

Diagnosis-related groups (DRGs) in Finnish Hospital Care

Utilisation des « Diagnosis-related groups » (DRGs) dans le système hospitalier finlandais

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Summary

The hospital districts in Finland determine the pricing of hospital services without any national guidelines. However, over the last few years the use of the DRG (Diagnosis-Related Groups)-based pricing system has expanded in Finland. The aim of this article was to explore the use of DRGs in hospital care and to discuss the experiences and potential problems associated with DRGs in the Finnish context. We reviewed studies analysing the impacts of the DRG system in Finland. In order to discover the current and planned use of DRGs in various applications, we sent a questionnaire to all hospital districts in Finland.

A clear majority of the hospital districts, 13 out of 20, already use DRGs in their internal reporting and management. DRG-based pricing systems were used in 6 hospital districts, covering 45% of the entire population in Finland, and several others were planning to use DRGs for pricing and contracting in the near future.

The motivation for the use of DRGs has had a practical basis, mainly for simplifying product definitions used in hospital management. The adoption of DRGs may have partly been associated with a 'signalling game' between hospitals and municipalities whereby hospital administrations signal that they are seriously concerned with efficiency issues. In the near future, DRGs will play an increasingly important role in assisting Finnish municipalities to compare quality, costs and prices of services among hospitals.

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Key words: DRG, PMSI, hospital pricing, hospital management

Résumé

En Finlande, chaque district hospitalier fixe le prix des services des hopitaux en dehors de toute directive nationale. Cependant, ces dernières années, l'utilisation des DRG (groupes homogènes de diagnostic) s'est développée en Finlande. Le but de cet article était d'examiner l'utilisation des DRG dans les soins hospitaliers et de discuter les expériences et les problèmes potentiels associés aux DRG dans le contexte finlandais.

Nous avons étudié les travaux analysant l'impact du système des DRG en Finlande. Un questionnaire a été envoyé à tous les districts hospitaliers du pays pour connaître l'utilisation actuelle ou envisagée des DRG dans leurs diverses applications.

Une nette majorité des districts hospitaliers (13 sur 20) emploie déjà les DRG dans leur rapport interne et dans leur gestion. Six districts, couvrant 45 % de la population de Finlande, ont utilisé les DRG comme systèmes d'évaluation des coûts, et plusieurs autres projetaient de les employer pour l'évaluation et la conclusion d'un contrat dans le proche avenir.

La motivation pour l'utilisation des DRG a eu un fondement pratique, principalement pour simplifier la définition des produits employés dans la gestion hospitalière. L'adoption de DRG a peut-être été un « message » échangé entre des hôpitaux et des municipalités, les administrations hospitalières pouvant ainsi montrer qu'elles sont sérieusement intéressées par les questions d'efficience. Dans le proche avenir, les DRG joueront un rôle de plus en plus important pour aider les municipalités finlandaises à comparer la qualité, les coûts et les prix des services des différents hôpitaux.

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I. INTRODUCTION

The diagnosis-related groups (DRGs) classification was originally developed in the USA for the product line management of hospitals. Using hospital inpatient data, the DRGs classification system groups inpatients according to principal diagnosis, comorbidities, surgical procedures, age, sex and discharge status in order to obtain homogenous resource groups. In hospital management systems based on DRGs, resource consumption is calculated for each DRG group, reflecting average treatment costs in that group [1, 2].

The use of DRGs tends to vary between countries and hospital care systems. DRGs have been applied to health care resource allocation, hospital pricing, management, quality control and productivity research. Growing health care expenditures and the move to more efficient hospital production in most countries have been the driving forces behind the adoption of the DRG system. Accordingly, DRGs have been mainly used in resource allocation and pricing [3-7].

Since the 1980s, DRG-based financing has been applied in American Medicare as a hospital pricing system, while in Canada, Australia and some West European countries, DRG are used for resource allocation [7]. The effects of DRG-based hospital pricing have been widely studied, especially in the USA, and several technical and incentive problems have emerged. Although average lengths of stay and thus health care costs in the Medicare system initially decreased following DRG-based pricing, several negative impacts, such as DRG-creep, patient selection and early discharges, have been noted [8-11]. In other countries, extensive studies on the effects of DRG-based financing systems remain relatively rare.

Since the end of the 1980s, the DRG-based applications have also been used in the Nordic countries, but were not applied to hospital financing systems until the 1990s [12-16]. In Finland, the DRG system is mostly used in internal hospital reporting, but also increasingly to determine the products and prices in hospital invoicing. This study describes the use of DRGs in Finnish health care and focuses on the problems of DRG-based reporting and hospital financing. We also discuss how the use of DRGs could be further improved.

II. THE ORGANISATION AND FINANCING OF THE HOSPITAL CARE IN FINLAND

1. The Finnish hospital care system

In Finland, the local administrative units (municipalities) are responsible for providing and financing health care services for their residents. The Finnish municipal health care system is hierarchical and or-

ganisationally divided into primary and specialized health services. Specialized public care is primarily provided by 20 hospital districts which administratively are federations of municipalities. Most hospitals contain management by objective (MBO) units which are responsible for their own budgets.

The hospital districts own and run more than 50 acute care public general hospitals, which are divided into three categories: university, central and other municipal hospitals. University hospitals are central hospitals for their own districts and provide tertiary level services for surrounding districts. In large urban municipalities, health centres may also provide specialized services. Demand for hospital services is regulated via a system of referrals. In some municipalities, physicians in health centres can be considered gate-keepers, whereas in urban areas a considerable proportion of referrals originate from private physicians and occupational care.

The municipalities finance their obligations from municipal taxes (70%), state subsidies (20%) and user charges (10%). State subsidies, designed to equalise economic disparities between the municipalities, are paid as a lump sum according to a capitation formula based on demographic and socio-economic factors.

The median size of municipalities is about 5,000 inhabitants, but they range from about 200 citizens to over 500,000 in the capital (Helsinki). Although 400 of the 448 municipalities have fewer than 20,000 inhabitants, 58% of the Finnish population lives in municipalities (49) with over 20,000 citizens. In terms of hospital financing, the Finnish system is exceptional, e.g. the counties in Sweden and Norway contain much larger units for pooling the financial risks of hospital care. Only in the most costly cases do the federations of municipalities, i.e. hospital districts, cover an individual patient's costs exceeding a fixed limit of FIM 100,000 - 300,000 (euros 17,000 - 51,000), which varies across districts.

The revenues of Finnish hospitals and their MBO units depend mostly on the amount and price of services provided to municipalities. However, when there are budget deficits, additional money can be granted at the discretion of the municipal authorities. The hospitals usually have a local monopoly in their area, but being public institutions, they are not allowed to maximise profit or accumulate capital. However, the MBO units shoulder the responsibility of collecting revenues and covering their costs. If a MBO unit contributes significantly to the revenue of a hospital, its status inside the hospital grows. At the same time, hospitals face pressure from the municipal administration to cut expenditures and minimise their unit costs.

Unlike Sweden and the UK, in Finland no real provider-purchaser split has been introduced. How-

ever, municipalities act as purchasers and can buy services outside their own district. Nevertheless, in practice, municipalities buy most of their services within their own hospital district.

2. Finnish hospital pricing

The hospital districts determine the prices of hospital services in the absence of national guidelines.

Consequently, methods and procedures for defining services and setting prices vary between districts, and the price-setting process is continually being modified. Three types of pricing are in use (Table 1).

Prices are set prospectively by the hospitals or hospital districts and confirmed by the district boards. While case-based prices are increasingly used by

Table I
The pricing types used in Finnish hospitals

Bed day price	Average price per bed day in different specialities, invoiced according to the number of bed days
A combination of fee for service and bed day price	Operations and bed days are invoiced separately
Case based price	<p>'Packet prices'</p> <ul style="list-style-type: none"> - packet price includes all services involved in inpatient care (e.g. X-rays, laboratory tests, surgical procedures and accommodation) <p>'DRG related prices'</p> <ul style="list-style-type: none"> - DRG price is based on average costs of a treatment period in a specific DRG group

hospitals or hospital districts, they are usually applied only to certain surgical procedures while other procedures or treatments are invoiced using prices per bed day. Six hospital districts also base their case-based pricing on DRGs. Pricing variations also exist in specialized outpatient care. Charges for specialty consultations are usually set as a price per visit, and categorised according to the type of treatment.

The new pricing types introduced after the Finnish health care financing reform of 1993 were not explicitly devised to provide economic incentives for hospitals. Rather, hospital pricing was designed to facilitate hospitals invoice municipalities. Pricing probably has a limited potential for creating economic incentives, since hospitals do not pursue financial profit. The heterogeneity of pricing systems means that municipalities cannot compare hospital services and their prices like – for – like, while small municipalities in particular have no expertise in negotiating volume for hospital care. In addition, Finnish patients are unable to promote competition among hospitals since the hospital they can choose is restricted. Moreover, physicians only receive a monthly wage independent of payments from municipalities to hospitals. Thus, physician motivation to increase case loads and revenue because of hospital price incentives only arise indirectly and collectively from organisational needs [17]. Rather than profits, physicians' professional ambitions may be to increase case loads and revenues in their MBO unit.

III. APPLYING DRGs TO THE FINNISH SYSTEM

The DRG system was first promoted for hospital management in Finland in the 1980s. Since 1987 the DRG grouper called FinDRG was developed using the groups and logic of the US-HCFA (the US Health Care Financing Administration) version 3 but employing original Finnish diagnosis and procedure codes without conversion. Until 1996 the FinDRG grouper was in use in only a few hospitals as a management tool and it was also used to control case-mix differences in productivity comparisons. The FinDRG was never used for hospital invoicing, because the medical profession strongly opposed its use for hospital reimbursement [18].

In 1996, the Nordic countries (Sweden, Denmark, Norway, Iceland and Finland) launched a modified DRG system based on the Nordic version of the ICD-10 and a new Nordic Classification of Surgical Procedures (NCSP) introduced in 1996. The current version of the NordDRG applies to the Nordic diagnosis and procedure codes but imitates the classification rules in the 12th edition of the DRG classification issued by the US-HCFA in 1994. With a common Nordic version, each country has its own localised national versions containing national modifications of the ICD-10 and NCSP. The national versions are owned by a particular health authority in each country; in Finland the owner of the NordDRG grouper is the Finnish Association of Local and Regional authorities. The maintenance costs of the NordDRG definitions are covered by licence fees [18].

The use of DRGs gained ground among hospitals soon after the commercial distribution of the Nord-DRG was started by private firms (Datawell Finland and Medici Data). The first hospital invoicing systems based on DRG-related case-based-pricing were introduced by large southern hospital districts in 1997 and by Helsinki University Central Hospital in

1998. By the year 2000, most hospital districts have considered using DRGs for pricing their services at some point of time in the future (see Table II). In most hospital districts using DRGs, the proportion of DRG-based revenues of the total invoicing remains close to 50% because outpatient care and psychiatric inpatients are not included in DRG-based invoicing.

Table II
The use of DRGs in the Finnish hospital districts in 2001, based on a recent survey (October, 2001)

Hospital district	Internal reporting, management (own NordDRG-licence)	External reporting, Benchmarking	Invoicing and contracting (scheduled)	The proportion of total invoicing
Uusimaa	1997	1997	1997	33%
Varsinais-Suomi	1994	1997	2003	-
Satakunta	-	1998	-	-
Kanta-Häme	1999	1997	2000	50%
Pirkanmaa	1997	1998	2004	-
Päijät-Häme	1998	1997	-	-
Kymenlaakso	2000	1997	2000	52%
Etelä-Karjala	2002	1997	2003	-
Etelä-Savo	2001	1997	2002	-
Itä-Savo	2000	2000	-	-
Pohjois-Karjala	-	1997	-	-
Pohjois-Savo	2001	1997	-	-
Keski-Suomi	2000	1998	2001	56%
Etelä-Pohjanmaa	2000	1997	2001	55%
Vaasa	1999	1997	2001	33%
Keski-Pohjanmaa	1999	1997	2003	-
Pohjois-Pohjanmaa	-	1998	-	-
Kainuu	2003	1998	2003	-
Länsi-Pohja	2003	2000	2004	-
Lappi	-	1998	-	-

In 1997, the Health Services Research Unit of the National Research and Development Centre for Welfare and Health (STAKES) launched a study project in co-operation with Finnish hospital districts to facilitate benchmarking and productivity measurement in hospitals. Data was collected by taking advantage of the existing patient and costing information systems in hospitals. Patients were classified according to resource consumption using the Nordic DRG version (the Finnish NordDRG version 1999). By the year 2000 all hospitals were included in the internet-based benchmarking database (Table II).

1. DRGs in hospital management

Hospital pricing as well as other managerial reporting are developed independently by hospital dis-

tricts and the decision to implement DRGs is made autonomously. The central authorities (The Ministry of Social Affairs and Health) do not interfere in hospital pricing systems or internal and external reporting. Furthermore, although the municipalities own the hospitals, they seldom take an active part in defining how hospital reporting should be improved.

The main purpose of hospital pricing has been to cover production costs and hospital prices are expected to follow production costs as closely as possible. The lack of reliable cost information has been a problem for the hospitals and municipalities. For hospitals, one important reason to adopt DRGs is to create a definition for the products in inpatient care and to establish a standardised and simple basis for their cost accounting systems.

The hospitals must meet cost containment expectations imposed by the municipal authorities. The adoption of DRG-based reporting/financing in the neighbouring hospital districts may increase pressure to follow other hospitals. Inability to provide comparable reporting may be interpreted as an effort to hide slack in the production of services. Some hospitals have reported that one important reason for moving into DRGs was in anticipation that municipalities will eventually learn to compare DRG prices and thus expect such information in the future. It is also known that DRG-based cost-per-case reporting has been used in many districts to inform the financiers about hospitals' cost-efficiency.

In recent years, the main focus of DRG applications has shifted to hospital pricing and invoicing systems. However, the proper use of the DRG system for hospital invoicing requires patient level cost accounting. Unfortunately only few Finnish hospitals have patient level costing at the present time. Accordingly, cost weights have been calculated using cost data from only a few hospitals in the Helsinki metropolitan area, which are possibly not representative of all hospitals in Finland. However, shortcomings in hospital cost information systems have not prevented the wider use of the DRGs in managerial reporting.

The incentive effects of the hospital price types (Table I) have been used on the utilization and length of stay in common orthopaedic procedures. For example, hospitals using case-based prices ('packet prices') performed 8 % more lumbar discectomies compared to hospitals using bed-day prices [19]. At the same time, the use of case-based price decreased the average length of stay for hip- and knee replacements by 0.5 days [20]. Because DRG-based prices are also case-based prices, we can expect that they will also encourage an increase in the number of hospitalised patients and decrease the length of stay. If DRGs are only used for internal reporting (and resource allocation within hospitals), they may create fewer incentives to increase production.

Theoretically, DRG pricing should allow Finnish hospitals to earn more revenues by manipulating the case mix. As public hospitals in a health care system based on hierarchically regionalised services, Finnish hospitals have little power to affect the real patient case mix, since they are not allowed to select patients. However, experiences in Sweden and Norway have shown that after a while physicians learn to code diagnoses and as well as comorbidities more accurately [21, 22]. Experiences in other countries where DRGs are used in hospital financing show that it is necessary to control the coding of patient data in order to guarantee fair resource allocation between hospitals [23].

It has been argued that DRG cost weights should be calculated according to hospital types in the hierarchical hospital system. Patients in university hospi-

tals are more heterogeneous and their cases generally more severe than in other hospitals. Therefore dividing DRG groups into sub-groups may also be needed to more accurately describe the resource consumption of cases in university hospitals. In addition, outpatient visits and post-acute care, which are not included in the DRG system, should be linked to cost control mechanisms. This would make it possible to evaluate and develop the total care process from the viewpoints of technical and allocative efficiency and quality.

In recent years, growing pressure to improve cost efficiency in Finnish hospitals has produced another important objective for hospital management: minimising costs per case without decreasing effectiveness and quality of services. DRG-based prices, like other case-based prices, encourage hospitals to contain resource consumption per case, usually by decreasing length of stay [20]. As in other countries in the 1990s, Finnish hospitals introduced new surgical techniques and increased operations in outpatient care, which effectively shortened hospital stays. However, it must be noted that the technological change towards shorter hospital stays and the increase in productivity of Finnish hospitals at the beginning of the 1990s [24] has occurred without any true financial incentives. Thus, this development is not directly associated with the adoption of hospital pricing systems and DRGs. In addition, hospitals in some hospital districts have been encouraged to transfer patients earlier to make post-acute care less expensive – in practice, to non-specialised health centre hospital wards and nursing homes.

Prices for different hospital services are set according to previously estimated costs. However, Finnish hospitals may also set other targets in addition to cost recovery for pricing. They may over- or underprice some products for cross subsidisation to other products and services. Moreover, special services requiring particular equipment establish a natural monopoly for university hospitals and therefore a possibility to overprice certain services.

On the other hand, university hospitals also provide similar services to central and other municipal hospitals. To enhance their ability to compete with other hospitals for patients, university hospitals may tend to underprice their standard services. A transparent pricing system based on DRGs could potentially reduce the scope of monopoly pricing.

The use of DRGs in patient management requires the integration of patient records into hospital financial information systems. This integration process is still far from complete in most hospitals, but the most advanced solutions can be found in hospitals using DRG-based financing.

Practically all hospitals have IT (Information Technology) systems which are capable of providing cost

accounting/billing data for intermediate outputs such as operational procedures, X-rays, laboratory tests, equipment and ward costs, but only a few hospitals routinely integrate these data into patient administration systems. This is mainly due to the fact that the information systems have been implemented without an objective to provide process type information on patient episodes and the data is therefore incompatible and heterogeneous.

However, many hospitals have succeeded in integrating financial and clinical information systems, and are thus able to base their product line management on DRGs. A typical use of DRGs in managerial reporting is to provide monthly reporting from a 'data warehouse' where patient cases are retrospectively grouped using a batch grouper (so far, none of the Finnish hospitals use online grouping of patient records). These monthly updated data warehouses are used to generate several types of reports for budgeting, follow-up, cost-per-case benchmarking and service line quality control. The reports are used to monitor the average resource usage within DRGs by observing the costs and use of various input types. Most advanced reporting/analysis tools allow drilling down to individual cases, making it possible for clinical management to explore the observed variations in detail.

2. DRGs and municipal invoicing

Finnish municipalities can freely negotiate and choose any type of contract or pricing system with producers. The municipalities benefit from a hospital pricing system which provides information on costs and outputs of hospital production. In recent years, the major objectives of health care in Finnish municipalities have been to decrease costs and increase efficiency of specialised care. To decrease costs and increase efficiency, the municipalities encourage the hospitals in their own hospital district to minimise unit costs and set limits on certain services. DRG applications could be used as an information base for such incentives.

Municipalities could use DRGs to compare prices among hospitals. In order to increase transparency in hospital operations, the standard definitions of hospital cases in the DRG system could allow municipalities to compare inpatient services and their costs and prices among hospitals. Such comparisons may induce competition and encourage municipalities to buy services from hospital districts outside their own. If hospitals elsewhere had lower prices for similar services, municipalities could at least question the prices of their local providers. However, many municipalities have a strong incentive to buy services from the hospitals in their own hospital district. Nevertheless, recent examples show that municipalities are ready to also purchase services from other hospital districts, e.g. to shorten waiting lists.

A DRG-based hospital pricing system could be used to guarantee a fairer allocation of costs between municipalities within the hospital district. The increasing comparability of services and prices should mean that services are organised and resources allocated more fairly and rationally between the municipalities of each hospital district. Small municipalities could particularly benefit from better price comparability, because of their lack of expertise in specialised care and the monopoly power of the hospitals.

Finnish municipalities have had problems with reliable annual budgeting and anticipating financial risks due to unexpected cost variations in specialised care. Cost information on cases using DRG-related prices may help municipalities budget incoming costs more accurately. Moreover, the municipalities cover the total risk of cost variation in specialised care. Only in the most costly cases do the federations of municipalities, i.e. hospital districts, cover an individual patient's costs exceeding a fixed limit.

The DRG-based payment schemes protect municipalities more effectively against financial risks due to random cost variation than against differences in per bed-day prices. However, the size of the municipality is the main determinant of total (random) financial risk. In municipalities of fewer than 20,000 inhabitants the financial risk was found to be substantial, irrespective of the type of pricing [25]. According to the study, changing the hospital pricing system (from bed-day based to DRG-based) seemed to affect the random risk more than the current risk balancing system.

In summary, it can be argued that Finnish municipalities have not yet discovered the potential benefits of DRG pricing or DRG-based reporting in contractual arrangements and producer monitoring. Possible reasons for this has been the lack of expertise in these issues and the fact that the medical profession has continuously questioned the validity (comparability) of DRGs.

IV. CONCLUSIONS

The implementation of DRGs in Finland is in many ways unlike its historical development in other countries. The initiative to use DRGs has not originated from central authorities (the Ministry of Social Affairs and Health) as has been the case for example in Norway and Portugal. Nor have the health care financiers, i.e. purchasers (municipalities), obligated producers to use the regulated DRG-based rates, as for example in the US Medicare system. The Finnish experience may provide an interesting example for other countries, because the motivation for the use of DRGs has had a practical basis, mainly for simplifying the product definitions

used by hospital management. The adoption of DRGs may have been partly associated with a 'signaling game' between municipalities and hospitals to show that hospital administrations are seriously concerned with efficiency issues [26]. However, hospital administrations have started to use DRGs to simplify their cost accounting and to analyse the variations in the resource use of their MBO-units.

However, DRGs can play a still greater role in Finland. Municipal decision-makers could use the new DRG-based hospital information systems more actively to monitor and compare the unit prices (cost-efficiency) of hospitals. The possibility to compare the (DRG) prices would be a significant improvement over the existing situation where the price types and their contents vary among districts. DRG prices could be used to predict and control production costs, to encourage cost-efficient operations and to reinforce the position of the municipalities in negotiating volume and spending quotas with hospitals. However, this would require municipalities to take a more active role in decision-making for hospital production. In the existing system, hospital districts have established pricing systems, whereas the municipalities have remained passive users of hospital information systems [16].

In Norway and Sweden DRG-based financing has been an effective incentive for increasing productivity in terms of numbers of DRG admissions [13-15, 27]. However, an increase in patient admissions is not currently the main concern of the financing hospital services of Finnish municipalities. They are also interested in cost containment, revealing production costs and maintaining quality of care. Furthermore, potential problems with DRG-based financing seems to be DRG-creep and a gradual deterioration in the validity of the classification even in public systems. These problems must be addressed when the DRG system is used as a base for financing. This may require systematic auditing and the use of rigorous statistical reporting methods.

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