

chapter **six**

DRG-based hospital payment: Intended and unintended consequences

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6.1 Introduction

Almost 30 years after the first introduction of a diagnosis-related group (DRG)-based hospital payment system in the United States in 1983 (Fetter, 1991), DRG systems have become the basis for hospital payment in most European countries, and in many other countries around the world (Kimberly et al., 2008). In fact, as illustrated in Chapter 2, one of the main purposes of the use of DRG systems in all countries discussed in this volume is to enable DRG-based hospital payment. Figure 6.1 illustrates the basic set-up of DRG-based hospital payment systems: (1) a patient classification system (PCS) is used to group patients with similar clinical characteristics and relatively homogeneous resource consumption into DRGs (see Chapter 4); (2) some kind of hospital cost information is used to determine DRG weight levels, usually at (about) the average treatment costs of patients falling within a specific DRG (see Chapter 5); (3) DRG weights are converted into monetary values and the payment rate may be adjusted for structural (teaching status, region) and further resource-consumption variables (length of stay, utilization of high-cost drugs or services); before (4) hospitals are paid on the basis of the number and type of DRGs that they produce.

DRG-based hospital payment systems provide a specific set of incentives that is different from other hospital payment systems, and the popularity of DRG-based systems is related to the fact that they are thought to have a number of (predominantly desirable) effects on quality and efficiency, which are discussed

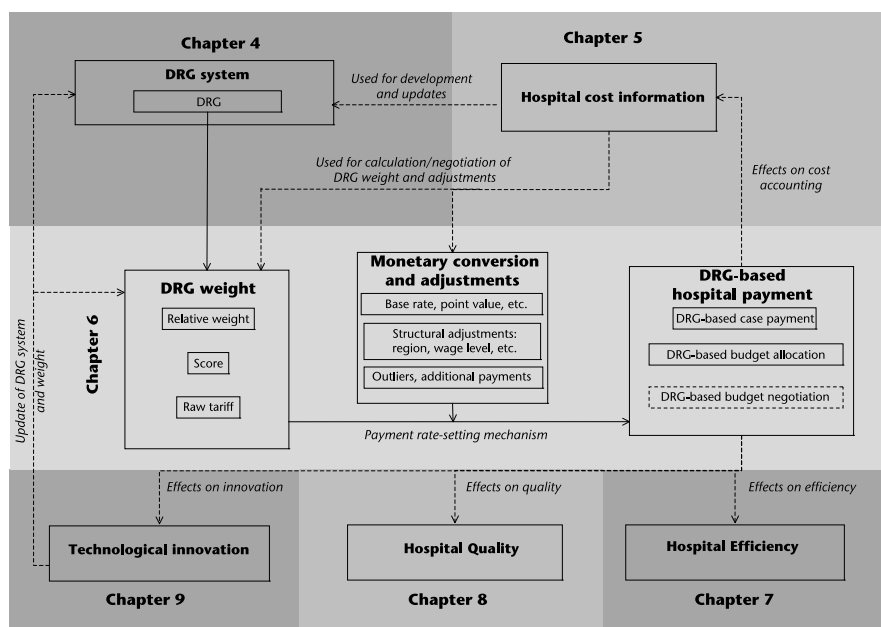


Figure 6.1 DRG-based hospital payment within the framework of this book

in Chapters 7 and 8 of this volume. Yet, since the introduction of the first DRG-based hospital payment system, discussions regarding negative or ‘unintended’ consequences of these systems have persisted in the United States (Lave, 1989; Ellis, 1998) as well as in Europe, following the adoption of DRGs for hospital payment (Böcking et al., 2005; Steinbusch et al., 2007; Farrar et al., 2009).

This chapter focuses on DRG-based hospital payment systems in the 12 countries included in this book, and on the main incentives generally attributed to these systems, which may generate both intended and unintended consequences. The chapter starts with an overview of how the payment rate is determined in DRG-based hospital payment systems (section 6.2). This is followed in section 6.3 by an introduction to the two main models of DRG-based hospital payment; namely, DRG-based case payment and DRG-based budget allocation. Section 6.4 provides a theoretical discussion of the main incentives attributed to the most basic model of DRG-based hospital payment and the related potential intended and unintended consequences. In section 6.5 we discuss how the countries analysed attempt to overcome some of the unintended consequences by modifying the basic model of DRG-based payment. Section 6.6 summarizes the findings and concludes that the incentives related to DRG-based payment systems have the potential to contribute to achieving the intended consequences, as long as they succeed at avoiding the unintended ones by implementing adequate control measures.

6.2 Paying hospitals on the basis of DRGs: Determining the payment rate

As illustrated in Figure 6.1, the hospital payment rate in DRG-based hospital payment systems is determined on the basis of the DRG weights and their conversion into monetary values. In general, the aim is that DRG weights are set at about the average costs of treating patients within a DRG. However, countries differ in terms of how they express DRG weights, usually calculated on the basis of information about average costs (see Chapter 5), or alternatively, a 'best practice' approach (see Chapter 7). Table 6.1 shows the distribution of the three main approaches that prevail in the 12 countries included in this book: (1) relative weights, (2) raw tariffs, and (3) scores. Each of these approaches corresponds to a specific monetary conversion method. The applicability of DRG weights and monetary conversion factors differs between countries and allows for adjusting hospital payments according to structural factors and/or national or regional priorities.

6.2.1 DRG weights and their applicability in 12 European countries

Most countries calculate DRG relative weights or use imported and adapted relative weights from other countries. The idea behind using DRG relative weights is that the weight of a DRG is expressed in relation to the average treatment costs of all cases in a country. In greatly simplified terms, DRG relative weights are computed by dividing the average costs of cases falling within a DRG through the average treatment costs of all cases in a country. Consequently, a DRG with a relative weight of one implies that average treatment costs of patients falling into that DRG are equal to the average treatment costs of all cases within the country. If relative weights are imported from abroad, DRG relative weights do not necessarily reflect national practice patterns. However, by adapting relative weights to national cost data (as in Ireland and Portugal, for example), countries aim to ensure that the adapted relative weights are linked to national resource-consumption patterns and that DRG weights can be interpreted in terms of above/below-average treatment costs.

England, France, the Netherlands and Spain calculate raw tariffs. These differ from relative weights in that they are expressed in monetary terms. In general, raw tariffs are calculated directly from the average treatment costs of patients within a DRG, even though they may be adjusted for inflation (as in England) or for national global budget control purposes (as in France). In Spain, raw tariffs are calculated on the basis of imported internal relative weights and national cost-accounting data. Interestingly, although the raw tariff is already expressed in monetary terms, it is not necessarily equal to the actual hospital payment, which is determined after further adjustments (discussed in more detail in the sections that follow).

Austria and Poland are the only two countries that express DRG weights as scores. The difference between scores and raw tariffs is that the score is not expressed in monetary terms but as a number of points. At the same time, and

Table 6.1 DRG weights, monetary conversion and their applicability in 12 European countries

<i>Country</i>	<i>DRG weight (unit)</i>	<i>Applicability of DRG weight</i>	<i>Monetary conversion</i>	<i>Applicability of conversion rate</i>
Austria	Score	Nationwide	(Implicit) Point value	Depending on state
England	Raw tariff	Nationwide (separate tariffs for emergencies, elective cases, day cases, children, orthopaedic activity)	Market forces factor	Hospital-specific
Estonia	Relative weight	Nationwide	Base rate	Nationwide
Finland	Relative weight	National (8 districts), District-specific (5 districts)	Base rate	Hospital-specific
France	Raw tariff	Nationwide (separate tariffs for public and private hospitals)	(1) Regional adjustment (2) Transition coefficient (until 2012)	(1) Region-specific (2) Hospital-specific
Germany	Relative weight	Nationwide	Base rate	State-wide
Ireland	(Adapted) Relative weight (locally referred to as relative value)	Nationwide (separate weights for paediatric hospitals)	Base rates	(1) Specific to one of four hospital peer groups (2) Hospital-specific
Netherlands	Raw tariff	Nationwide (67% of DRGs), hospital-specific (33% of DRGs)	Direct (no conversion)	Not applicable
Poland	Score	Nationwide (separate tariffs for emergencies, elective cases, day cases)	Point value	Nationwide
Portugal	(Adapted) Relative weight	Nationwide	Base rate	Hospital peer group
Spain (Catalonia)	(1) (Adapted) Raw tariff (AP-DRGs); (2) (Imported) Relative weight (CMS-DRGs)	(1) Nationwide (AP-DRGs) (2) Region-wide (CMS-DRGs)	(1) Direct (no conversion) (2) Base rate	(1) Not applicable (2) Region-wide (CMS-DRGs)
Sweden	Relative weight	Nationwide, county-specific (some counties)	Base rate	County-specific

Source: Based on the country-specific chapters in Part Two of this volume (most recent information available).

in contrast to relative weights, the score does not relate the DRG weight of one DRG to the average treatment costs of all cases within a country. Therefore, unlike relative weights, scores and raw tariffs do not facilitate the calculation of the casemix indices (CMIs) of hospitals, which are frequently used in countries using a relative/weight approach to comparing differences in patient populations across hospitals.

In the majority of countries, the same DRG weights apply to all hospitals and regions, nationwide. However, in Ireland, a separate set of relative weights is calculated for paediatric hospitals, and in England, different tariffs exist for (amongst others) day cases, emergencies, elective cases, children, and orthopaedic activity. In Finland and Sweden, national relative weights exist as well as district- or county-specific relative weights, and districts or counties are free to choose the set of relative weights that best suits their needs. In France, separate tariffs are calculated for public and private hospitals, as physicians' salaries are included only in DRG-based payments for public hospitals. In the Netherlands, national tariffs apply only for 67 per cent of DRGs, while 33 per cent of tariffs are the result of negotiations between hospitals and insurers. In Spain, raw tariffs for All Patient (AP-)DRGs apply only for patients treated in regions in which they are not ordinarily resident, while relative weights of Centers for Medicare and Medicaid Services (CMS-)DRGs apply only to the autonomous community of Catalonia. Furthermore, even if the DRG weight is the same for all hospitals and regions within the country, monetary conversion and adjustments may result in different payments for hospitals in different regions (see subsection 6.2.2).

6.2.2 Monetary conversion and structural adjustments

Table 6.1 also shows that all countries except for the Netherlands and Spain (AP-DRGs) multiply DRG weights with some sort of monetary conversion factor in order to determine actual DRG-based hospital payments. All countries that use a 'relative weight' approach multiply the relative weight with a so-called 'base rate'. However, significant differences exist between countries in terms of the applicability of the base rate to different hospitals. Estonia is the only country in which the same base rate is applied to all hospitals, nationwide. In Finland and Sweden, base rates are calculated specifically for every hospital according to predetermined global budgets and the expected hospital activity. In Germany, different base rates are negotiated between the self-governmental bodies (most importantly the social health insurance associations and the hospitals) for every *Land* (federal state). In Ireland, an increasing share of the DRG-based budgets is determined on the basis of a hospital peer-group (for example, major teaching hospitals, other hospitals, paediatric hospitals) base rate, which ensures that similar hospitals are grouped together for payment purposes; the hospital-specific base rate, which sheltered hospitals from excessive budget cuts during the introduction period, currently determines only 20 per cent of hospitals' budgets. In Portugal, a similar approach is taken, as hospitals are also paid on the basis of a base rate that is specific to the hospitals' peer group. In Catalonia, the base rate is the same for the entire region.

In England and France, raw tariffs are multiplied by adjustment factors, which ensure that certain structural characteristics (such as higher salary levels), are taken into account in DRG-based payments. In addition, DRG weights in France are still adjusted for a transition coefficient, reflecting historical cost patterns of hospitals in order to shelter them from excessive budget cuts, which is similar to the approach used in Ireland and other countries during the introduction period of DRG-based payments. In the Netherlands and Spain (for nation-wide use of AP-DRGs) raw tariffs are not adjusted but are directly used for payment.

In Poland, DRG scores are multiplied by a point value that is the same for the entire country. In Austria, the point value is implicit and state specific, as point values are not published and hospital budget allocations are determined on the basis of state-specific rules. For example, some states inflate the scores of teaching hospitals or hospitals located in areas with higher salary levels. The implicit point value is then determined by dividing the entire inpatient budget available for DRG-based payment within a state through the total (adjusted) scores produced by all hospitals. In Poland, the point value depends on the available national hospital budget and is determined through negotiations between the National Health Fund (NFZ), the Ministry of Health and representatives of associations of medical professionals.

6.3 DRG-based hospital payment

After monetary conversion and structural adjustments, hospitals in all 12 countries are paid – to at least some extent – on the basis of DRGs. Table 6.2 shows the distribution of DRG-based case payment and DRG-based budget allocation systems across countries. It also indicates the percentage of hospital revenues related to DRGs in acute care hospitals, and specifies further payment components of the hospital payment system in each country.

Most countries included in this book use a variant of DRG-based case payment systems, whereby each discharged patient is grouped into an applicable DRG, and hospitals receive a payment per case that is determined by the weight of that DRG (after monetary conversion and relevant adjustments). Several other countries use some kind of a DRG-based budget allocation system, whereby the available regional or national hospital budget is distributed to individual hospitals on the basis of the DRGs that they produced during one of the previous years, or that they are expected to produce in the next year. In these cases, the casemix (that is, the sum of the weights of all DRGs produced by a hospital) and the CMI (the casemix divided by the number of discharges) are usually the determining factors. In addition, some countries with DRG-based case payment systems – such as Germany or Finland – use DRGs to negotiate global hospital budgets, which limit (to a certain degree) the total amount of money that hospitals can earn from DRG-based case payments.

Table 6.2 shows that DRG-based hospital payment accounts for the majority of hospital revenues in all countries except for Spain (that is, Catalonia) and Estonia. Consequently, the incentives related to these payment systems are particularly important. However, it should be borne in mind that in most countries, psychiatric, rehabilitation and long-term care hospitals are not financed on the basis of DRGs, although several countries plan to extend their DRG

systems beyond the acute care hospital sector (see Chapter 4). In addition, the hospital payment system in almost all countries includes other payment components aside from DRG-based hospital payment, such as global budgets and additional payments for certain activities or cost categories. For example, in some countries, DRG-based payments do not include capital costs (see Chapter 5), and almost all countries have additional payments for certain innovative and high-cost services (see Chapters 4 and Chapter 9 of this volume), as well as additional budgets for teaching and research or availability of emergency care.

To appreciate fully the discussion that follows regarding the incentives associated with DRG-based payment systems, it is important to be aware of the differences between and within the two basic models of DRG-based hospital payment. First, in theory, DRG-based case payment systems could provide stronger incentives to hospitals than DRG-based budget allocation systems

Table 6.2 DRG-based hospital payment for acute care hospitals

<i>Country</i>	<i>DRG-based hospital payment model</i>	<i>% of hospital revenues related to DRGs</i>	<i>Other payment components</i>
Austria	DRG-based budget allocation	≈ 96	Per diems
England	DRG-based case payments	≈ 60	GB, additional payments
Estonia	DRG-based case payments	≈ 39	FFS (33%), per diem (28%)
Finland	In 13 out of 21 districts: DRG-based case payments (within GB)	Varies	Varies
France	DRG-based case payments, MLPC	≈ 80	GB, additional payments
Germany	DRG-based case payments (within GB)	≈ 80	GB, additional payments
Ireland	DRG-based budget allocation	≈ 80	GB, additional payments
Netherlands	DRG-based case payments (within GB for 67% of DRGs)	≈ 84	GB, additional payments
Poland	DRG-based case payments, MLPC	≥ 60	GB, additional payments
Portugal	(1) DRG-based budget allocation (NHS) (2) DRG-based case payments (health insurance)	≈ 80	Additional payments
Spain (Catalonia)	DRG-based budget allocation (Catalonia)	≈ 20	GB (based on structural index), FFS, additional payments
Sweden	DRG-based case payments with volume ceilings or GBs (region-specific allocation methods)	Varies	Varies

Source: Based on the country-specific chapters in Part Two of this volume (most recent information available).

Notes: FFS: fee-for-service (payment); GB: global budget; MLPC: macro-level price control.

because the link between hospital service provision and payment is more direct and transparent: hospitals know how much money they can expect if providing a specific set of services to a specific patient. In contrast, in DRG-based budget allocation systems, hospitals only know that the provision of a specific set of services to a specific patient in one year will increase the DRG-based budget for one of the following years, but the exact size of the payment remains unknown: it depends on the number of DRGs produced by other hospitals and on the available budget in the following year. Consequently, it is more difficult for hospitals to predict whether the provision of certain DRGs is profitable or not.

Second, incentives relating to DRG-based case payment systems can be more or less intensive, depending on country-specific modifications. For example, in Germany or the Netherlands, where DRG-based case payment systems are operated within global budgets, the incentives to increase hospital activity are less strong than in England, where hospital activity is not (yet) limited by global budgets or volume thresholds. Furthermore, the situation in countries with DRG-based case payment systems that operate within global budgets differs depending on whether or not hospitals are allowed to exceed the budgets. For example, in Germany, hospitals are allowed to exceed the budget but are paid at a reduced rate for those cases that are treated in addition to the negotiated budget. In the Netherlands, however, hospitals must pay back at the end of the year all revenue from DRG-based case payments that they received in excess of the global budget.

Third, independent of the model of DRG-based hospital payment, the strength of the theoretical incentives (see section 6.4) depends on how the monetary conversion rate is determined. For example, on the one hand, in Poland, where a nationally uniform monetary conversion rate is used, hospitals face strong incentives to reduce their treatment costs to below the DRG payment rate. On the other hand, in Finland, hospitals are paid according to a hospital-specific payment rate, as the base rate is determined by dividing the negotiated hospital budget by the predicted activity. Consequently, there are no incentives for Finnish hospitals to lower their costs to the level of treatment costs in other hospitals – and even less so since any potential deficits accruing to hospitals are compensated by the municipalities, which are both the purchasers and providers of hospital care.

6.4 DRG-based hospital payment in theory: Incentives and their consequences

As already mentioned, the principal reason for the popularity of DRG-based hospital payment systems is that they are thought to have predominantly desirable effects on hospital efficiency and quality. In general, there are three main incentives attributed to DRG-based hospital payment systems (Lave, 1989). Hospitals are incentivized (1) to reduce costs per treated patient, (2) to increase revenues per patient, and (3) to increase the number of patients. Table 6.3 summarizes these basic incentives of DRG-based hospital payment systems, presents the most important response strategies of hospitals, and indicates whether these imply positive or negative effects on efficiency and quality.

Table 6.3 Incentives of DRG-based hospital payment systems and their effects on quality and efficiency

<i>Incentives of DRG-based hospital payment</i>	<i>Strategies of hospitals</i>	<i>Effects</i>	
1. Reduce costs per patient	a) Reduce length of stay		
	• optimize internal care pathways	• quality ↑, efficiency ↑	
	• transfer to other providers		
	– improve coordination/integration with other providers	• quality ↑, efficiency ↑	
	– transfer/avoidance of unprofitable cases ('dumping' or 'cost-shifting')	• quality ↓	
	• inappropriate early discharge ('bloody discharge')	• quality ↓	
	b) Reduce intensity of provided services		
	• avoid delivering unnecessary services	• efficiency ↑	
	• substitute high-cost services with low-cost alternatives (labour/capital)	• efficiency ↑	
	• withhold necessary services ('skimping/undertreatment')	• quality ↓	
2. Increase revenue per patient	c) Select patients		
	• specialize in treating patients for which the hospital has a competitive advantage	• efficiency ↑, quality ↑	
	• select low-cost patients within DRGs ('cream-skimming')	• efficiency ↓	
	a) Change coding practice		
	• improve coding of diagnoses and procedures	• quality ↑	
	• fraudulent reclassification of patients, e.g. by adding inexistent secondary diagnoses ('up-coding')	• efficiency ↓	
	b) Change practice patterns		
	• provide services that lead to reclassification of patients into higher paying DRGs ('gaming/overtreatment')	• efficiency ↓, quality ↓	
	3. Increase number of patients	a) Change admission rules	
		• reduce waiting list	• efficiency ↑
• split care episodes into multiple admissions		• efficiency ↓↑, quality ↓↑	
• admit patients for unnecessary services ('supplier-induced demand')		• efficiency ↓	
b) Improve reputation of hospital			
• improve quality of services		quality ↑	
• focus efforts exclusively on measurable areas	quality ↓↑		

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Taking a step back: how are these incentives generated? The first main incentive (that is, to reduce costs per case) is generated because, in mathematical terms, the most basic DRG-based hospital (case) payment system is one in which hospital revenue for treating a patient falling into a specific DRG (R^1) is determined by the fixed payment rate per DRG₁ (\hat{p}_1) (Ellis & McGuire, 1986):

$$R^1 = \hat{p}_1 \quad (1)$$

Figure 6.2 provides a simplified graphical illustration of the relationship between costs, length of stay, revenue of hospitals, and the incentives related to this basic DRG-based hospital payment system for a hypothetical standard patient in DRG₁. As hospital revenue (R^1) per patient in DRG₁ does not depend on the costs of service provision, hospitals are strongly incentivized to reduce their costs below the payment rate (\hat{p}_1).

The three most important response strategies for hospitals trying to reduce costs per case are (Berki, 1985; Miraldo et al., 2006): (1a) to reduce the length of stay, (1b) to reduce the intensity of the services provided, and (1c) to select patients for whom hospitals can provide care at costs that are below the DRG payment rate (not shown in Figure 6.2). On the one hand, reducing the length of stay and the intensity of services are intended effects of DRG-based hospital payment systems because both can contribute to increased efficiency of hospital care. For example, length of stay can be reduced by optimizing internal care pathways (Kahn et al., 1990); and intensity of services may be reduced by not providing unnecessary services. However, on the other hand, reducing length of stay could result in inappropriately early ('bloody') discharges and service intensity could be reduced to a level at which necessary services begin to be withheld from patients ('skimping'; Ellis, 1998), both leading to reductions in quality (see Table 6.3). Similarly, the selection of patients can have intended and unintended consequences. On the one hand, hospitals could specialize in treating those patients for whom they have a competitive advantage (for example, better qualified personnel or better care pathways), which could lead

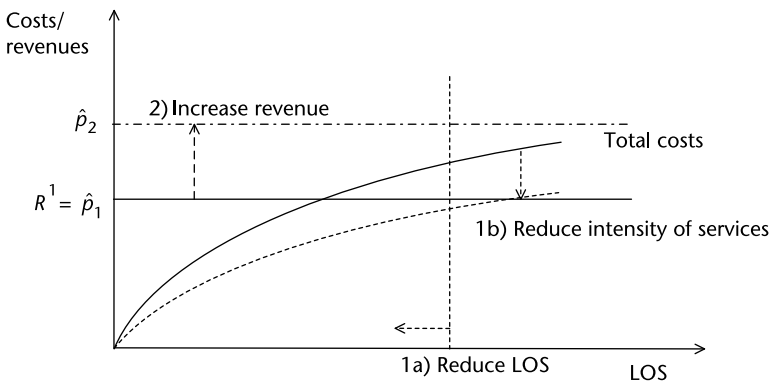


Figure 6.2 Selected incentives of DRG-based hospital payment for a hypothetical standard patient

to greater efficiency and higher quality. However, on the other hand, there is also the danger that hospitals engage in 'cream-skimming' (Levaggi & Montefiori, 2003; Martinussen & Hagen, 2009); that is, they attempt to admit only those patients within each DRG that can be expected to have costs below the payment rate (for example, by selecting patients without co-morbidities, if these are not adequately accounted for in the DRG system) or that they 'dump' unprofitable patients by transferring them to other providers or avoiding them altogether (Ellis, 1998; Newhouse & Byrne, 1988).

The second main incentive of basic DRG-based hospital payment systems – that is, to increase revenues per case (see Table 6.3) – can be achieved by hospitals through one of two strategies: (2a) changing coding practices, or (2b) changing practice patterns. As illustrated in Figure 6.2, the aim of both strategies is to reclassify patients into a different DRG (DRG₂) with an associated higher payment rate (\hat{p}_2). While more thorough coding of secondary diagnoses and procedures is an intended effect of the introduction of DRG-based hospital payment systems, the attempt by hospitals to increase revenues through fraudulent coding practices – such as adding inexistent secondary diagnoses or inverting primary and secondary diagnoses (known as 'up-coding' or 'DRG creep'; Simborg, 1981; Steinbusch et al., 2007; Silverman & Skinner, 2004) – is not intended because it leads to unjustified payments to hospitals. Furthermore, changed practice patterns would be an unintended consequence if hospitals provide additional (unnecessary) procedures that lead to the reclassification of patients into higher paying DRGs ('gaming/overtreatment'). However, this should be relevant only if these procedures can be performed at marginal costs that are below the level of the additional obtainable revenue as a result of the reclassification.

Finally, because hospital revenue in basic DRG-based hospital payment systems is determined simply by multiplying activity in each DRG by the fixed payment per DRG, the third main incentive for hospitals is to increase the number of admitted patients. Again, an increase in activity can be both an intended and an unintended consequence of the introduction of this type of hospital payment. On the one hand, if waiting lists existed under the old hospital payment system, an increase in hospital activity is an intended consequence that can contribute to increasing efficiency of hospitals. On the other hand, if activity is increased by admitting patients for services that could be provided in outpatient settings, efficiency is reduced. Furthermore, in competitive environments, hospitals' efforts to attract more patients may result in strategies to improve the reputation of hospitals by providing higher quality services, but could also lead to strategies that focus all efforts on improving only those services that are visible to patients or measurable by quality assurance programmes.

In summary, the intended and unintended consequences of DRG-based hospital payment systems are deeply intertwined. Most importantly, they are related to the fact that payment in these systems is independent of the costs of care provided to a specific patient. This becomes particularly problematic in the context of health care markets, in which information asymmetries are highly prevalent and make it difficult for payers to monitor and control providers' activity or behaviour (Lave, 1989). Furthermore, unintended consequences are

related to the fact that DRG-based hospital payment systems can be interpreted as providing highly powerful incentives (Frant, 1996) because hospital payment depends directly on provider behaviour.

6.5 DRG-based hospital payment in practice: Modifications and instruments to avoid unintended consequences

In practice, DRG-based hospital payment systems in the 12 countries included in this book are far more complicated than the basic model of DRG-based hospital payment presented in the previous section. As already mentioned, different models of DRG-based hospital payment systems, selective applicability of DRG weights and monetary conversion and adjustment factors, and structural payment adjustments modify the basic incentives of DRG-based payments. This section focuses more closely on the explicit attempts of the 12 countries to avoid and control unintended consequences.

6.5.1 Fairness of payment: assuring adequate payment for outliers and high-cost services

While DRG-based hospital payment systems can be considered to provide adequate reimbursement for the average patient within each DRG, they overpay hospitals for patients with below-average resource consumption and underpay for patients with above-average costs. In general, most of these differences are compensated automatically, as relatively more expensive cases within a DRG are compensated by cheaper cases within the same DRG, and even unprofitable DRGs may be compensated by highly profitable DRGs within the same hospital. However, ensuring that DRGs comprise cases with relatively homogeneous costs has been a major concern in all countries, as evidenced by the increasingly large number of DRGs in all systems (see Chapter 2). On the one hand, if DRG systems adequately account for differences between patients (by considering all relevant secondary diagnoses) and necessary treatments (by considering all relevant procedures), the incentives for certain unintended consequences, such as cream-skimming and skimping/undertreatment, could be greatly reduced. On the other hand, refined DRG systems with more narrowly defined DRGs also increase the scope for other unintended consequences, such as up-coding (if DRGs are defined on the basis of classification criteria that are easy to manipulate) and gaming/overtreatment (if procedural classification criteria introduce strong incentives to deliver certain services) (Hafsteinsdottir & Siciliani, 2010).

Yet, in spite of the continuous refinement of DRG systems, DRGs in all systems 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 (Cots et al., 2003). 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

patients. 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).

Consequently, most of the countries analysed in this book have developed mechanisms to identify outlier cases and to pay hospitals separately for the extra costs of treating such patients. Table 6.4 shows that most countries define outlier cases on the basis of a length-of-stay threshold (a certain number of days beyond which cases are considered outliers), as cost data are usually available only for a sample of patients across the country (see Chapter 5). The Nordic countries (Estonia, Finland, and Sweden) are an exception as they define outlier cases on the basis of costs. However, while all countries (except for the Netherlands) define outliers, the trimming methods determining the outlier threshold differ. They are either based on a variant of the interquartile method or the parametric method (Schreyögg et al., 2006), leading to varying percentages of all cases being considered outliers.

Figure 6.3 illustrates how hospital payment systems in most countries ensure adequate payment for outlier patients. Most often, the DRG-based payment rate is increased for long-stay outlier cases by a surcharge that depends on the number of days that patients were in hospital beyond the specified threshold. In Estonia and Finland, where outliers are defined on the basis of costs, the extra costs of outlier patients are reimbursed directly through a fee-for-service system. In Catalonia and the Netherlands, hospitals do not receive surcharges

Table 6.4 Definition of outliers and associated deductions/surcharges

	<i>Definition of outliers (trimming method)</i>	<i>Outliers as % of total cases</i>	<i>Outlier payment</i>	
			<i>Deductions/ payments</i>	<i>Surcharges</i>
Austria	LOS (interquartile)	~ 12–15	Per day	Per day
England	LOS (interquartile)	7	No (but short-stay tariff)	Per day
Estonia	Cost (parametric)	9	?	FFS
Finland	Cost (parametric)	5	No	FFS
France	LOS (interquartile)	0.4 (public hospitals)	Per day	Per day
Germany	LOS (parametric)	22	Per day	Per day
Ireland	LOS (parametric)	6	Per day	Per day
Netherlands	–	–	Not applicable	Not applicable
Poland	LOS (interquartile)	~ 2	No (but short-stay tariff)	Per day
Portugal	LOS (interquartile)	–	Per day	Per day
Spain (Catalonia)	LOS (interquartile)	5	No	No
Sweden	Cost/LOS (parametric)	5	Varies	varies

Source: Based on the country-specific chapters in Part Two of this volume (most recent information available).

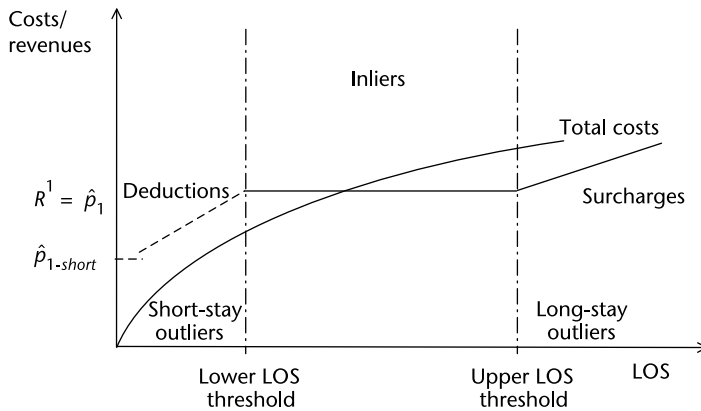


Figure 6.3 Trimming and reimbursement for outliers

for outlier cases. In Catalonia, the extra costs of outlier cases are supposed to be taken into account in the structural adjustments that determine the majority of hospital budgets.

In the Netherlands, the problem of outlier cases is dealt with very differently: if a patient has more than one diagnosis requiring treatment, this additional 'diagnosis-treatment combination' (the Dutch equivalent of a DRG, known as a DBC) triggers an additional DRG-based payment to the hospital. Interestingly, in Finland (and, prior to the recent update, also in England), a similar approach exists, whereby hospitals can assign more than one DRG for patients that were treated in several departments during one hospital stay.

Furthermore, several countries also determine lower length-of-stay outlier thresholds, which are sometimes an explicit attempt at avoiding inappropriately early ('bloody') discharges. These countries calculate a reduced payment rate for patients that are discharged prior to the lower length-of-stay threshold, either by deducting a certain amount from the standard DRG rate for each day that patients are discharged before the lower length-of-stay threshold, or by calculating the sum of a minimum payment plus a certain daily rate. England and Poland do not determine lower length-of-stay thresholds but have specific short-stay (one-day) weights ($\hat{p}_{1-short}$) for certain DRGs. In the Finnish and Swedish versions of the NordDRG system, specific DRGs exist for day-care patients.

Aside from the issue of outlier cases, all DRG systems are confronted with the problem that certain high-cost services are provided to a heterogeneous group of patients that fall into different DRGs. As discussed in Chapter 3, most DRG systems have instituted additional payment mechanisms for certain services that cannot be assigned to a specific DRG. Consequently, these services are exempt from the incentives that tend to apply to DRG-based hospital payment, and this can therefore be interpreted as an attempt to avoid skimping/under-treatment relating to these services. In addition, most countries have developed similar payment mechanisms for certain innovative drugs and treatments that are not adequately accounted for by their DRG systems (see Chapter 9).

6.5.2 Asymmetry of information: Monitoring and controlling unintended consequences

The asymmetry of information between providers and payers gives rise to several unintended consequences of DRG-based hospital payment systems: for example, payers do not necessarily know whether a specific patient was in need of a specific procedure; whether the patient really needed to be admitted as an inpatient; whether non-existing secondary diagnoses were coded; and whether certain secondary diagnoses resulted from medical errors. Consequently, providers can perform procedures that lead to the reclassification of patients into higher paying DRGs (gaming/overtreatment); they can increase the volume of admitted patients; they can up-code their patients; and they may receive higher payments for providing services of poorer quality (see Chapter 8).

In order to control some of these unintended consequences, several countries have implemented auditing systems that aim to reduce the asymmetry of information. For example, in Germany, the regional medical review boards of the sickness funds send teams to randomly selected hospitals to evaluate the coding and treatment of patients by auditing patients' medical records (MDS, 2011). In 2009, 12 per cent of all hospital cases were audited by the sickness funds, resulting in average costs of around €800 per audited case being recovered. In France, 1 per cent of hospital discharges were audited by the Regional Hospitalization Agencies (ARH) in 2006, which found that 60 per cent of evaluated records had some kind of coding error.

Other control mechanisms aim to limit the ability of hospitals to exploit the asymmetry of information by determining global budgets or volume thresholds (see Table 6.2), which ensure that hospitals do not increase their activity beyond predetermined limits. Furthermore, in order to control frequent readmissions, Germany and England financially penalize hospitals if patients are readmitted for the same problem within 30 days after initial discharge: for these patients, hospitals do not receive a second DRG-based payment. In addition, if countries in Europe were to follow the example of the United States in obligating hospitals to specify whether secondary diagnoses were present on admission (see Chapter 8), they would be able to differentiate between hospital-acquired (potentially avoidable) conditions, and those that were beyond the control of hospitals.

Finally, the regular recalculation of DRG weights and monetary conversion factors (see Chapter 9) reduces the ability of hospitals to benefit from up-coding: if all hospitals engage in up-coding, the recalculation of DRG weights and monetary conversion factors will lead to reduced payment rates for previously higher paying DRGs. However, if some hospitals engage in up-coding and others do not, the honest hospitals are likely to be penalized by reduced payment rates. Therefore, the readjustment of payment rates is useful as an effective mechanism for cost control, but it does not replace the need for thorough auditing of hospital coding activities.

6.5.3 The power of incentives: Reducing the share of DRG-based payment in total hospital revenues

As illustrated in Table 6.2, DRG-based hospital payment systems never determine the entirety of hospital revenues.² These other sources of revenue contribute to reducing the power of the incentives related to DRG-based hospital payment, as hospitals can focus their efforts on maximizing revenues through other strategies.

For example, in Spain (Catalonia), where DRG-based hospital payment accounts for only 20 per cent of hospital revenues, the power of the incentives related to DRG-based hospital payment are relatively weak. As pointed out by Cots and colleagues (see Chapter 22, subsection 22.7.2, p. 420), 'since hospital revenues are mostly determined by their SRI [structural relative index], hospitals are more likely to focus on introducing new and advanced technologies in order to increase their SRI, rather than focusing on improving performance as measured by DRGs'.

Furthermore, most countries that have introduced DRG-based hospital payment systems have phased in the systems over several years, with the size of total hospital revenues related to DRG-based payment slowly increasing over time. Consequently, the incentives of such hospital payment were minimal at first, giving hospitals time to slowly adjust to the changing financial environment.

6.6 Conclusions: Maximizing the intended and avoiding unintended consequences

This chapter illustrates that DRG-based hospital payment systems in the 12 countries analysed for this volume do not conform to the basic model presented in section 6.4. All countries' hospital payment systems include other payment components: the cumulative effect of structural adjustments of weights or monetary conversion factors, of outlier payments, and additional payments can be assumed to moderate the incentives associated with the basic model of DRG-based hospital payment. The resulting intricately blended hospital payment systems are more likely to contribute to achieving the societal objectives of securing high-quality hospital care at affordable costs than any other hospital payment mechanism alone (Ellis & McGuire, 1986).

One advantage of determining hospital payment on the basis of DRGs is that hospitals will be incentivized to increase their efforts in terms of coding of diagnoses and procedures, which will contribute to generating better hospital activity data. Yet, it is important to be aware that DRG-based hospital payment systems should always be accompanied by thorough monitoring systems that enable payers to reduce the information asymmetries, which would give rise to unintended consequences of the incentives that are inherent to DRG-based hospital payment systems. Furthermore, continuous refinement of DRG systems (see Chapter 4), and high-quality cost-accounting data (see Chapter 5) are essential for optimizing DRG-based hospital payment systems, and for assuring that payment rates are sufficiently related to the costs of care.

However, the country experiences presented in this book also suggest that governments do not need to be afraid of introducing DRG-based payment systems – as long as they do so carefully and over extended time periods, slowly increasing the share of DRG-based payments within the overall hospital payment system. The large number of alternative models – ranging from DRG-based case payment systems (operating within DRG-based negotiated budgets or not) to DRG-based budget allocation systems – illustrate that countries can tailor DRG-based hospital payment systems to the specific structure of their existing hospital payment system. If the effects of DRG-based hospital payment systems are carefully re-evaluated at regular intervals, ideally in close collaboration with all actors concerned, the incentives of DRG-based payment systems have the potential to contribute to achieving the intended consequences, as long as the unintended ones can be adequately controlled through the mechanisms described.

6.7 Notes

- 1 Even though some DRG-like PCSs do not define DRGs in the strict sense of the word (that is, groups are not diagnosis-related), this chapter uses the term DRGs to summarize all groups of patients defined by DRG systems or DRG-like PCSs (for further details see Chapter 4 or the relevant country-specific case study chapters in Part Two).
- 2 In fact, the extraordinarily high share of hospital revenues appearing to be determined by the DRG-based payment system in Austria is somewhat misleading, for example, as the state-specific monetary conversion factors in several of the federal states adjust – to a significant extent – for the structural characteristics of hospitals.

6.8 References

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