 HRGs do not have a national tariff and are therefore excluded patient groups. They are either core HRGs or unbundled HRGs (separated high-cost elements, which become an HRG in its own right and can be added to a core HRG). Examples include patients with major burns or renal insufficiency. Furthermore, HRGs with national tariffs can sometimes be adjusted to local variations, where they do not adequately reimburse efficient costs because of structural, local circumstances.³⁰



Beside of patient-exclusion mechanisms, several high-cost drugs, devices and procedures are excluded. Their exclusion is based on criteria such as their frequency of usage within a HRG or their proportion of cost in comparison to the relevant HRG. Lists of exclusions are regularly revised by steering groups of the NHS, advised by health providers.³⁰

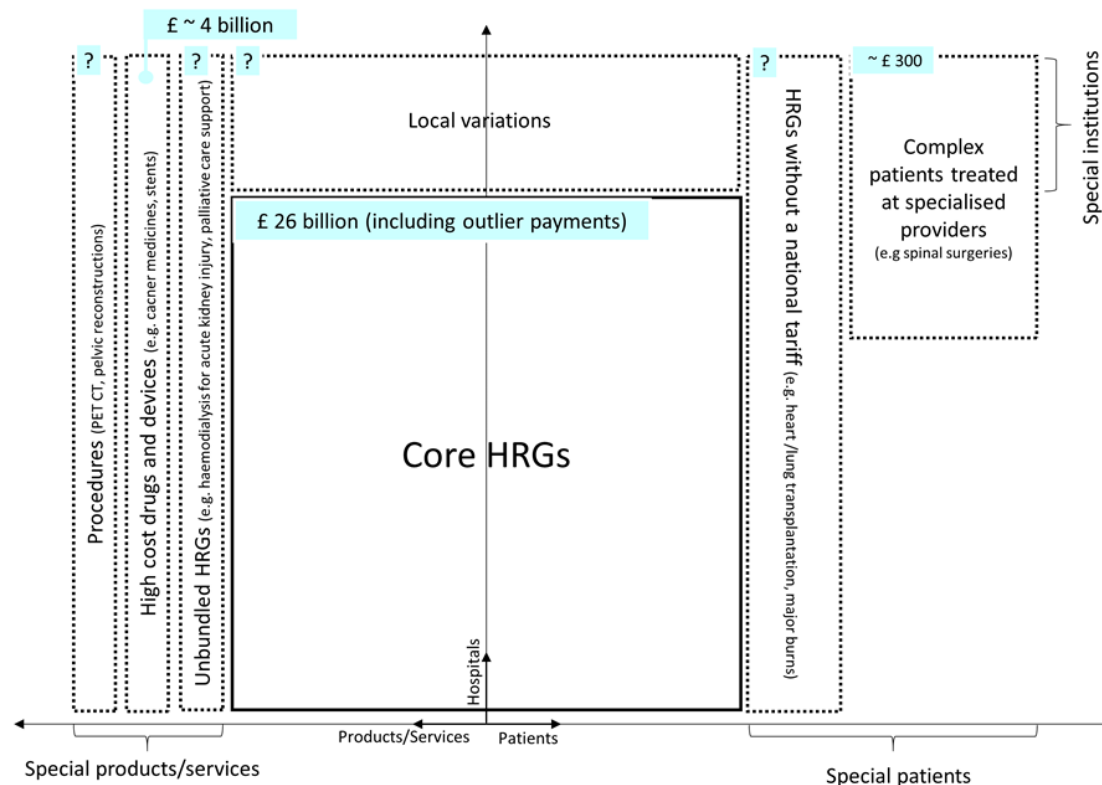
Hospitals can get excluded if they have a special arrangement with their CCG. These excluded hospitals are mostly put on block grants – but there is no national rule. These 'local variations' have significantly increased over the last years. Currently the NHS does not have information on the number of hospitals working under local contract agreements.

For all components without a national tariff (HRGs without a national tariff, high-cost drugs/devices/services etc.), local tariffs are negotiated between commissioners and providers. The commissioners can define the way of reimbursement and can experiment with it. Therefore, there is a large variation in how local prices are set. In case a non-mandatory price exists (e.g. 33 HRGs have a non-mandatory nationwide tariff), they must be used as an orientation point for local negotiations.

Similar to the Danish way of treating 'complex patients' the NHS makes top-up payments for specific patients treated at children's, neuroscience, spinal surgery, orthopaedics departments. Patients are triggered by (highly) specialised services, which are determined by criteria such as number of occurrence, costs or number of providers able to provide the service. Providers who are commissioned to provide special services receive top-up payments for treating these patients.



Figure 2 – Exclusion mechanisms used in England



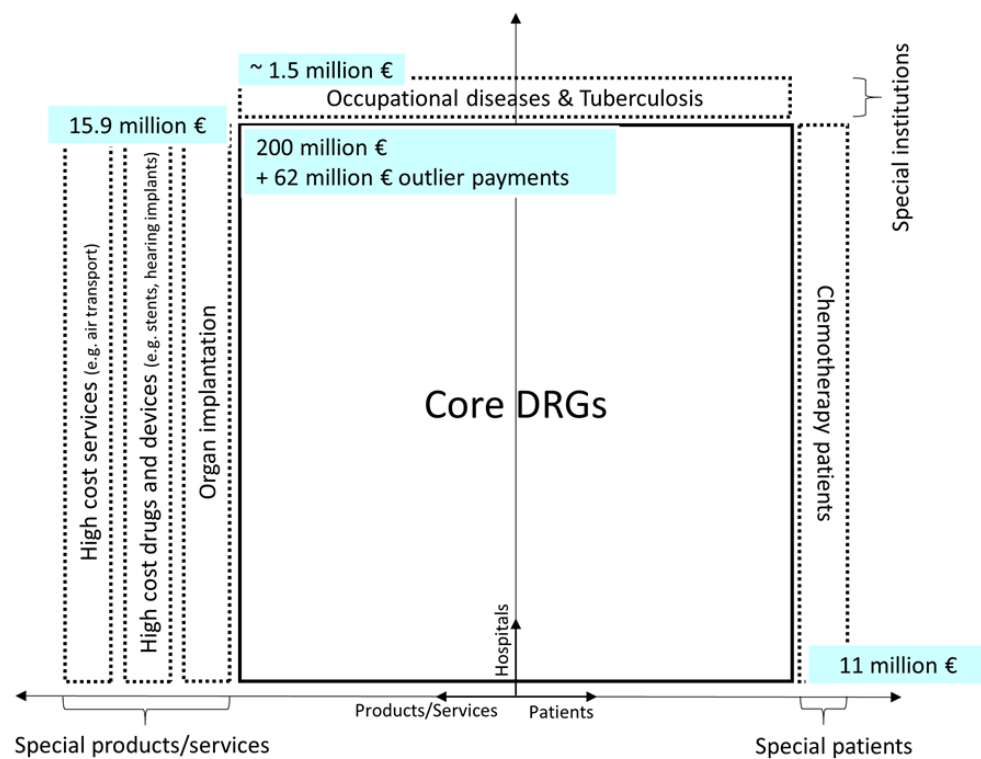
Dotted lines represent payments outside the DRG-based payment; coloured boxes are payments in 2013

In **Estonia**, all three mechanisms are applied (see Figure 3). Patients with chemotherapy sessions are excluded, as well as ambulatory patients receiving a transluminal endoscopy and patients being transferred from one hospital to another. Beside of that, several high-cost drugs, devices and services are excluded, as well as departments for occupational disease and tuberculosis. All excluded elements in Estonia are reimbursed with a

combination of per diems and fee-for-service payments, identical for all hospitals. There is no regular revision of exclusion lists. Most of the exclusions were first defined when the DRG system was implemented. Recent evaluation studies have concluded that several elements from the exclusion list could be removed.



Figure 3 – Exclusion mechanisms used in Estonia



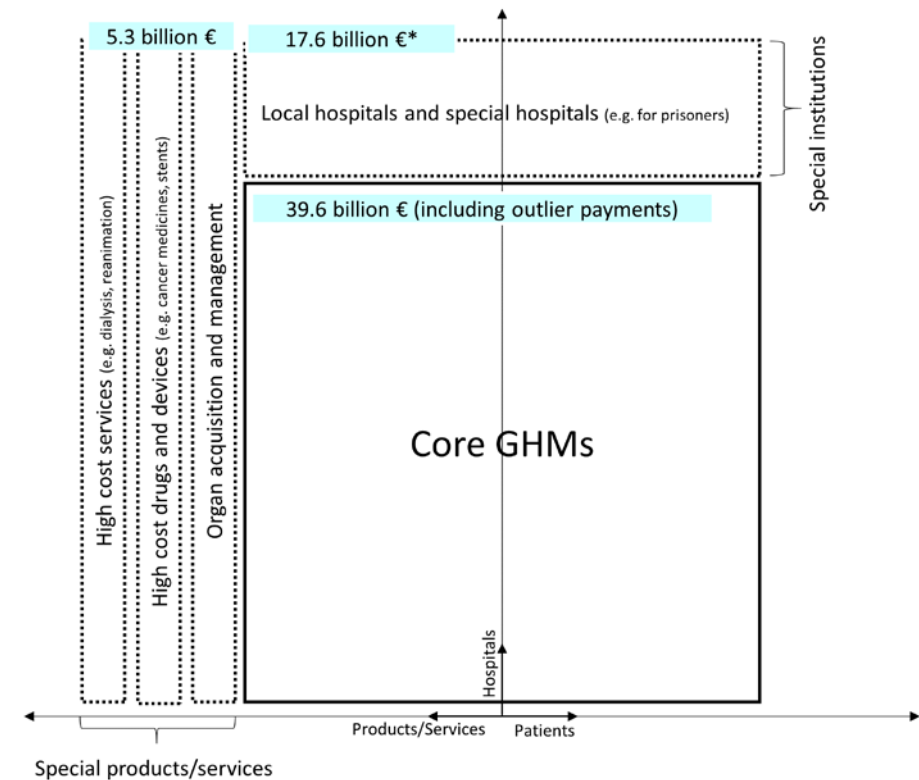
Dotted lines represent payments outside the DRG-based payment; coloured boxes are payments in 2015

In **France**, it is not common to exclude entire patient groups from the DRG-based payment system (see Figure 4). Hospitals can receive additional payments for dialysis patients without chronic kidney insufficiency, called dialysis packages “Dxx”.³¹

Beside of that, hospitals receive block grants for the coordination and management of transplantations. High-cost drugs and devices are also excluded and paid separately with nation-wide prices. Hospitals can receive payments for services in addition to a core DRG. Most of them are for intensive care.

Almost 10% of all hospitals are excluded from the DRG-payment system, most of them are local hospitals which have less than 5 500 patient-days per year.³² They are paid by a mixture of block grants (based on historic costs), regional characteristics and activity produced.

Figure 4 – Exclusion mechanisms used in France



Dotted lines represent payments outside the DRG-based payment; coloured boxes are payments in 2010; *including payments for non-acute hospitals, e.g. psychiatry



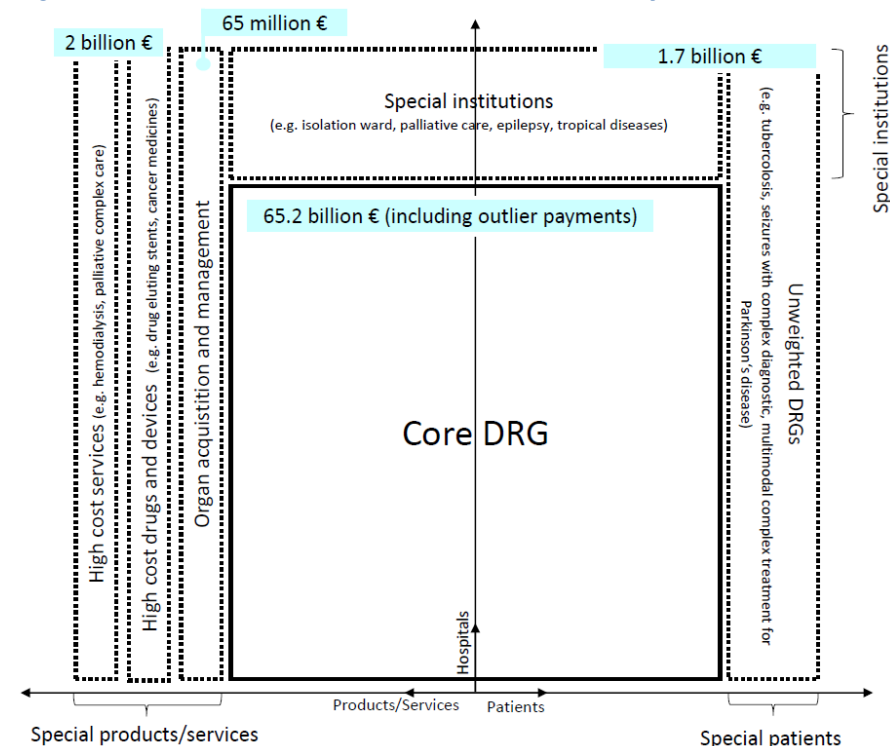
In **Germany**, all exclusion mechanisms are applied (see Figure 5). The German DRG system defines 45 DRGs (in 13 major diagnostic categories or MDCs) without a national cost-weight, including for example bone marrow transplant patients and tuberculosis patients. Furthermore 192 products/services, including 96 pharmaceuticals, are excluded, which accounted for 2 billion € in 2014 (about 3% of total payments). It is also possible to exclude a broad scope of hospitals or hospital departments, which are classified as *special institutions* (for example departments for epilepsy or palliative care), or even entire hospitals in case three quarter of all inlier cases had a LOS above the average LOS of each DRG, and which is not due to inefficiency (the hospital has to send a report to the insurance association and needs to show that only 'special patients' have exceeded the usual length of stay).³³ Exclusion criteria are defined by the InEK. No explicit thresholds for the exclusion of services/products/patient groups are given (e.g. minimum number of cases needed to build a DRG or thresholds for variance of LOS). Instead, for each case all criteria are taken into consideration. Based on that, a final decision is made.³⁴

DRG-tariffs for unweighted DRGs are negotiated on hospital level, while excluded services/products are paid with a fee for service (nation-wide fee or negotiated on hospital level). Excluded hospitals/departments are reimbursed on either case-based or per diem payments for their services.

In the **USA-Medicare Part A**, there is clear focus on the exclusion of local-hospitals/departments and cancer-hospitals/departments (Figure 6). Children's hospitals are also excluded – but this is reasoned by the nature of the Medicare insurance scheme (insurance covers people who are age 65 or under 65 and disabled). Medicare pays excluded hospitals for inpatient care on the basis of their Medicare allowable incurred costs.

CMS has so far resisted to exclude services/products such as sole-source products under patent (e.g. pharmaceuticals). The only excluded service is the 'organ acquisition of transplant cases', which is reimbursed based on each centre's incurred costs, only at certified, transplant centres. Furthermore, the USA is one of the two analysed countries which defines their outliers based on the occurred costs (instead of defining them in terms of patients' length of stay).

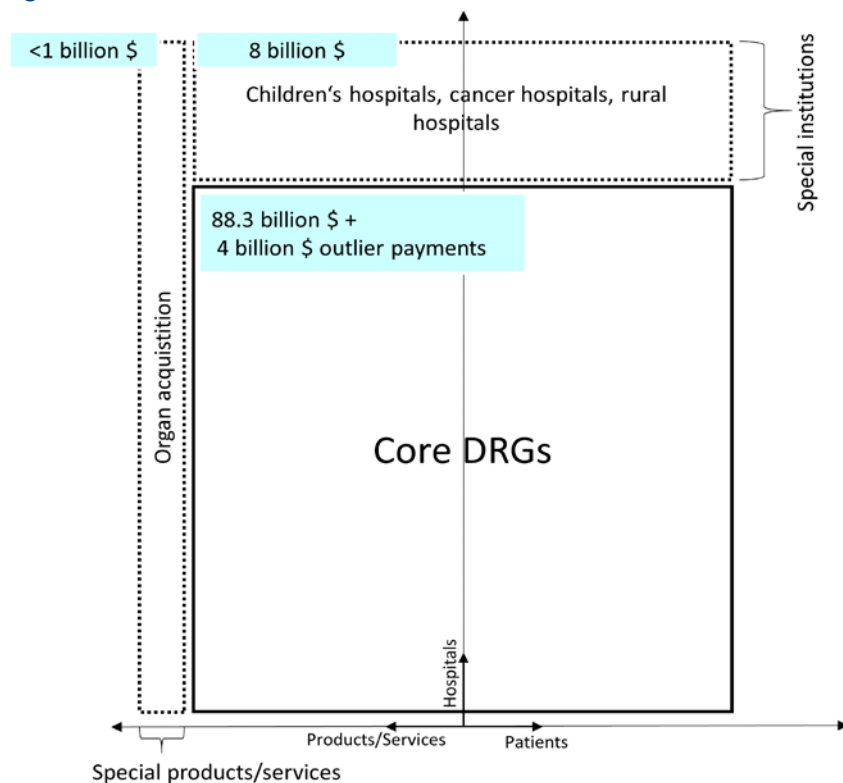
Figure 5 – Exclusion mechanisms used in Germany



Dotted lines represent payments outside the DRG-based payment; coloured boxes are payments in 2015



Figure 6 – Exclusion mechanisms used in the USA-Medicare Part A



Dotted lines represent payments outside the DRG-based payment; coloured boxes are payments in 2015

4.2 Exclusion of patient groups

In this section, it is analysed if and how countries exclude certain patient groups from their DRG-based payment system. The most common way is to have DRGs with no cost weight/national tariff. For these patient groups other reimbursement mechanisms, e.g. based on local negotiations between hospitals and payers, are used. DRGs with no cost weight/national tariff can be found in England and Germany. Another approach is to define excluded patient groups via their main diagnosis (instead of defining DRGs). This is the case in Estonia, where the exclusion is triggered by the primary diagnosis of the patient.

Denmark excludes complex patients treated at specialised hospitals/departments. Since this is a combination of excluded patient groups and excluded hospitals, it is explained in section 4.6 “Other mechanisms outside the DRG based payment system”.

In the USA-Medicare Part A and France patient groups are not excluded.

Table 5 – Overview of patient exclusions

Country	Excluded patient groups
Denmark	-
England	130 out of 2 782 HRGs do not have a national tariff, 33 HRGs have a non-mandatory tariff
Estonia	Chemotherapy patients
France	-
Germany	45 out of 1 255 DRGs (in 13 major diagnostic categories) do not have a cost weight
USA-Medicare Part A	-

HRG = Healthcare Resource Group



4.2.1 England

What is excluded?

In England, there are currently 130 core HRGs with no national tariff. Examples include patients receiving hearing implants, transplantations, having major burns, haemodialysis (hospital, satellite, home, continues), cystic fibrosis, disorders (behavioural and eating).

Additionally there are 33 HRGs with non-mandatory tariffs. They also do not have a national tariff, but have non-mandatory prices, which are used as an orientation for local negotiations (see below at *'how is it reimbursed'*).

The full lists of excluded HRGs can be retrieved from the excel file https://improvement.nhs.uk/documents/597/Copy_of_Annex_A_-_National_tariff_workbook.xlsx.

In addition, certain specialised departments receive top-up payments for certain complex patient groups. This method is similar to the Danish way of treating 'complex patients' at specialised departments. Since this is a combination of excluded patient groups and excluded hospitals, it is explained in section 4.6 "Other mechanisms outside the DRG based payment system".

Why is it excluded?

HRGs have no national tariff because of

- a low volume of activity which makes it difficult to conduct a robust price calculation;
- no cost data in the data capture system.

For HRGs with non-mandatory prices, a nation-wide funding is seen as problematic due to local differences in clinical practice.

How is it reimbursed?

For HRGs without a national tariff, local tariffs are determined (negotiated between commissioners and providers). The commissioners define the way

of reimbursement and can experiment with it, e.g. incorporating integrated care tariff or paying fee for services. Therefore, there is a large variation and it is not transparent how the local prices are determined.

In case there are non-mandatory prices (see above: 33 HRGs have a non-mandatory tariff), they need to be used as an orientation point for local negotiations between the providers and commissioners.

In addition, 'non-excluded' HRGs with national tariffs can be adjusted to local variations, where they do not adequately reimburse efficient costs because of structural, local issues. These local modifications are meant to ensure that care can be delivered everywhere, even if the cost of providing services is higher than the national price.³⁰

4.2.2 Estonia

Who is excluded?

Excluded from the DRG-based payment are patients

- with chemotherapy sessions (ICD codes Z51.1: "chemotherapy session for neoplasm" and Z51.2: "other chemotherapy");
- being transferred from one hospital to another and these are different types of hospitals (for example from local hospital to regional hospital or central hospital to local hospital).

Why are they excluded?

Patients with "chemotherapy session" (ICD codes Z 51.1 & Z51.2) were excluded since the summer of 2007 because of the large differences in the prices of chemotherapy courses. Excluding patients being transferred from one hospital to another was added in spring 2007, because lower level hospitals tend to transfer complicated cases to the higher level and therefore, would get overpaid when reimbursed by DRGs.

Exclusions are not regularly revised. Suggestions for exclusions can come from medical specialties. Then EHIF analyses the suggestions and makes the decision based on the billing data in the EHIF database. Also, in 2015



and 2016 EHIF procured analyses of DRG prices and price limits that looked at the exclusions as well and suggested removing some exclusions.

How are they reimbursed?

Hospitals are paid for excluded chemotherapy patients with a combination of per diems and FFS. Per diem payment covers accommodation, examination, consultation, basic drugs, bandages. The size of payment is dependent on the hospital department. FFS covers the actual treatment with procedures etc., and is based on historical cost data received from hospitals.

For patients being transferred from one hospital to another, the higher-level hospital is reimbursed according to the DRG and the lower level hospital gets 100% fee-for-service payment. FFS payments are the same for all hospitals and are based on an activity-based costing model that uses historical cost information received from hospitals.

4.2.3 Germany

Who is excluded?

The G-DRG system defines a list of patient groups (DRGs) for whom it is impossible to calculate a cost-weight. In 2017, the list included 45 DRGs without a cost-weight, the so-called unweighted DRGs. The number of unweighted DRGs has steadily increased in the first years after DRG introduction but has not changed much since 2007 (46 unweighted DRGs in 2007). Unweighted DRGs accounted for 62 544 cases in 2015, which is equivalent to 0.3% of all hospital cases. The full list of unweighted DRGs with their number of occurrence is available in the excel file http://www.g-drg.de/content/download/7388/55411/version/1/file/Fallpauschalen_Katalog_2018_171124.xlsx.

Unweighted DRGs with more than 1 000 cases in 2015 were:

- Early rehabilitation for diseases and disorders of the nervous system, LOS>27 days
- Certain acute diseases and injuries of the spinal cord without complex intervention, or LOS>13 days

- Seizures, LOS>1 days, with complex diagnostics and therapy
- Multimodal complex treatment in Parkinson's disease
- Social and neuro-paediatric and paediatric-psychosomatic therapy for mental illnesses and disorders
- Tuberculosis, LOS>14 days
- Social and neuro-paediatric and paediatric-psychosomatic therapy for mental illnesses and disorders
- Social and neuro-paediatric and paediatric-psychosomatic therapy for diseases and disorders of the nervous system

Why are they excluded?

The InEK checks for each DRG on the basis of cost data whether the following criteria are met:

- Sufficient homogeneity of all cases
- Sufficient homogeneity of all inliers
- Sufficient number of cases
- Sufficiently low variance of length of stay
- Sufficiently low excess daily costs of long-stay outlier cases when compared to the daily add-on outlier payments
- Precise allocation to existing ICD-10 and the '*Operationen- und Prozedurenschlüssel*' (OPS codes=German classification system for surgeries and procedures used for the grouping procedure).

In case one (or more) of these criteria is not fulfilled, the InEK does not calculate a cost weight. However, there is no universal definition or threshold for one of these parameters (e.g. number of cases needed to calculate a cost weight). Each exclusion from the DRG-based payment is taken into consideration based on its influence on the whole DRG system ('*Gesamtwürdigung*' / System-approach as described by the InEK).



Additionally, the InEK developed a proposal process/structured dialogue whereby medical experts/certain organisations are asked to contribute their knowledge from clinical practice in order to refine certain DRGs. This can be done each year, between 30th of November and 31st of March. Examples for proposals are the development of a new ICD/OPS DRG allocation, the development or modifications of the calculation procedure. After collecting the suggestions from clinicians, the InEK carries out statistical analysis to prove the proposals empirically. In case the calculation-data is sufficient enough for carrying out a statistical analysis and the R^2 value is significantly better than before, the proposal will be accepted (23% of all proposals were accepted in 2016). However, the proposal process does not aim at excluding patient groups or hospitals from the DRG based payment – this instrument is meant to find solutions inside the DRG-based payment (e.g. by reallocating procedures to DRGs or creating new DRGs).

All decisions regarding the development and update of the DRG catalogue are taken by InEK. The proposed updated catalogue is then put into force based on an annual agreement between the Federal Association of Sickness Funds and the Federal Association of Hospitals.

How is it reimbursed?

Prices for unweighted DRGs are negotiated at the hospital-level. Negotiating partners are the individual hospitals, the hospital associations (on state ('länder') level), individual sickness funds and/or state-level associations of sickness funds or (private) insurance associations. The hospital is obliged to transmit cost data to all partners.

In case the hospital has not negotiated the price for an unweighted DRG, it receives € 600 per diem (inpatient case) or € 300 per diem for patients who require the infrastructure of a hospital but who do not stay overnight, which is called 'semi-inpatient' care in Germany.

4.3 Exclusion of products / services

Most countries use the instrument of excluding certain products and services from their DRG-based payment system. This includes components which are only sometimes used within a certain DRG or have very high-costs compared to other costs within a DRG. All countries, but Denmark, employ this exclusion mechanism. The price for excluded services/products can be added to a specific core DRG. Some of them have a national tariff, some others do not have a national tariff. In this case they are subject to local negotiations.

Table 6 – Overview of product/service exclusions

Country	Excluded products/services
Denmark	-
England	High-cost drugs, devices, services, unbundled HRGs
Estonia	High-cost drugs, devices, services, organ transplantation
France	Organ management, harvesting and transplantation, high-cost drugs, devices and services
Germany	Organ management, harvesting and transplantation, high-cost drugs, devices and services
USA-Medicare Part A	Organ acquisition for transplant cases

HRG = Healthcare Resource Group



4.3.1 England

What is excluded?

In 2016/2017 excluded are

- 299 high-cost drugs (without various dosage forms)
- 28 high-cost devices
- 5 procedures
- 15 non-HRG services with non-mandatory prices (e.g. adult hearing services, direct access plain film X-ray, non face-to-face outpatient attendances, specialist rehabilitation)
- 203 unbundled HRGs: (high-cost) elements of treatment are separated from the core HRGs. The 'unbundled components' become an HRG in its own right as an addition to a core HRG (see below at '*how is it reimbursed*').¹⁴ Currently, 135 unbundled HRGs have no national tariff and the remaining 68 have a mandatory tariff. Unbundled HRGs capture eight types of specialised care:
 - o Chemotherapy; critical care; diagnostic imaging; high-cost drugs; radiotherapy; rehabilitation; specialist palliative care; renal dialysis for acute kidney injury.

The full lists of excluded high-cost drugs and high-cost devices can be retrieved from the excel sheet https://improvement.nhs.uk/documents/597/Copy_of_Annex_A_-_National_tariff_workbook.xlsx.

Why is it excluded?

The following criteria are used to determine the exclusion of drugs:

- they are used for only some of the activity within the same HRG
- the drug and its expected associated costs of care are disproportionately high cost compared to the other expected costs of care within the HRG, which would affect fair reimbursement

- there is, or is expected to be, more than £1.5 million spend or 600 cases in England per annum
- high-cost drugs are defined by the cost of the average expected use or unit of the drug. Low-cost drugs, irrespective of prescribing volumes, will not be considered for inclusion on the high-cost drug list.

For devices the following similar criteria are used:

- high cost and represent a disproportionate cost relative to the relevant HRG
- used in a subset of cases within an HRG and/or used in a subset of providers delivering services under a specific HRG
- relatively high cost in terms of volume and cost
- used as part of patient care and generally cannot be transferred or re-used
- not considered capital equipment.

The list of exclusions is regularly revisited (with each cycle of tariff calculation). In order to keep the list as current and practically as possible, health providers can nominate high-cost drugs/high-cost devices at a 'high-cost drugs portal' / 'high-cost devices portal'. The 'high-cost drug steering group' / 'high-cost device steering group' of the NHS then analyses the nominations based on the criteria mentioned above.

Oncology Regimens (OPCS 4 Chemotherapy Regimens) list of drugs is maintained by the 'Oncology Regimens Steering Group' and has a separate portal for nominations.³⁵

Unbundling is meant to separate specific elements such as diagnostic imaging, high-cost drugs and rehabilitation from a core HRG. These elements of care can be identified as additional, exceptional, high-cost or non-routine, and are allocated to separate 'unbundled' HRGs.³⁶ The grouper ignores these unbundled components when deriving the core HRG for each patient.¹⁴ More than one unbundled HRG can be added to one core HRG. For example, the core HRG HB12B '*Major Hip Procedures for Non Trauma*



Category 1 with CC' (with a nation-wide tariff) can be added with the unbundled HRGs 'RA08Z Computerised Tomography scan' and CD08Z 'Medical Cases band 1'.³⁷

How is it reimbursed?

Excluded services and unbundled HRGs with no nation-wide tariff are subject to local pricing. Same rules apply as for local pricing for excluded patient groups. The CCGs define the way of reimbursement and can experiment with it, e.g. incorporating integrated care tariff or paying fee for services. Therefore, there is a large variation in how the local prices are determined.

In case there are non-mandatory prices, they need to be used as an orientation point for local negotiations between the providers and commissioners.

For high-cost devices a national supply chain was put in place in 2016. Providers order high-cost devices directly from 'NHS supply chain', which negotiates prices with suppliers and invoice NHS England. The provider itself does not have to pay for the device.³⁸

4.3.2 Estonia

What is excluded?

The following products/services are excluded and defined as service codes in the Estonian list of reimbursed health services (all exceptions can be found at <http://haigekassa.ee/et/partnerile/raviasutusele/tervishoiuteenuste-loetelu/drg>):

- Enzyme replacement therapy for Fabry, Gaucher and Pompe diseases (3 codes)
- Long-acting injectable atypical antipsychotic therapy (1 code)
- Biologic therapy for multiple sclerosis, arthritis, psoriasis, asthma, lupus, Crohn disease and ulcerative colitis, ANCA-associated vasculitis and chronic spontaneous urticaria (13 codes)

- Endovascular stents for abdominal and thoracic aorta (2 codes)
- Transcatheter aortic valve implantation and ventricular assist device in heart surgery (2 codes)
- Intrathecal baclofen pump (1 code)
- IVF and embryo transplanting (2 codes)
- Air transport (4 codes)
- Hearing implants (2 codes)
- Artificial urinary sphincter (1 code)
- Brachytherapy (1 code)
- Haematology treatments (6 codes) coagulation factor VIII, 100 units of Willebrand factor, anti-inhibitor coagulants for factor VIII, recombinant active factor VII, factor VII and factor IX
- All organ implants (44 codes) – heart transplants are performed in Finland and eye surgery (cornea transplants) is included in the DRG-based payment.

Why is it excluded?

Exclusions are set for rare and expensive services and pharmaceuticals. They can be analysed based on billing data in the EHIF database. However, there is no empirical rule. Decision to exclude a service (or an expensive drug) is based on

- price
- expected usage and
- care setting (whether used mostly in ambulatory or inpatient setting).

Furthermore, experience with similar services is taken into account – often a service is excluded if similar services have been previously excluded.



Exclusions are not regularly revised. They were first defined in 2003 when the DRG system was implemented and exclusions have been added when necessary. There is no regular revision. Suggestions for exclusions can come from medical specialties. Then EHIF analyses the suggestions and makes the decision. This process is the same as for excluded patient groups.

A recent evaluation study on DRG prices and price limits concluded that the exclusion of products and services from the DRG based payment system could be removed (see section 4.7.3).

How is it reimbursed?

Hospitals are paid fee for service and per diem. Inpatient treatment is reimbursed for hospitals as a combination of per diem (fixed amount per day of hospital stay, patients have a small co-payment as well) and fee for service (fixed price for service that applies for all hospitals). Therefore, the EHIF operates a cost model – activity-based costing (ABC) based calculations that use historical cost information received from hospitals.

4.3.3 France

What is excluded?

- Management (including transportation and removal) of organ-transplantations
- Expensive medicines (n=3 649, including various dosage forms)
 - o e.g. cancer drugs, coagulation factors, cardiac defibrillator, orphan drugs, some 'expensive' antifungals, and other blood-derived medicines. A complete list of excluded drugs can be found in the excel file https://www.atih.sante.fr/sites/default/files/public/content/1596/historique_liste_ucd_en_sus012018.xls.
- Medical Devices Implants
 - o e.g. cochlear implants, defibrillator, vascular implants (full list available in the excel file https://www.atih.sante.fr/sites/default/files/public/content/1596/historique_liste_ucd_en_sus012018.xls)
- Dialysis patients without chronic kidney insufficiency (GHM codes 11K02J, 28Z01Z, 28Z02Z, 28Z03Z, 28Z04Z) receive additional payments for the service of dialysis (see excel file https://www.atih.sante.fr/sites/default/files/public/content/1596/historique_liste_ucd_en_sus012018.xls)
- Hospitals can add one or several of the 10 following codes in addition to a core DRG in case certain conditions are being met (e.g. malfunctioning of an organ, artificial respiration):
 - o Paediatric reanimation (REP Supplément de réanimation pédiatrie)
 - o Reanimation (REA Supplément réanimation)
 - o Intensive care unit (STF Supplément soins intensifs)
 - o Continuous monitoring (SRC Supplément surveillance continue)
 - o Neonatology (NN1 Supplément néonatalogie)
 - o Neonatology with Intensive care unit (NN2 Supplément néonatalogie avec soins intensifs)
 - o Neonatology reanimation (NN3 Supplément réanimation néonatale)
 - o Peritoneal dialysis (DIP Supplément dialyse péritonéale)
 - o Radiotherapy (RAP Supplément radiothérapie)
 - o Women before birth (ANT Supplément ante partum)



Why is it excluded?

The list of excluded services/products is updated regularly by decree of the Minister in charge of health and on recommendations of the Hospitalization Council. Expensive drugs and medical devices are identified in PMSI (medicalised information system programme) and excluded because of the heterogeneity they introduce in the DRGs.

The Hospitalization Council specified the criteria for the exclusion of pharmaceuticals in 2010 (Recommendation No. 2010-25):

- level of improvement, specified by the Transparency Commission of the High Authority of Health (HAS)
- frequency of prescription (<80% of all cases in a given DRG)
- average cost of drug in relation to the DRG tariff (>30% of the DRG tariff)

The exclusion criteria for medical device implants are:³⁹

- cost of device accounts for more than 50% of the DRG-tariff
- high variability of average prices per hospital

The exclusion of transplantation management, dialysis services and supplementary codes is not based on empirical basis. It was decided by the order of 22 February 2008 and by a decree of March 2016 (for the supplementary codes).

How is it reimbursed?

For dialysis services hospitals receive a budget (fee for package or '*financement par parcours*') called dialysis packages "Dxx" in addition to a core GHM. The "Dxx" packages are billed for each session or, in case of peritoneal dialysis, for each week of treatment.

Additionally, several regions are experimenting with care pathways for the treatment of chronic kidney insufficiency (decree of 17 May 2016 (article 43)), in order to guarantee a better coordination and to avoid fragmented care pathways.

Management (including transportation and removal) of organs-transplantations is financed with additional budgets (e.g. to a transplantation centre), which covers the transplant coordination, transplant transfer, and management of living donors. These payments are based on last year activities. The transplantation itself is covered by the DRG system.

Hospitals receive fixed prices with which they have to pay the drugs (nation-wide tariff) and the devices on top of a DRG tariff. In order to get fully reimbursed the hospitals need to agree on a so called 'good use contract' ('*contract de bon usage*'), which ensures that the provider adheres to best practise guidelines when using the drugs.⁴⁰

For the supplementary codes, there are currently two lists with nation-wide per diem reimbursement rates: one for public hospitals and one for private hospitals (see excel file https://www.atih.sante.fr/sites/default/files/public/content/1596/historique_li ste_ucd_en_sus012018.xls). Private reimbursement rates go directly to the physicians, while public tariffs go to the hospitals.³¹ Paediatric radiotherapy (RAP) is paid per session and not per diem.

4.3.4 Germany

What is excluded?

There are currently 191 services/procedures (n=1 538 with various dosage forms) additionally paid to the core DRG based payment system (see excel file http://www.g-drg.de/content/download/7388/55411/version/1/file/Fallpauschalen_Katalog_2018_171124.xlsx).

Affected are interventional/operational procedures, application of pharmaceuticals (96 products are excluded), blood and special treatments. In 2015, payments for excluded services/products accounted for 3.4% of all DRG payments (2.3 billion €). The most cost-intense additional service was 'complex care of adults' (241 million €), followed by the application of Rituximab (115 million €). Additional payments for all pharmaceuticals accounted for 705 million €. ⁴¹



Examples are:

- Hemodialysis
- Hemoperfusion
- Palliative-medical complex treatment
- Extracorporeal photopheresis
- Plasmapheresis
- Liver replacement therapy
- Celluaresis, Stemlappheresis

Also, the management (including transportation and removal) of organ-transplantations is excluded.

Why is it excluded?

Criteria for excluding services/products from the DRG-based payment are:³⁴

- sporadic occurrence, which cannot be allocated to one specific DRG
- high level of costs (for the overall-budget of the hospital and the individual case)
- the service is only provided by some care providers. Without an additional fee these providers would be disadvantaged compared to other providers.

How is it reimbursed?

There are currently two separate lists for the reimbursement of separately paid services/products. One list with nation-wide FFS ('*bewertete Zusatzentgelte*' = weighted additional payments) which contains 95 elements with fixed prices. 74 products/services of these 95 elements have adjusted prices dependent on the amount of applied drug (e.g. how many mg were applied). The adjusted prices are given in a separate table, which contains over 1 500 codes. The additional payment with the highest tariff is

the application of 1.800 mg (or more) of Clofarabine (drug against child-leukemia): € 184 557.

The second list contains 96 procedures/products with no reimbursement rates. FFS-rates are negotiated individually on hospital level. Negotiation-partners are the individual hospital, the hospital association (on state ('*länder*') level) and (private) insurance association (on state level).

This procedure is similar to the negotiation-process for excluded patient groups.

The management (including transportation and removal) of organ-transplantations is paid by the '*Deutsche Stiftung Organtransplantation*'. Each year, they negotiate with providers and insurers fee for services for every component.⁴²

4.3.5 USA

What is excluded?

The only patient care product excluded from payment under the IPPS is the cost of

- organ acquisition for transplant cases.

Costs for cadaveric and live-donor organs vary enormously. To mitigate the related financial risk, these costs are excluded and paid separately. Organ acquisition costs and charges are also excluded from the calculation of the DRG relative weights.

Why is it excluded?

Organ acquisition costs were excluded because they were already separately identified and reported, they were highly variable among both transplant patients and hospitals, and including them would have raised transplant-performing hospitals' financial risks and created undesirable financial incentives. These decisions were made in 1983. More commonly, manufacturers of costly pharmaceuticals and devices have sought to have CMS create new DRGs exclusively for patients who receive those products.



The CMS has so far refused when the product in question is a sole-source product under patent and the manufacturer has monopoly power.

How is it reimbursed?

Medicare limits coverage and payment for organ transplants to certain hospitals that meet the requirements for approved transplant centres. For example, as of 12 September 2016, heart transplantation is covered in only 97 approved transplant centres; pancreas transplants are only covered in 114 centres; and kidney transplants are covered in 186 approved centres. There are no negotiations and each approved transplant centre must set a price for each type of organ. The transplant centre must record its organ harvesting costs on its annual cost report. Incurred costs may reflect their own internal expenses associated with organ excision from a live donor, their payments to another hospital or other provider for such services, or some mixture of both. The actual organ transplantation is paid by the DRG system.⁴³

4.4 Exclusion of hospitals or hospital departments

The third method of dealing with high variability, beside of the exclusion of services/products/patient groups, is to exclude certain hospitals/departments. In Estonia, France and Germany special institutions such as tuberculosis departments or hospitals for tropical disease are excluded from the DRG-based payment system. In the USA there is a larger number of rural hospitals which are excluded in order to guarantee access to care in rural regions ('critical access hospitals'). Denmark has several (highly) specialised hospitals/departments which receive additional payments for treating certain complex patient groups. Since it is a combination of excluded patient groups and excluded hospitals, this is explained in section 4.6 'Other mechanisms outside the DRG based payment system'. In England, there is a decentralised system of excluded hospitals reimbursed under special arrangements.

Table 7 – Overview of hospital exclusions

Country	Excluded hospitals
Denmark	-
England	Decentralised system: the exclusion of hospitals depends on the local Clinical Commissioning Group
Estonia	Departments for occupational disease / tuberculosis
France	Local hospitals / special institutions (n=166, 8.4% of all acute care hospitals)
Germany	Special institutions
USA-Medicare part A	Children's hospitals / cancer hospitals (n=11) / certain hospitals in Maryland / Critical access hospitals (n=1 300)

4.4.1 England

What is excluded?

Hospitals can be excluded from the HRG payment if they have a special arrangement with their local CCG (known as local variations). Since 2014, the proportion of NHS trusts (sub-organisation within the NHS serving a geographical area or a specialised function) who are now on block contracts has increased significantly since the increasing financial instability of the NHS makes it more difficult for commissioners to adhere to national payment rules. There is currently no national list of excluded providers. NHS Improvement is currently investigating the number of providers put on alternative payment arrangements. Providers who change their IT systems are sometimes unable to report on the HRG level during transition.

**Why is it excluded?**

The increasing financial instability of the NHS makes it more difficult for commissioners to adhere to national payment rules and they impose the local variations instead.

NHS Improvement does not have information on the number of trusts currently working under block contract arrangements. However, they have investigated the issues in 2017 and the information should be available within the next months.

How is it reimbursed?

CCGs are responsible for any local negotiations with the hospitals, which includes exclusion of the hospital from the HRG-based payment in line of an alternative, such as block contract.

Several factors are involved in negotiation with the hospital, e.g. hospital's financial performance or the transition process of IT system.

Hospitals are usually put on a block contract – which are also locally negotiated. There is no national rule.

4.4.2 Estonia**What is excluded?**

The following medical specialties/hospital departments are excluded from DRG-based payment:

- Departments/'beds reserved' for occupational disease (for patients that come with complaints about neck and shoulder area, impact of vibration, industrial chemicals and dust in work environment)
- Tuberculosis-departments (in regional and in some central hospitals)

Why is it excluded?

The list of excluded hospitals/departments were first defined in 2003 when the DRG system was implemented based on cost variability and type of care (e.g. psychiatry was not considered). Tuberculosis departments were added to the exclusion list in 2008, because tuberculosis treatment is often a long-lasting care, similar to rehabilitation or psychiatry.

However, there are no specific rules set to exclude departments with high-cost variability and it is perceived that certain departments (e.g. tuberculosis) can be removed from the exclusion list.

How is it reimbursed?

Hospitals are paid fee for service and per diem. Fee for service and per diem payments are fixed, there are annual changes to the list prices of services. EHIF operates a cost model – (activity-based costing) based calculations that use historical cost information received from hospitals. The payment is the same for all providers. [Answer is the same as in previous sections.]



4.4.3 France

What is excluded?

In 2015, 166 hospitals (8.4% of all acute care hospitals) were not paid on the basis of DRGs: ⁴⁴

- 163 small local hospitals (called '*Hôpitaux de proximité*'; full list available at <https://www.legifrance.gouv.fr/affichTexte.do?cidTexte=JORFTEXT000032851526>³²) that focus on coordinating care at the interface between inpatient and ambulatory care as well as medical and social care and that do not provide surgical or obstetric services
 - the National Institution of Invalids (INI)
 - the public health establishment in Fresnes (hospital for prisoners)
 - and the establishments of Saint-Pierre and Miquelon and Mayotte
- were excluded.^a

Why is it excluded?

Local hospitals are defined as having less than 5 500 patient-days per year with at least two of the following four characteristics:

- the share of the population over 75 years is higher than the national average
- the share of the population below the poverty line is higher than the national average

- the density of its population does not exceed 150 people per square meter
- the share of general practitioners per 100 000 population is below the national average

These institutions are excluded from the DRG-based payment (Decree of 23 June 2016 for the organisation, financing and reimbursement of local hospitals).

The National Institution of Invalids (INI), the public health establishment in Fresnes and the establishments of Saint-Pierre and Miquelon and Mayotte are excluded based on their special status (*'établissements à statut particulier'*).

The list of excluded hospitals is updated based on the goals of the 'National Health Insurance Expenditure Objectives' (ONDAM – '*Objectif National des Dépenses d'Assurance Maladie*'). The ONDAM is set annually by the Social Security Financing Act (LFSS) and aims at cost-savings in terms of ambulatory care and hospitalisation provided in private or public institutions.

The final decision for excluding hospitals is taken by the State and the Health Insurance. Other actors involved in the process are

- DSS ('*Direction de la Sécurité Sociale*')
- DGOS ('*Direction Générale de l'Offre de Soins*')
- ATIH ('*Agence Technique de l'Information sur l'Hospitalisation*')
- and ARS ('*Agence Régionale de santé*').

^a In 2003, hospitals of the army health service and of Guyana were among the excluded hospitals. The hospitals of the army health service were introduced in the DRG system in January 2009 and the hospital of Guyana in January 2010.



How is it reimbursed?

Since 2016, excluded hospitals are financed by a mixed grant, which is dependent on the following parameters:⁴⁵

- the basis of the institution's historic costs (accounting for 80% of costs)
- the characteristics of the region served
 - share of the population aged over 75
 - part of the population below the poverty threshold
 - population density
 - proportion of general practitioners per 100 000 inhabitants
- the activity produced.

4.4.4 Germany

What is excluded?

Special institutions can be excluded from the DRG based payment:

- Palliative care institutions (which are independent in terms of organisation and location) with a minimum of 5 beds
- Child and youth-rheumatology
- The treatment of tropical disease
- Department with a focus on the treatment of Multiple Scleroses (DRG: B42B, B43Z, B44C, B44D, B48Z, B68A, B68B, B68C, B68D)
- Morbus Parkinson (DRG: B42B, B43Z, B44C, B44D, B49Z, B67A, B67B, B85A, B85B, B85C, B85D)
- Epilepsy (DRG: B13Z, B76A, B76B, B76C, B76D, B76E, B76F, B76G) (if the cases account for at least 40% of all department cases)

- Children-hospitals can be excluded, if at least 40% of all cases are B46Z, B61A, B61B, I66A, I66B, I66C, I66D, I66E, I66F, I66G, I66H, I79Z, I97Z, U41Z
- Necessary departments (from a societal perspective) with a low number of cases, e.g. isolation wards, institutions for heavy-burn injured or neonatal satellite stations (intensive care units are excluded from this list)
- Psychiatric and psychosomatic hospitals

Acute care hospitals can be excluded

- if three quarter of all inlier cases had a LOS above the average LOS of the individual DRG
- if more than half of all cases were lying above the upper trim point

This list of excluded hospitals/departments has not significantly changed over the last years.⁴⁶ In 2014, 8.2% (115) of all acute care hospitals had special institutions/departments.

Why is it excluded?

Based on the law, it is possible to exclude 'special institutions' from the DRG-based payment system. The term 'special institutions' is defined by an agreement between the public and private insurers and the German hospital associations.³³ This agreement needs to get renewed each year.

How is it reimbursed?

The negotiation partners agree on either case-based or per diem payments.



4.4.5 USA

What is excluded?

The Congress excluded three types of hospitals from the IPPS when it was implemented in 1983:

- Children's (in the late 1980ies, about 60 children hospitals were excluded)
- Cancer treating hospitals (11 hospitals) (see https://www.cms.gov/Medicare/Medicare-Fee-for-Service-Payment/AcuteInpatientPPS/PPS_Exc_Cancer_Hospasp.html)
- Acute care hospitals that were paid under state-operated all-payer payment systems in Maryland
- Small rural hospitals, also referred to as 'critical access hospitals' (1 300 hospitals).

Why is it excluded?

Children's hospitals were excluded because the DRG definitions were developed to reflect patterns of care and related cost differences for aged and disabled patients. Medicare covers very few children because they have to be disabled to qualify for benefits. In fact, annual case volumes were less than 10 for many paediatric and maternity DRGs and Medicare had to rely on data supplied by a few state Medicaid programs – which cover primarily low-income families – to set relative weights.

Certain cancer hospitals were also excluded from the IPPS by law. The rationale was similar: cancer hospitals were believed to have different patterns of care and higher costs than other acute care hospitals treating the same kinds of patients. Cancer hospitals were believed to be test beds for the latest treatment methods and high-cost early adopters of new technologies. The original 8 cancer hospitals were identified in the law by very narrow criteria that could not have been met by other hospitals at a later date: the hospital must (1) be designated as a comprehensive cancer centre (= it must conduct laboratory, clinical, and population-based research, as

well as research bridging these areas. It must also undertake outreach and education efforts in the community it serves); (2) be organised primarily for treating and researching cancer, and (3) show that at least 50 percent of its total discharges had a principal diagnosis of cancer or other neoplastic disease.³⁷

However, 3 more cancer hospitals were included in the IPPS-exempt list in later legislation, bringing the total to 11 hospitals. The concerns that led the Congress to exclude cancer hospitals may have been valid in the early 1980s. Today, however, most cancer therapies are provided in outpatient settings and inpatient cancer treatment is widely provided in acute care hospitals, as well as cancer hospitals. But again, the relatively low Medicare volume and spending attributable to cancer hospitals, and the fact that Congress would have to change the law, makes reforming payment policy for cancer hospitals a low priority for CMS.

Hospitals located in the state of Maryland are also excluded from the IPPS, under a waiver of Medicare rules. Instead Maryland operates a unique all-payer hospital payment system that includes hospital payments for Medicare patients.

1300 small, rural hospitals are also exempt from the IPPS, because it has been issued in the past that small low-volume hospitals could not bear the financial risk of cost variation within DRGs. These hospitals are part of the Critical Access Hospital Program (CAH).

How is it reimbursed?

Medicare pays children's and cancer hospitals for inpatient care on the basis of their Medicare allowable incurred costs, subject to a cumulative rate of increase limit on operating costs per discharge. Medicare pays for its share of their incurred capital costs (rents, interest, and depreciation) without a limit. Medicare pays for outpatient services furnished to Medicare beneficiaries in these hospitals under the outpatient PPS (OPPS), using about 660 ambulatory payment categories (APCs) to bundle outpatient services and set payment rates; these payment rates generally reflect the updated average historical cost of each APC service bundle among all acute care hospitals.



Hospitals are paid 101 percent of their Medicare-allowable incurred cost. Medicare pays for most services at critical access hospitals (including inpatient and outpatient services).⁴⁷

Maryland hospitals receive a global revenue budget, which they cannot exceed.⁴⁸

4.5 Outliers

DRGs always incorporate patients that require much more resources than most patients belonging to the same DRG. These high-cost 'outlier' cases often account for a sizeable share of total hospital costs and consequently have a strong influence on the average costs of cases within a DRG.⁴⁹ If DRG weights were calculated based on the average costs of patients within a DRG, including the outlier cases, this would lead to hospitals being overpaid for the majority of cases. Furthermore, if outlier cases were not paid for separately, hospitals would experience particularly strong incentives to avoid these high-cost cases ('dumping'), or to discharge them inappropriately early ('bloody' discharge). Therefore, all countries have introduced mechanisms to pay separately for outliers. However, each country follows its own methodology to define and pay for outliers (see Table 8). Germany for example calculates them by adding 2 standard deviations to the mean length of stay of each DRGs, Denmark or England use a definition based on the quantiles of each DRG and the USA and Estonian definition is based on cost thresholds.

Most countries apply per diem payments for each case that exceeds the normal LOS. Only in Estonia hospitals get reimbursed by FFS payments. And in the USA payments are made equal to 80% of all additional costs occurred.

4.5.1 Denmark

How are outliers defined?

Upper LOS threshold: $Q75 + (Q75 - Q25) * 1.5$ ⁵⁰

No lower trim point is determined, in order to create incentives for short-stay visits.

How are outliers paid?

If a patient is discharged above the upper LOS threshold, an additional per diem can be charged per day above the trim-point. The additional per diem is always € 270.5, independent of the DRG and the hospital, where the patient is treated.

4.5.2 England

How are outliers defined?

Upper LOS threshold: $Q75 + (Q75 - Q25) * 1.5$

In England no lower trim point is determined, in order to create incentives for short-stay visits.¹⁴

How are outliers paid?

Excess bed days are paid with HRG specific per diems, for each extra day that the patient stays in the hospital past the HRG specific threshold.

**Table 8 – Overview of outlier definition and reimbursement mechanisms in the six countries**

Country	Outlier definition	Outlier reimbursement
Denmark	No lower LOS threshold	-
	Upper LOS threshold: $Q75+(Q75-Q25)*1.5$	Per diem (global*)
England	No lower LOS threshold	-
	Upper LOS threshold: $Q75+(Q75-Q25)*1.5$	Per diem
Estonia	Lower cost threshold: $AMC - 2*SDC$	Fee For Service
	Upper cost threshold: $AMC + 2*SDC$	Fee For Service
France	Lower LOS threshold: $AML/2.5 + 1$	Per diem (<i>tariff EXB</i>) or fixed price (<i>forfait EXB</i>)
	Upper LOS threshold: $AML*2.5$	Per diem
Germany	Lower LOS threshold: round [max (2, $AML/3$)]	Per diem
	Upper LOS threshold: round [min ($AML+2*SDL$, $AML +17$)]	Per diem
USA	No lower cost threshold	-
	Upper cost threshold: DRG price + fixed loss deductible amount	80 percent of its costs above the cost threshold

AML= arithmetic mean of length of stay; SDL= standard deviation of length of stay; AMC = arithmetic mean of costs; SDC = standard deviation of cost; * same per diem payment regardless of the DRG

4.5.3 Estonia

How are outliers defined?

The upper and lower limit for every DRG price is calculated in three steps.

First, if the cost of a case differs from the average cost by more than three standard deviations, the case is excluded from DRG-based payment (and reimbursed according to fee-for-service prices).

Secondly, new average cost based on the trimmed sample is calculated and all cases differing by more than two standard deviations from the average are excluded.

Third, upper and lower limit are defined as being two standard deviations from the average cost and if the lower limit has a negative value (it happens with asymmetrical distribution, e.g. costs are usually right-skewed) then it is derived from the minimum per diem rate.

How are outliers paid?

Outliers are paid fee for service.

4.5.4 France

How are outliers defined?

The lower limit of a DRG is the duration corresponding to the lower integer of the ratio $DMS / 2.5$ (with DMS = average length of stay of a given DRG), to which the value 1 is added.

The upper limit corresponds to the lower integer, of the ratio $DMS * 2.5$.

Since March 2014, many lower limits were deleted in order to encourage ambulatory care.

**How are outliers paid?**

Above the upper LOS, the hospital invoices the price of the DRG plus a per diem (called *tariff EXH*) for each day above the limit. The per diem is 75% of the daily price for the concerned DRG (given by the price of the DRG/ Average LOS for the DRG).

Before March 2009, hospitals received only half of the DRG price for outliers.

If the length of stay is less than the DRG lower bound:

If '*forfait EXB*' (price calculated for lower outliers) is given:

$$\text{Tariff} = \text{DRG price} - \text{'forfait EXB'}$$

If '*tarif EXB*' (daily rate) is given:

$$\text{Tariff} = \text{DRG price} - \text{numberDays} * \text{TarifEXB}$$

$$\text{Number of days} = \text{lower limit} - \text{duration of stay}$$

If the date of leaving is the same as the entry date (ambulatory) the number of days is 0.5.

Since March 2014, many lower limits were deleted in order to encourage ambulatory care.

4.5.5 Germany**How are outliers defined?**

The InEK applies a mathematical trimming method and defines for each case a low trim-point and a high trim-point in terms of length of stay (calculated in days of occupancy, so the day of discharge is not considered unless it is also the day of admission). Outliers are located outside these trimming points.

Lower LOS-threshold: round [max (2, AML/3)]

Upper LOS threshold: round [min (AML+2*SDL, AML +17)]

AML= arithmetic mean of length of stay

SDL= standard deviation of length of stay.⁵⁰

How are outliers paid?

Payments for patients, discharged later/before than the trim-points date, are added/deducted with per diems (defined in the DRG catalogue). Discharge days do not count as a bed-day.

4.5.6 USA**How are outliers defined?**

CMS annually uses its latest available database of claims and cost reports to set a national fixed-loss (deductible) amount (e.g. \$ 23 573 for fiscal year 2017). This national amount includes both operating and capital components (69.6 and 30.4 percent, respectively), which CMS adjusts by the IPPS wage indexes and the (analogous) capital geographic adjustment factors to create an input price-level adjusted fixed-loss (deductible) amount for each market area. A hospital's outlier cost threshold for any MS-DRG equals its full MS-DRG payment plus the input price adjusted fixed-loss amount for its local market.⁵¹

How are outliers paid?

For patients above the cost-threshold, Medicare pays the hospital its full payment amount for the MS-DRG plus 80 percent of its estimated costs above the cost threshold (that is, its costs above the cost threshold minus the 20 percent coinsurance).

Outlier payments account for between 5 and 6 percent of total payments determined by DRGs.



4.6 Other mechanisms outside the DRG-based payment system

As already mentioned before, Denmark and England use a standardized way of steering specialised services for complex patients. In Denmark these highly specialised services can be found among every medical specialties. In England this is restricted to four certain types of care. Both ways of dealing with this type of care are explained below.

4.6.1 Denmark

What is excluded?

Hospital services in Denmark are classified into two categories:²⁸

- *Main services* (patient care of limited complexity, accounting for 90% of all cases, reimbursed with DRGs) and
- *Specialised services*. Specialised services are defined as
 - o *Regional specialised services* (certain degree of complexity, usually provided by 1-3 hospitals per region)
 - E.g. gestational diabetes, glaucoma surgery
 - o *Highly specialised services* (considerable degree of complexity, usually provided by 1-3 hospitals in Denmark).
 - E.g. pre-gestational diabetes, cornea transplant
 - There are approximately 75 functions only available at one place in the country (e.g. liver transplant, intrauterine blood sampling, phenylketonuria, Wilsons disease)⁵²

- o In addition, some services are so complex, rare or resource-intensive that treatment at an adequate level cannot be established independently in Denmark. In those cases, and in respect to current legislation in Denmark, patients can be referred for highly specialised hospital services abroad.
 - E.g. small intestine transplant, particle radiotherapy, fetal surgery, EC-IC bypass

There are currently approximately 1 100 specialised hospital services within 36 medical specialties. The highly specialised functions are listed for each specialty and are available online.^{29b} For each specialty, the specific clinical competence, equipment available and types of patients eligible (diagnoses, clinical criteria, etc.) and the specific departments who are allowed to undertake the functions, are listed.

The list is revised every 3 years.⁵² The new specialty plan was published in 2017.

Why are they excluded?

This concentration in specific hospitals is designed to generate synergies and to ensure quality and continuity of care.

According to the National Board of Health²⁸ *highly specialised hospital services* depend on the

- Complexity, in terms of assessment, need for collaboration with other specialties/services, need for emergency preparedness
- Rarity, in terms of the incidence of disease, or the number of specific diagnostic or therapeutic modalities offered within the respective specialised service

^b The lists can be found under „højt specialiserede funktioner“ at the bottom of each “Specialevejledning“.



- Costliness, in terms of their resource consumption, including socioeconomic and economic conditions (equipment etc.), staff (specially trained etc.)

These 3 criteria are not static. A specialised service may evolve to become more established, commonly known and uncomplicated.

Requirements for *highly specialised hospitals and departments* performing highly specialised hospital services are:²⁸

- The available capacity to perform the service in question
- The activity, experience, expertise and qualification at individual, unit and hospital level
- Established collaborations with other specialities where the expertise of other specialities are needed

Public or private hospitals and departments can apply for providing highly specialised services. Last application round was in 2015. While the regions are responsible for the planning of standard hospital services, the Danish Health Authority is responsible for planning the distribution of specialised hospital services (in dialogue with the Danish Regions and the Medical Associations).⁵³ Based on the criteria mentioned above, the National Board of Health decides which patient groups are highly specialised and which hospitals/hospital departments can call themselves highly specialised hospitals.²⁸

How is it reimbursed?

The treating 'highly specialised hospital/department' calculates the cost per treatment/patient using its own local cost data. This is in accordance to an agreed procedure e.g. regarding the types of direct and indirect costs to be included, and principles for allocation of overhead to the individual patients.

Each region has a pre-payment of 25% of last year's total payment for specific highly specialised patients to the departments where the functions are undertaken. The total payment for each specific patient will be settled later – e.g. at the end of the year.

All hospital costs are covered by the payments, except for pre-hospital/ambulance services and capital costs (the regions own the hospitals).

4.6.2 England

What is excluded?

The NHS makes also top-up payments where the care provided is more complex, which is referred to as '*highly specialised services*'. Complex patients are currently (in 2016/2017) triggered by 7 643 procedures/diagnoses codes (see excel file https://improvement.nhs.uk/documents/597/Copy_of_Annex_A_-_National_tariff_workbook.xlsx) and are classified into four categories:

- Children
- Neurosciences
- Spinal surgery
- Orthopaedics.

Only few providers are commissioned to provide these specialised services (see excel file https://improvement.nhs.uk/documents/597/Copy_of_Annex_A_-_National_tariff_workbook.xlsx). In case the specialised provider treats a complex patient, it receives a top-up payment.

This exclusion mechanism is a mixture between patient and department exclusion, since certain departments receive payments for certain patients.

Why is it excluded?

The current list of specialised services is informed by research undertaken in 2011 by the Centre of Health Economics (CHE) at the University of York.¹⁵

Specialised services are determined by four factors:⁵⁴

- The number of individuals who require the service
- The costs of providing the service



- The number of people able to provide the service
- The financial implications for Clinical Commissioning Groups (CCGs) if they were required to arrange for provision of the service or facility themselves

Highly specialised services are provided to a smaller number of patients: usually no more than 500 patients a year.

How is it reimbursed?

Certified providers get a top-up payment for patients who are categorized as complex. These top-ups depend on the field of specialised care:¹⁴

- Eligible children-departments get 44% (for low complexity) or 64% (for high complexity)
- Eligible neurosciences-departments receive 28%
- Eligible spinal surgery departments get 32%
- And orthopaedics departments 24%

Payments for specialised services are commissioned directly by NHS England.

Furthermore, there is longer list of almost 150 different services categorized as complex⁵⁵ but they haven't received a top-up payment yet. This might happen in the future.

It is not common that CCGs make local arrangements regarding specialised services.

The top-up payments for specialised services are calculated on the basis of average costs and are commissioned directly by NHS England.

4.7 Current developments, debates and reforms

In this chapter, we are describing current challenges, debates and recent reforms, such as improving the costing system (e.g. Estonia), substituting inpatient care by ambulatory care (Germany), implementing DRGs to other settings such as the mental health sector (e.g. France, England), giving more attention to quality outcomes (USA) or increasing the transparency (Denmark), as perceived by the contacted experts.

4.7.1 Denmark

Challenges

The level of complexity is very high, and not completely transparent, although more rules of the DRG system have become explicit and have been written down in guidelines.

Debates

There are suggestions to move towards payments for entire patient pathways (similar to the Dutch DBC system). Also payment for outcomes ('value based health care') instead of – or as a supplement to – activity-based payment is discussed.

Currently, the specialty plan is under revision. One of the changes will be that the specialised departments will be more extensively monitored using the National Patient Registry data and data from various clinical databases.

Reforms

No larger reforms, but frequent modifications of the DRG system (e.g. only one grouping key for ambulatory and inpatient care).

Evaluation studies

n.a.



4.7.2 *England*

Challenges

Nearly three quarters of trusts were in deficit in 2015/16, compared to only 8% in 2009/10. The total deficit in 2015/16 was almost 2 billion pounds, which is unprecedented for the NHS.⁵⁶ The increasing pressure on the NHS in recent years was not counteracted with sufficient increase in funding, which is now resulting in a deteriorating financial position for most of the NHS providers. This is resulting in a move away from Payment by Results (HRG payment), and into higher use of the block contracts.⁵⁷

Debates

There is a drive towards using HRGs for other settings, such as mental health and community care. The commissioning of specialised services (see section 4.3.1) is currently under reform and there are debates between the NHS and the specialised hospitals to improve the commissioning for these services.⁵⁸

Reforms

In 2012/13 there was a complete restructuring of the DRG system, with the creation of several new HRGs, while old ones were deemed obsolete. The number of HRGs increased from approximately 1 500 to 2 100, while only around 600 HRGs were common to both years (11/12 and 12/13).

Also, the introduction of so called Best Practice Tariffs (BPTs), where providers are encouraged to provide care according to some pre-defined (agreed) care pathway, incentivizes standardization practices. When the provider meets the criteria for the pathway, it receives a BPT payment in a form of a HRG top-up. BPTs cover over 60 care procedures (e.g. multiple trauma or stroke).

Evaluation studies

Currently NHS Improvement is conducting a study on the exclusion of hospitals from the HRG payment (see above).

4.7.3 *Estonia*

Challenges

Challenges in hospital payment system are e.g. increasing the coding quality, improving cost information (incl. hospital costing systems) or adjusting the DRG system to compensate the hospitals as fairly as possible (incl. analysis for reducing exclusions).

Debates

The current debates are mainly about reducing exclusions, dealing with small DRGs (there are several DRGs that have less than 30 cases in 2 years) and changing the definition of upper and lower DRG price limits (since the treatment costs do not follow a normal distribution but are rather right-tailed, then the current DRG price limit definition results in negative lower limits for many DRGs).

Reforms

No recent reforms. Only smaller adjustments to the DRG system have been made.

Evaluation studies

Recently, there have been two evaluation studies on DRG prices and price limits. The first one focused on the methodology of DRG price (and price limit) calculation and evaluated whether the applied methodology ensures that the DRG prices adapt well to the provided healthcare services and their cost. The study concluded that excluding cost outliers is reasonable, excluding specialties/departments seems not debatable but all other exclusions could be removed. Also, using high-cost drugs, length of stay or use of intensive care as exclusion criteria was not recommended.

The second focused on alternative methodologies to calculate DRG prices and price limits. The study recommended using 5th and 90th percentiles to define lower and upper price limits and reducing exclusions from DRG-based payment as much as possible. Documents about the DRG system are uploaded at the webpage of the Estonian health-insurance webpage.⁵⁹



4.7.4 France

Challenges

The main challenge for the hospital payment system is the classification of hospital activity in homogeneous groups.

Debates

Debates are mainly about the efficiency of the DRG-based payment system. The principle of paying a fixed price that is directly indexed to the observed average costs and common to all types of establishments is increasingly contested.⁶⁰

Reforms

A reform is initiated for the implementation of DRG-based payment for rehabilitation hospitals and psychiatric hospitals.

Evaluation studies

n.a.

4.7.5 Germany

Challenges

Challenges in Germany are for example the decentralised and fragmented healthcare system, the expansion of certain DRG volumes or the missing incentives and legal opportunities for hospitals to treat patients in ambulatory settings.

Debates

It is debated whether a DRG-based payment system should be used for psychological cases (so called PEPP system).

Hospital payments must be tied to quality measures in the future. The German legislator demands this by law (*'Qualitätsorientierte Vergütung'*). It

is now debated how the self-governing bodies in the German healthcare system should implement this.

Reforms

One recent reform (implemented in 2017) has introduced extra payments for rural hospitals which are important for the provision of care (so called *'Sicherstellungszuschlag'*).

Also, since 2016 hospitals are allowed to receive additional budgets for their nursing staff (so called *'Pflegezuschlag'*) – this reform was initiated in order to counteract the cutbacks in nursing-staff induced by DRG-based payment system. The additional budget for each hospital depends on the existing payments for the nursing staff.

Another reform from 2016 implemented additional payments for building up centres (e.g. stroke-centre). Payments for these so called *'Zentrumszuschläge'* (additional payments for centres) accounted for 90 million € in 2016.

Evaluation studies

n.a.

4.7.6 USA

Main challenges

Recent policy initiatives have focused on ways to improve coordination of care and the quality of outcomes, and create broader (beyond the IPPS) incentives for efficiency and value for Medicare beneficiaries and in the larger healthcare system.

However, the main challenges in US health policy are mostly outside the IPPS. The main challenges inside the IPPS tend to be technical: How to efficiently measure quality of care; how to reduce treatment errors and other hospital acquired conditions; how to encourage more effective chronic disease management; and how to rationalize treatment to significantly reduce the use of post-acute care.



Debates

At the moment, there are no significant debates about the adequacy of payments for patients.

Reforms

Recent reforms have focused on quality measurement and publication of quality data for individual hospitals, followed by using quality and efficiency measures to reward and penalize individual hospitals (e.g. for avoidable re-admissions). A second strain of reforms focused on improving payment accuracy in the IPPS by improving the DRG system and the basis and calculation of the DRG relative weights. These reforms were triggered by MedPAC's 2005 study of physician-owned specialty hospitals, which focused on distortions in the IPPS payment rates that created undesirable financial incentives for patient selection and inappropriate specialization.⁶¹ Many people thought that fixed-price payment using DRGs would encourage hospitals to improve quality of care and reduce costs by reducing hospital treatment errors and hospital-acquired infections. That did not happen, so in the Affordable Care Act (ACA), the Congress added a third strain of reforms based on penalizing hospitals for preventable hospital-acquired conditions and excessive rates of hospital-acquired infections. Similarly, although prospective payment was not expected to reduce readmission, many people thought that readmission rates of 20 percent were substantially too high. Also in the ACA, the Congress added a readmission reduction program, which penalizes hospitals for excessive readmission rates.

Evaluation studies

MedPAC has studied the impact of the critical access hospital program (CAH), which provides payments of 101 percent of incurred Medicare-allowable costs for most services furnished by qualifying small rural hospitals. The study found that CAHs generally received substantially higher payments than they would have under the IPPS. However, the program is somewhat disadvantageous for Medicare beneficiaries who receive outpatient services in a CAH because their coinsurance payments, based on 20 percent of the hospital's service charges, are higher than the 20 percent of the APC payment rate they would otherwise pay under the Medicare outpatient prospective payment system.⁶²



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■ APPENDICES

APPENDIX 1. QUESTIONNAIRE

Expert survey: Dealing with high variability in DRG-based payment for acute care hospitals

A. INTRODUCTION

Future hospital payment reforms in Belgium are likely to introduce a DRG-based payment system. In order to assure fair hospital payment for patients with costs that are difficult to predict, the Ministry of Health has announced that it would like to explore options that allow separate payment for hospital stays with highly variable costs. In order to prepare for this reform, the Ministry of Health is looking for examples from England, France, Germany, USA, Estonia and Denmark.

This survey is conducted to contribute to discussions on future hospital payment reform in acute care hospitals in Belgium. In addition to this survey, we are conducting an extensive literature review. The results of both will be integrated into a report on options for payment systems for patients with highly variable costs, i.e. with costs that are difficult to predict based on diagnoses and procedures.

As part of our literature review, we have identified 4 basic options that hospital payment systems employ to deal with high variability of costs by excluding from DRG-based payment:

- 1) Certain patient groups
- 2) Certain services and products
- 3) Certain hospitals or hospital departments
- 4) Outliers with considerably higher costs than other patients in a DRG

This survey aims to find out, which of these mechanisms are applied in your country and if there are any other mechanisms that are used. The structure is as follows:

Section 1: Background / Context of hospital payment

Section 2: Exclusion from DRG-based payment system

- 1) The exclusion of patient groups
- 2) The exclusion of services / products



- 3) The exclusion of hospitals / departments
- 4) Outliers
- 5) Other mechanisms employed

Section 3: Main challenges, debates and reforms

B. QUESTIONNAIRE

Section 1: Background / Context of hospital payments

- 1) What proportion of total (national) hospital payment is determined by DRGs? Please fill in the table below.

Table: National hospital payments

	Local Currency	% of total acute care hospital payments
Total national hospital payment (Year)		
– Hospital payment determined by DRGs		
– Hospital payments for outliers		
– Hospital payments for excluded patient groups (e.g. for DRGs without a cost weight)		
– Hospital payments for excluded services (e.g. additional FFS payments, unbundled payment)		
– Hospital payments for excluded departments/hospitals (e.g. ICU, palliative care)		
– Other hospital payment mechanisms (please specify)		

- 2) Development and updates: Is there a database of costs or length of stay data to inform updates of the DRG catalogue?

- a. What information does it include?
- b. How many hospitals provide data for this database?
- c. How long is the time-lag between data collection and use of the data for payment?

Section 2: Exclusion from DRG-based payment system

- 1) The exclusion of patient groups

- a. Which patient groups are excluded from the DRG-based payment system? (If there is a list, please provide it as an appendix.)
- b. Determining the list of excluded patient groups :
 - i. Responsibilities: Which institution is responsible? Which actors are involved in the process?
 - ii. Process: Is the list of excluded patient groups regularly revised (how often)? Or was it defined only once (and how)? Is there a formal process for updating the list? For example, can medical specialties apply/suggest patient groups to be excluded? Who takes the final decision and how?
 - iii. Empirical basis: Is the list of excluded patient groups defined on an empirical basis? For example, is there a (cost or length of stay) data base, where patients with highly variable costs are identified. If this is the case, please explain also the rules that are used to identify patient groups that are to be excluded? (For



example, a rule could be that patient groups for which the standard deviation is larger than the mean of costs are to be excluded.)

c. What is the percentage of all patients/cases that is excluded?

Please provide the total number of hospital cases (in year xxxx) and the number of cases for which hospitals were not paid on the basis of DRGs.

d. How are hospitals paid for these patients? Please explain:

- i. The payment system, i.e. whether hospitals receive a budget/fee-for-service payments or per diems;
- ii. How the size of the payment is determined, e.g. based on historic costs of individual providers or average costs across similar providers;
- iii. The scope of the payment, i.e. what services are covered by the payment.

2) The exclusion of services and products

a. Which products or services are excluded? (If there is a list of excluded products/services, please provide it as an appendix.)

b. Determining the products/services that are to be excluded

- i. Responsibilities: Which institution is responsible? Which actors are involved in the process?
- ii. Process: Is the list of excluded services/products regularly revised (how often)? Or was it defined only once (and how)? Is there a formal process for updating the list? For example, can medical specialties apply/suggest that certain procedures are to be excluded? Who takes the final decision and how?

- iii. Empirical basis: Is the list of excluded services/products defined on an empirical basis? For example, is there a (cost or length of stay) data base, where high-cost services/products are identified. If this is the case, please explain also the rules that are used to identify services/products that are to be excluded? (For example, a rule could be that services, which account for more than half of the costs of an inpatient stay and which are provided as part of at least three different DRGs are to be excluded.)

c. How are hospitals paid for these products/services? Please explain

- i. The payment system, i.e. whether hospitals receive a budget/fee-for-service payments or per diems
- ii. How the size of the payment is determined, e.g. based on historic costs of individual providers or average costs across similar providers?

3) The exclusion of certain hospitals or hospital departments

a. Which hospitals or departments are excluded? (If there is a list of excluded hospitals and/or hospital departments please provide it as an appendix.)

b. Determining the list of hospitals/departments that are to be excluded

- i. Responsibilities: Which institution is responsible for determining excluded hospitals / departments? What actors are involved?
- ii. Process: Is the list of excluded hospitals / departments regularly revised (how often)? Or was it defined only once (and how)? Is there a formal process for updating the list? For example, can



medical specialties apply/suggest that departments are to be excluded? Who takes the final decision and how?

- iii. Empirical basis: Is the list of excluded hospitals / departments defined on an empirical basis? For example, is there a data base, where cost data from hospitals / departments shows that cost are high variable? If this is the case, please explain also the rules that are used to identify hospitals / departments that are to be excluded? (For example, a rule could be that hospital departments for which the standard deviation is larger than the mean of costs are to be excluded.)

- c. **What is the percentage of excluded hospitals/departments?** Please provide the total number of hospitals (in year xxxx) and the number of hospitals that were not paid on the basis of DRGs.

- d. **How are excluded hospitals/departments paid?**

- i. The payment system, i.e. whether hospitals receive a budget/fee-for-service payments or per diems;
- ii. How the size of the payment is determined, e.g. based on historic costs of individual departments or average costs across similar departments;

4) Outliers

- a. **How are outliers defined?** (based on which data)
- b. **Which institution is responsible for determining the outlier definition?**
- c. **What payment mechanisms exist to take outliers into account?**
- d. **How are outliers paid?**

5) Other

- a. **Are there other mechanisms used to pay for highly complex or specialised care outside the DRG-based payment system?**
- b. **If yes, what is excluded?**

Section 3: Main challenges, debates and reforms

Please focus on challenges and debates related to the problem of patients with high variability of costs (if this is an issue in your country).

1) Main Challenges

- a. **What are the main challenges for the hospital payment system?**

2) Debates

- a. **Are there any current debates about the DRG-based payment system?**
- b. **What are the debates about?** In particular, we would be interested to know if the payment of hospitals for highly complex/highly variable patients has been an issue.
- c. **Who is taking part in the debates?**

3) Reforms

- a. **Have there been recent reforms of the DRG-based hospital payment system?**



- b. **Have there been reforms introducing standardised care pathways involving multiple hospitals? If yes, how are these reflected by the hospital payment system?** For example, stroke patients may be systematically transferred from an initial hospital to a more specialised hospital (or vice versa), and there may be rules for splitting the payment.
- c. **Have there been evaluation studies on the impact of reforms that excluded patients/services/hospitals from the DRG-payment system?** (E.g. is there a bias towards/against smaller hospitals?)

APPENDIX 2. COUNTRY EXPERTS

Country	Expert	Institution
England	Katja Grasic ^a , Donald Franklin ^b , Michael Chaplin ^b	^a Centre for Health Economics; ^b NHS
France	Mariama Toure	National School of Statistics and Information Analysis
Germany	Victor Stephani, Alexander Geissler, Wilm Quentin	Department of Health Care Management
Denmark	Lone Bilde	Danish Institute for Local and Regional Government Research
Estonia	Riina Sikkut	Praxis Centre for Policy Studies
USA	Julian Pettengill	The Medicare Payment Advisory Commission