Performance measurement and strategic behavior in Dutch hospital care

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New Public Management and the consequent liberalization programs that took place in various North American and Western European countries have increased the demand for accountability of professional organizations in the public sector. In response, many systems of performance measurement have been introduced in the public sector to increase transparency and efficiency. In this development professional autonomy is often perceived to be a barrier for such instruments of external regulation. Literature shows that performance measurement in professional organizations can have both beneficial and perverse effects. On the one hand it can enhance transparency, productivity, efficiency and innovation. On the other hand systems of performance measurement can conflict with professional values when it interferes with professional the organization of professional work. This paper explores the effects of performance measurement in Dutch hospital care and the strategies that medical professionals apply in dealing with this system. For this purpose, interviews were conducted with medical specialists, managers in different types of hospitals in the Netherlands. Analysis of the interviews revealed that the autonomous position of professionals enables various forms of strategic accounting. However, the underlying motivations appear to vary. Strategic accounting can be perceived as opportunistic and self-serving behavior on behalf of the professional. It can also be perceived as a coping mechanism that is applied by professionals in order to make the system work in practice by coping with unintended effects of performance measurement.
I Introduction

Despite the extraordinary effort that governments in Western European and North American countries have made in implementing systems for public sector performance measurement much remains unknown about the effects of these systems (Moynihan & Pandey, 2010). This also appears to be the case for performance measurement in the Dutch hospital care sector. Here, a system of performance measurement based on Diagnosis Treatment Combinations (In Dutch: DBC) was introduced in 2005. In evaluating the effects of the DBC system over the past few years, some stress the positive effects it has on transparency\(^1\), innovation\(^2\), efficiency\(^3\) and productivity\(^4\). However, literature on performance measurement suggests that the DBC-system could have negative effects on these very same aspects (e.g. Smith, 1995; Johnsen, 2005; De Bruijn, 2007). Also this literature suggests that systems of performance measurement, especially in highly professionalized organizations like hospitals, are vulnerable to strategic behavior displayed by the monitored party.

In academic literature, strategic behavior in response to performance measurement in the health care sector has received quite some attention (e.g. Goddard et al., 2000; Smith 2002; Steinbusch et al, 2006; van der Voort and Kerpershoek, 2010). Since the introduction of the DBC-system, this topic has also been addressed in the public debate. Especially voiced by health insurance companies, which serve as the purchasers of hospital care in the Dutch system, newspapers have reported on fraud and opportunistic behavior\(^5\) Also medical fora like Medisch Contact, a Dutch journal for medical practitioners, has reported on strategic or creative behavior of medical professionals in response to DBC performance measurement on several occasions. However, besides reporting on these strategic and deviant behaviors, little attention has been paid to the underlying motivations and the effects of DBC performance measurement at professional level.

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1. [http://www.dbconderhoud.nl/Over-de-DBC-systematiek/Waarom-de-DBC-systematiek](http://www.dbconderhoud.nl/Over-de-DBC-systematiek/Waarom-de-DBC-systematiek)
3. [http://www.dbconderhoud.nl/Over-de-DBC-systematiek/Waarom-de-DBC-systematiek](http://www.dbconderhoud.nl/Over-de-DBC-systematiek/Waarom-de-DBC-systematiek)
This paper aims to clarify the effects of DBC performance measurement at professional level in Dutch university-, general hospitals and specialized clinics. The primary focus is on how medical professionals in these hospitals perceive the effects of DBC performance measurement on transparency, productivity, efficiency and innovation. Furthermore, we identify and categorize strategic responses to DBC performance measurement at the level of medical professionals. Finally, the various forms of strategic behavior are explained and motivated from theoretical perspectives on professionalism and principal agency relationships. Therefore this paper addresses three questions:

1) What are the effects of DBC- performance measurement on productivity, efficiency, innovation and transparency at professional level in the Dutch hospital care sector?
2) What strategic responses to these effects of DBC performance measurement arise at professional level?
3) How can these types of strategic behavior be explained from theory on professionalism and principal agency relationships?

The paper is structured as follows. The following section provides an overview of the development, aims and functioning of the DBC system in hospital care in the Netherlands. The third section presents theoretical notions on beneficial and perverse effects of performance measurement, professionalism and principal agency relationships and concludes with an analytical framework. In the fourth section we present our findings on effects of DBC performance measurement on professional level. Finally in the concluding section, we elaborate on these effects, the strategies that professionals apply in dealing with tensions with DBC performance measurement from theoretical perspectives on professionalism and principal agency relationships.

2 Health care sector reform in the Netherlands

2.1 Health care reform and introduction of the DBC system

During the 1980s and 1990s, Western European and North American countries developed liberalization programs to improve the performance of public sector organizations. Despite the
diversity of these national administrative reforms, the common denominator was the believe that efficiency of the public sector performance could be in improved by creating an institutional and organizational context that resembles the private sector (cf. Noordegraaf and Van der Meulen, 2008). In line with the New Public Management (NPM) school of thought, the reform of the public sector was aimed at the introduction of competition. For this purpose, NPM focuses on explicating standards, performance indicators and on hands-on professional management (e.g. Hood, 1991; Osborne and Gaebler, 1992; Kickert, 1997; Dawson and Dargie, 1999).

The reform of the health care sector in the Netherlands followed a similar logic. From the late nineties until the first years of the 21st century, the Dutch health care sector was facing some serious challenges. In the first place, health care expenditure had increased substantially. Whereas health expenditure had been relatively stable in proportion to the GDP since the 1980’s, the years 2001 and 2002 showed an annual increase in expenditure of approximately 12% (CBS, 2006). A second challenge that arose besides the rapid growth of health care expenditure concerned a considerable increase in waiting times for common hospital treatments like knee-, hip- and cataract operations (CBS, 2005). The subject of increasing waiting times for hospital care generated much media attention and public upheaval, and was consequently placed high on the political agenda. The general opinion was that health care demand and the available financial and human resources for health care provision were growing out of balance (Schut, 2003). After the year 2000, the Dutch government made additional funds available for Dutch hospitals to increase their production and thereby decrease the waiting times, which contributed to the increase in health care expenditure (CBS, 2009). Both the increase in health care expenditure and the problem of hospital waiting times were considered to be signs of a structural inefficiency of the health care sector in Netherlands.

To enhance the efficiency and transparency of the health care sector the Dutch government has initiated a major liberalization programme to introduce market processes in the sector. A central element in this reform of the Dutch health care sector was the introduction of a new system for hospital reimbursement and performance measurement, the so-called the DBC-system. With this system patients are categorized into clinical groups based on Diagnose-Treatment-Combinations (In Dutch: DBC). The design of the DBC-system and the targets that have been set with the implementation of this system are described in the following section.
2.2 Design of the DBC-system

The DBC-system is a casemix system that categorizes patients in clinical groups in order to create transparency in clinical or cost differences in the patient mix (cf. Sutherland and Botz, 2006). Each of the 30.000 DBCs that the system counts can be seen as a predefined health care product that reflects an average profile of all medical activities and services that are required for the treatment of a patient in that particular condition. Therefore, in the first place the DBC system serves as an instrument of performance measurement that standardizes the complex medical process into a fixed collection of DBCs. In the second place, DBCs serve as health care products that are used for the reimbursement of hospital care by the health insurers in the Netherlands.

In order to create competition in the health care sector, free pricing of DBCs was introduced for a small segment of the total hospital production. For this segment of hospital care (called List B), the prices of DBCs are freely negotiable between the hospital and the medical insurance companies. Initially in 2005 only 8% of the hospital production fell under List B but this segment has been gradually increased to approximately 34% in 2010. The DBCs in the remaining segment of hospital care fall under List A, which is not opened to the market. The tariffs for List A DBCs are fixed by the Dutch Healthcare Authority and the List A DBCs merely serve as vessels to bring in the traditional hospital budget.

By means of competition and product definition, the DBC system aims to stimulate transparency, innovation, functional standardization and performance in the hospital care sector. In the first place, DBCs contribute to transparency by translating the essence of the medical process into easily communicated figures on performance characteristics. Secondly, the competition that is introduced with the free-pricing of List B DBCs is expected to stimulate innovation. Thirdly, product definition in hospital care service delivery is believed to result in a functional standardization of the professional medical process and will consequently improve efficiency and productivity. These intended and beneficial effects of DBC performance measurement are assumed. However, literature suggests that performance measurement in professional health care is an illusion.

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6 Information on the historical development of the DBC system is available (in Dutch) at the website http://orde.artsennet.nl/belangenbehartiging/vrijberoep/DBCs/Historie-van-het-DBContwikkelingstraject.htm

7 http://www.dbconderhoud.nl/Over-de-DBC-systematiek/Waarom-de-DBC-systematiek

8 http://www.ictzorg.com/home/blog/3578/competitie-stimuleert-innovatie

9 http://www.dbconderhoud.nl/Over-de-DBC-systematiek/Waarom-de-DBC-systematiek
organizations is also known to result unintended and perverse effects (e.g. Smith, 1995; 2002; Goddard et al, 2000; Johnsen, 2005; De Bruijn, 2007). Therefore, the following section will address academic literature on the beneficial and perverse effects of performance measurement in professional organizations.

3 Theory

3.1 Beneficial effects of performance measurement in professional organizations

Literature reveals that performance measurement can have important beneficial effects (e.g. Johnsen, 2005; De Bruijn, 2007; Spekle and Verbeeten, 2009). Both the organization itself as well as external stakeholders can benefit from the information and transparency that performance measures provide. In the first place, performance measurement can serve for purposes of accountability and legitimization of the organization. This external transparency enables external parties to benchmark the organizations’ performance and stimulate competition. From this perspective, performance measurement provides the organization with an incentive to improve their performance relative to its competitors. On the other hand, this external transparency can be used for purposes of accountability and regulation. In the second place, performance measurement can generate information that is useful for the organization itself. Performance measurement can be used to standardize the production process, which can benefit the organization’s efficiency. This internal transparency, allows the organization to detect flaws or inefficiencies in the production process. Hereby performance measurement can improve the organizational learning process and stimulate innovation when flaws or inefficiencies come to light. Following the literature on beneficial effects of performance measurement, the DBC-system aims to:

1. Create both internal and external transparency
2. Provide an incentive to increase hospital performance
3. Offer a functional standardization of professional medical performance
4. Create an incentive for innovation in hospital care
3.2 Perverse effects of performance measurement in professional organizations

Besides the beneficial effects of performance measurement, academic literature also reports on a variety of unintended and perverse effects of performance measurement (e.g. Smith, 1995; 2002; Goddard et al, 2000; Johnsen, 2005, De Bruijn, 2007). Some of these perverse effects of performance measurement might interfere with the beneficial effects or even outweigh them (RVZ, 2010). For example, as a result of these perverse effects, systems of performance measurement are at risk of providing distorted or incomprehensible information that actually creates intransparency of performance (Smith, 1990). Related to this, performance measurement might lead to ‘misrepresentation’ of reported performance (Smith, 1995; Goddard et al, 2000). Smith (1995) defines misrepresentation as ‘the deliberate manipulation of data so that reported behavior differs from actual behavior’. This form of strategic behavior is also referred to as ‘gaming the numbers’ (Osborne & Gaebler, 1992; De Bruijn, 2007). This perverse effect of performance measurement is especially likely to occur in professional organizations. Professionals are working in highly specialized fields which gives them a relatively autonomous position (cf. Smith, 1995; Goddard et al, 2000). In line with this tension between professional autonomy and performance measurement, the standardization and product definition that follows from performance measurement might conflict with professional values on health care service delivery. As a result, performance measurement is often claimed to deprofessionalize public sector organizations (Noordegraaf, 2006) and could potentially drive out the professional attitude towards public service delivery. De Bruijn (2007) argues that the uniform and unambiguous product definitions associated with performance measurement can be at odds with the professional’s multiple value reality. Hereby, performance measurement can take the trade offs between conflicting values (e.g. efficiency and quality) out of the hands of the professional. Finally, performance measurement can also inhibit innovation and lead to ‘ossification’ or organizational paralysis (Smith 1995). The process of product definition implies that systems of performance measurement are static and conservative in nature. ‘The danger of ossification arises because of the inevitable delay in designing and putting in place a performance evaluation scheme’ (Smith 1995: 300). Also, when linked to a financial reward performance measurement can be an incentive for organizations to focus
production on ‘cash cows’ and thereby provide a disincentive for innovation (De Bruijn, 2007). Summarizing these theoretical notions, DBC performance measurement could:

1. Lead to intransparency for the organization or external stakeholders
2. Lead to creative accounting when data on performance is manipulated
3. Lead to a loss of professional attitude
4. Create a disincentive for innovations in hospital care

Even though systems of performance measurement can create incentives of disincentives, the actual effects still depend on the behavioral response in professional organizations. As a result, both the positive and negative effects of performance measurement can be influenced by the strategies that professionals apply in adopting a system of performance measurement.

3.3 Theoretical notions on professional autonomy

Especially performance measurement in professional organizations is thought to be susceptible to strategic behavior. Due to the high level of specialization, expertise and the control they have over the organization of professional work, professions have an extensive informational advantage over external parties. As a result, professional groups and organizations have a relatively strong and autonomous position. Academic literature on professionalism holds opposing views on the desirability of this professional autonomy. From one perspective, the autonomous position of professions is believed to result in undesirable outcomes. In this light, professions are seen as occupational monopolies that are prone to self serving and opportunistic behavior (Dingwall and Fenn, 1987; Abbott, 1992).

From another point of view, the same professional autonomy is thought to benefit the public interest. The profession can serve as a normative reference group with a collective occupational interest to improve standards of quality (e.g. Dingwal & Fenn, 1987; Frankel, 1989; Freidson; 2001). Hereby, professionals bare a collective responsibility to shield the occupation from external influences that interfere with professional values.
From this perspective, strategic behavior on behalf of the professional organization can be understood as a coping mechanism to prevent the professions core values and standards of quality from being perverted by external influences (cf. Freidson, 2001).

Both these perspectives on professional autonomy contribute to the understanding of the interface of professionals and instruments of performance measurement. The former perspective would expect professionals to deal with performance measurement strategically for reasons of opportunism. The latter perspective, on the other hand would predict that strategic behavior is likely to occur in response to conflicts between performance measurement and professional values.

3.4 Theoretical notions on Principal Agency relationships

The notion of professional autonomy and strategic responses to performance measurement is closely related to the concept of information asymmetry in theories on principal agency relationships. In the traditional paradigm of this theory, the principal agency relationships are confined to a single principal that holds a formal position of authority and an agent that has an informational advantage over the principal. (Jensen and Meckling, 1976; Waterman and Meier, 1998) Due to this informational advantage, the principal’s ability to monitor and control agent behavior is limited (Alchian and Demsetz, 1972; Mitnick, 1992; Williamson, 1993). This leaves the agent in an autonomous position that enables him to deal strategically with the requirements that are set and with the information that is provided to the principal. From this perspective, strategic behavior on behalf of the agent is perceived to be opportunistic in nature and the principal’s main problem. Due to conflicting interests of the principal and the agent, the principal runs the risk of contracting shirking agents (Williamson, 1993; Brehm and Gates, 1993; Shapiro, 2005). In other words, the agent will try to minimize its efforts, either within or outside the boundaries of the contractual arrangement. However, more sociological and management oriented approaches to principal agency models claim that the agent’s strategic responses are not necessarily to the detriment of the principal’s interests. Agents can also serve as good stewards (Donaldson, 1990) or principled agents (Dilulio, 1994)
and apply their knowledge, expertise and autonomous position to the benefit of their principals (Mitnick, 1975; Perrow, 1986) From this perspective, the agent’s strategic or creative behavior can serve the principals interests because it allows him to benefit from the agents expert knowledge.

3.5 Analytical framework

Based on the theory presented in this paper we argue that DBC performance measurement in hospital care will result in both beneficial and perverse effects. See Table 1.

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<tr>
<th>Effect dimension</th>
<th>Beneficial effects</th>
<th>Perverse effects</th>
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<tr>
<td>I Transparency</td>
<td>Transparency</td>
<td>Intransparency</td>
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<tr>
<td>II Productivity</td>
<td>Incentive for performance</td>
<td>Creative accounting</td>
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<td>III Efficiency</td>
<td>Functional standardization</td>
<td>Deprofessionalization</td>
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<tr>
<td>IV Innovation</td>
<td>Incentive for innovation</td>
<td>Disincentive for innovation</td>
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Following the literature on professional autonomy and principal agency relationships, we argue that the effects of performance measurement at professional level are related to strategic behavior. The motivation for strategic responses to DBC performance measurement can vary from opportunistic behavior and exploitation of professional autonomy to the shielding of professional values like quality and innovation, and bridging the gap between system logic and medical reality.

4 Method

The findings presented in this paper are based on an ongoing research project on DBC performance measurement in the Dutch hospital care sector. For this research, 58 semi-structured interviews have been conducted with medical specialists, managers and facilitating staff members. It should be noted here that medical specialists and managers
are not clearly distinct groups. Many of the managers interviewed were also practicing as medical specialists. However, since this group showed a broader perspective on the effects of DBC performance measurement, a distinction was made between medical specialists and management representatives.

Since the DBC system relies on self-reported performance provided by medical professionals, this study will draw primarily on interviews with medical specialists. To include the potential differences in effects of the DBC-system for different medical specialties and to control for contextual differences to a certain extent, it was decided to select a single University Medical Center (UMC), a single large scale general hospital and four small scale specialized clinics that provide insured hospital care (ZBC) in the Netherlands for the interviews. Within these hospitals, we selected our interview candidates based on a cross section of the medical specialties that are present in these hospitals and that are also involved directly in DBC-registration. To get in contact with the interview candidates from the selected medical specialties, interview candidates were typically asked to recommend one or more colleagues within the hospital, who could be approached for this research.

Strategic behavior of medical professionals in dealing with the DBC-system was a central topic in the interviews. Given the precarious nature of strategic behavior in DBC-registration as a topic of discussion, a social desirability bias in the responses of the interview candidates, which were mostly medical specialists themselves, needs to be accounted for. To alleviate the risk for a social desirability bias, in the first place respondents were assured of the confidentiality of the interview. In the second place, anonymity in future publications of both the respondent as well as the hospital of affiliation was agreed upon. Furthermore, to introduce the topic of strategic behavior interview candidates were first asked to reflect on a number of examples of strategic behavior in the hospital care sector. Initially these examples were derived from a literature study of a Dutch journal for medical practitioners (in Dutch: Medisch Contact) from articles on the DBC-system from 2005 - 2009. Later on, also findings on strategic behavior from previous interviews were presented to the interview candidates. The
examples and findings presented to the interview candidates all resolved around discretionary space and creativity in DBC registration that resulted in the registration of more or other DBCs than was strictly allowed.

Interview candidates from hospital management, and external stakeholders like professional associations, umbrella organizations, health insurers and regulatory bodies were also presented with these examples and findings on strategic behavior of medical professionals. However since the current study is part of an ongoing research project, especially the perspectives from the latter types of interview candidates require more attention. Therefore, the findings presented in this paper will draw primarily upon the interviews conducted with medical professionals till thus far.

5. Results

5.1 Productivity: An incentive for performance or an incentive for strategic accounting?
In line with the introduction of the free pricing segment, the DBC system is thought to have a positive effect on productivity in the sector for hospital care. Since the introduction of the DBC-system in 2005, the waiting lists that existed for certain types of hospital care (e.g. cataract treatments, hip and knee replacements) have declined significantly (CBS, 2009). This view that hospital productivity has increased over the past years, especially in the List B segment, is shared by two representatives of the general association of medical specialists. Even though most of the interviewed specialists did not attribute this increase in productivity strictly to the DBC-system, they do see the loosening of budget ceilings that was continued with the DBC-system as an important factor. Especially since this allowed for expansion of capacity in the hospital care sector and performance based payment for medical specialists. However, medical specialists make a distinction between actual production and DBC-production. In other words, a change in figures on hospital performance that follows from DBC-registration may not correspond with a change in the actual performance. The interviews provide a vast number of practices and motivations on professional level, that contribute to the divergence of actual and DBC-

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10 Interview 56 & 57
11 Interview 54, 52, 48, 47
12 Interview 53
performance. A selection of the strategic responses of medical professionals to DBC performance measurement are presented below:

Optimization of DBC-registration: An increase in DBC-production could be partly explained by the optimization of the registration process over the last years. A gynaecologist and representative of the medical specialists in the general hospital explains that a relative increase productivity compared to the index year 2005, can be partly explained by the optimization of registration by the medical specialists.  

Back in 2005, hospital reimbursement was not yet related to DBC-registration. Therefore, in contrast with DBC-registration today, sloppy registration in the first years had no or limited financial consequences. A logical consequence is that medical specialists in general hospital and ZBCs, whose income is directly related to DBC-production, will be much more thorough in DBC-registration than they were before.

Compensation strategies: Sometimes treatment related considerations of the medical specialist in DBC registration can lead to a misrepresentation of performance. During the interviews in all hospitals and clinics many instances were mentioned where DBC-registration proved to be incompatible with the treatment that was preferred by the specialist. For example, an academic oncologist explained that he preferred to give his patient an oral administered type of chemotherapy in outpatient setting, whenever possible. He considered this type of chemotherapy less invasive for the patient and therefore preferable over the traditional chemotherapy which requires one day of hospital admission. However, the appropriate DBC for chemotherapy could only be registered in combination with one day of hospital admission. Therefore the secretary is asked to add a fictive day of hospital admission to the medical registration for these patients. Furthermore, the director of one of the ZBCs shared that he noticed that many hospitals register ‘DBC 703’ when they treat patients for uterine prolapse with an implant. Officially, DBC 703 represents a more demanding treatment, namely the extirpation of the uterus. According to the respondent, specialists and hospitals choose to register this DBC to compensate for the costs of the implant, which is not covered by the traditional DBC for uterine prolapse.

Performance inflation: In other cases, considerations by medical specialists in DBC-registration can also be more financially driven. An eye surgeon stated that glaucoma is usually accompanied

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13 Interview 48
14 Interview 6
15 Interview 54
by other ailments of the eyes. Therefore when during the first consult a DBC is registered for glaucoma, on the second consult a specialist could decide to open a DBC for allergic complaints. In this case, the specialist and the hospital get both DBCs reimbursed while from a medical perspective both consults and treatments should fall under the one DBC for glaucoma. The respondent acknowledges that this kind of practice takes place in other clinics and hospitals. A similar practice was elucidated by a director of one of the ZBCs. Medical specialists can choose to either register a DBC for a singular consult or a DBC for multiple consults, which yields a higher reimbursement. When a patient requires multiple diagnostic tests, some specialists schedule these on different days so that they can register the DBC for multiple consults.

Intentional under-registration: Since the rules for the registration of multiple DBCs per patient are rather ambiguous (i.e. a 40% increase in effort and a second ailment that is unrelated to the first diagnosis) health insurers check the claims from hospitals rigorously for these so-called parallel DBCs. The problems medical specialists experience with parallel DBCs are widespread and are considered to be one of the biggest bottlenecks of the DBC-system. Most health insurers use ICT-tools to reject multiple DBCs for a single patient automatically when they overlap in time span. For the hospitals and clinics this means that they will have to challenge this decision of the health insurer and argue why both DBCs are justified. This means a reverse burden of proof, where the specialist has to justify the validity of both DBCs. To avoid this bureaucratic process, many of the medical specialties represented in the case studies decided not to register parallel DBCs, regardless of the circumstances of the patient. This strategy can therefore cause under-registration and distort the DBC figures on performance. However, also the costs of the treatments in question are a factor in this. A DBC coordinator from the academic cardiology department explained how the rules for parallel registration could be problematic in the case of the two expensive treatments for angina pectoris and the placement of a pacemaker. In order to get both DBCs reimbursed they have to be registered sequentially. This meant that on paper, the hospital admission of the patient had to be divided into two episodes as if the patient had been treated in the hospital on two separate occasions.

Patient selection based on risk profiles: Besides a sector wide increase in production volumes of hospital care, there also appears to be a shift in the patient population of the different types of

16 Interview 53
17 Interview 54
18 Interview 58, 57, 49, 50
19 Interview 50, 49, 48
20 Interview 6
hospitals and clinics. An academic eye surgeon explained that the number of cataract operations, a list B DBC, that his department performed had decreased by 60% since the introduction of the DBC system. He also noted that the remaining cataract patients treated within his department could be characterized as patients with a higher risk profile for complications, like people with small eyes and patients with Down-syndrome. Based on this he concluded that general hospitals and especially the ZBCs were treating more cataracts, but were also selective in the patients they accepted.21 This view of selectivity in patient selection was concurred by an academic plastic surgeon who worked part time at a ZBC in the region: ‘Any of the patients that look frail or have complicating factors are sent directly to the UMC’.22

5.2 DBC performance measurement: efficiency by functional standardization or deprofessionalization in hospital care?

One of the foremost anticipated beneficial effects of the DBC system was that the standardization (i.e. product definition) of the DBC system would not only result in more transparency, but also in more efficiency in hospital care service delivery. Even thought this perspective is not shared by most medical specialists, the director of one the ZBCs explains that the level of standardization of a DBC is an important factor for efficiency. According to him, the selection of treatments and corresponding DBCs that are provided by his ZBC is based on the clarity and predictability of the care trajectory of the patient.23 In other words, the focus of the production of this ZBC was on patient treatments that lend itself best for standardization and high volume production. Another recent development that might signal that efficiency can benefit from standardization is the interest that especially management representatives show in benchmarks based on anonymous DBC-registration by the same medical specialties in other hospitals and clinics.24 Now, DBC registration has been in effect for a number of years and many problems or inconsistencies in DBC-registration have been resolved, various medical specialties show an interest in comparing and evaluating their performance on the basis DBC-information. The availability of this information enables both hospitals and medical specialists to have a critical look at the costs and efficiency of their processes.

21 Interview 43
22 Interview 8
23 Interview 54
24 Interview 54, 53, 48
However, often the standardization that comes with DBC-performance measurement is seen as a threat to the professionalism of medical specialists and therewith to the quality of patient treatment. Since the introduction of the DBC-system in 2005 there has been quite some debate on the question whether the medical specialist would still be in charge of patient treatment. Several articles in national newspapers claimed that health insurers would be sitting in the seat of the doctor, determining the course of action in patient treatment based on cost considerations. In other words, alternative or more expensive treatments that are not included in the standardized care profile of a DBC would not be reimbursed. This tension between DBC standardization and the professional was also recognized by a number of the interview candidates. However, all of medical specialists assured that quality of patient treatment has not been affected by this tension. The interviews with medical specialists provide a number of examples of tensions between DBC-performance measurement and professionalism which and the strategies applied to deal with these tensions:

Invalid combinations of diagnoses and treatments
Especially medical specialists in the UMCs, but also specialists working in general hospitals and ZBCs mention examples of treatments they provided for patients that turned out to be incompatible with the diagnosis they set for these patients. To illustrate, surgical treatment of certain patients diagnosed with epilepsy is a rare, but an effective treatment that is not accounted for in the DBC-system. The same goes for curative chemotherapy for patients with cancer to the throat and biological treatments for patients with certain types of poly arthritis. All these treatments are considered suitable and even preferable from a medical perspective, but incompatible and therefore not reimbursable from DBC perspective. Nevertheless these treatments are still provided. Instead of altering choices in patient treatment, medical specialists attempt to resolve this tension by creative accounting in DBC-registration. Examples of strategies applied by medical specialist in occasions like these are simply switching the primary and secondary diagnosis, changing the diagnosis to a bordering one that allows for the treatment.

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25 e.g. Volkskrant 02-07-08; NRC Handelsblad, 16-01-09
26 Interview 54, 53, 52, 50, 47
27 Interview 14
28 Interview 6, 8
29 Interview 4
30 Interview 4
31 Interview 8
or sometimes just registering another unrelated treatment that approximates the costs and efforts of the treatment. 32

Organization of professional work

DBC performance measurement can interfere with the organization of professional work. It was common practice in the UMC that dermatologists were the medical specialists treating patients with allergic ailments, since no certified allergologists were employed by the hospital. Therefore, the dermatologists were providing the same treatments that an allergologist would provide. However, these dermatologists could not register the same DBCs as an allergologist, since the DBCs that are available for registration are bound to the medical specialty. As a result fewer and less fitting DBCs had to be registered for these patients, which was an incentive for this hospital to hire one of the scarce certified allergologists. 33 However according to the respondent, this would be unnecessary from a medical point of view, since the dermatologists are experienced and capable of treating these patients.

Patient selection, or treatment adjustment

Sometimes negative financial consequences of DBC-performance measurement can influence the type of treatment or the patient selection by the hospital or clinical. An eye surgeon working in one of the ZBCs explains that Fluorescent Angiography (FAG) is an expensive diagnostic test that is not accounted for by the average care profile of the DBC and therefore not covered. Since FAG has a slight risk of causing anaphylactic shock in a patient, the respondent only performs this test under supervision of an anesthesiologist. The eye surgeon explains that in his clinic still treats patients that need an FAG, but he adds that he knows that other ZBCs either stopped treating these patients and direct them to other hospitals, or perform the FAG without the presence of an anesthesiologist. 34 An eye surgeon in a general hospital expresses his doubts on whether it is really necessary to have an anesthesiologist present for a FAG, but admits that ZBCs might be more cautious because they are not equipped with the same facilities as larger hospitals like trauma teams et cetera. 35

32 Interview 54 ,49, 15
33 Interview 8
34 Interview 53
35 Interview 51
5.3 DBC performance measurement: an incentive or disincentive for innovation

Not only in health care, but also in other liberalized sectors competition is generally believed to increase innovation. In this, a distinction can be made between innovation of products and processes. For hospital care product innovation could relate to the use of new and less invasive methods of treatment, but also to the use of improved implants or prosthetics. Process innovation, on the other hand is more related to the organization or design of health care provision and could refer to improved results of specialized clinics due to a concentration of expertise or efficiency gains of collective programs for medical rehabilitation after surgery. However, both medical specialist and other interview candidates view the effects of DBC-performance measurement on innovation mainly from a treatment perspective. Hereby, the static nature of the DBC-system is often perceived as a blockage for innovation. Usually the examples provided reflect cases where the traditional DBC for a certain treatment did not cover the costs of a new or alternative method of treatment, like the less invasive laparoscopic surgery\(^{36}\) or using bodily tissue instead of artificial implants\(^{37}\). Medical specialists prefer these new types of treatment as they yield better results or shorten the recovery time for patients. However, these treatments are usually more time consuming and expensive than the traditional type of treatment, which is not reflected by the average care profile that is based on the traditional approach. The same is true for the use of improved prosthetics for knee of hip replacements\(^{38}\). In practice it is hard to alleviate this tension. In the first place, the procedure for the formulation of a new DBC-code that could solve this problem takes approximately two years and is therefore perceived as bureaucratic and lengthy. In the second place, most medical special and managers claim that health insurers are rather rigid when it comes to negotiations on compensation for innovative treatments.\(^{39}\) Nevertheless, innovative treatments are still performed by the hospitals and clinics despite the disincentives that the DBC-system provides. However, it is likely that the use of innovative treatments would have been more widespread if these treatments would be included in the average care profile of the DBC. On the other hand, these tensions can also be alleviated by creative accounting like it was the case for registration of more expensive DBCs to compensate for the costs of prosthetics, implants or the extra time spent on the patient in case of more demanding treatments.

\(^{36}\) Interview 58  
\(^{37}\) Interview 55, 54, 7, 6, 3  
\(^{38}\) Interview 3  
\(^{39}\) Interview 54, 53, 49, 47
5.4 DBC-performance measurement: transparency or intransparency?

In general the interviews revealed that medical professionals in all types of hospitals and clinics appear to have a rather narrow conception of what the DBC-system is. They tend to see the DBC-system purely as an instrument for hospital reimbursement and not so much as a source of information. Therefore many of the specialists interviewed express that the information and transparency that the DBC-system offers, is of little relevance from a medical perspective. This opinion is explained by DBC coordinators for the medical specialties of internal medicine and cardiology by pointing out that the DBC-system has a low tolerance for complexity. For patient that are treated in the medical specialties for cardiology or internal medicine on average four diagnoses are set, while the DBC-registration only allows for one primary and one secondary diagnosis.\textsuperscript{40} As a result DBC registration is less refined than the traditional medical registration in the UMC. For this reason also research studies taking place in the UMC rely on the separate medical registration of diagnoses and medical interventions that is kept by the medical specialties and not on DBC registration.\textsuperscript{41} In the general hospital under study, there appeared to be less interest in transparency of production based on diagnosis. While many specialists did not see the medical relevance of DBC-information, they also did not keep a separate or more refined registration of the diagnoses set for the patients they treated either.\textsuperscript{42}

DBC information appears to be appreciated more by managers and management oriented medical specialists. This last category consists mainly of medical specialists who, besides practicing medicine also have managerial obligations in the function of head or coordinator of the department. In addition, also medical specialists that are working in ZBCs appear to be more involved in managerial issues. For these medical specialists the DBC-system is seen as an instrument for benchmarking on prices for List B DBCs and efficiency.\textsuperscript{43}

6. Conclusions

This paper aims to clarify the effects of DBC performance measurement and strategic behavior at professional level in Dutch university-, general hospital and ZBC context.

Therefore 3 questions were addressed in this paper:

\textsuperscript{40} Interview 15, 8, 1
\textsuperscript{41} Interview 7
\textsuperscript{42} Interview 51,50,49,48
\textsuperscript{43} Interview 53, 52
1) **What are the effects of DBC performance measurement on productivity, efficiency, innovation and transparency at professional level in the Dutch hospital care sector?**

2) **What strategic responses to these effects of DBC performance measurement arise at professional level?**

3) **How can these types of strategic behavior be explained from theory on professionalism and principal agency relationships?**

The following sections will reflect on these questions based on the findings from the interviews and the literature presented in this paper.

6.1 **Beneficial and perverse effects of DBC performance measurement at professional level**

1) **Productivity:** The question whether DBC performance measurement increases actual performance or whether it increases performance merely on paper, is one hard to answer. The interviews revealed that both medical specialists and management representatives feel that productivity has increased since the introduction of the DBC system, but they also report on a number of strategies that distort the DBC-figures on hospital performance. Therefore, an increase in DBC-performance does not necessarily reflect an increase in the actual performance of hospitals and medical specialists.

2) **Efficiency:** Also the question whether DBC standardization has resulted in efficiency or in deprofessionalization cannot be answered univocally. On the one hand, standardization enables especially ZBCs to focus on health care services that are clear and insightful, which allows them to work efficiently and for tariffs that are approximately 15% lower than in the traditional hospitals. On the other hand, the interview candidates report on conflicts that arise between standardization and professional values when treatments can not be registered or when they can be registered but are not covered adequately. Usually these conflicting situations are solved by strategic behavior in DBC-registration.

3) **Innovation:** For the perceived effects of DBC performance on innovation, some medical specialists and managers from ZBCs claimed that innovation might have improved in terms concentration of knowledge, expertise and state-of-the-art equipment in the specialized clinics. However, most medical specialists and managers felt that the DBC system either did not improve innovation or more often that it hampered innovation in patient treatment. This is mainly attributed to rigidity of the DBC systems when it comes to adjustments or the inclusion of new
DBC, but also to unwillingness of health insurers to provide financial compensation. Again conflicts between the DBC system and the registration of innovative treatments can sometimes be resolved by creativity in registration.

4) **Transparency:** Finally, concerning the effects of the DBC system on transparency, managers and specialist working at the ZBCs, which are more involved in the market settings in the hospital care sector, do see the value of DBC transparency as it allows them to benchmark their prices, efficiency and productivity with other hospitals. However, DBC-transparency is irrelevant for the majority of the medical specialists. They see the DBC system solely seen as an instrument for reimbursement and not as a database that contains medically relevant information. Whenever medical transparency is required, UMC specialists rely on their own traditional registration systems for diagnoses and for treatments. Medical specialists in general hospitals and ZBCs usually do not have a separate diagnoses registration and appear to be indifferent to medical transparency of their production in terms of diagnoses. Therefore, no creative efforts are made in DBC registration to correct or improve the medical transparency or applicability.

All in all, with exception of the effects on transparency, DBC performance measurement appears to be susceptible to various types of strategic behavior. The following section present a classification of the strategic responses to DBC performance measurement.

6.2 **Classification of strategic behaviors of professionals in response to DBC performance measurement**

**Coping strategies:** In cases where the costs of certain treatments outweigh the reimbursement of the corresponding DBC or when a combination of diagnosis and treatment cannot be registered at all, medical specialists tend to look for creative solutions in DBC-registration. An observation here is that the interview candidates spoke freely and openly about these forms of strategic accounting since they felt that medical and patient consideration justified their creativity in DBC registration. The same attitude of medical specialists applies to cases were the standardization and product definition of the DBC-system conflict with the specialist’s preferred treatment. Especially in cases where the preferred treatment from professional perspective was incompatible with the DBC perspective, various forms of strategic accounting arise. Both the expensive and incompatible treatments are often related to innovation. The characteristics of new methods of treatment or new materials are that they have better results and fewer side effects which make them preferable over the traditional approach. However, the use of new materials and methods of
treatment are often also more demanding, time consuming and expensive. From a different perspective, also the strategies to avoid bureaucracy by not registering parallel DBCs could be interpreted as a strategy to cope with the administrative workload. However, all these coping strategies contribute to further divergence of actual performance and DBC-performance.

**Up-coding strategies:** Nearly all medical specialists interviewed recognized strategies and specific examples in their field of expertise of strategic practices to inflate performance by creative choices in DBC registration, also referred to as up-coding. In case of up-coding strategies, the increase in performance on paper has no relation with an increase in actual performance in terms of time spent or materials used. In contrast with the compensation strategies, specialists spoke less openly of up-coding. Even though they mentioned numerous examples, these examples almost always concerned undefined ‘other hospitals or clinics’

**Casemix selection:** Interviews with medical specialists from all hospitals suggested that especially ZBCs make a careful selection of the patients they treat based on risk profiles, also referred to as case mix. By referring the more complication prone patients (e.g. diabetic, obese, and elderly) to other hospitals they increase the commercial viability of their patient population. This case mix selection is considered to be an important factor in the profitability of the health care provided. The instrument of casemix selection can also be applied to groups of patients that have specific and unprofitable medical requirements. For example when these patients need expensive diagnostic testing that is not included in the product definition of the DBC.

All these different categories of strategic behaviors cause performance in terms of DBCs to diverge from the actual performance of medical specialists and hospitals. Therefore, the question whether the DBC system increases performance in hospital care is hard to answer and, at least open to interpretation. On the other hand, the different motives for strategic responses to DBC performance measurement raise the question on how to appraise strategic behavior at professional. The following section aims at connecting the presented forms of strategic behavior to notions from literature on principal agency relations and professionalism

6.3 How are these types strategic behaviors to be understood from theoretical perspectives on principal agency relationships and professionalism
Both from literature on professionalism and principal agency relationships, strategic responses by professionals to a system of performance measurement can be explained as beneficial or perverse effects. From a principal agency perspective, this strategic behavior can be interpreted as a shirking professional agent that is exploiting the informational advantage it has over its principal. From this perspective, coping-, upcoding- and casemix strategies are likely to be interpreted as opportunistic or shirking behavior. Coping and upcoding strategies could be labeled as inappropriate conduct or even fraud. Casemix selection based on profitability of the patient population could be interpreted as cherry picking or market disturbance when it concerns List B DBCs. Similar, from the literature on professionalism, these same strategies could be seen as self-serving exploitations of the autonomous position of professionals or attempts to consolidate this autonomous position. On the other hand, strategic behavior can also be explained in a positive manner in that the professional agent’s creativity makes him a good steward for his principal. In other words, without the strategic behavior of a professional the system could result in undesirable outcomes, even for the principal. Coping strategies can be said to repair the flaws and shortcomings of a system of performance measurement to reduce the gap between system- and medical reality. This would imply that the principal benefits from the knowledge and expertise of the professionals. The same can be true for casemix selection. Patients with a higher risk on complications might just be better off in most general hospitals and UMCs than in a small scale clinic. Compared to bigger hospitals, the specialized ZBCs may lack some of the facilities and perhaps the expertise to handle complications adequately. On the other hand, the specialization combined with the low complexity of the patient population of ZBCs may allow them to treat these patients more efficiently.

Also, from literature on professionalism coping strategies can be seen as ways to shield the professions’ core values of quality and innovation from harmful external influences. This appears to be a factor, especially when conflicts arise between DBC registration and innovative or uncommon treatments that increase the quality of patient care. Strategies of avoiding bureaucracy represent another type of coping mechanism in that shields the professional from administrative overload.

6.4 Discussion

The appraisal of strategic behavior of medical professionals in response to DBC performance measurement is open to interpretation. The line between opportunistic behavior and good
stewardship can be thin and fuzzy. The definition of upcoding as intentional inflation of performance on paper without a corresponding increase in actual performance makes interpretation rather straightforward. However, there is some overlap between upcoding and coping strategies. Creative accounting to register a treatment that is in the best interest of the patient may also be in the best interest of the medical specialist. Changing the diagnosis to get a treatment registered or to compensate for the costs of an implant could mean that the average treatment time reflected by the DBC is also higher. Therefore the salary component of this adjusted DBC will also be higher than in the traditional one. In this situation it would be hard to determine how this relates to the actual time and effort spent on the patient.

Another aspect of interest is that several forms of creative accounting appear to be institutionalized to a certain extent. Some of the interview candidates indicated that the strategies they applied in conflicting situations were consulted with health insurers, suggested by their professional association or advised by the organization in charge of the maintenance and execution of the DBC system. Given these ambiguities, we expect that evaluation and interpretation of the effects of the DBC system and the consequent strategic behavior at professional level will depend largely on the perspectives and interests of the various stakeholders involved in DBC performance measurement. Therefore, our future research efforts will aim at including the different perspectives of stakeholders involved in DBC performance measurement in our analysis of DBC performance measurement and strategic behavior.
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