

**The control Gap in Hospitals- do they survive  
the hospital enterprise Reform?  
A Norwegian Case<sup>1</sup>**

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## **Abstract**

This paper investigates the use of performance measures in the management control and decision-making processes in the Norwegian hospital sector as the hospitals now are organised as state enterprises. The motivation for the study is to understand the implementation of performance-based management systems, which is an element in the reforms that are similar to the New Public Management reform waves affecting the hospital sector on an international scale.

The theoretical framework is based on the description of hospitals as complex and de-coupled organisations. The use of benchmarking is discussed, and the focus is put on the information biases that exist in such data. The main finding in the empirical study is that the ambiguous information which exist in the performance measures used at the hospital department level, maintains the decoupling between the clinical activities and the management control practices. This decoupling creates management control problems because it hampers the knowledge on the cause-effects of actions, which is important in order to undertake strategic decisions and diagnostic action.

## INTRODUCTION

The hospital sector has been exposed to large managerial reforms processes on an international scale during the last decades. In the European public hospitals, these reform waves are known as “The New Public Management reforms” (NPM), and the reforms imply a move towards explicit and formal measures of performance. These changes in management practices presuppose allocations based on per case payment systems and actual performance standards. Taken together, these changes indicate a more specific focus on measuring input and performance. One main stream of these changes is associated with the introduction of performance audit schemes and a more explicit demand from the hospital owners (the state) to implement evaluation programmes to assess efficiency and effectiveness. As a consequence, the use of accounting information has become an important topic in the hospitals, and the concept of performance measurement is a key word in this respect.

Against this background, this paper investigates the use of performance measures in the management control and decision-making processes in the Norwegian hospital sector. The focus is put on the application of performance measures as parts of the management control processes. Thus, the research issue is whether the performance measures give relevant information for decision making in hospitals.

This paper is organised as follows: First, the theoretical framework is outlined. The framework is based on the description of hospitals as complex and de-coupled organisations. Thereafter the use of benchmarking is discussed, and the focus is put on the information biases that exist in such data. The theoretical discussion is finished by a concluding paragraph on the concept of interactive control processes as a bridge between the clinical action and managerial practices in hospitals. In the next section of the paper, the empirical study is described. The main finding is that the ambiguous information which exist in the performance measures used at the hospital department level, maintains the decoupling between the clinical activities and the management control practices. This decoupling creates management control problems because it hampers the knowledge on the cause-effects of actions, which is important in order to undertake strategic decisions and diagnostic action. In order to increase transparency, cost information should be decomposed as to develop practical indicators for interactive control purposes in clinical departments.

## **THE THEORETICAL FRAMEWORK**

The theoretical perspective of the paper is based on both normative and descriptive frameworks. In normative literature on management control, the link between plans and actions is not questioned. Within the more descriptive works, concepts such as de-coupling and ambiguity are used to understand the control tasks in complex organisations such as public hospitals.

### *Hospitals as complex organisations- the role of performance measures*

Conventional accounting information with a normative perspective is more in line with the aims of traditional production organisation efficiency than with the multiple objectives and complexity of organisations such as large hospitals. According to Anthony and Young (1999) organisations can be described as to the rational means-end paradigm to achieve cost efficiency savings and effectiveness improvements. According to this perspective, the management control systems in public sector organisations can be defined as three levels of planning and control: strategic planning based on a long term and broad focus, management control which has a short term view and a less broad perspective and the task control activities which are day-to-day responsibilities. In order to achieve a well functioning control system, these levels should be integrated by relevant performance measures.

However, this rational model does not cope with the fact that the measuring of output and efficiency is very complicated in hospital organisations. There are few -if any - value measures of the services provided and no profit measurement of public services, mainly because the budget allocations do not mirror the quality of health care activities. Several studies have pointed to the ineffectiveness of costing and management accounting information in hospitals (Perrin, 1988; Preston et al., 1992; Lapsley, 2001; Jones and Dewing, 1997). Some studies have also discussed the lack of information in existing databases on hospital care services (Ovaskainen et al, 2004). In particular, a focus has been on the inability of the accounting systems to match with the relevant information needs of the key decision makers – the clinicians - when it comes to hospital resource allocations (Lapsley, 1996; Jones and Dewing, 1997). Therefore, there has been a demand for accounting information to contribute to making hospital organisations more transparent and easier accessible for external evaluation.

Consequently, the accounting practices have become more visible in the hospitals. This trend has been called *accountingization*. According to Hood (1995:93), “accountingization means the introduction of ever more explicit cost categorization into areas where costs were previously aggregated, pooled or undefined”. Power and Laughlin (1992:132-133) have used this concept to illustrate the influence of financial measures and how they impinge on core values in organisations. This instrumental perspective on accounting is an alternative to the concept of legitimation based on a more social constructivist perspective. The instrumental perspective has been developed as it was observed that in loosely-coupled organisations like hospitals, accounting rules and other formal procedures may be of less importance instrumentally than in private sector production organisations (Meyer and Rowan, 1977; Lapsley, 1994).

The complexity of hospitals has been analysed by introducing the concept of de-coupling between the administrative activities and the clinical activities. In this respect, Meyer and Scott (1992: 101-102) have pointed to the strength of medical professionals’ autonomy and the strong professional structures and dominance of professionals in hospitals. This situation implies a de-coupling of the core activities; the performance of the health care professionals, from the administrative hierarchy in the hospitals. We may speak about two worlds of management in these organisations; the administrative world and the clinical world. The organisational solutions to these situations have been conceptualised by Weick (1976) as loose couplings between the professional performance and service production and the administrative structures and practices.

The de-coupling of the health care delivery processes from the formal, administrative structures such as accounting practices may be observed as the lack of coordination between clinical action and managerial activities. In such inconsistent environments that characterise the contexts of hospitals, the budgets may also serve the function of maintaining legitimacy, as the budget frames are constructed by the politicians and disconnected from the actual expenditures and activities of the hospitals (Brunsson, 1989; Pettersen, 1995). These observations also apply to the two different rationalities in such organisations. The clinical world follows the logic of appropriateness, whereas the administrative world’s decisions are based on the logic of consequentiality (March and Olsen, 1976). Thus, health care delivery is buffered from accounting structures. When accounting information does penetrate into the core activities of the hospitals (the health care delivery processes), the information may

induce unintended action visualised as symbols, rituals, and hypocritical behaviour (Brunsson, 1989).

In practice, the role of management accounting in hospitals can play both a legitimating role and an instrumental role. In their study on the use of accounting information in intensive care units in Finland and the UK, Kurunmäki et al. (2003) found that management accounting was absorbed by health care professionals in the Finnish setting. In the UK, the process was observed differently, as the accounting expertise was deployed as a defensive shield by health care professionals. Differing social and institutional contexts as they are observed in different countries will shape the management practices in divergent directions. Clinicians may actively use accounting information and performance measures (as in Finland) or they may observe such information with scepticism and as irrelevant to their activities (as in the study of UK). Despite these diverging practices, we may expect that as management accounting practices emerge in the hospitals, the emphasis will shift from input and process accountability elements to accountability in terms of results (Hood, 1995). Performance measures based on accounting information and activity statistics are expected to become more important as tools for decision making.

#### *The use of benchmarking*

Due to the processes mentioned above, there will be a search for mechanisms to develop more transparency in the delivering of hospital services. This process has been central to the introduction of benchmarking initiatives in several European countries (Power, 1997). In the public sector, the idea of benchmarking is that this systematic gathering of quantitative data may give evidence of efficiency and of quality in the delivered services. The benchmarking practices were early introduced in the UK (Clarke et al, 2000). The international series of financial management reforms in hospitals during the last decades in the UK has motivated the reporting of NHS (National Health Services) cost information with the intention of introducing external cost control: "*The new performance framework will encourage greater benchmarking of performance in different areas, and the publication of comparative information will allow people to compare performance and share best practice.*" (Department of Health, UK, 1998:6).

The intention of this benchmarking initiative was to supply purchasers of health care services and NHS executives with tools to tackle inefficiency and differential performance in order to

put pressure on “inefficient” hospital trusts to reduce costs. As Northcott and Llewellyn stated (2003), the benchmarking themes of measurement against a referent hospital, the opportunity of information sharing and, hence, continuous improvement were all present in the government rhetoric when the increased work on national benchmarking data in the UK was introduced.

As benchmarking initiatives are introduced in several other countries some serious problems are associated with the fulfilment of the benchmarking ideas when relevant information is not available (Pollitt and Bouckaert, 2000). First, there will be the problems in identifying the benchmarking standard of excellence dimensions. Second, the large differences in the costing practices in hospitals make the construction of cost indexes dependent on data with low robustness. This contributes to standards with wrong specifications. These difficulties may negate the achievements of the benchmarking ideas such as continuous improvements through measurements against a referent other hospital.

Benchmarking in the hospital sector is based on cost indexes and performance measures mostly at aggregated levels. Criticisms of the use of such cost indexes and other financial measures have recurrently been raised in the general accounting literature. It has been stated that the traditional management accounting systems have lost their relevance: *“Today’s management accounting information, driven by the procedures and cycle of organisation’s financial reporting system, is too late, too aggregated and too distorted to be relevant for managers’ planning and control decisions”*. (Johnson and Kaplan, 1987:1).

Consequently, there is a need to study more closely the use of cost indexes as performance measures in the hospital sector, to counter the lack of knowledge of the factors that drive costs behind the unit-cost indexes. The focus on cost causality is considered as crucial, because the traditional costing systems fail to reveal the structures of the cost drivers (Cooper and Kaplan, 1988). This cost-driver perspective is important when cost indexes and other measures are analysed on hospital levels, because this knowledge is in principle necessary if the indexes should be used in strategic decisions. The cost level of a hospital can be divided into costs related to various functions, specialities, or departments. Furthermore, costs depend on resource consumption arising from the severity of illness of the patients and the intensity of treatment, number of patient admissions, and number of examinations, tests and procedures undertaken in the treatment of patients.

All these stated cost elements should be explicitly available in the information system if cost index information is to guide decisions and actions. The question is whether such information is available in the hospitals' management systems.

### *Interactive control mechanisms*

When performance measures are developed and introduced in complex organisations, a special focus should be put on how these measures are understood and used by key decision makers. Two different perspectives are of special interest (Simons, 1995). First, the diagnostic perspective points at what kind of actions are taken when deviations between budgets and actual performance are observed. From this perspective, budget and accounting information should be followed by performance evaluation schemes that often are characterised as the main chain in the control system: "*Diagnostic control systems are the formal information systems that managers use to monitor organisational outcomes and correct deviations from present standards of performance.*" (Simons, 1995: 95).

This diagnostic control perspective is based on the more conventional view on organisations as rational systems designed for motivation, control, and evaluation. The quality of such systems is dependent on the ability to tie performance (output) to the processes of service production, the availability of evaluation standards/indexes, and the possibility of active intervention when deviations are observed. The control problem arises as the making of performance measures and standard measurement criteria is difficult in hospital settings.

An alternative to the rational view on control in the diagnostic perspective is the interactive control perspective. In this perspective, the focus is put on the dialogue and formal and informal communication activities that managers undertake as part of their control activities. The dialogue-based activity is considered as the mechanism that ties together the formal and the informal elements in the control systems (Simons, 1995). In contexts such as hospitals with a high degree of complexity, ambiguity and change, we argue that dialogue and face-to-face communications will be vital as rich information media for managers (Daft and Lengel, 1986). Of special importance is the fact that as relevant performance measures are scarce, communication and active dialogues between the clinical managers and their colleagues in the departments will be the important mechanisms to tie together planning and control with clinical activities in order to cope with the phenomenon of de-coupling. However, the

dialogues should be based on relevant information: “*Interactive control systems are formal information systems managers use to involve themselves regularly and personally in the decision activities of subordinates.*” (Simons, 1995: 95). The interactive control perspective focuses not on output as such, but on monitoring the organisational processes for the implications of decisions as the main consideration (rather than the data). Consequently, the discursive frame of the interactive perspective is expected to facilitate the decision processes at strategic levels, which presuppose active participation from managers at all levels.

#### *A summary of the framework*

We have above described hospitals as complex organisations where relevant performance measures should bridge the de-coupling between formal management control systems and clinical activities. The introduction of benchmarking to develop relevant performance measures and increase transparency is, however, hampered by the lack of relevant information. Due to the difficulties in developing relevant measures, the interactive control perspective can be developed as a means of enhancing managers’ control activities in hospitals. This perspective focuses on communication and interaction between people as alternatives to formal control structures. In the next part of the paper, we will discuss these theoretical perspectives against empirical studies in hospital settings.

## **THE EMPIRICAL STUDY**

### *Introduction*

Almost all hospitals in Norway are owned by the state, and the Norwegian hospital sector has since 2002 been divided into five large administrative regions. There are some 250 different health care institutions, diverging from large hospitals to small outpatient units, which are organised into 40 local hospital enterprises. These enterprises are defined as autonomous administrative entities as to internal management systems and strategies. One of the main objects behind this enterprise reform in 2002 was to make the hospital enterprises more accountable for their economic performance (Law on Hospital Trusts, Ot.prp. no 66, 2000-2001). Since 1997, Norwegian hospitals have been paid on a combined per-case payment and fixed-frames basis, where 60% of the total expenditure is based on budget frames (Governmental Note No. 44, 1995-96). The revised payment system and the hospital

enterprise reform are in line with the New Public Management reform concepts, as described previously.

The Norwegian hospital enterprise reform created new demands for management system structures, and the Norwegian Parliament decided that all hospital departments had to implement unitary management from 2002. The introduction of unitary management can be understood as implementation of one cornerstone idea of the New Public Management reforms, namely the realization of the performance management idea as a basis for governing public services. According to this view, managers must be given full accountability and autonomy to find ways to achieve objectives. In other words, the hospital department should be evaluated against its ability to reach a set of clear performance criteria and performance targets. The tendency is to evaluate actual performance rather than relying on evaluation systems based on professional norms, rules, and specification of procedures.

Furthermore, a new law on patients' rights accompanied the hospital enterprise reform in 2002. This law implies that patients are given stronger legal rights, which—more or less—contribute to the patients being considered as customers. The different reforms mentioned here aim to establish organisational autonomy, to achieve transparency and professional management. This framework of managerial assumptions is believed to enhance the hospitals' ability to clarify and translate visions and strategies, communicate and link strategic objectives and measures to performance. In one important governmental document in 2001, these reform visions are presented:

One of the most important initiatives of the reform is that the hospitals will have more clearly defined roles and responsibilities. This is due to the fact that the entities will, as mentioned above, no longer be integral parts of the public administration. Rather they will be organised as enterprises. These enterprises will have their own responsibilities as employers and will be responsible for use of capital. The enterprises will also be responsible for their own finances, with the restriction that they may not go into voluntary liquidation. As sole owner, central government will have unlimited responsibility for and full control of the enterprises.

(The Norwegian Hospital Reform - Central government assumes responsibility for hospitals. <http://odin.dep.no/shd/sykehusreformen>)

Taken together, these reforms move the public hospitals away from traditional public administrative systems of governance to more transparent and managed systems with an emphasis on the role of performance management. Seen a mere three years after the introduction of the hospital enterprise reform, transparency may be observed as the introduction of more detailed instruments to monitor performance and quality, accompanied

by the patients' rights to be informed. The clinical department managers are supposed to document better performance and results compared with many indicators on economic, medical, and clinical activities and indirect/direct quality measures.

The monitoring of economic performance in Norwegian hospitals is based on a national benchmarking database. Every year, the Ministry of Health coordinates to work out performance indicators at all levels, including national data and data on the hospital enterprise levels. Table 1 illustrates the kind of information given. These performance indicators include measures on productivity like cost indexes, number of in-patients treated per hospital (and per hospital departments and specialities) and the number of outpatient consultations. The measures are presented at national and regional levels, and their quality should be questioned as to the aggregation problems, the failures to decompose the indicators into relevant units, and the complexity of tasks. These aspects, which are not accounted for in the measures, will be discussed below.

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Table 1 about here  
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**Table 1: Patient composition and cost level for university hospitals in Norway, 2003**

*The management control functions in Norwegian hospitals*

In order to understand how management control activities are organised in the Norwegian hospital sector, a survey study was undertaken among the financial managers in the national population of hospitals. Among the 35 responding hospitals, the average number of employees in the management control function was counted as one employee per each 300 person-years in the hospitals. At that time (1999) the strategic and operational management control functions were centralised to the staff at the general manager's office.

These key respondents pointed to large deficiencies in the management control systems. The cost structure was perceived as complex, and every one of the 35 respondents said that it was impossible to calculate the cost of activities or cost-per-patient groups. This was contradictory to the fact that almost all the directors (84%) claimed this information to be very important for high quality control. Furthermore, calculation for decision making seldom took place, and the

focus in the budget evaluation process was heavily on the cost side, whereas the income side was underestimated. In other words, the focus was on record keeping without attention on performance evaluation and feedback, and no action was taken to tie performance measures to activity information. Thus, accounting information was not used to guide decision making.

The financial managers in our study claimed that very few models of management control tools such as Activity Based Costing (ABC) and Balanced Scorecard were implemented in the hospital. Reasons given included these:

*“Time is a bottle-neck, and we do not have the right competence.”*

*“We have too little resources for strategic planning—we have only time for keeping the wheels going ....”*

*“A general problem for hospitals is the fact that we need managerial generalists to keep going. Lack of time is then the problem.”*

“To keep the wheels going” meant that the activity was focused on record keeping. Most managerial and accounting resources in the hospitals were occupied with cost reporting from clinical departments and aggregating these into cost reports at hospital level. This approach implied that management control for strategic purposes and planning was absent in the hospitals, and the knowledge about the connection between activity and cost was scarce. In an interview conducted in February 2004 with a financial director in one of the five regional health administrations, the informant concluded that this absence of management control for strategic purposes was still the situation after two years with the hospital enterprise reform.

These observations confirm the impression that information on cost is aggregated and not decomposed to activity level or performance groups. This is in accordance with the general observation that the focus on performance measures has not been present (Banker and Datar, 1987). The existing performance measures in the Norwegian hospitals are made up by aggregated productivity measures published at hospital and clinical levels, see figure 1 above. As can be understood from the foregoing comments from the financial managers in the survey study, these measures are not used for internal strategic purposes. Performance measurement indicators are based on the cost index, which shows the cost level relative to the hospital average, corrected according to patient composition (diagnoses). These measures are not very relevant to decision making at clinical department levels. If indexes are used for any

information purposes, the focus is on cost DRG-adjusted in-patient-treatment<sup>3</sup>, cost per in-patient day, number of patients per person (or doctor)-year and other efficiency rates. These measures are very aggregated and standardised.

### *The case study*

In order to do a closer study of the unit cost per patient as relevant performance measures, a case study was conducted in 2001/2002. The special focus was if this measure could give information as to explain why the cost had been so quickly rising in the hospital the last couple of years. The study was undertaken in the surgical department of a large university hospital in Norway.<sup>4</sup> The research question was whether high unit costs indicated unsuccessful management control in hospitals.

The surgical department in the University Hospital is one of the largest in Norway. In the department there are approximately 50 physicians and 7300 in-patients were treated during 2002. The managerial problem was—among others—defined as an increase in number of doctors without the same relative increase in activity levels. This department had experienced the same challenges as other hospitals in Norway, as the number of doctors employed in hospitals, had been rising in Norway during the last 5–10 years. The hospital activity and the number of patients treated had also increased, but at a lower rate than the increase in number of doctors. During the same time period, the unit cost had also increased, which is to say that efficiency also was reduced substantially. No information was available in the management information systems that could indicate what kind of factors that had driven the costs, and it was impossible to explain why efficiency had been reduced.

To understand and analyse the actual operation of management control systems, it is necessary to go beyond the descriptive accounts and to study how key decision makers understand and act under the system in practice. Consequently, it was decided to conduct a case study to go further into a complex system in practice (Yin, 1994). The research model was based on qualitative data, implying that our empirical information depended on the responses from members of the organisation. These members were key decision makers and their attitudes and knowledge gave input to a deeper understanding of the empirical setting. The answers and information from these key informants are vital data when studying

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<sup>3</sup> According to the system of patient Diagnosis-Related-Group (DRG) (Fetter and Freeman (1986).

managerial processes. By conducting interviews with key actors in the control processes, we were able to understand and identify systems in practice. The data collection was based on semi-structured interviews. The interview guide was pre-tested before the final data collection. In order to obtain valid information, each construct was explained and discussed with the respondents during the interviews. The interviews were transcribed, and a summary of the transcriptions was sent to each respondent for comments and corrections.

Secondary data such as budget documents, activity data and data on patient records (anonymous) were used as supplementary information in order to gather relevant contextual knowledge about the hospital. However, the key informants provided most of the information used in this study. While this may have introduced elements of bias to the study, the inclusion of key informants as data sources is well recognised in the qualitative research literature (Rubin and Rubin, 1995).

The case study was introduced by presenting the doctors with the figures showing the development in the overall unit cost in the surgical department. After this introductory meeting, the chief clinician participated in selecting a representative number of informants to be included in the case study. Thirteen doctors agreed to be included, and they were each interviewed for an average length of approximately 90 minutes. The interviews were conducted in the doctors' offices. An interview guide was prepared beforehand and presented to the doctors during the interview. The questions were developed to discuss the degree of knowledge on the factors that affect the use of resources. The aim was to unbundle the complexity of coupling between activity and the use of resources according to the following questions:

- Factors which could be associated with driving the resources used, dependent on the number of patients and the medical needs of individual patients
- Factors which could be associated with driving the resources used, and which were not dependent on the number of patients and the situations of individual patients

## **FINDINGS**

### *Proxy measures of productivity*

When analysing the documents and reports on activity in the clinical department, it was observed that the services and outcomes in the department were difficult to define. The

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<sup>4</sup> There are four university hospitals in Norway. This case study was done in the University hospital in the middle part of Norway.

resources consumed with each unit of outcome were difficult to measure. Therefore, some indirect measures had to be defined. The most widely applied efficiency measure is the DRG (Diagnosis Related patient Group)-adjusted in-patient treatments, which implies that in-patient treatments are defined as outcomes. The constituent parts of the patient-related activities which comprise out-patient and day-patients are restructured into DRG-points which are meant to include all patient activities (Fetter and Freeman, 1986). Information on these indicators was available in the surgical department.

The input measure used in this department is the number of doctor-years. This measure is very crude, because it is impossible to match with the mix of services and activities that are made. The measure is calculated as number of doctors employed multiplied by the number of planned working hours a year—not the number of actual hours worked. It does not include overtime, which is an element believed to be substantial in the actual number of hours performed. Furthermore, it was observed that the doctors' activities in the department were very interrelated with the activities of other professional groups (mainly nurses) and interrelated with the use of medical-technical equipment and innovations. Consequently, the measuring of doctor-years as proxy input measures do not include all the relevant and interrelated activities. Despite all the crudeness inherent in the outcome-measures and activity measures discussed in this paper, they are widely used as indicators of development in unit costs.

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Figure 1 about here  
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**Figure 1. Unit cost defined as wage expenditures per DRG-point, 1993–2000<sup>5</sup>**

Figure 1 shows that there has been a heavy increase in the department's unit cost by 44% in the period 1995–98. During this period, wages increased substantially, and a large part of these increases in unit cost was caused by this price-effect. These increases in unit costs are externally imposed, and they should in principle be extracted from the evaluation of the development of the department efficiency. However, unit costs may also be affected by

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<sup>5</sup> When the DRG-indexes are calculated, it is important that the same reference model for the calculations is used. Changes in the treatment practices and technological innovations may be expected to affect the efficiency measures. However, these changes are supposed not to be included here.

internal department decisions such as the mix in use of doctor resources in the department. One method to isolate the effect of changes in unit cost is to use number of doctor-years as a measure of resources.

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Figure 2 about here  
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**Figure 2. Number of doctor-years per 1000 DRG points, 1992–2000<sup>6</sup>**

From Figure 2 we can observe that the unit cost increased by 24% from 1992 to 1997, and the increase during the whole period was 14%. In this way, we can illustrate the use of doctor resources combined with volume and activity. But the effects of non-volume factors are still present in the unit cost. The information in Figure 2 constitutes a mixture of different effects made by volume, productivity, and measurement biases due to the conceptual problems inherent in the definition of activity numbers and resource consumption.

Another proxy measure of productivity is the number of DRG-points per employed doctor per year. According to the hospital manager, this is a performance measure used in the management control of the hospital. Figure 3 shows the number of DRG-points per doctor and the number of doctors employed in the department during the period 1992–2000.

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Figure 3 about here  
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**Figure 3. Number of DRG-points per employed doctor and number of doctors in the department, 1992–2000**

*The understanding an use of proxy measures*

Most of the key informants pointed to the fact that these performance measures (DRG-points) were highly ambiguous and not “real” measures. The key informants interviewed said that

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<sup>6</sup> Changes in number of hours per doctor-year due to changes in the contracts between the employer and the employees, extra hours worked, and so on are not included. This makes the numbers somewhat more misleading.

when the hospital payment system was changed in 1997 from basically fixed-frame budgets to prospective per-case payment based on DRG-unit prices, this change increased the focus on the coding of diagnoses and procedures. The informants interpreted the increase in DRG-points per employed doctor in the department from 1997 as a strategic adaptation. The measured increase in production number was not a real increase in activity.

Other important trends in activity which the output measures do not account for, are the observations that the population of patients is growing older and therefore more demanding of resources:

*“We have got very old patients and the tendency is towards ever older and more demanding (due to severity of illness) patients. These patients stay longer in the hospitals and consequently, the capacity for other patients’ decreases. The illnesses are getting more complex, with problems from heart, lungs and circulation deceases. This implies that we must cooperate and coordinate with other specialities ...”*  
(Surgeon in the department).

As can be observed from this statement, more complex diseases are now registered with more frequent comorbidity among patients. Complexity of diseases increases with age, as older patients have more comorbidity diseases in heart, lung, and other organ systems. The presence of more demanding patients is partly caused by the great technological innovations made in surgical specialities during the last 10 years. This is especially true for the use of laparoscopic surgery and invasive techniques:

*“We are now treating patients who earlier did not get any treatment such as patients with cancer spreading to the liver .... This reduces the capacity to treat patients with less complex diagnoses.*  
*As the degree of specialisation increases, both the patients and the doctors will work towards higher levels of competence and complexity....”* (Surgeon in the department).

### *Technological changes*

Technological development causes changes in efficiency in different ways. Sometimes, these changes will imply less resource-demanding procedures (e.g., laparoscopic surgery).

However, this is in fact very seldom the case:

*“Technically complex procedures need more doctors in order to supply high quality services. The procedures are technically more demanding, the learning processes are slower and many doctors will – on the average – need training and education. This will in turn imply duplication of doctors. Of course, this will cause high quality treatments, but not necessarily shorter stays and reduced costs” ... (Assistant surgeon in the department).*

Another tendency is the fact that the most highly specialised hospitals, due to this specialisation, receive patients from other hospitals:

*“No doubt that other hospitals transfer the most seriously ill patients to us... and thus, they keep the cheaper (and more profitable) patients themselves. As soon as there is comprehensive intensive care treatments involved, patients are sent to us....”*  
(Surgeon in the department).

This kind of “patient shuffling” has been widely debated as a possible consequence of the DRG-based payment system to hospitals (Ellis, 1998).

#### *Changes in practices and tradition*

Costs and efficiency in hospitals are also affected by factors other than technological innovation and patients’ diagnoses. Some of these factors are related to cultural and traditional practices, such as the tradition that doctors work without payment when they are technically off-duty. This is a cultural factor, which has changed during the period, and this trend has in fact reduced the number of working hours:

*“In my career as doctor here since 1983... I now notice that the assistant doctors consequently leave the hospital when they are off-duty in the mornings even when there might be very interesting challenges in the operating theatre. Leisure time is now given higher priority than the career “... (Chief surgeon in the department).*

*“I do very little work which is not directly paid by the employer...” (Assistant surgeon in the department).*

This is to say that the doctors on average work fewer hours for their full payment than earlier. This structural element can be observed as a cost driver which is not explicitly analysable in the cost indexes.

### *Specialisation and complexity*

Over the last 10 years, the department has been split into six different sections. This structural change is an outcome mainly driven by technological development and the demand for highly specialised services. The direct cost accompanying this sectioning might not be high, but the indirect costs are estimated to be relatively high. Due to on-call services in every section, the number of doctors has increased far more than the relative increase in patient volume in these sections:

*“The patient volume has been relatively stable here. So, in your way of measuring this, we are now more specialists treating the same amount of patients...”* (Chief surgeon in the department).

*“In order to make the system of working-plans to fit together, we need more doctors – but they are here less at the day time – due to the continuous work day and night...”* (Assistant surgeon in the department).

In this hospital there are other functions present such as research activities and the education and training of doctors. The number of students has increased significantly in recent years. Most clinical education is done in close contact with patients in the clinic. This structural contingency can imply that the number of doctors have been almost doubled during periods with educational activities. Figure 3 shows that the number of doctors increased by 60% over the whole period. Since the efficiency measure does not include research and education, increased activity within these fields is causing the calculated efficiency to decrease although the fact may be the opposite. One informant has experienced change in this way:

*“These days it happens that we can do clinical research work during ordinary working days. This was completely impossible in the earlier days”...* (Surgeon in the department).

However, this picture is not quite homogeneous. The complexity of service production defined as an increased number of different clinical specialities has itself affected an increase in the number of doctors and has driven resource consumption:

*“The more people we are here in the department, the more complex is the activity...”* (Surgeon in the department).

*“There are now so many different hierarchies to cooperate and communicate with... it takes too much time more than ever...”* (Surgeon in the department).

*“Now we have different specialists for every part of the body. This means that the patients must be administered through different doctors and specialities, and this is very time-consuming. Such quality implies higher costs”* (Assistant surgeon in the department).

In general, the doctors are less accessible to patients in the daytime, and consequently, several different doctors have to get information on the same patient and spend time to understand and communicate their information, which in turn also reduces the continuity in the treatment chain. As the number of doctors having clinical responsibility for a patient increases, the need for documentation and paperwork also increases:

*“Reduced throughput of patients is not a problem of resources, but an organisational problem. A patient may during his/her stay meet 5-6 different doctors; one at the outpatient unit, one who prepares for the operation. Another who performs the procedures in the operating theatre, one doctor who takes care of the patient when he/she leaves, and finally, the clinical manager of the department very often looks through all the patient administrative papers after the patient has left. Thus, a lot of resources are consumed which are not directly connected to the treatment itself...”*  
(Chief surgeon in the department).

#### *Vertical and horizontal coordination*

As it has been discussed above, increased unit costs do not necessarily imply lower productivity and unsuccessful management control. The reason is to be found in the very crude measures of input and output. As a synthesis, we may say that increased specialisation, sectioning of departments, and complexity in the production of services have increased the tasks of coordination vertically and horizontally in the hospital. Furthermore, doctors work in general fewer hours on duty than earlier. These structural changes will affect unit costs, and consequently, unit costs will not mirror the actual performance level and management control activities.

In order to understand what drives the increase in hospital unit costs, it is necessary to decompose the different factors related to patient needs and the services offered by the

hospital. This implies that there are costs related to the patients' resource consumption and costs related to more function-related resource consumption. The traditional focus on aggregated information based on activity volume and number of patients produces low-quality information that in turn is not relevant to support the clinical and administrative managers in their strategic and operational decisions.

## **DISCUSSION AND CONCLUDING REMARKS**

### *Introduction*

The new management practices in the hospital sector have been discussed with the focus on the introduction of performance measurement and performance audit schemes. These reforms are associated with the New Public Management logics. The research question was to investigate the application of performance measures in decision making at clinical department levels. A national survey study and a case study in a surgical department at a large university hospital were undertaken in order to study the systems in action.

### *Measurement biases*

There are obvious weaknesses associated with performance measures in hospitals. These apply mainly to the fact that the activities that are not directly included in the treatment of patients such as the education and training of professional staff, capacity invested in on-call services and research activities, are not included in the performance concept. In a surgical department there are many different performance measures like surgical procedures, number of patient treatments, research activities, education activities, and on-call services related to emergency situations. The choice of the number of DRG-adjusted treatments as a performance measure indicates that most of the other measures mentioned are not included in the statistics.

The main reason for these measurement problems is that surgical services—as is the case with most health care services—are integrated production processes where resource usage is not separable into clearly defined elements. Consequently, the input measure (costs) most often includes total resource usage, while the output measures only account for part of the total range of activity. Furthermore, these measurement biases are not constant over time. In general, performance measures which are crude, aggregated, and inflicted with mismatched

information are of very little practical use as performance measures, because they invite strategic action in the form of sub-optimisation, but give little causal information to guide actions through interactive control (Simons, 1995).

#### *Complexity and the role of performance measures*

The financial directors in the nationwide survey study confirmed without exception that there were large problems in the hospitals' management control systems. The focus has been— and still is—on cost reporting and cost control, and the use of accounting information in strategic planning is more or less absent. Furthermore, there is little knowledge on the connection between activities in the hospital and the factors that drive costs. The main reason is that cost information is not decomposed into relevant elements at clinical department level. There are also obvious weaknesses attached to the national benchmarking data that are based on cost, including unit costs associated with the diagnosis-adjusted in-patient treatments (DRGs). First, there are the technical problems inherent in the make-up of the statistics on patients and patient groups. Second, the cost indexes and unit-cost concept are too aggregated to give relevant information for diagnostic management action and interactive management control processes.

The case study in the surgical department illustrated the managerial problems associated with the measuring of input and output in order to analyse why expenditures were rising substantially during several years. The study illustrated the process of decomposing information in order to understand why unit costs, defined as wage expenditures per DRG-point for 1993–2000 were rising. And it turned out that this cost analysis had to consider the number of doctor-years per 1000 DRG-points for 1992–2000, the number of DRG-points per employed doctor, and number of doctors in the department for 1992–2000 in order to develop indicators with relevance for decision making. But measurement errors in unit costs existed because input measures included total resource consumption, while output measures only comprised the number of patients treated. This is to say that the information was not decomposed into relevant elements, and the measures did not add transparency to the organisation.

#### *The de-coupling between clinical activity and management control*

Another main finding was that the cost per patient treated in the hospital did not provide an adequate performance measure that could give relevant information for strategic decisions at

department level. Although the clinical managers in the surgical department in the large hospital over a long period had observed rising unit costs, no diagnostic actions were taken. The discussions were mainly focused on reasons and excuses for the rising costs, and very few questions were raised as to developing alternative strategies.

This lack of diagnostic action may be due to the measurement problems, as the existing performance measures did not give transparency upon which control action could be based. When information is too aggregated and includes too much irrelevant information or is missing relevant information, interactive control procedures also will be hampered. Thus, the motives behind the introduction of performance measures—learning and improvement through monitoring—are more rhetorical and symbolic than observable in practice in our case study.

As the main finding in our study we can conclude that the information biases in the performance measures contribute to maintain the loose couplings between the clinical activity and the information gathered for managerial purposes. The unpredictability inherent in these organisational loose couplings indicates a management control problem, because the understanding of cause – effect relations is hampered by ambiguous information. One effect of this de-coupling is that this situation tends to create a buffer towards turbulence in the hospitals' political environments. On the other hand, ambiguous information gives benchmarking data of little relevance to managers. This situation reduces the hospitals ability to undertake strategic planning and diagnostic action in order to adjust to future external demands.

#### *Implications and future research*

This research has been based on three sources of data that gave insight into the fact that performance measures were mostly used for recording and historical purposes, and that there was very little managerial action based on this information. Furthermore, large measurement biases were found in the performance measures, and it turned out that managers could not analyse from the data why unit costs were rising, whether this was due to technological changes, changes in the mix of patients or activities or changes in efficiency rates. Consequently, these measures did not facilitate strategic and operational decisions. In fact, the data on unit cost created frustration, confusion and did not act as incentives for learning or improvement and strategic action.

It should be noted that these data give a picture of the situation in a surgical department as a particular context, and the findings can therefore only to a limited extent be generalised. If the study were to be repeated in departments with other medical specialities, new insight might be given as to the adjustments hospitals make in times of changing management control systems.

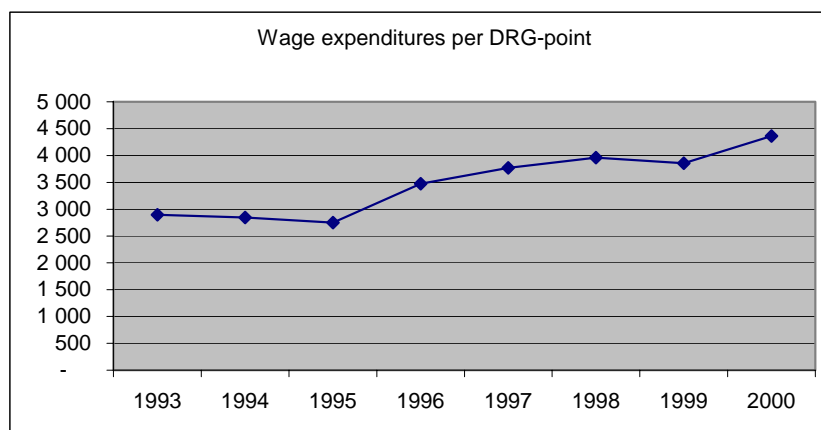
However, the analyses add to our knowledge on how performance measures are used in hospital settings. Future research will benefit from going deeper into the questions on the cost-driver perspectives and the complexity of health care services that should be understood in order to develop practical indicators for interactive control purposes.

**Table 1: Patient composition and cost level for university hospitals in Norway, 2003.**

**Source: SAMDATA Sykehus (Benchmarking data, hospitals) 2003. SINTEF Helse-Report 1/04.<sup>7</sup>**

Hospital group:	Unit cost per in-patient Norwegian kroner	Relative Cost index	In-patients per man years worked	Relative DRG index
University hospitals				
The Central Hospital (Rikshospitalet)	27 000	1,09	19,3	1,23
Haukeland Hospital	24 800	0,99	17,1	1,04
Ullevaal Hospital	25 000	1,00	16,5	1,08
St Olavs Hospital	24 300	0,97	18,3	1,08
University Hospital Northern Norway	24 100	0,96	17,9	1,00

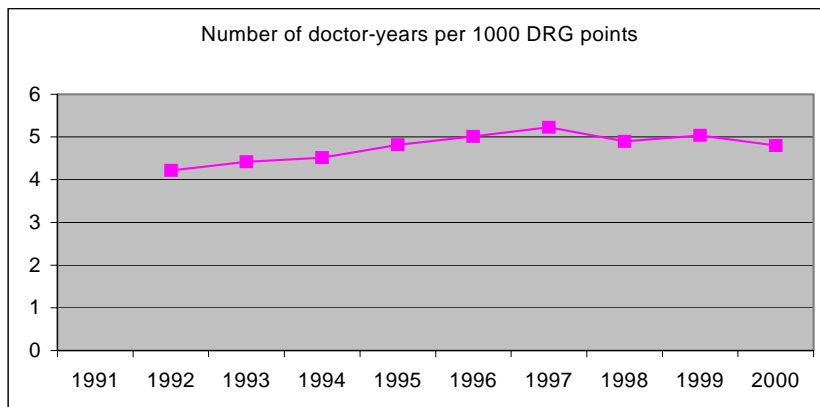
**Figure 1. Unit cost defined as wage expenditures per DRG-point, Norwegian kroner, 1993-2000<sup>8</sup>**



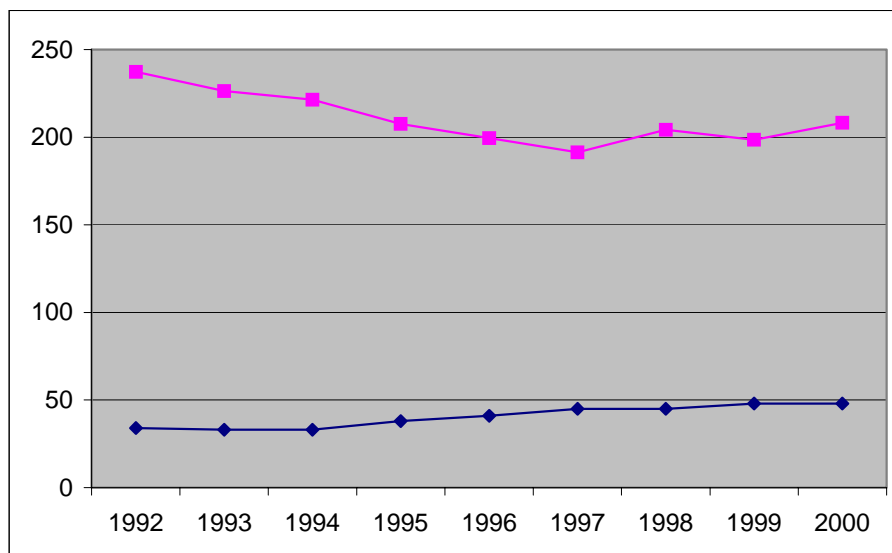
<sup>7</sup> The patient composition is determined as the DRG index, which weights patients based primarily on their diagnosis. A higher DRG-index indicates a more resource demanding patient mix. The cost index shows the cost level relative to the average, corrected for patient composition according to the DRG system.

<sup>8</sup> When the DRG-indexes are calculated, it is important that the same reference model for the calculations is used. Changes in the treatment practices and technological innovations may be expected to affect the efficiency measures. However, these changes are supposed not to be included here.

**Figure 2. Number of doctor-years per 1000 DRG points, 1992–2000<sup>9</sup>**



**Figure 3. Number of DRG-points per employed doctor (1) and number of doctors in the department (2), 1992–2000.**



<sup>9</sup> Changes in number of hours per doctor-year due to changes in the contracts between the employer and the employees, extra hours worked and so on are not included, which make the numbers somewhat more ambiguous.

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