

Funding and Future Diagnosis Related Group Development

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Abstract

Purpose: *Diagnosis Related Groups (DRGs) are widely used for a variety of purposes including quality improvement, hospital output measurement and funding. DRGs are a patient classification scheme which provides a means of relating the type of patients a hospital treats (i.e., its casemix) to the costs incurred by the hospital. This is done by classifying patients into mutually exclusive groups based on the patient's principal diagnosis and other information. The original Health Care Financing Administration DRGs (HCFA DRGs) have been in use since 1982. This document provides an overview of future directions for the newer DRG systems and it provides a framework for understanding the use of DRGs for funding. Future Directions:* Newer DRG systems incorporate explicit adjustment for severity of illness, include separate measures for the likelihood of mortality, and are more independent of the underlying coding systems (e.g., ICD-10 for diagnoses, ICD-9-CM for procedures). **The Framework:** The framework for a casemix-based budgeting system consists of five basic aspects. They are: 1) Categories—which kind of DRG will be the basis for the casemix system; 2) Relative Weights—relative weights reflect the expected cost of a case in one DRG relative to the expected cost of the average patient; 3) Base Rates/Pricing—the base rate converts the relative values to prices or budgets; 4) Adjustments—adjustments account for exogenous factors; 5) Transition Policy—this provides time so hospital administrators can learn to respond to the incentives contained in the DRG system.

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Introduction

Singapore has been using Diagnosis Related Groups (DRGs)¹ for several years now. This paper provides an overview of the benefits to the government and to hospitals of basing funding for inpatient care on the kinds of cases that a hospital treats. Treated cases are the final output of a hospital and a summary measure of the expected relative cost of this output is known as the hospital's "casemix". Casemix is measured by DRGs. As there are several types of DRGs, the paper also provides an overview of the characteristics of the alternative DRG systems. Finally, the paper provides a framework for understanding the various issues which must be considered in developing a DRG-based payment or budgeting system.

Objectives and Benefits

In deciding to move to the use of DRGs as a basis for funding hospitals, governments have several objectives in mind. While these objectives vary across countries, objectives often include:

- Maintain quality of care: this is the original purpose of the DRGs.
- Rationalise health care expenditures: for example, Portugal knew that, as it moved into the EU, its people

would demand more sophisticated and expensive inpatient hospital care. DRGs were used to control and manage the growth in health care spending in Portugal.

- Minimise administrative burden: using DRGs involves paying a standard price for a standard product. This is not unusual for governments.
- Minimise burden to providers: DRGs use standard data that is commonly collected on billing and encounter forms.
- Provide management information: 3M's philosophy has always been to develop a system for management because this system will, in fact, also prove to be useful for budgeting and for payment. This is the philosophy behind the new International Refined DRGs (IR-DRGs), the advanced All Patient Refined DRGs (APR-DRGs), as well as the International Ambulatory Patient Groups (the outpatient analogue to the inpatient DRGs) and Clinical Risk Groups (CRGs), a person-based rate setting system.

Of course Western Europe, Japan and the United States also face rapidly ageing populations. The probable demands of an ageing population on these health care systems are a powerful motive for considering casemix-based funding.

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There are related objectives which have guided the updating and development of the DRGs over the past 30 years. These include:

- Aid in clinical management—by emphasising the importance of clinical judgement in forming the categories.
- Provide equitable allocation methodology—by providing categories that are homogeneous in terms of resource use.
- Promote efficiency and effectiveness in managing inpatient care—by giving providers financial incentives to become more efficient and the tools to respond constructively to these incentives.
- Increase accuracy in reporting workload and associated costs—by using the information created through this process in a way that influences resources.

The use of DRGs results in certain benefits to hospitals and to funding agencies such as insurance companies and governments. These are summarised in Table I.

TABLE I: BENEFITS OF DRGs

Hospitals	Funding agencies
Provide comparative information	Efficient resource allocation
Relate funding to casemix	Allocate resources based on production
Provide efficiency incentives	Increased understanding of service provision
Provide predictable revenue stream	Facilitates comparative reporting
Support internal management efforts	

DRGs: Diagnosis Related Groups

Diagnosis Related Groups

Definition

DRGs are a patient classification scheme which provides a means of relating the type of patients a hospital treats (i.e., its casemix) to the costs incurred by the hospital. This is done by classifying patients into mutually exclusive groups based on the patient's principal diagnosis and other information. DRGs use information that is routinely collected for classification. The categories are homogeneous clinically and in terms of resource use. 3M's DRGs are updated annually to account for new codes and to allow for new technologies and for changes in medical practice.

Changing Role

As the health care industry has evolved, there has been increased demand for a patient classification system that can be used for applications beyond resource use, cost and payment. Examples of new uses include:

- comparing hospitals across a wide range of resource and outcome measures;
- evaluating differences in inpatient outcomes of care

such as inpatient mortality rates;

- implementing and supporting clinical pathways and continuous quality improvement projects.

These requirements have led to the development of increasingly sophisticated and flexible DRG systems.

Future Directions

Future directions for DRGs may be summarised by the following six points:

1. Increasing refinement:²
 - a. explicit severity adjustment (e.g., APR-DRGs, IR-DRGs);
 - b. distinguish hospital-caused problems from those problems that the patient had on admission (large 3M/California project is on-going);
 - c. link to outpatient care [e.g., International Ambulatory Patient Groups (I-APGs)].
2. Common base, country-specific refinements
 - a. WHO ICD-10 model;
 - b. flexible severity level definitions for IR-DRGs.
3. Additional dimensions have/will be added
 - a. mortality;
 - b. morbidity.
4. Extend to post acute settings (in process).
5. Code independence
 - a. interchangeable for ICD-9 or 10 allows international comparisons to all countries;
 - b. "plug and play" procedure codes allow inexpensive updating and localisation.
6. Easy to localise while maintaining common framework: this involves the way that software is written, i.e., using programs to write and to document distributable software efficiently so that "Singapore DRGs" would be affordable should Singapore desire to move in this direction, as well as using concepts such as code independence and the common base to facilitate comparisons across countries.

Finally, it is important to note that, in addition to several types of inpatient DRGs, 3M has successfully developed classification systems for outpatient care [Ambulatory Patient Groups (APGs) and Ambulatory Payment Categories (APCs)], post-acute care [Long-term Care Diagnosis Related Groups (LTC-DRGs)], and a system which is person based and which extends over time (CRGs). Ultimately, these systems will be linked through CRGs into a unified casemix system covering an individual as he/she moves across settings.

Funding

The following sections provide a framework³ which will be useful in understanding the various decisions which will need to be made in developing a DRG-based funding

system for inpatient care. However, before turning to that topic, it will be useful to review some basic concepts related to funding. For example, incentives for efficient behaviour extend to the unit of payment, but not beyond. Specifically:

- Incentives to provide inpatient care efficiently are created by DRGs;
- Incentives to provide outpatient care efficiently are created by APGs.

However, treatment cost equals the sum of inpatient and outpatient cost times the number of services provided to treat a particular disease or during a given time period. Thus, an extension of DRGs and APGs will involve person-based systems that extend over time. Incentives to substitute outpatient for inpatient care and to control both, are provided by episodes (managed care) and by capitation payment. For this reason, CRGs are episode-based and they define capitation payment. CRGs control the quantity of services provided, while DRGs and APGs define the price for these services. Clearly, both are needed for a complete casemix system. In addition, the episode-based systems require data systems which are person-based and which extend over time.

The Framework

The framework for a casemix-based budgeting system consists of five basic aspects. These are:

1. **Categories:** Which kind of DRG will be the basis for the casemix system. In Singapore, the current DRGs are Australian National Diagnosis Related Groups (AN-DRGs).
2. **Relative weights:** Relative weights are unitless numbers which reflect the expected cost of a case in one DRG relative to the expected cost of the average patient.
3. **Base rates/pricing:** The base rate converts the relative values to prices or budgets. Thus, it determines spending for the funding agency and revenues for the hospitals.
4. **Adjustments:** Adjustments account for exogenous factors⁴ and are intended to increase the equity of the DRG system for providers.⁵
5. **Transition policy:** This set of policies gives the hospitals and the funding agency funding predictability for a pre-defined time so they can learn to respond to the incentives contained in the DRG system.

These aspects will be considered in turn, next.

Categories

There are several types of DRGs available today. For this paper, four systems will be briefly described.

Health Care Financing Administration DRGs (HCFA DRGs): These are the original DRGs developed in 1981 by Averill and Fetter for use by the US Medicare Program.

They include multiple trauma, transplants, and tracheotomy DRGs (the latter a surrogate for duration of mechanical ventilation). The main limitation of the HCFA DRGs is that updates have focused on the over-65 population.

All Patients DRGs (AP-DRGs): These DRGs were developed by 3M for New York State in response to the limitations of the HCFA DRGs. These DRGs also include multiple trauma, transplants, and tracheotomy DRGs, but AP adds improved DRGs for newborns, contains a concept called Major Complications and Co-morbidities (the forerunner of the severity adjustments in the APR and IR-DRGs). AP-DRGs are robust and are intended for a general population.

APR-DRGs: The most advanced DRGs are based on AP-DRGs with Yale-developed refinements and HCFA updates. The APR-DRGs add four severity levels (Minor, Moderate, Major, Extreme) to each DRG category. The severity levels are based on a sophisticated algorithm which uses interactions of secondary diagnoses and procedures. A separate scale reflecting risk of mortality is also available for this system

IR-DRGs: The International Refined DRGs begin with an APR base and use simpler, but more robust, severity logic. This increases the likelihood that observed differences between hospitals will be real instead of differences in coding completeness. IR-DRGs are further unique in that they are code-independent between ICD-9-CM and ICD-10 diagnoses codes. That is, a patient coded in one of these systems and then the other will wind up in the same IR-DRG. The IR-DRGs are easy to localise in that the base system can be easily modified with country specific refinements, and in that the procedure codes are easily replaced with alternatives. The IR-DRGs are native, not mapped from one coding system to another.

Relative Weights

As noted above, relative weights are unitless numbers that express the relative resource use expected for an inpatient admission in a particular DRG to the expected cost of the average case. That is, relative weights represent the average resource use for a given DRG relative to all other DRGs. Singapore can develop its own weights or use weights from another country. Relative weights convey information and are important for management. Thus, accurate weights are important for the long-term success of DRG-based financing. There are several technical issues regarding the method used to compute the relative weights. While these issues are beyond the scope of this paper, it is worth noting that the best method that we have found for making decisions in this complex area is to simulate the financial effect of each option on specific providers.

Base Rate

The base rate and relative weights, taken together, determine the price or the allocation amount for specific DRGs. In addition, the base rate determines overall spending for the funding agency and revenue for hospitals. The reason that the weights have been separated from the base rate is that the base rate is, ultimately, a political decision while the weights are technical. A prospective payment or budgeting system can use either national, regional or hospital peer group base rates (or combinations of these). The concept of a peer group base rate overlaps the next section, Adjustments, as some adjustments, in effect, create “peer groups”. The teaching adjustment used by the US Medicare program is an example.

Adjustments

Adjustments are applied to the base rate. They are intended to account for factors which influence hospital costs and which are beyond the control of the hospital, i.e., exogenous factors. As a practical matter, it is prudent to consider factors such as teaching as potential candidates for an adjustment when these factors systematically influence costs. Other potential reasons that have been used for adjustments include:

- Geographic location: an issue in the US, but probably less important in Singapore.
- Specialty hospital: Portugal defines five types of specialty hospitals as peer groups. Singapore is small for this level of peer groups, but hospital-specific base rates may prove useful as a transition method (see below).
- Direct health profession education costs: These are the direct costs of professors, learning materials. It is not clear that these are health care-related expenses. In contrast, indirect medical education is the higher patient care cost associated with teaching. This is the basis for the teaching adjustment used by the US Medicare Program.

Transition

A transition strategy is needed for the following reasons:

1. To minimise impact on hospitals: The intent of the DRGs is to change behaviour. In DRGs, the absence of a transition period could financially damage or even bankrupt some hospitals while others earn large profits. A transition period limits this risk. It is, however, critical that the DRGs have some effect on hospital finances during the first year so that the data needed to calibrate the system become more accurate and more complete.
2. To minimise impact on the state: Incomplete and inaccurate data, typical in years before data are used to

influence funding, means that spending estimates for the funding agency are likely to understate expenditures for the following year. Withholds, risk corridors and blended rates can be used to approach this issue from the payers’ perspective.

3. To provide management with time to learn: DRGs have a learning curve. Hospitals need time to adjust to the new system.
4. To determine accuracy of the historical data: Data will improve as it is used. Thus, using data allows one to assess the validity of the information that was used, in part, to establish prices and/or budgets. This is likely to reinforce a need to re-base and to re-calibrate soon after the system is implemented.

Potential transition strategies include:

- Withhold: Set aside an amount for contingencies. If not spent, this amount is paid to providers.
- Risk corridors: Risk corridors set limits on profits and losses. For example, in Iowa for APGs we established a policy that no provider would receive more than 5% more than it received last year (adjusted for inflation and volume changes) or less than 95% of last year. This is a plus or minus 5% risk corridor. The APGs determined where between 105% and 95% a particular provider fell.
- Blended rates: Medicare used this strategy in 1983. Singapore might blend hospital specific rates (budgets) with national and/or group rates.

It is important that the industry understand the phased-in implementation schedule as this allows for planning. In addition, it is useful to establish a schedule for re-calibration (re-computing relative values) and re-basing (re-setting the base rate).

REFERENCES

1. 3M Health Information Systems. Chapter 1—Design and development of the diagnosis related groups. Diagnosis Related Groups Definitions Manual. Wallingford, CT, USA: 3M Health Information Systems, 2000:1-12.
2. Medicare Payment Advisory Commission. Chapter 3—Improving Medicare’s payments for inpatient care and for teaching hospitals. Report to the Congress: Selected Medicare Issues. Washington DC, USA: United States Printing Office, 2000:51-77.
3. Pettengill J, Vertrees J. Reliability and validity in hospital case-mix measurement. Health Care Financing Review 1982; 4:101-28.
4. Newhouse J, Wilenski G. Paying for graduate medical education. Health Affairs 2001; 20:136-47.
5. Department of Health and Human Services. Report to Congress: DRG Refinement: Outliers, Severity of Illness, and Intensity of Care. Health Care Financing Administration Publication Number 03254. Baltimore MD, USA, 1987:1-77.