

chapter twenty two

Spain: A case study on diversity of DRG use – The Catalan experience

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22.1 Hospital services and the role of DRGs in Spain

22.1.1 The Spanish health system

The Spanish 1978 Constitution granted all citizens the right to health protection and care, and this was confirmed by the 1986 General Health Care Act (GHCA). The GHCA specified the basic features of the Spanish health care system, such as public financing and universal access to public health care services free of charge at the point of use. Furthermore, it recognized the devolution of health care responsibilities to the Autonomous Communities (ACs), that is, to the Spanish regions, which is an important characteristic of the Spanish health care system today.

In 2007, total health expenditures amounted to €1980 per capita per year, which corresponds to 8.4 per cent of gross domestic product (GDP) (European Commission, 2011). Public expenditures (mostly financed through general taxation) are the most significant source of finance in the Spanish health system as they account for roughly 72 per cent of total health expenditures. Household out-of-pocket expenditures account for about 22 per cent of total health expenditures and are mostly spent on services not covered by the public system (for example, dental care and services provided by private specialists). In addition, an increasing share of the population (25 per cent in 2007) holds private health insurance coverage (López Casasnovas, 2008), which pays for care provided in the private sector.

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On the one hand, the main responsibilities of the central Government still include setting the general framework for coordination and financing of the National Health Service (NHS), defining the basic NHS benefits package, regulating pharmaceuticals, and coordinating medical education (Durán et al., 2006). On the other hand, each of the 17 ACs has a Regional Health Service that is responsible for purchasing and provision of health care. In addition, ACs develop public health policies, and are entitled to extend the basic NHS benefits package (Health Information Institute, 2010).

Most importantly, the central Government collects income taxes and value-added tax (VAT) and allocates health budgets to the Health Service of each AC on a simple per capita allocation basis which includes criteria for adjusting the allocation, such as the proportion of the elderly population and insularity. In addition, each AC is free to collect additional resources through marginal add-on taxes on income.

Besides the general per capita allocations, the central Government also finances the Health Cohesion Fund, which was created in 2002 and accounts for less than 1 per cent of public health expenditures. The Cohesion Fund is managed by the NHS and aims to assure equal access to health care for the entire Spanish population. In order to do so, the Fund allocates resources to ACs that provide care to patients from ACs in which certain services defined by the Ministry of Health are not available (mostly high-technology services).

Each AC has developed its own structures and financing mechanisms. This chapter focuses on Catalonia in particular, as it was the first AC to adopt diagnosis-related groups (DRGs) for casemix analyses, management and hospital financing (HOPE, 2006). In Catalonia, in 2007, total health expenditures were at 7.4 per cent of GDP (CatSalut, 2010), of which 67.2 per cent were paid from public sources.

22.1.2 Hospital services in Spain and Catalonia

Spain

About 40 per cent of total health expenditures in Spain are spent on hospital care, almost exclusively (93 per cent) from public sources (European Commission, 2011). There are about 770 hospitals in Spain, of which 591 are acute care hospitals. Some 42 per cent of acute care hospitals are public (247). They represent 72 per cent of all acute care beds, with their average being greater than that of private hospitals (380 beds and 105 beds, respectively).

In general, the private sector offers services which are excluded from the public benefits package. It has specialized in areas such as plastic surgery and certain elective procedures for which waiting lists exist in the public sector.

As the responsibility for purchasing and provision of health care lies with the ACs, the central Government is not directly involved in the financing of hospital care. Instead, all resources (per capita allocations and Cohesion Fund resources) are channelled through the ACs' Regional Health Services, which have set up different organizational structures and management tools for the purchasing and provision of hospital care.

Catalonia

ACs differed greatly in terms of the availability of public health care infrastructures at the time of devolution. In some ACs the existing number of public hospitals (and their capacity) was adequate for the task; in others less so. In Catalonia, public health centres and hospitals were mostly concentrated in major cities. Therefore, in order to ensure universal availability of services a Public Hospital Network (*Xarxa Hospitalària d'Utilització Pública*, XHUP) was created by incorporating hospitals from a wide range of owners, including several town councils, the Red Cross, the Catholic Church and private charity societies.

In the XHUP there are 68 hospitals with an average of 237 beds (Table 22.1). Just 10 of the hospitals are directly owned by the Health Care Department and they constitute the Catalan Health Care Institute (ICS). The remaining hospitals have different owners (some of them private non-profit-making entities) and they are represented by two hospital associations: the Consorci de Salut i Social de Catalunya and the Unió Catalana d'Hospitals.

The private sector is relatively important as it represents about 20 per cent of discharges and 15 per cent of beds. Private care tends to be primarily used for obstetric services (perceived to offer higher comfort and room quality), for elective surgery (in order to avoid waiting lists), and for specialties with no public coverage, such as cosmetic surgery and dental care.

Hospitals do not only provide inpatient care: In 2007, over 10 million ambulatory care specialist visits took place at public hospitals. Primary care is provided through a public network organized on a territorial basis. Within the primary care network, each person is assigned to a general practitioner (GP), who has a coordinating role with the XHUP and who refers patients to hospital specialist

Table 22.1 Acute hospitals in Catalonia

<i>Acute hospital activity XHUP 2007</i>	<i>XHUP</i>	<i>%</i>	<i>Private network</i>	<i>%</i>	<i>Total</i>
Hospitals	68	63.0	40	37.0	108
Beds	16 119	85.5	2 813	14.5	18 932
Occupancy rate (%)	83.8	–	63.8	–	80.7
Staff	42 624	90.4	4.512	9.6	47 136
Staff/Number of beds	2.6	–	1.5	–	2.5
Discharges	725 108	79.7	184 864	20.3	909 972
Total bed days	4 932 360	87.4	709 004	12.6	5 641 364
Ambulatory visits	10 061 109	89.1	1 232 137	10.9	11 293 246
Emergencies	3 923 380	85.2	679 619	14.8	4 602 999
Publicly financed discharges	665 755	99.9	475	0.1	666 230
Publicly financed discharges/ Total discharges (%)	92.7	–	0.3	–	83.9
Expenditures	4 960 000	90.9	495 000*	9.1	5 455 000
Revenues	4 917 000	91.6	450 000*	8.4	5 367 000

Sources: Authors' own compilation based on EESRI, 2007 and CatSalut, 2007.

* Includes mixed acute, social and mental health care centres.

ambulatory care. In addition, major ambulatory surgery (MAS) has increased significantly since the mid-1990s and accounted for 15 per cent of all hospital discharges and 40 per cent of total surgical activity in 2007 (CatSalut, 2007).

The current hospital payment system in Catalonia has been in place since 1997 and is the same for the entire XHUP, independent of hospital ownership. Global inpatient budgets are set on the basis of DRGs and structural indicators. Additional budgets are distributed to hospitals for specific health programmes, capital investments, research and education. Inpatient hospital treatment accounts for the largest share of total hospital revenues. Outpatient consultations are paid through a flat fee per visit that differs according to the structural characteristics of the hospital. Emergency care is paid for by means of a fee-for-service system, whereby the fee is adjusted according to the structural characteristics of the hospital. 'Specific techniques' are financed through additional payments (see subsection 22.5.1 for further details).

22.1.3 Purpose of the DRG systems in Spain and Catalonia

Spain

National use of All-Patient (AP)-DRGs in Spain has two main purposes: (1) performance assessments and benchmarking, and (2) enabling DRG-based case payments from the Cohesion Fund to the ACs.

The casemix index (CMI) and the length of stay per DRG are the basic indicators of hospital scorecards used for performance assessments and benchmarking. Most ACs and the national Government give hospitals feedback in terms of national and regional DRG norms. The use of DRGs to evaluate efficiency is quite popular, and in some cases it is related to the evaluation of contract programmes. However, the most extensive and important uses of benchmarking come from private companies (IASIST, 2008).

The Cohesion Fund uses AP-DRGs to compensate ACs for care provided within their hospitals to patients from other ACs. As already mentioned, the Cohesion Fund was introduced in 2002 to assure equal access to public sector hospital services for the entire Spanish population. However, prior to receiving treatment in another AC, patients must seek authorization from their home AC. The Cohesion Fund does not compensate ACs for emergency care provided in their hospitals to patients from other ACs.

Catalonia

In Catalonia, DRGs have been used since 1997 to adjust hospital payments. Since the year 2000, 35 per cent of hospital inpatient budgets have been related to DRGs. Before the introduction of DRGs as a tool for hospital payment, the Catalan Health Service used the UBA (Basic Care Unit) model, which paid hospitals an equal amount of money per equivalent hospital stay (Brosa & Agusti, 2009). The purpose of the introduction of DRGs for hospital payment was to ensure an enhanced measure of hospital activity that would contribute to making hospital payment more closely related to performance (Cots &

Castells, 2001). Using DRGs was thought to encourage efficiency, improve data quality, and facilitate hospital management.

22.2 Development and updates of the DRG systems

22.2.1 The current DRG systems at a glance

All ACs provide to the Ministry of Health their minimum basic datasets (MBDS) detailing hospital activity, grouped using 3M AP-DRGs (current version 25), as is the standard defined at national level. National data from hospital patients grouped with AP-DRGs are used to analyse the casemix and for benchmarking. There are no national modifications of the imported AP-DRG system to the number of DRGs, nor to the algorithms used.

In Catalonia, all XHUP hospitals are required to group their discharges (inpatient and MAS) using Centers for Medicare and Medicaid Services (CMS)-DRGs. The CHS uses CMS-DRGs in order to adjust hospital budgets (see section 22.5). However, all Catalan hospitals also have to report on AP-DRGs, which are used to analyse efficiency, and to compare Catalan hospitals with the rest of Spain.

22.2.2 Development of the DRG systems

Spain has not developed a national DRG system but has relied on different DRG systems imported from abroad. In the 1990s, Spanish authorities decided to use imported DRG systems as there was no reliable cost-accounting information available in Spain that would have allowed a Spanish national DRG system to be developed. Only very few Spanish hospitals have a complete bottom-up cost-accounting system (as explained in section 22.4).

Spain

Table 22.2 provides an overview of the main facts relating to the national-level use of DRGs in Spain. AP-DRGs were introduced in 1999 for the benchmarking of hospitals. Since then, copies of the MBDS of all Spanish hospitals are transmitted to the national Ministry of Health, which uses the information to group discharges into DRGs. Every year, hospital activity data for all Spanish hospitals are reported by the Ministry of Health using AP-DRGs.

Since 2002, imported AP-DRG cost weights have been adjusted to the Spanish context by using cost-accounting information from an increasingly large sample of Spanish hospitals to calculate national tariffs. The original sample for the calculation of national AP-DRG tariffs included 19 hospitals, increasing to 30 in 2008. Hospitals were deliberately selected in order to be representative of all national public hospitals. However, the sample only includes one Catalan hospital, which means that wage and price differences between ACs are not adequately reflected in the estimated national AP-DRG tariffs. Hospitals

Table 22.2 Main facts about the use of DRGs in Spain

	<i>National/ Intercommunities</i>				
DRG system	AP-DRG v. 14.1	AP-DRG v. 18.0	AP-DRG v. 21.0	AP-DRG v. 23.0	AP-DRG v. 25.0
Date of introduction	1999	2002	2006	2008	2010
(Main) Purpose	Analysis/benchmarking of hospital data at national level				
	–	DRG-based case payments for compensation of intercommunity activity through the Cohesion Fund			
Data used for development	Grouping algorithm: Completely imported. National DRG tariffs: Data at cost centre level form a sample of 18 hospitals		Grouping algorithm: Completely imported. National DRG tariffs: Data at cost centre level form a sample of 30 hospitals		
Number of DRGs	644	656	670	676	684
Applied to	MBDS of all hospitals of the NHS (inpatient and MAS care)				
	–	ACs (to compensate patient mobility)			
Included services	All inpatient care, excluding psychiatric and long-term care	Benchmarking: all inpatient care (excluding psychiatric and long-term care) DRG-based case payments: elective high-complexity patients treated in non-resident ACs			
Included costs	–	Capital and recurrent costs			

participating in the data sample must follow a standardized cost-accounting methodology (see section 22.4 for more details).

Catalonia

Since 1985 some initiatives introduced United States Health Care Financing Administration (HCFA)-DRGs in the CHS (Ibern, 1991). However, it was not until 1997 that the Catalan Health Authority decided to officially introduce CMS-DRGs to the CHS (see Table 22.3).

The CMS-DRG system is not modified for use in Catalan hospitals, and unadjusted CMS-DRG cost weights are used for hospital payment. However, CMS-DRGs and AP-DRGs are used in Catalonia not only for inpatient care but also to group high-profile emergencies and MAS.

Since 1999, when data from all Spanish hospitals started being transmitted to the national Ministry of Health, data from Catalan hospitals were included in the national dataset. However, only in 2006 did the CHS start using AP-DRGs for casemix analysis at the regional level. Since then, the CHS has grouped patients discharged from XHUP hospitals using AP-DRGs. The CHS produces annual AP-DRG reports for every hospital to facilitate performance comparisons and to benchmark hospitals.

Table 22.3 Main facts about the use of DRGs in Catalonia

		Catalonia									
		1st set					2nd set				
DRG system		HCFA-DRGs (now CMS-DRG) v. 13.0	CMS v. 16.0	CMS v. 18.0	CMS v. 20.0	CMS v. 22.0	CMS v. 24.0	AP-DRG v. 21.0	AP-DRG v. 23.0	AP-DRG v. 25.0	
Date of introduction		1997	2000	2002	2004	2006	2008–2010	2006	2008	2010	
(Main) Purpose		Adjust the allocation of global budgets									
Data used for development		None (completely imported)									
Number of DRGs		492	499	499	510	520	538	670	676	684	
Applied to		XHUPs									
Included services		Inpatients, MAS and high-profile emergencies, excluding psychiatric and long-term care									
Included costs		DRGs determine 35% of hospital inpatient budgets									
		As in the rest of Spain									
		n/a									

Note: n/a: not applicable.

22.2.3 Data used for development and updates of the DRG systems

All DRG versions in use in Spain and Catalonia have been imported from the United States. Their algorithms were not developed in Spain.

National use of AP-DRGs for benchmarking and performance comparison relies on imported cost weights. However, in order to adapt AP-DRGs for intercommunity hospital payment, national tariffs have been calculated based on United States cost weights and cost data from an increasingly large sample of Spanish hospitals.

Over the last few years, cost data used for updates were always two years old: tariffs in use in 2008 and 2009 were based on cost data from the year 2006; tariffs in use since 2010 are based on cost data from the year 2008.

22.2.4 Regularity and method of system updates

In Spain as a whole (all ACs), DRG systems are updated every other year; that is, every two years a new version of AP-DRGs (CMS-DRGs in Catalonia) is imported from the United States. A new AP-DRG version is purchased every other year by the Ministry of Health from 3M Health Information Systems. In addition, ACs and individual hospitals purchase AP-DRGs according to their needs. In Catalonia, CMS-DRGs are also purchased from 3M Health Information Systems.

For the last update of national AP-DRG tariffs, a new version of AP-DRGs (version 25) was imported at the end of 2008. Then cost data from the hospital sample were grouped using AP-DRGs during the year 2009 in order to calculate tariffs for the year 2010. Consequently, in 2010 a version of AP-DRGs was used that had been introduced in the United States two years earlier. In Catalonia, CMS-DRGs are always two years old as they are introduced in the United States two years prior to their import to Catalonia.

Both AP- and CMS- (in Catalonia) DRG systems require that information about diagnoses and procedures is coded using the WHO International Classification of Diseases (ICD) 9th revision – clinical modification (ICD-9-CM), which is a United States-modified version of the ICD. As each version of the DRG systems is based on a specific ICD-9-CM version, a new ICD-9-CM version is always imported, together with the new DRG systems.

22.3 The current patient classification systems

22.3.1 Information used to classify patients

Every hospital in Spain produces a standardized minimum basic dataset (CMBD), which provides information on demographic characteristics of each patient, length of stay, type of admission, discharge destination, discharging department, and diagnoses and procedures coded using the ICD-9-CM. This information is transmitted to the Regional Health Authority (for example, the Conselleria de Salut in Catalonia), which forwards the data to the national

Ministry of Health. The national Ministry of Health extracts the necessary information from the national dataset in order to group patients into AP-DRGs.

In Catalonia, the Conselleria de Salut uses the same data from the CMBD to group patients into AP- and CMS-DRGs.

22.3.2 Classification algorithm

Since the general grouping algorithm of AP-DRGs is presented in the Portuguese chapter of this volume (see Chapter 21), this section will focus on CMS-DRGs.

Figure 22.1 illustrates the grouping process of the CMS-DRG system: in the first step, the grouper checks for invalid or implausible data and classifies patients into Error DRGs. Subsequently, cases are assigned into one of 25 major diagnostic categories (MDCs) on the basis of their principal diagnosis, with each MDC corresponding to a single organ system or etiology. However, there are a certain number of high-cost treatments (such as transplantations), which are reclassified into a Pre-MDC DRG on the basis of the performed procedure, without considering the principal diagnosis. Within each MDC, the presence of a surgical intervention assigns patients into the surgical 'partition', and its corresponding class (for example, Major Surgery), according to the procedure.

If no procedure was performed, cases are assigned to the medical 'partition' and to one of four classes (such as Neoplasms), according to the principal diagnosis. In the last step, the presence of certain secondary diagnoses that are considered to be complications and co-morbidities (CCs) is checked, and the final DRG is determined based on CCs, age of the patient, weight of the newborn (where relevant), and discharge status. This is similar to the process in the AP-DRG system, but the CMS-DRG system does not differentiate between major CCs and other CCs (see Chapter 4 of this volume).

There are a total of 281 DRGs in the medical partition and 255 in the surgical partition. Each DRG is characterized by a three-digit number, for example DRG 167 (appendectomy without complicated diagnosis, without CCs). The numbers are counted from DRG 001 to DRG 578 and do not indicate the MDC or the partition.

22.3.3 Data quality and plausibility checks

Spain

The Spanish Ministry of Health audits the cost-accounting information provided by the hospitals for the calculation of national AP-DRG tariffs (Spanish Ministry of Health and Consumption, 2008). For these hospitals a systematic auditing process is undertaken when the CMBD is submitted to the national Ministry of Health. The Ministry of Health verifies the plausibility of clinical data and the cost information provided. In addition, the Ministry performs site visits and checks patient records within hospitals, to ensure that the information provided is correct.

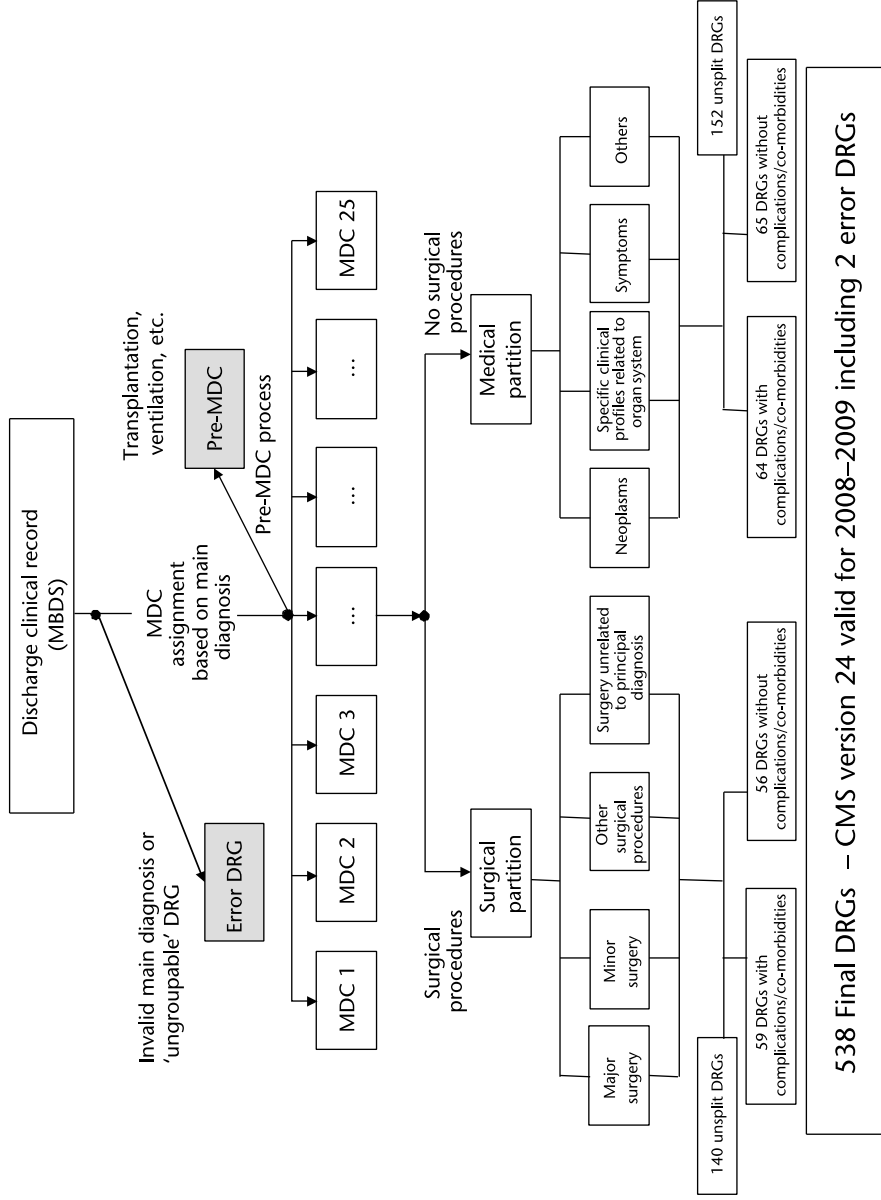


Figure 22.1 CMS-DRG version 24 grouping algorithm

22.3.4 Incentives for up- or wrong-coding

Catalonia

Since hospital payment depends partly on classification of patients into DRGs, hospitals have moderately strong incentives to ‘up-code’ their patients. In order to ensure that fraudulent practices are avoided, the CHS regularly carries out random auditing of hospital records to verify consistency between internal patient records and those reported. However, even when unusual coding practices are detected, auditing is oriented towards improving the quality of coding, rather than towards imposing sanctions.

22.4 Cost accounting within hospitals

22.4.1 Regulation

There are no national regulations mandating hospitals to use a specific cost-accounting system. However, given that the responsibility for the public health care system lies with the ACs, some ACs have defined minimum cost-accounting standards for their hospitals, requiring them to generate patient-level cost data (for example Catalonia and Cantabria).

In Catalonia, the Central de Balanços, which is a department of the CHS, provides hospitals with regulations relating to the production of financial statements (CatSalut, 1992). Furthermore, some (mostly private) hospitals collect patient-level cost information in order to improve hospital management.

As already mentioned, in 2008 a sample of 30 hospitals collected cost data for the calculation of Spanish AP-DRG tariffs. Hospitals participating in the sample were required to have at least a top-down cost-accounting system.

22.4.2 Main characteristics of cost-accounting systems in Spain

There are only few hospitals which have complete patient-level cost information. Different cost-accounting models are in use in Spain.

Before 2002 there was the GECLIF model (Financial and Clinical Management) of INSALUD (the former national centre of the Ministry of Health). The model was developed at national level within some projects that aimed to calculate costs per department (SIGNO I and SIGNO II – still used in a few hospitals) (González Pérez, 2008) in order to determine costs per DRG (INSALUD, 2001a, b).

At present, GESCOT™ – developed by a private consulting firm (SAVAC S.L.) and based on the GECLIF model – is one of the most common and most consistently used accounting systems in Spanish hospitals. It can determine costs per patient if hospitals have a fully functioning and high-quality information system, allocating costs to each patient according to each care service received. It means that the Health Information System must register each service, patient

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and cost centre at which the service is provided. The advantage of GESCOT™ is that it has a strong and valid imputation system, based on matricial distribution between cost centres, namely the Structural, Intermediate and Final cost centres.

In addition to these systems, some ACs have started introducing and developing their own cost-accounting systems, the most important of which are listed here.

- COANh, by the Andalusian Health Service, extended to the XHUP since 1995, uses a full costing system that employs reciprocal imputation in attributing costs between different types of cost centres.
- ALDABIDE, by the Basque Health Service, implemented in 1994 and updated in 1996 and 1998, aims to calculate costs at the department level.
- SIE has been implemented by the AC of Valencia since 1992.

Table 22.4 summarizes the four main cost-accounting systems in Spain, the methodology of cost imputation to final cost centres (that is, whether reciprocal imputation or mixed imputation with iterations (loop or matricial imputation) is used); and whether the model is able to provide patient costs through direct allocation to patients (that is, whether the system includes a bottom-up cost-accounting module).

Table 22.4 shows that relevant differences exist in imputation methodologies between different cost-accounting systems. GESCOT™ has the same structure within all hospitals for the first step of the cost-accounting process – that is, the primary cost-distribution method (top-down approach) – and each of these hospitals has developed a different final attribution structure, according to the level of detail of the activity information system.

Monge (2003b) surveyed hospitals employing the presented accounting systems and found that almost 40 per cent of polled hospitals declared using their own accounting systems, and that they were characterized by imprecise

Table 22.4 Main Spanish cost-accounting systems

<i>Accounting system</i>	<i>Cost categories</i>	<i>Methodology</i>	<i>Level of aggregation</i>
GESCOT™	Staff costs Goods and services Structural services Secondary services	Reciprocal imputations	Bottom up
COANh	Staff costs Goods and services Structural services Secondary services	Reciprocal imputations	Top down
ALDABIDE	Staff costs Goods and services Structural services Secondary services	Mixed, with iterations between cost centres of the same level	Top down
SIE	Staff costs Goods and services	Mixed, with iterations between cost centres of the same level	Top down

imputing methods and parameters, as well as slow information processing with manual dataset capture and management.

SAVAC Consultants S.L., provider of GESCOT™, estimate that – out of the almost 130 Spanish (public and private) hospitals using the GECLIF-derived cost-accounting system (GESCOT™) – only a few of them (around 15) can calculate costs per patient in accordance with a secondary cost distribution (bottom-up) process from final cost centres to patients.

22.5 DRGs for hospital payment

22.5.1 Range of services and costs included in DRG-based hospital payment

Spain

In general, AP-DRGs are only used for determining payments from the Cohesion Fund to compensate ACs for treating inpatients from other ACs. Payments from the Cohesion Fund are made mostly on behalf of small ACs that do not have the capacity to treat highly complex cases. In these cases, patients are treated electively in hospitals of other ACs, after authorization has been obtained from the Regional Health Authority where the patient lives. Payments from the Cohesion Fund are supposed to include all costs categories, that is, capital costs (for example, buildings and equipment) and running costs (for example, personnel and supplies).

Catalonia

In Catalonia, CMS-DRGs are used to determine DRG-based budgets for all hospitals within the public network, which includes many non-profit-making organizations. DRGs are used not only for inpatient activity (hospitalization), but also for MAS and high-profile emergencies (stays of longer than 12 hours, deaths or transfers to other hospitals). In general terms, DRGs include only acute care and do not cover psychiatric and long-term care. The inclusion of MAS was a political decision designed to provide a powerful incentive to set surgery in an outpatient setting, as one of the measures to reduce waiting lists, as well as to reduce costs.

About 15–20 per cent of total revenues in Catalan hospitals are related to the DRG-based CMI (relative resource intensity, RRI), which means that incentives to use DRGs are only moderate or weak. A much larger share of hospital revenues is determined by the hospitals' structural characteristics – namely its equipment, size, and so on – which influence payments not only for inpatient care but also for outpatient care and emergency care.

Non-surgical day cases are financed through fee-for-service prices, adjusted at the hospital level. Outpatient consultations are paid by means of a flat fee per visit, which is supposed to cover all possible following visits, and differs according to the structural characteristics of the hospital. Emergency care is financed by a fixed price that is adjusted according to the structural characteristics of the hospital.

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Hospitals receive additional funding for teaching and research. Furthermore, certain specific techniques are paid for on a fee-for-service basis (such as radiotherapy sessions), while others are financed through specific budget allocations (such as breast cancer screening programmes). Furthermore, a specific fund exists that finances surgical activity related to waiting list reduction and a programme to cope with emergency pressure in the winter. There are also additional payments for high-complexity treatments and diagnostic tests, such as radiotherapy, neuroradiology, catheterization and dialysis.

22.5.2 Calculation of DRG prices/cost weights

Spain

As already mentioned, Spanish national tariffs are calculated by adapting American AP-DRG cost weights on the basis of cost information from 30 Spanish hospitals. To elaborate these datasets and relative hospital-level costs, first a top-down cost allocation is realized in order to estimate costs of 11 'partial cost centres' (Operating Room, Radiology, Laboratory, Pharmacy, Medical Services, Intensive Care, Other Hospitalization Costs, Other Intermediate Hospitalization Costs, Medical Staff, Functional Costs, and Overheads).

Hospital cost-accounting systems perform a top-down process using a limited amount of clinical data. Once the top-down distribution to the 11 partial cost centres is completed, American DRG weights are used to value the cost of each patient and calculate an average cost per DRG (Falguera Martínez-Alarcón, 2001). The main weakness of this system is that it calculates an estimated, rather than real, cost per patient (Table 22.5).

Table 22.5 Evaluation of unit cost using internal DRG weights

	CC_i	... CC_i	... CC_{11}
DRG_1	$N_1 * W_{1-1}$	$N_1 * W_{i-1}$	$N_1 * W_{11-1}$
...			
DRG_j	$N_j * W_{1-j}$	$N_j * W_{i-j}$	$N_j * W_{11-j}$
...			
DRG_{886}	$N_{886} * W_{1-886}$	$N_{886} * W_{i-886}$	$N_{886} * W_{11-886}$
Total weighted activity	$TW_1 = \Sigma(N_j * W_{1-j})$	$TW_i = \Sigma(N_j * W_{i-j})$	$TW_{11} = \Sigma(N_j * W_{11-j})$ $UC_{11} = TCOST_{11} / TW_{11}$
Unit cost 1 to 11	$UC_1 = TCOST_1 / TW_1$	$UC_i = TCOST_i / TW_i$	TW_{11}
Cost per DRG_j	$CDRG_j = \Sigma(UC_i * W_{i-j})$		

CC_i is a partial cost centre

W_{i-j} is the internal (partial) DRG weight for DRG_j and the partial cost centre CC_i

N_j is the total number of patients classified into DRG_j

$TCOST_i$ is the total cost for the partial cost centre CC_i

UC_i is the unit cost for the internal (partial) cost weight W_i

$CDRG_j$ is the cost in Euros for DRG_j

The imputation is realized for each discharge (by its length of stay) and for each 'partial cost centre'. The weights are based on information about costs for these partial cost centres from a large number of American datasets, which are supposed to be statistically representative (Spanish Ministry of Health and Consumption, 2008).

By multiplying the number of cases (N_i) in each DRG (DRG_i) with an internal AP-DRG cost weight ($W_{i,i}$), the total weighted activity is calculated for each partial cost centre. Subsequently, the total costs of each partial cost centre (W_i) (derived from the top-down cost allocation) are divided by its total weighted activity to calculate a partial unit cost and then assigned to each discharge, for which a total cost can be calculated. Consequently, average costs for each AP-DRG can be calculated, which are used for setting national AP-DRG tariffs.

Catalonia

In Catalonia, the original CMS-DRG cost weights are used. However, in the process of determining hospital budgets, CMS-DRG cost weights are used only as an indicator of the RRI of cases within one hospital compared to the RRI of cases in the entire XHUP.

22.5.3 DRGs in actual hospital payment

Spain

The process before payment from the Cohesion Fund takes place can be described as consisting of several steps: (1) authorization must be obtained from the AC in which the patient is living; (2) the patient is transferred to another AC for treatment; (3) after treatment has been completed, the hospital is paid on the basis of the normal system of payment applicable in the hospital's own AC; (4) the Cohesion Fund compensates the AC in which the patient was treated for the provided services.

In order to determine payment to a specific AC, the MBDS of all non-resident patients treated in the AC are submitted to the Cohesion Fund at the end of the year. The Cohesion Fund groups the patient information from the CMBD into AP-DRGs, and pays hospitals on the basis of the national tariff, which is the same for all ACs.

Catalonia

The current Catalan hospital payment system relies on two types of information in order to determine global hospital budgets: (1) the RRI of cases treated by the hospital (measured through CMS-DRGs), and (2) each hospital's structural characteristics. Based on these two types of information, hospitals are paid for the number of discharges contracted by the CHS.

Figure 22.2 shows how the RRI of cases treated by a hospital is accounted for in the payment system: first, the CMI is calculated for each hospital by dividing the sum of all CMS-DRG cost weights of all patients treated by the hospital in

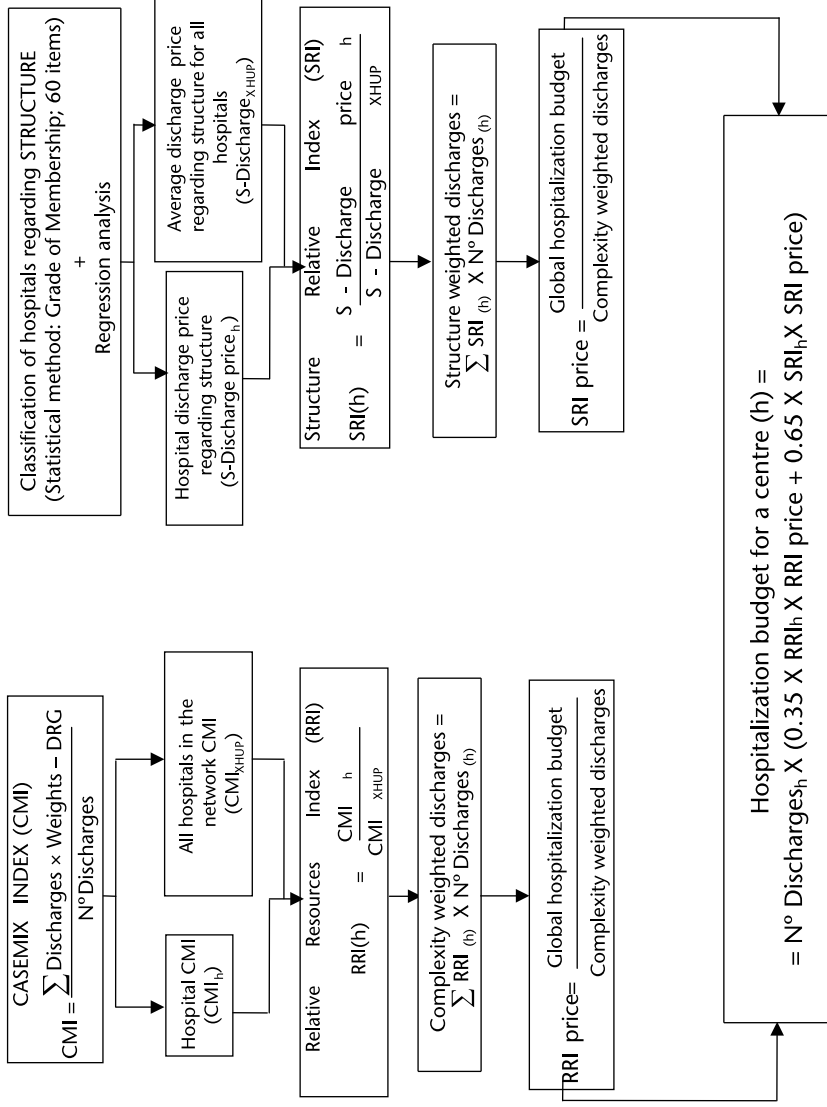


Figure 22.2 The hospital payment system in Catalonia

Source: Adapted from Sánchez-Martínez et al., 2006.

the previous year by the number of total patients treated. Accordingly, the CMI of the entire XHUP is calculated (Sánchez-Martínez et al., 2006). Second, each hospital's CMI is divided by the casemix of the XHUP in order to determine the RRI of patients treated in each hospital. Third, the complexity of all discharges within the XHUP is determined by summing the product of the RRI of each hospital (RRI_h), multiplied by the number of discharges in the hospital. Finally, the price per RRI (RRI price) is calculated by dividing the predetermined global hospitalization budget by the sum of complexity-weighted discharges of the XHUP.

In order to account for the structural characteristics of each hospital, a structural relative index (SRI) is calculated by the CHS for each hospital every four years. First, different structural groups are defined (for example, university hospitals, specialized hospitals), and structural weights are assigned to each group. Then, each hospital is classified into one or more of these structural groups, and its Grade of Membership to the group is determined through regression analysis. Finally, the SRI is computed for each hospital by applying the Grade of Membership proportions to the mean structural weight of each group.

In order to calculate DRG-based hospital budgets, the RRI and the SRI are multiplied by the RRI price and the SRI price, which are established by the CHS and updated every year. Hospital budgets for the year 2010 were determined on the basis of hospital activity data for the period from July 2008 to June 2009.

When CMS-DRGs were introduced in 1997, the CHS planned to gradually reduce the weight of the SRI and to increase the weight of the RRI. However, the weight of the RRI has been increased only once (in the year 2000), from 30 per cent to 35 per cent. Consequently, the hospital structure (the SRI) still determines 65 per cent of hospital payment. Apparently, the current weight attached to the RRI is not significant enough to motivate hospitals to attract more complex patients, as the complexity of patients (measured through CMS-DRGs) is responsible for only 35 per cent of hospital payment. Figure 22.3 shows the distribution of RRI values for each hospital within the network of public hospitals in Catalonia.

22.5.4 Quality-related adjustments

There are no quality-related adjustments to hospital payments on the basis of DRGs. In general, it is assumed that certain structural characteristics of hospitals – such as teaching status – imply higher quality and higher costs. However, these costs are not reflected in the DRG weight but are accounted for in the structural payment components of the Catalan hospital financing system.

22.5.5 Main incentives for hospitals

Since hospital payment is only partly based on DRGs, hospitals have only moderate incentives to up-code their patients (especially to increase the number and severity of secondary diagnoses).

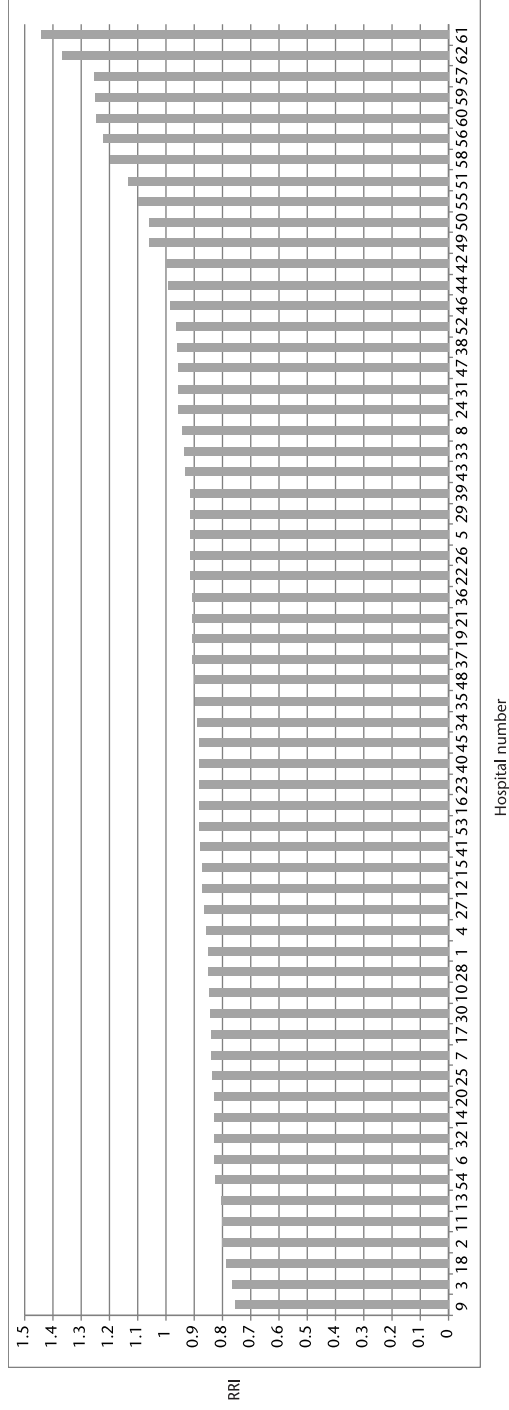


Figure 22.3 Relative resource intensity values for Catalan hospitals, 2009

Source: Secretaria Tècnica UCH, 2009.

'Present on admission' flags are not used in the Spanish coding system, and the DRG system is unable to discriminate between secondary diagnoses representing genuine co-morbidities and secondary diagnoses, reflecting complications as a result of medical errors or negligence. However, it remains unclear whether this inability to discriminate between different types of secondary diagnoses has a negative effect on treatment quality. The fact that hospitals have received the same payment for surgical procedures performed in an ambulatory setting (MAS) as for those surgical patients treated as inpatients has been a strong incentive to substitute inpatient surgery with MAS.

22.6 New/innovative technologies

Providers (for example, teaching hospitals) are entitled to make use of any health technology on the market. However, in order to receive additional payments for a specific new technology that is more costly than an existing one, hospitals need to apply to the CHS for funding. Unfortunately, there is not a clearly specified process of steps required in order for hospitals to receive additional payment. Applications by hospitals proposing the introduction of a specific technology can be either accepted by the CHS or rejected, depending on the available evidence on effectiveness and costs of the new technology.

The costs of initial applications of new technologies are usually borne by providers (such as teaching hospitals) and 'the industry' in general (namely, pharmaceutical companies or medical device manufacturers). Eventually, the technology is either included in the general benefits basket and paid for as with any other activity, or it is added to a list of certain approved innovative services to be financed from a specific fund for certain techniques and specific procedures (Brosa & Agusti, 2009).

Treatments and procedures that are financed through additional (fee-for-service) payments are generally delivered in day-care settings, and include high-complexity treatments and diagnostic tests, such as radiotherapy, stereotactic radiosurgery and neuroradiology, cardiac or hepatic catheterism, as well as highly technical care procedures such as those in urology departments and care of patients with renal failure.

In general, as hospital payment is only partially based on DRGs, the DRG-based incentives and disincentives relating to introducing new technologies (see Chapter 9) are thought to be of only moderate strength in Catalonia.

22.7 Evaluation of DRG systems in Spain

22.7.1 Official evaluations

Spain

The Spanish Ministry of Health oversees the development of AP-DRGs and, recently, has also been pilot testing International Refined (IR)-DRGs. The Ministry publishes data and information about casemix and costs based on AP-DRGs (Spanish Ministry of Health and Consumption, 2008).

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Recently, the potential to change to the IR-DRG system has been discussed, as this would provide the opportunity to include in one DRG-based system also non-surgical outpatient activity and emergency care.

Catalonia

The CHS has used HCFA- and later CMS-DRGs since the first introduction of DRGs in Catalonia in 1997. It did not make the change to the AP-DRG system used in the rest of the country because the change would have brought about significant changes in the distribution of resources among hospitals.

22.7.2 Authors' assessment of successes and problems

Spain

Spain has adopted a foreign DRG system based on the notion that it was too small to develop its own system. Several articles have been published by the authors of this chapter criticizing the adoption of a foreign DRG system. However, given the difficulty of developing and updating a national DRG system, and given the increasing interest in cross-border comparisons of hospital performance, the adoption of a foreign system does not seem to be such a bad choice.

If Spanish authorities seek to adopt a DRG system that explicitly considers outpatient care, Spain can migrate to the IR-DRG system without any significant cost. Currently, a project is under way, which aims to estimate national Spanish cost weights for IR-DRGs, using detailed patient-level cost data from a sample of hospitals following a common bottom-up cost-accounting methodology. Therefore, once these national cost weights are available, a change to IR-DRGs would also have the advantage that IR-DRGs would better reflect Spanish practice patterns.

Yet, any DRG system has the limitation that it only partially reflects the entire patient health care process. DRGs are always related to only one hospital stay and ignore care provided prior to admission or after discharge.

Catalonia

Almost 85 per cent of hospital financing remains related to structural indicators (SRI or prices for medical day cases, outpatient visits and emergencies based on structural levels) (Brosa & Agusti, 2009). Only 15–20 per cent of hospital revenues are related to the DRG-based RRI index. Consequently, the Catalan system of adjusting hospital payment on the basis of DRGs carries only moderate incentives, whether these are intended (to increase efficiency) or unintended (to engage in up-coding). Since hospital revenues are mostly determined by their SRI, 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.

The importance of structural financing components can be partly explained by the fact that outliers are not accounted for in the Catalan hospital financing

system. Teaching hospitals tend to have a higher rate of outliers (Cots et al., 2003). Increasing the share of DRG-based payment in total hospital revenues would mean that hospitals would not receive adequate payments if they have a high rate of outliers. If the CHS wanted to increase the importance of DRG-based financing, it would need to find a way of paying hospitals for treating outliers. Until then, the SRI ensures that those hospitals that are likely to treat a large share of outlier patients (for example, teaching hospitals) receive sufficient funding to cover their associated costs.

22.8 Outlook: Future developments and reform

The most significant trend in health care delivery in Spain (including Catalonia) is the increasing importance of outpatient care in hospital activity. Consequently, there is a need for the health care system to develop and use management tools that better fit with the new patterns of service delivery. In this context, adoption of the IR-DRG system would be a step forward. IR-DRGs have been specifically developed to better integrate outpatient activity with inpatient activity. Unfortunately, the benefits of the process of moving towards IR-DRGs at the national level are not being sufficiently promoted in Spain.

Furthermore, there is an increasing awareness of the need to coordinate hospital-level care with primary care and long-term care. Consequently, there has been a lot of interest in per capita grouping algorithms, such as Adjusted Clinical Groups (Sicras-Mainar & Navarro-Artieda, 2009) or Clinical Risk Groups (Inoriza et al., 2009). Currently, the CHS is focusing on a project for the development of per capita grouping mechanisms (Brosa & Agusti, 2009).

Until now, sufficiently detailed information about treatment costs in Spanish hospitals – to inform decisions relating to DRG system development – has remained unavailable. Ten Spanish hospitals have now built a cost database¹ for per-patient cost information, which has been used to provide information for the EuroDRG project. The intention is to regularly update the database with new cost information, with consistent input from a greater number of participating hospitals, and to make it accessible for use by other hospitals, researchers and benchmarking projects.

In the Spanish context, which includes the specific case of Catalonia, there is marked stagnation in the development of patient classification systems. The current hospital financing system does not require refined per-patient cost information. The division of regulating, financing, purchasing and supplying functions of the health care system has not been consolidated, even though this separation was clearly specified in national legislation. DRGs are and will probably continue to be used as tools to generate quality indicators (efficiency and effectiveness), but they also continue to have a minor impact on the management of the health care system and its transformation.

The inability to make changes is a significant aspect of this stagnation. Although the 17 Spanish ACs could independently introduce changes in patient classification systems, the overall health system requires homogeneity in its health care model. An active process of improvement is hampered by the duplication of responsibilities among the different levels of government, namely the

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ACs and central Government. A joint national and regional effort would be required in order to progress to a better DRG system and to use it more consistently for hospital payment.

22.9 Note

- 1 See the *Red Española de Costes Hospitalarios* (Spanish Network of Hospital Costs) web site (www.rechosp.org, accessed 10 July 2011).

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