

chapter twenty one

Portugal: Results of 25 years of experience with DRGs

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21.1 Hospital services and the role of DRGs in Portugal

21.1.1 The Portuguese health system

Since 1979 the Portuguese health care system has been based on a National Health Service (NHS) structure financed by general taxation, characterized by universal coverage and access to care that is mostly free at the point of use. The state is committed to achieving equity, and to promoting efficiency, quality and accountability in the Portuguese health care system (Assembleia da República, 1990). However, the Portuguese NHS has never conformed to the general characteristics of the Beveridge model of health care, mainly due to the incomplete transition from a previously fragmented social insurance system. Occupation-based insurance schemes that existed in 1979 are yet to be integrated into the NHS (Barros & de Almeida Simões, 2007). These schemes benefit from additional public funding and provide additional coverage to around 25 per cent of the population, who enjoy double coverage.

The Portuguese health care system is mainly financed through the state budget (around 75 per cent; Barros & de Almeida Simões, 2007), that is, through taxes. Since the early 1980s, total health expenditure has increased steadily and Portugal is at present among the highest spenders in the European Union (EU) in terms of health care expenditure as a percentage of gross domestic product (GDP) (above 10 per cent), in comparison with other countries that have NHS-based systems (OECD, 2008). Private financing accounted for around 25 per cent of total expenditure in 2006 (OECD, 2008), corresponding mainly to out-of-pocket payments for specialty visits, pharmaceuticals, dental care and physiotherapy.

All patients are assigned to an NHS general practitioner (GP) within their area of residence. Primary care GPs are expected to act as gatekeepers and refer patients to secondary care provided by medical specialists. However, access to

emergency services is not restricted, contributing to an imperfect gatekeeping system. A large private sector co-exists with the NHS and its role was explicitly recognized in the 1990 NHS law that instituted a mixed health care system (Assembleia da República, 1990). Consequently, the public and private sectors are both involved in the delivery of health care, with the private sector mainly responsible for carrying out specialist visits, elective surgery, ancillary tests and kidney dialysis.

The central government level still exerts most powers according to the tradition of centralized management. Regional Health Administrations manage the provision of primary care and are responsible for state reimbursement of prescribed drugs to the Pharmacies Association. The Central Administration of the Health System (ACSS) is an agency of the Ministry of Health, principally responsible for managing NHS financial resources for primary and hospital care. It also produces statistical information and regulates information technology (IT) both in hospitals and health care centres.

A detailed description of the Portuguese health system – including an overview of key institutions, relationships between the public and private sectors, modes of payment used for different providers and services – is beyond the scope of this chapter but can be found in Barros & de Almeida Simões (2007).

21.1.2 Hospital services in Portugal

Hospital services are provided by both the public and private sectors. Statistics on the number of beds in the private sector are not available for the whole country. The number of public and private hospitals (according to the last five years of data available) is presented in Table 21.1.

In 2007 the number of patients discharged per bed was 37 and (in NHS hospitals only, including mental health care facilities) the average length of stay (ALOS) corresponded to 7.7 days (DGS, 2008). The occupancy rate was close to 79 per cent, but higher in medical specialties than in surgical ones, despite existing waiting lists for surgeries.

NHS hospitals are owned by the state but are managed as independent institutions that are allowed to make profits and run deficits. However, deficits are generally compensated by the Ministry of Health if they threaten the financial viability of hospitals. Hospitals provide elective and non-elective care, ambulatory surgery, maternity services, diagnostic procedures, ancillary tests,

Table 21.1 Number of NHS (public) and private hospitals, 2003–2007

<i>Year</i>	<i>NHS</i>	<i>Private</i>	<i>Total</i>
2003	114	90	204
2004	116	93	209
2005	111	93	204
2006	107	93	200
2007	99	99	198

Source: INE, 2009.

and accident and emergency services. Non-acute psychiatric inpatient and outpatient services are mostly provided by psychiatric hospitals.

Private hospitals provide care to private patients, whether or not they are covered by occupational schemes or private insurance. Private hospitals charge patients a fee for each service according to costs incurred but can also negotiate fees with occupational schemes or insurance plans.

Inpatient services and ambulatory surgery provided at NHS hospitals, except psychiatric hospitals, are paid on the basis of diagnosis-related groups (DRGs). On the one hand, DRGs have been used since the late 1980s to determine DRG-based case payments from occupation-based and other insurance schemes to hospitals. On the other hand, the NHS has used DRGs since 1997 for DRG-based hospital budget allocation. Other hospital services (day care, specialist consultations, emergency services, high-cost drugs and so on) are paid on the basis of fee-for-service with a volume cap that is negotiated between the hospital and the ACSS.

21.1.3 Purpose of the DRG system

When DRGs were first introduced in Portuguese hospitals through a pilot study in 1984, the Ministry of Health had two main objectives. Urbano and colleagues (1993) who were leading the introduction process at the Ministry of Health have recalled that:

[T]he first objective of the project was to create an integrated information system for hospital management based on a set of necessary and uniform data, which would allow all levels of management to measure and control their productivity, support their decision-making, make plans and budgets, and establish equitable financing criteria. The second objective was to develop an information system that could efficiently collect, treat, analyse, and transmit information within hospitals, between hospitals and central departments, and among central departments.

In summary, the two objectives were to (1) improve resource allocation, and (2) increase transparency. However, the main goal of introducing DRGs was to rationalize the allocation of resources to NHS hospitals by more closely linking resources for inpatient care to hospital output (as measured through DRGs). According to Dismuke & Sena (2001), the Portuguese Ministry of Health sought to encourage a more efficient utilization of resources in public hospitals in order to increase productivity and to curb the uncontrolled growth of public expenditure in the health care sector.

21.2 Development and updates of the DRG system

21.2.1 The current DRG system at a glance

A non-modified version of All Patient (AP-)DRGs (Version 21.0) was imported in 2006. There is only one DRG system in Portugal that applies to all NHS

hospitals and all patients (inpatients and ambulatory surgery), except outpatients and patients treated in psychiatric and rehabilitation care settings. Private hospitals are not included in the system.

The current AP-DRG system defines 669 DRGs within 25 Major Diagnostic Categories (MDCs), each corresponding to one organ or physiological system, and one Pre-MDC (including high-cost cases such as transplantations). The DRG system is supervised and maintained by the ACSS within the Ministry of Health.

DRGs are used for DRG-based hospital budget allocation from the NHS to hospitals and for DRG-based case payment from third-party payers. DRG-based hospital budget allocations amount to about 75–85 per cent of total hospital inpatient budgets. The rest corresponds to DRG-based hospital payments from third-party payers. In order to control overall spending, the national base rate can be adjusted to ensure that total hospital payment does not exceed the available budget.

21.2.2 Development of the DRG system

In 1984 the Portuguese Ministry of Health started a pilot project to study the feasibility of implementing United States Health Care Financing Administration (HCFA-)DRGs as a measure of hospital output. The results of the pilot study were seen to be encouraging, and a decision was made to extend the system to all public acute care hospitals. The implementation process followed a centralized top-down approach (from the Ministry of Health to the hospitals). Given the centralization of the Portuguese political system, and the fact that the Ministry of Health owns the majority of hospitals, hospitals had to comply with the decision to introduce DRGs.

Implementation originally started in the Ministry of Health and was spread to NHS hospitals through the involvement of physicians and hospital managers in selected hospitals. A small team led by hospital managers working at the Ministry of Health (initially João Urbano and, after his departure, Margarida Bentes) worked in close cooperation with the Secretary of State for Health. Margarida Bentes was the most influential person regarding the implementation of DRGs in Portugal.

After the pilot study it was decided to adopt HCFA-DRGs to the Portuguese setting, without any adaptation. Several versions of HCFA-DRGs have been used (see Table 21.2). In 2006, the Ministry of Health decided to switch to Version 21.0 of the AP-DRG system, which was developed for use in hospitals in the United States for the calendar year 2004.

The first release of the AP-DRGs was Version 5.0, developed by 3M™ Health Information Systems in the 1980s. In the United States it was effective for the 1988 calendar year. As described in the *All Patient DRG Definitions Manual* (3M, 2003, p. 12) ‘the process of forming the DRGs was highly iterative, involving a combination of statistical results from test data with clinical judgement’. AP-DRG Version 21.0 was imported to Portugal without modifications.

The most significant Portuguese development concerning the use of DRGs was that in 1996 a process was initiated to adapt DRGs for the classification of

Table 21.2 Versions of DRG groupers used in Portugal

DRG system	HCFA-DRG Version 4.0	HCFA-DRG Version 6.0	HCFA-DRG Version 10.0	HCFA-DRG Version 15.0	HCFA-DRG Version 16.0	AP-DRG Version 21.0
Date	1984–1989	1990–1993	1994–1998	1998–2000	2001–2006	2006–2011
Purpose	Pilot study	Information system, DRG-based case payments from third parties	DRG-based budget allocation			
Data used for development	None: the grouper is not developed in Portugal. Cost weights have been adapted based on Maryland cost weights and the Portuguese hospital cost database					
Number of DRGs	470	477	491	503	511	669
Included services	All inpatient care			All inpatient care and ambulatory surgery		
Included costs	None	Excluding: outpatient care, and psychiatric and rehabilitation care				
Applied to	Participating hospitals	Full costs: including recurrent and capital costs, and costs of research and teaching in relevant hospital; excluding certain high-cost drugs				
		All NHS hospitals				

ambulatory surgery procedures (Bentes et al., 1996; Mateus & Valente, 2000). The rationale for this lay in the growing trend to shift care from inpatient to ambulatory settings and an ever-growing number of ambulatory surgery procedures being financed through DRGs as short-stay outlier or inlier admissions, depending on the low trim-point of the relevant DRG. From the viewpoint of the payer (the Ministry of Health itself), this was a clear distortion of the inpatient DRG system, considering that it was neither designed nor intended to classify ambulatory surgery procedures.

Based on a list developed by the Irish Department of Health and a survey of 56 selected hospitals, a set of 33 DRGs was selected from existing HCFA-DRGs as being eligible to classify ambulatory surgery procedures based on four criteria: physician's responses; homogeneity of the DRG's content; reported volume of zero day stays for the most common selected procedure code above 30 per cent; and, in addition, the low trim-point for the DRG in question had to be less than or equal to two days, to preserve face validity. To ensure validity and acceptability of results, panels of physicians were assembled and through consensus techniques a final list of 38 HCFA-DRGs were selected as 'ambulatory surgery DRGs' (five other DRGs were included with the original set of 33).

Subsequently, a price was computed for each ambulatory surgery DRG according to the Portuguese DRG cost/weight model (see subsection 21.5.2). Hospital costs were separated into those that could be assumed to vary with length of stay (e.g. physician, hotel) and those which were likely to be similar for each inpatient admission in the same DRG (e.g. laboratory, pharmacy). The price of each ambulatory surgery DRG was established according to the following price components of the corresponding inpatient DRG: 100 per cent of operating room (OR) cost; 100 per cent of physician cost for one day; 100 per cent of hotel and nursing costs for one day; 100 per cent of administration cost for one day; 80 per cent of the cost of supplies; 25 per cent of imaging and laboratory costs; 25 per cent of the cost of the relevant drugs for the procedure; zero per cent of intensive care unit (ICU) and other ancillary costs.

The first prices were published in 1998 and used for funding in the same year. More recently, a similar methodology has been used to select a list of specific therapeutic medical procedures that are eligible to be carried out in day-care settings.

DRGs were introduced for hospital payment from third-party payers in 1988. Starting in 1997, DRGs were also progressively introduced for the calculation of hospital budget allocations from the NHS (see subsection 21.5.3). Since 2002, the total NHS inpatient budget has been allocated through DRG-based hospital budget allocations.

21.2.3 Data used for development and updates of the DRG system

All DRG systems that have been in use in Portugal were purchased from abroad, and no Portuguese data were used to develop these systems. For the selection of

Table 21.3 Sources of data for the calculation of Portuguese prices by DRG

<i>Variable</i>	<i>Country</i>	<i>Source</i>
Costs	Portugal	Hospitals cost database (ACSS)
Relative weights	United States	Maryland cost weights
Inpatient discharges	Portugal	DRG database (ACSS)
National base rate	Portugal	Ministry of Health

ambulatory surgery DRGs only, information about Portuguese ambulatory care patterns was considered.

Table 21.3 presents sources of information that are considered for the calculation of Portuguese cost weights and for setting the national base rate. Portuguese DRG cost weights are calculated using Maryland cost weights (see subsection 21.5.2) and data from the national hospital costs database at ACSS, which contains information about treatment costs in all NHS hospitals (see section 21.4). Cost information is forwarded electronically to the national database, which is maintained and updated by the data unit at ACSS. Cost data from the database are also used to calculate Portuguese cost weights for ambulatory surgery DRGs.

Another important database used for the calculation of Portuguese cost weights is the DRG database at ACCS. The database contains all information from the uniform minimum basic datasets (UMBDS) of all NHS hospitals in the country. The national base rate is set by the Ministry of Health but the decision is based on information relating to the average costs of the average patient for a given year.

21.2.4 Regularity and method of system updates

The 3M™ Health Information System regularly updates the AP-DRG system in order to account for changes of the ICD-9-CM (WHO International Classification of Diseases 9th revision, Clinical Modification), or to adjust the system to new developments in medical technology or to changing practice patterns. A variety of statistical techniques are used to ensure optimal redesign and to maintain and improve quality and statistical coherence of the grouper.

Imported DRG systems have always been implemented in Portugal without any changes to the grouping algorithms developed in the United States. No system of regular updates of the DRG system exists in Portugal. DRG cost weights are recalculated at irregular intervals. The base rate is usually revised every 18 months. However, there is always a time lag of at least two years between the year of the data and the year of application of new DRG cost weights in hospitals. For example, hospital cost data from the year 2009 were analysed during the year 2010 in order to define the national base rate used for hospital payment in 2011.

21.3 The current patient classification system

21.3.1 Information used to classify patients

After a patient is discharged from hospital, the information on her/his medical record is abstracted to the UMBDS according to the coding rules. All patients are classified into AP-DRGs on the basis of the principal diagnosis, secondary diagnoses, procedures, age, sex and discharge status (3M, 2003).

Since the beginning of the first pilot project, diagnoses and procedures have always been coded through ICD-9-CM and coding activities have been carried out by trained physicians within hospitals.

21.3.2 Classification algorithm

Hospitals group every discharged patient into exactly one DRG using a computerized grouping software. The AP-DRG system defines 669 DRGs within 25 MDCs and one Pre-MDC. Figure 21.1 illustrates the grouping algorithm. In a first step, the grouping algorithm checks an exception hierarchy that specifies certain cases, which are separated during the Pre-MDC process (see Table 21.4). The Pre-MDC process defines specific high-cost procedures (such as transplants) that lead to direct classification of patients into certain DRGs within the Pre-MDC, or it assigns cases to MDCs on the basis of certain criteria other than their principal diagnosis. All cases that do not have conditions specified in the exception hierarchy are classified into MDCs on the basis of their principal diagnosis.

Within MDCs, the algorithm groups cases into a 'surgical' partition or a 'medical' partition according to whether an OR procedure was performed during the hospital stay. At the partition level, cases with secondary diagnoses

Table 21.4 AP-DRG hierarchy in the pre-MDC process

<i>Exception Hierarchy</i>	<i>MDC / AP-DRG Assignment</i>
Liver transplant	Assign to AP-DRG 480
Lung transplant	Assign to AP-DRG 795
Simultaneous kidney/pancreas transplant	Assign to AP-DRG 805
Pancreas transplant	Assign to AP-DRG 829
Heart transplant	Assign to AP-DRG 103
Kidney transplant	Assign to AP-DRG 302
Allogenic bone marrow transplant	Assign to AP-DRG 803
Autologous bone marrow transplant	Assign to AP-DRG 804
Age less than 29 days	Assign to MDC 15
Principal diagnosis of HIV or secondary diagnoses of HIV and principal diagnosis of HIV-related condition	Assign to MDC 24
ECMO or tracheostomy	Assign to AP-DRG 482 or 483
Principal diagnosis of trauma and at least two significant traumas from different body sites	Assign to MDC 25
Principal diagnosis	Assign to MDCs 1–14, 16–23

Source: 3M, 2003.

Note: ECMO: extracorporeal membrane oxygen.

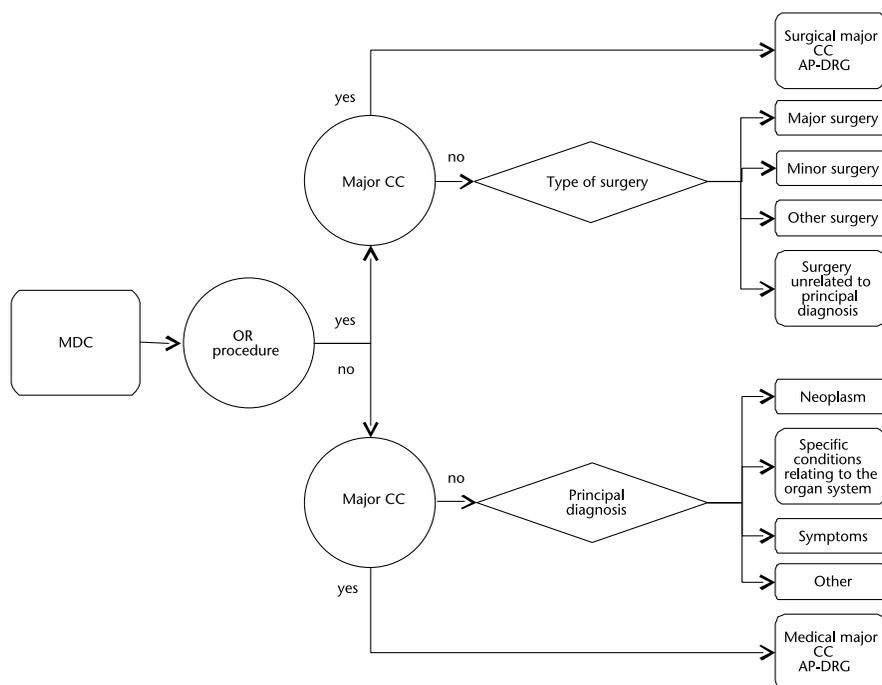


Figure 21.1 AP-DRG (Version 21.0) classification algorithm

Source: 3M, 2003.

that are considered a 'major CC' (major complication and/or co-morbidity) are separated and combined into a small number of medical or surgical 'major CC' groups. All other surgical cases are grouped into a surgical 'class' based on the highest ranked OR procedure or into the 'unrelated surgery' class in the event that the procedure is unrelated to the principal diagnosis. 'Classes' are similar to base-DRGs in other DRG systems in that they comprise patients with similar characteristics (see Chapter 4). Medical cases are grouped into medical classes (e.g. neoplasm, or symptoms and special conditions relating to the organ system). Both partitions also include a residual class for infrequent cases or those that are not well defined. In the last step of the grouping algorithm, classes can be split in order to increase economic homogeneity of the final DRGs based on age, discharge type, body weight (neonates) and secondary diagnoses that are considered to be 'CCs'. Both the 'CC list' and the 'major CC list' are globally defined with exclusions and adjustments at the principal diagnosis level (3M, 2003). There are 303 DRGs in the surgical partition and 364 DRGs in the medical partition.

21.3.3 Data quality and plausibility checks

High-quality data are essential for any DRG system. In Portugal, coding is carried out by physicians who are voluntarily trained as coders. A hospital-wide

framework for data evaluation was put in place early in the process of introducing DRGs (Bentes et al., 1997). Since 1995, internal and external hospital clinical coding audits have been carried out on a regular basis. Each hospital has assigned an internal auditor who coordinates the data-collection process and supervises the clinical coding of physician coders within hospitals. An external clinical coding auditing team – composed of eight physicians and a senior manager from ACSS – has been appointed to promote, support and monitor clinical coding audit activity at the hospitals. In addition, the external auditing team conducts site visits and verifies patient records in order to assess whether the classification of patients into DRGs has been carried out correctly.

Clinical coding audits are supported by computer software, which identifies the main data errors and inconsistencies in samples of hospital records. The software returns information about the average number of codes per record, the percentage of invalid codes for diagnoses, procedures and administrative data, and coding errors (e.g. opposite codes), as well as alerting the users to coding problems or deficient information within the medical records (e.g. diagnosis and procedure duplication, unspecified principal diagnosis) and atypical lengths of stay.

By the end of 2009 a web portal completely devoted to coding issues was made available.¹

21.3.4 Incentives for up- or wrong-coding

As more complex DRGs have a higher cost weight, hospitals are incentivized to code all existing secondary diagnoses of their patients. However, there is also an incentive to engage in up-coding (see Chapter 6), although the periodic coding audits that are carried out strongly disincentivize this behaviour. During the external clinical coding audits that took place between 2006 and 2008, one third of the records presented critical non-conformities. Nevertheless, only 11 per cent had errors leading to a change of the original DRG, and the change was not always for a less complex group.

It is worth noting that as part of the financing criteria for 1998, the final quality coding score of each individual hospital has been considered for adjustments to the preliminary budget (in terms of premiums/penalties), thus creating incentives for data-quality improvement. The impact of the premiums/penalties was below 1 per cent of the inpatient budget of the hospital, and this was a one-off adjustment.

21.4 Cost accounting within hospitals

21.4.1 Regulation

It is mandatory for all NHS hospitals to report their activity and costs annually to ACSS. Since 1995 an NHS Costing Manual has been in place and sets out the mandatory practice of costing to be applied in NHS hospitals (IGIF, 2007). With the implementation of the Costing Manual, the collection and production of costing information presents a greater degree of consistency.

Clinical costing standards cover acute inpatient care, consultations, day-case treatments, emergency visits and ancillary tests. In January 2010 more detail was introduced for mental care services and psychiatric hospitals also had to collect costing information according to the Costing Manual regulations.

21.4.2 Main characteristics of the cost-accounting system

The range of costs included in accounting terms corresponds to the full cost of the provision of all services borne by the hospital. Therefore, all operating expenses, staff costs and capital costs are included. As usual, total costs should be reconciled to the financial costs of the provider for the previous financial year.

Costs are calculated using a top-down approach because information on itemized resource use by individual patients is not collected at NHS hospitals. The Costing Manual (IGIF, 2007) specifies that hospitals should group their costs into five homogenous sections (see Table 21.5), which are cost centres within hospitals, created to absorb direct costs and to allocate indirect costs (IGIF, 2007).

Costs are allocated to cost centres in the principal section, following a step-down approach that includes four steps (see Figure 21.2), as detailed here.

1. First step: imputation of direct costs into principal, auxiliary and administrative sections.
2. Second step: allocation of total costs of the administrative sections to the auxiliary and principal sections.
3. Third step: allocation of total costs of general support auxiliary sections to the sections that benefit from their activities.
4. Fourth step: allocation of total costs of clinical support auxiliary sections to the sections that benefit from their activities.

Table 21.5 Homogenous sections and cost centres

<i>Homogenous sections</i>	<i>Relevant cost centres</i>
1. Principal sections	Clinical inpatient services, e.g. medical specialties, surgical specialties, obstetrics, radiotherapy, ICU, transplant unit Clinical ambulatory services, e.g. day-case treatments, ambulatory surgery, outpatients, emergency care
2. Auxiliary sections of clinical support	Diagnostic and therapeutic tests Anaesthesiology OR Other clinical support services
3. Auxiliary sections of general support	Buildings and equipment services Hotel services
4. Administrative sections	Administration and board, e.g. accountancy, management Technical and administrative services
5. Non-imputable	Costs not associated with activities of other sections, e.g. tests ordered by other hospitals

Source: IGIF, 2007.

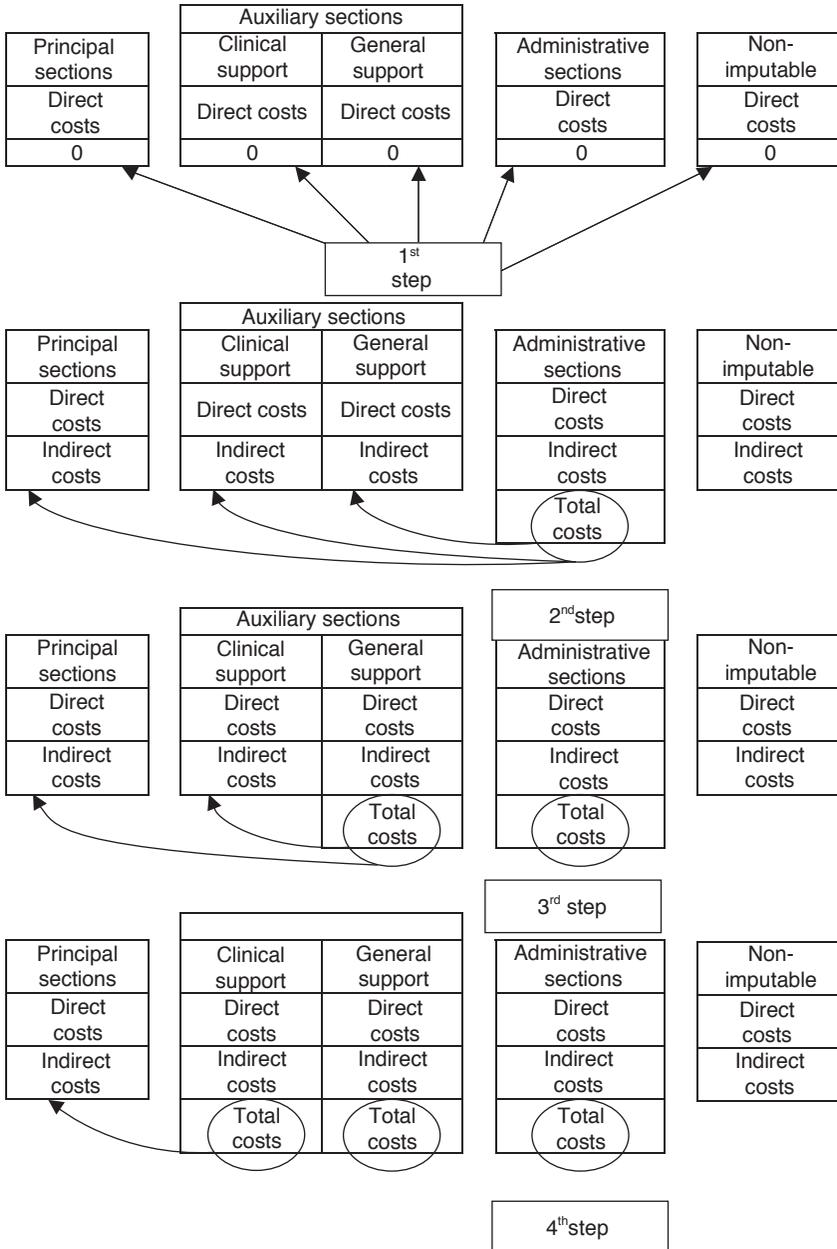


Figure 21.2 Structure/rules for cost allocation

Source: IGIF, 2007.

First-level costs – direct costs – are directly associated to a homogenous section because they are a direct result of its activity. Second-, third-, and fourth-level costs – indirect costs – have to be apportioned to the principal sections that use the services they provide according to the reciprocal distribution method (IGIF, 2007).

Hospitals report their costs for all sections (principal, auxiliary and administrative) to the national hospital cost database that is used for the DRG cost/weight calculation model. A working group was established in 1997 in order to improve the linkage between the hospitals' cost accounting and the DRG cost/weight calculation model. For all hospitals, items to be included in each cost centre were reviewed in order to ensure greater comparability within costs included in the model. However, the hospitals' cost-accounting systems still use different reporting criteria, which impacts negatively on the DRG cost/weight calculation model.

21.5 DRG-based hospital payment in Portugal

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

For payment of hospital activities, DRG use in Portugal is threefold: (1) calculation of a prospective global budget for inpatient care (accounting for about 75–85 per cent of total NHS hospital inpatient revenues); (2) DRG-based case payment for care provided to beneficiaries of occupation-based schemes and insurance companies (mainly for traffic accidents and occupational injuries); (3) DRG-based case payment for surgical procedures included in the waiting list recovery programme. Outpatient care, rehabilitation and psychiatric care are not included in the system. Furthermore, hospital payment of private hospitals is not based on DRGs.

DRG-based budgets or DRG-based case payments cover the full costs of treatment of a patient in a particular DRG, including recurrent costs such as salaries of medical doctors, and capital costs. There are no specific adjustments for research and teaching activities, which are supposed to be financed through additional budgets from other ministries. Nevertheless, a proportion of the higher costs of teaching and research are supposed to be taken into account through the adjustments that are in place for different groups of hospitals (see subsection 21.5.3).

21.5.2 Calculation of DRG cost weights

Calculation of national Portuguese cost weights suffers from the inexistence of data relating to per-patient costs in NHS hospitals. However, a Portuguese DRG cost/weight calculation model is in place that adjusts original AP-DRG cost weights to the Portuguese context using Maryland cost weights and information contained in the national hospital cost database and the national DRG database (see section 21.2.3). Maryland cost weights are developed by the

Maryland Cost Review Program and provide a set of internal cost weights that reflect the costs of one service relative to other services within each DRG. By assuming that Portuguese hospitals have the same pattern of service use as hospitals in Maryland, but at different levels, it is possible to determine the relative costs of each service that comprise total hospital costs by DRG (see also Chapter 22 of this volume).

The shortcoming of this methodology lies in assuming an identical profile of treatment in Portugal and in Maryland in the United States. Since 1994, panels of physicians (by MDC) have convened at the ACSS when necessary to validate Portuguese cost weights estimated through the DRG cost/weight calculation model.

In order to account for cases with extremely long or short length of stay, calculated cost weights apply only to cases falling within specified length-of-stay thresholds. These thresholds are calculated on the basis of an inter-quartile method using length-of-stay data from the national DRG database.

The national base rate is determined by the Ministry of Health on the basis of the 'calculated base rate' for the previous year (e.g. 2009), and the available budget for the next year (e.g. 2011). The calculated base rate is the quotient between the total costs of a given year and the total number of discharges for the same year, and it expresses the average costs for the average patient for that year. When setting the value of the national base rate, the Ministry of Health bears in mind its impact on third-party payers' budgets and on the expenditure of the NHS. The base rate is used to calculate the hospitals' budgets and the DRG tariff for third-party payers (see subsection 21.5.3). After changes in cost weights or base rates, the model is recalibrated in order to ensure a national casemix index (CMI) of one.

21.5.3 DRGs for hospital payment

DRG-based budget allocation from the NHS

Key components of the DRG-based budget allocation model are the hospital casemix indices, hospital adjustment rates and the total number of discharges. However, it should also be kept in mind that the amount spent under the DRG funding system cannot exceed the national budget for inpatient care and, frequently, it is necessary to adjust the national base rate to conform to that constraint. The hospital inpatient budget (H_i) is calculated by multiplying the number of standardized NHS inpatients the hospital is expected to treat during the budget year (t) (predicted equivalent discharges)² multiplied by its CMI in the year before last ($t-2$) and multiplied by the group base rate. Hospital groups are defined normatively based on the number and diversity of specialties they can provide, among other criteria. The group base rate is determined to a certain percentage based on the hospitals' base rates within the group (that is, the average costs of the average patient treated in each hospital), with the remaining proportion based on the national base rate.

$$H_i = CMI_{(t-2)} \times \sum \text{predicted equivalent discharges} \times \text{group base rate}$$

Table 21.6 Percentage of funding based on DRGs

<i>Year</i>	<i>DRG (%)</i>	<i>Previous year's budget (%)</i>	<i>Limit of losses</i>
1997	10	90	Zero
1998	20	80	No limit
1999	30	70	No limit
2000	30	70	Zero
2001	40	60	Zero
2002	50	50	n/a

Note: n/a: not available.

Hospital budgets for the year 2011 were defined on the basis of the hospitals' CMI in the year 2009.

Since 2003, DRGs have been used to set the total amount of each NHS hospital's inpatient budget. However, between 1997 and 2002 they were introduced gradually with a progressively increasing share of the budget being determined through DRGs (Table 21.6). For some years, the Ministry of Health decided to limit losses to zero; that is, it was decided not to reduce the budgets from one year to another.

DRG-based case payments from third-party payers

In order to receive DRG-based hospital payments for a given month, hospitals must provide information to third-party payers about the number and type of DRGs that were provided to their patients. The payment for every DRG is based on the official tariff, which is determined by multiplying the applicable DRG cost weight with the current national base rate. Payments are adjusted to account for both long-stay and short-stay outliers. Long-stay outliers are paid, after the high trim-point (according to the relevant DRG), at a daily rate that is identical for all DRGs. For short-stay outliers, the payment corresponds to the number of days multiplied by the day price for the DRG. The payment is the same to all NHS hospitals, regardless of the type of hospital (specialty hospitals or general hospitals).

21.5.4 Quality-related adjustments

According to the goals set in the contracts between the ACSS and hospitals, the hospitals can receive a bonus if the percentage of readmissions in the first five days after discharge remains under a defined threshold. The share of ambulatory surgery procedures as a percentage of the total programmed surgical procedures and the ALOS are also considered for the calculation of bonuses.

21.5.5 Main incentives for hospitals

One of the main goals related to the introduction of DRGs for hospital payment was to improve efficiency through increased activity and shorter ALOS and, therefore, to reduce waiting times. The other goal was to control the growth of

public expenditure in the health care sector. As hospitals are paid according to the number and type of DRGs that they provide, DRGs encourage hospitals to cut costs, to reduce length of stay and to treat more patients. Analysis of the evolution of the number of patients treated and of the ALOS seems to confirm these expectations (see section 21.7).

21.6 New/innovative technologies

Innovative drugs and devices not included in any DRG are treated on an ad-hoc basis. Physicians remain responsible for decisions related to need. However, physicians must justify their decisions to the hospital's board or to the Drugs and Therapeutics Committee. Usually, clinical criteria prevail. There are no disincentives for hospitals to use new or innovative technologies, as hospital budgets are not fixed and there are no penalties if hospitals incur a deficit.

21.7 Evaluation of the DRG system in Portugal

21.7.1 Existing evaluations

Since the introduction of DRGs, the ALOS has been decreasing in Portuguese NHS hospitals, while the number of patients discharged shows the opposite trend (Table 21.7). This could indicate increasing efficiency in the treatment process, especially as occupancy rates have been constant at around 75 per cent (Bentes et al., 2004).

It should be noted that data for the last two years originate from a different source, which might explain the increase observed in the inpatients' ALOS. Furthermore, the number of patients being treated in ambulatory settings has been rising, which certainly indicates that the complexity/severity of cases being treated in inpatient settings has also been increasing.

In Table 21.7, the cost weights from 1998 were used for the computation of the CMI in each year presented. This explains why the CMI is 1 for the year 1998 and higher for all subsequent years. With that information in mind it can be ascertained that the complexity of cases being treated in Portuguese NHS hospitals has been increasing.

As was the case in the United States, after the first ten years with a DRG-based hospital payment system, in Portugal some of the interest in evaluations of the system has also vanished. Mateus (2008) provides a review of previous evaluations. In summary, the results found in Portugal were similar to those in the United States or Australia; namely, a decrement in the ALOS, and an increase in the CMI and in the number of discharged patients. More patients are being treated, which could indicate efficiency gains.

21.7.2 Author's assessment

After 25 years we can now say that the implementation of DRGs in Portugal has been a success. Not only have NHS hospitals since the late 1980s been billing

Table 21.7 Cases treated, ALOS and CMI in the period 1997–2006

	1997	1998	1999	2000	2001	2002	2003	2004	2005*	2006*
Inpatient discharges	810 979	818 513	839 393	899 935	895 836	892 607	900 415	876 385	970 146	958 606
Ambulatory surgeries	20 237	20 334	24 850	26 857	37 856	47 735	63 366	77 821	80 417	90 487
Total	831 216	838 847	864 243	926 792	933 692	940 342	963 781	954 206	1 050 563	1 049 093
ALOS (inpatient only)	7.5	7.5	7.3	7.1	7.1	7.0	6.8	6.8	7.2	7.2
CMI	0.99	1.00	1.02	1.04	1.07	1.08	1.08	1.10	1.12	1.13

Sources: IGIF, 2005; * ACSS, 2007.

third-party payers based on DRGs, but also, since the late 1990s, DRG-based hospital budget allocation has been used for the funding of NHS inpatient activity. More patients are being treated in a shorter time, and DRGs have proved to be a helpful cost-control mechanism (Mateus, 2008; Barros & de Almeida Simões, 2007).

Moreover, the creation of the DRG database with morbidity information and treatment profiles of the Portuguese population has great potential in terms of informing decision-makers. Yet, it has remained unused, apart from in three major fields: hospital funding, hospital comparisons, and the setting of national tariffs for inpatient and ambulatory surgery care. In the author's opinion, information from the DRG database could be useful in the design of national health plans and health care policy: to profile morbidity characteristics of the Portuguese population at national and regional levels; to organize provision of care according to need; to target areas for utilization review and quality assurance; and to control the achievement of goals set in existing national health plans for different pathologies. Furthermore, data collected in patient registries could be used – as pointed out by Noe and colleagues (2005) – to support health economics research in certain areas, such as identifying of practice patterns and evaluating variations based on setting, examining regional differences, conducting population sub-group analyses, determining the characteristics of high- or low-cost patients, and so on.

It would be a major achievement to develop national cost weights, and a sample of representative hospitals should be sought. Encouraging private hospitals to code their inpatient activity with the DRGs would be another worthwhile step. The private sector is becoming increasingly more important in the provision of care and there is no justification for the non-reporting of their activity.

21.8 Outlook: Future developments and reform

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

According to the latest available data, hospital inpatient care is still very important in Portugal and ambulatory surgery represents no more than 10 per cent of inpatient activity. Services provided in non-inpatient settings are funded on a fee-for-service basis. The number of hospitals being built (both public and private) sends a signal that, at the least at the planning level, inpatient care is and will continue to be important in the provision of health care in Portugal.

21.8.2 Trends in DRG application and coverage

The use of DRGs for hospital payment and budget allocation has been evolving since its implementation. In the mid-1990s two pilot studies were carried out concerning the adaptation of Ambulatory Patient Groups (APGs) to the Portuguese context. The results obtained from both studies were very promising;

however, APGs were never implemented due to a lack of political will. Currently, ambulatory activity (consultations and ancillary services) is financed on a fee-for-service basis, which is the preferred method of payment of hospital managers and physicians. Therefore, there is strong opposition from hospitals to the implementation of APGs.

Studies have been carried out regarding the feasibility of using a patient classification system suited for mental health care settings. No decision has been made regarding the grouper to be used, but both the system implemented in the United States and those being developed in Canada (System for Classification of In-Patient Psychiatry)³ and Australia (Mental Health Classification And Service Costs)⁴ are being closely analysed.

Due to the development of a National Network of Nursing Homes in Portugal, interest is also being raised in the implementation of a patient classification system for rehabilitation care. At present, care is financed by a per diem payment that reflects neither the characteristics of the patients nor of the facilities.

It can be expected that increasingly more fields of care will be covered by DRG-like systems for funding and for information purposes. Portugal was one of the earliest countries in Europe to adopt DRGs for inpatient care and it is likely that it will also be one of the pioneers in the use of patient classification systems for other types of care.

21.9 Notes

- 1 Available only in Portuguese (<http://portalcodgdh.min-saude.pt>, accessed 10 July 2011).
- 2 Equivalent discharges correspond to the total number of inpatient episodes obtained after standardizing outlier lengths of stay (below or above the low and high trim-points) in each DRG with equivalent lengths of stay in terms of the 'normal' episodes (those with lengths of stay within the trim-points). Patients with short-stay admissions are accounted for as less than one; patients with long-stay admissions are accounted for as more than one; and those with episodes involving lengths of stay within the trim-points are accounted for as one.
- 3 See the Canadian Institute for Health Information web site (<http://secure.cihi.ca>, accessed 10 July 2011).
- 4 See the Australian Government Department of Health and Ageing web site (<http://www.health.gov.au>, accessed 10 July 2011).

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