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Mixed reimbursement of hospitals: Securing high activity and global expenditures control?

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**Mixed reimbursement of hospitals:
Securing high activity and global expenditures control?**

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Abstract

When introducing Diagnosis-Related Group (DRG) tariffs as the basis for paying hospitals in Europe, one of the major problems was to find a balancing point between the aim of increasing hospital activity and the need to control global expenditures on hospital care. Consequently, in several European countries, DRG-based reimbursement has been mixed with the already existing forms of hospital reimbursement, such as block budgets, instead of replacing the latter entirely. The mixed reimbursement is viewed as a cautious way of introducing DRG-based funding, which offers the potential for achieving activity expansion without jeopardizing global expenditures control.

Denmark is one of the countries where DRG tariffs have been added to the system of block budgets coupled with activity targets. The transition to the mixed reimbursement occurred by replacing a part of each hospital's 'old' block budget by a 'new' DRG-based component. The DRG-based component depends on a hospital's case mix and applicable DRG tariffs, which are, however, reduced by, e.g. 30-50% as compared with a monetary value of a full tariff. The usual interpretation is that such a mix of reimbursement methods provides a specific set of incentives that is different from other hospital payment methods. Yet, the exact *modus operandi* of the mixed reimbursement remains obscure. It is not entirely clear whether and how the unit rate of reimbursement was changed after the transition? Was the entire volume of a hospital's activity affected or only certain treatments and/or higher levels of activity? Another question is what happened with the activity targets that traditionally accompanied the 'old' block budgets? The aim of this article is to

provide a comprehensive description of the change in hospital incentive scheme that followed the transition to the mixed reimbursement in Denmark. In doing so, the paper provides a qualitative assessment of the mixed reimbursement with regard to the asserted exceptionality of its incentive structure, with a particular focus on its ability to balance incentives for activity expansion and global expenditures control.

We show that the mixed reimbursement is simply a veiled version of the usual block budget system, which due to certain added complications might even distort activity/efficiency improvements in a new way. The cautious way of implementing DRG -based reimbursement resulted in a system that has hardly moved away from the historical patterns of activity and costs. The sum of the 'new' DRG-based component and the remaining part of the 'old' block budget simply added up to the total of the 'old' block budget (+/- standard annual corrections for inflation, etc.), which allowed hospitals to produce unchanged sort and volume of activity at unchanged unit cost. Only few percent of the annual activity volume is indeed subject to altered reimbursement incentives. In sum, the mixed reimbursement as implemented in Denmark does not present any innovation. Hence, any empirical research based on the assumption that the incentive scheme for the entire volume of hospital activity was changed by the transition to the mixed reimbursement might produce false conclusions.

Keywords: Diagnosis-Related Groups; Block budgets; Hospital reimbursement; Denmark

Introduction

Following the US lead, the Diagnosis-Related Group (DRG) case-mix classification system has become the basis for the reimbursement of hospitals in most European countries (O'Reilly et al., 2012; Cots et al., 2011; Wiley, 2011, 1999). When introducing DRG-based reimbursement in Europe, one of the major problems was to find a balancing point between the aim of increasing activity and the need to control global expenditures on hospital care (Cots et al., 2011; Street et al., 2011; Street and Maynard, 2007). Prior to the introduction of DRG-based reimbursement, many of the countries relied on the system of block hospital budgets coupled with activity targets. The key advantage of that system was control over global expenditures. It was, however, accompanied by the risk of hospitals not meeting population needs. In contrast, the DRG-based reimbursement incentivises hospital to increase admissions - in its basic form hospital revenue is determined by simply multiplying activity in each DRG by the fixed tariff per DRG. Yet, an undesired effect of such incentive is that hospitals might attempt to increase their revenue through increasing the number of cases/diagnosis even if this should be medically inappropriate and financially unsustainable (Ellis & McGuire, 1986; Gay & Kronenfeld, 1990). Consequently, in several European countries, DRG tariffs have been mixed with the already existing forms of hospital reimbursement, such as block budgets coupled with activity targets, instead of replacing the latter entirely. The resulting mixed reimbursement is viewed as a cautious way of introducing DRG-based reimbursement, which can balance its undesired features with the key advantage of the block budgets. Accordingly, the mix of DRG tariffs and block

budgets tends to be presented as advancement, which offers the potential for achieving activity expansion without jeopardizing global expenditures control (Biørn et al., 2003; Cots et al., 2011; Lindqvist, 2008; Roed & Sjuneson, 2008; Street et al., 2011; Wiley, 1992). The discussion of the modus operandi of this type of mixed reimbursement is, however, short on detail, as the existing accounts are almost exclusively international reviews. Moreover, the models which are cited to demonstrate advantages of this reimbursement system (Ellis & McGuire, 1986; Ellis, 1998; Ma, 1994; Newhouse, 1996), combine DRG tariffs with cost reimbursement. As such these models do not shed much light on the mix of DRG tariffs and block budgets, where both reimbursement methods are prospective.

One of the countries, which is referred to as employing the mix of DRG tariffs and block budgets in the reimbursement of hospitals is Denmark (Jakobsen, 2010; Roed & Sjuneson, 2008; Street et al., 2007). The aim of this article is to provide a comprehensive description of the change in hospital incentive scheme that followed the transition to the mixed reimbursement in Denmark. In doing so, the paper provides a qualitative assessment of the mixed reimbursement with regard to the asserted exceptionality of its incentive structure, with a particular focus on its ability to balance incentives for activity expansion and global expenditures control. The article answers questions such as: Whether and how the unit rate of reimbursement was changed after the transition to the mixed reimbursement? Was the entire volume of a hospital's activity affected or only certain treatments and/or higher levels of activity? What happened with the activity targets that traditionally accompanied the 'old' block budgets? Another motivation behind the present

research is to reveal the rationale behind the particular proportions, in which the DRG-based and the block components have been mixed in hospitals' budgets.

In Denmark the mixed reimbursement is described as being implemented gradually between 2000 and 2007; first with the DRG-based component amounting to 10% of each hospital's annual budget, then to 20% as of 2004, and 50% from 2007 until now (Roed & Sjuneson, 2008; Street et al., 2007). DRG tariffs have been added to the system of block budgets coupled with activity targets with the aim of giving the hospitals an incentive to respond to demand more flexibly, which is absent under fixed budgets and targets. DRG tariffs are, however, used at a reduced rate since the block budgets are partially retained. This has been motivated by the second aim: controlling global expenditures on hospital care. Thus, the intention of the mixed reimbursement is to rely on e.g. 70% of a full DRG tariff, to account for the marginal cost of production rather than the average cost. Moreover, the partial use of the unique countrywide DRG tariffs has been expected to introduce elements of yardstick competition (Shleifer, 1985) and improve transparency in reimbursement as compared to the block budgets coupled with activity targets, which have been negotiated by each hospital individually and therefore, varied across a country (Roed & Sjuneson, 2008; Street et al., 2007). The transition to the mixed reimbursement occurred by replacing a part of each hospital's 'old' block budget by a 'new' DRG-based component. The usual interpretation is that the transition rewarded (punished) financially hospitals with an average unit cost below (above) the national DRG tariffs. Moreover, the mixed reimbursement is expected to provide a specific set of incentives that is different from other hospital payment methods

(Ankjær-Jensen, Rosling, & Bilde, 2006; Jakobsen, 2010; Roed & Sjuneson, 2008).

We show, however, that the mixed reimbursement is in fact only the old system of block budgets in disguise. The mixed reimbursement has hardly moved away from historical costs and activity targets. This is mainly due to the fact that by construction the 'new' DRG-based budget component simply corresponds to the missing share of the 'old' block budget. Hence, the sum of the 'new' DRG-based component and the remaining part of the 'old' block budget are nothing more or less than the total of the 'old' block budget (plus/minus the standard annual corrections for inflation, etc.). Only few percent of the annual activity volume is indeed subject to altered reimbursement incentives - if a hospital delivers activity above the historical target, the corresponding revenue is determined by DRG tariffs, usually also applied at a reduced rate. Yet, the third party payers have very limited additional resources to reimburse activity above the targets and impose narrow secondary activity ceilings. In cases when no ceiling is announced and activity expansion results in global budget deficits, the third party payers limit activity in consecutive years by resetting the activity targets to past (lower) levels and/or suspending the reimbursement of the so-called 'unplanned' activity. Therefore, the mixed reimbursement continues to suffer from problems inherent to systems based on fixed budgets and targets such as limited potential for activity and efficiency improvements. In sum, the mixed reimbursement as implemented in Denmark does not present any innovation. Moreover, any empirical research based on the assumption that the incentive scheme for the entire volume of hospital activity was changed by the transition to the mixed reimbursement might produce false

conclusions.

The remaining part of the article is organised as follows: material and methods; Danish institutional background; details of hospital reimbursement from the end of 1990s to 2010; discussion of the qualities of the mixed reimbursement; conclusions.

Material and methods

The mixed reimbursement system has been implemented between 2000 and 2007. In order to grasp the magnitude of changes, information on details of the hospital reimbursement before and after the implementation of the mixed system has been collected and analysed. Consequently, the period under consideration is from end of the 1990s to 2010. We used primary sources, such as official documents of the third party payers (state and local governments). In the period of interest the administrative division of Denmark changed. Consequently, at the local level we use the documents of the counties (up to 2006) and the regions (2007-2010). The analysis of the documents was supplemented by interviews (conducted in spring 2011) with local executives responsible for the reimbursement of hospitals. The purpose of the interviews was to handle ambiguities of the data from the collected documents. Taking stock, the analysis is predominantly based on the following primary sources:

- Documents of the counties/regions describing methods of hospital reimbursement and minutes from the relevant meetings of the counties/regions councils.
- Agreements between the state and the counties/regions regarding the

transfers from the national budget to the county/regional budgets.

- Financial statements of the counties/regions including details of budget allocations to individual hospitals.
- Interviews with executives responsible for the reimbursement of hospitals in each of the 5 regions.

Institutional background

The healthcare system in Denmark is a decentralized public system with universal coverage and tax-based financing. The local governments are responsible for hospital care and generally own the hospitals, although there are a small number of state-owned hospitals as well as private non-profit hospitals. Until 2007, Denmark was divided into 13 counties and the hospital care was financed through local taxes supplemented by state grants, with the latter amounting to approximately 20% of the budget (Christiansen, 2002; Pedersen, Christiansen, & Bech, 2005). A general economic and legislative frame for the provision of health care services was negotiated annually between the state and the counties. There existed, however, a long-term agreement that the local taxes shall not be increased. Therefore, the counties' budgets were largely fixed.

The administrative reform of 2007 created 5 regions in place of the 13 counties. The regions cannot levy taxes. Thus, the regional budgets for health care originate from the state grants (approximately 80%) and municipal co-financing. The state grants are based on the size and composition of each region's population and socio-economic criteria. The population-based part defines about 77.5% of the grant and

reflects the current national average health care expenditures per capita in various population groups. The municipal co-financing includes a payment per capita and an activity-based payment depending on the actual utilisation of hospital services by inhabitants. Both types of municipal payment are subject to maximum limits (Roed, & Sjuneson, 2008). Under both the regime of counties and the new regime of the regions, capital costs as well as costs of pharmaceuticals, expensive medical devices and materials have been covered by separate annual state grants.

The regions (formerly counties) have large autonomy in decisions regarding, e.g. a hospital's catchment area, specialisation, level of supply, or placement of acute services. The assignment of the specialised services is, however, decided at the state level, and the provision of these services is concentrated in the few state-owned hospitals.

The employment conditions in the hospitals, including salaries, are settled every few years through negotiations between the organisation representing all regions (formerly counties) and the national associations of the respective health care professionals (Vallgård, 2007). Consequently, the employment conditions are standardized all over the country.

In addition to the regional hospitals, there exists a minor private hospital sector - about 2% of the total hospital production in 2010, with activity in selected areas of up to 10% of the total production (Danish Health and Medicines Authority, 2011).

Regarding access, General Practitioners (GPs) act as gatekeepers to hospital care. Patients can choose any public hospital for basic-level treatment since 1993 and specialised treatment since 2003 (Roed & Sjuneson, 2008). The hospitals, however,

can refuse to admit a patient from outside their own catchment area if they experience capacity problems (Madsen, 2007). Moreover, in 2002 the patient's choice of hospital was extended to include free-of-charge treatment in private and foreign hospitals if none of the local public hospitals can provide treatment within certain maximum waiting time (Winblad, & Aanen, 2009) (two or one month depending on severity of patient condition). If a patient chooses to be treated in a hospital outside the place of residence or a private hospital, the treatment is reimbursed by the region in which the patient resides, either according to DRG tariffs (public hospitals) or negotiated prices (private and foreign hospitals) (Pedersen, Christiansen, & Bech, 2005). Patients face, however, limits on the refund of travel costs incurred in connection with a treatment outside a place of residence or in a private hospital (Madsen, 2007).

Development of mixed reimbursement¹

Reimbursement at the end of 1990s

Payment to individual hospitals was via block budgets coupled with activity targets, usually defined as a number of acute and elective patients. Each hospital's budget and activity target were outcomes of negotiations between a county, a hospital's management, and the management of individual departments within the hospital (Alban & Jeppesen, 1995). The hospitals were making an offer to the counties, and the main decision-criterion to the local politicians was a unit price of activity with a

¹ This section reports developments as described in the primary documents listed under 'Material and methods', unless specified otherwise by a reference to other sources.

given quality within a given period of time (usually a calendar year). The quality objectives included, e.g. a minimum share of patients treated within the waiting time guarantee (Alban & Jeppesen, 1995). The final hospital budgets were adjusted for local variations in input prices and transferred at the beginning of a calendar year. The budgets were split into only two cost categories: salaries and other recurrent costs. Some flexibility existed with regard to the realization of the targets, e.g. it was allowed to shift inpatient to outpatient admission, and a few per cent of a total budget was often left at the disposal of a hospital's management, to be used in case of activity above the targets. Efficiency concerns were addressed by the standing condition that an activity increase amounting to 1-2% of a budget should be achieved annually without a corresponding reimbursement (the so-called efficiency requirement).

Negotiations of consecutive budgets and activity targets were based on the previous year's budget (adjusted for inflation and any one-time lump sums) and activity (or target in case of activity below target), as well as the above-mentioned efficiency requirement, and any structural changes. Activity above the targets, if any, was planned and realised within the so-called targeted initiatives, i.e. one-time lump sums granted in advance for predefined additional volume of activity in a selected area, e.g. specific cancer treatment. Any other/unplanned activity above the target was financed by the hospital. It should be stressed, that a long-term agreement between the counties and the state limited the annual expenditures growth rate to 1-2%.

A hospital budget deficit or any plus/minus difference between a target and the

realised activity was subject to negotiations between a county and a hospital. Officially, the 'missing' activity and/or deficits were accounted for in the consecutive budget and activity target. For large deficits, an economic plan was delineated with the aim of reducing the deficit over a number of years. Yet, it is difficult to trace the realisation of those plans due to a large number of structural changes, such as mergers or relocation of functions and medical specialties between hospitals; e.g. the number of hospitals decreased from 66 in 1999 to 52 in 2004, which affected structurally 40 hospitals (Danish Health and Medicines Authority, 2007). Moreover, there are indications that the budget rules have been routinely circumvented and the hospitals received bailout money (Jakobsen, 2010).

The counties' documents provide few details about a follow-up on the quality targets, but it seems that any discrepancies between the targets and the reality would not have entailed direct financial consequences for the hospitals.

The free choice of a hospital resulted in a movement of patients across the counties – the share of the cross-country patients varied between 2-4%, in general hospitals (Danish Health and Medicines Authority, 2002). The reimbursement for the treatment of the cross-county patients was based on rates per bed-day and the money went directly from the hospital in a patient's catchment area to a hospital of treatment (Roed & Sjuneson, 2008).

Mixed reimbursement: 2000-2010

At the end of the 1990s, long waiting times for hospital treatment were a major problem. In 2000, the agreement between the state and the counties included a

recommendation that the latter should make their hospitals' revenue more sensitive to the realised activity. Concretely, the state recommended that beside the block transfers hospitals' annual budgets should depend also on DRG-based reimbursement². The objective was to give hospitals an incentive to respond to demand more flexibly but also to improve cost-efficiency in unit production and maintain the high degree of control over the total expenditures on hospital care. The latter was expected to be achieved by employing DRG tariffs at a reduced rate, i.e. less than a full tariff, to account for marginal rather than the average cost of production. Moreover, the use of DRG tariffs has been expected to introduce elements of yardstick competition (Shleifer, 1985) and improve fairness and transparency in reimbursement (Ministry of Health, 2005).

The modified reimbursement system is usually referred to as the 90/10 model, which is described as if in 2000 the hospitals received 90% of the 'old' block budget and the remaining revenue depended on case mix and the corresponding DRG tariffs applied at a reduced rate. Thus, the transition to the mixed reimbursement is interpreted as benefiting (punishing) financially hospitals with an average unit cost below (above) the national DRG tariffs (Ankjær-Jensen, Rosling, & Bilde, 2006; Roed & Sjuneson, 2008). In fact, how the modified reimbursement manifested itself in reality was quite different. The key to understanding the difference is how the share of a DRG-based component was defined: the DRG-based component of a hospital budget should be equal to or greater than 10% of the value of the hospital's activity as measured in full DRG tariffs. It is important to notice that this requirement can be

² The Danish DRG system was established in 2000 and the tariffs reflect average cost of production among all hospitals. For details see (Ankjær-Jensen, Rosling, & Bilde, 2006).

met without any changes to the total budget and total activity. The transition can be made and, in fact, was made by stating that for all or some groups of patients the hospital receives a certain fraction of the corresponding DRG tariffs. Thus, by construction the 'new' DRG-based component simply corresponds to the missing share of the 'old' block budget. Hence, the sum of the 'new' DRG-based component and the remaining part of the 'old' block budget are nothing more or less than the total of the 'old' block budget.

Indeed, in 2000, the hospitals received budgets based on the previous year's budgets adjusted as earlier for inflation, any one-time lump sums, and/or structural changes. Also the activity targets remained and reflected the previous year's activity (or target) adjusted as earlier for the efficiency requirement and any structural changes. Instead of a number of acute and elective patients, the targets were expressed as a corresponding number of treatments in each DRG or a total value of activity in full DRG tariffs. In other words, the implementation of the DRG-based component into hospitals total budgets was a paper exercise. The usual statement in the counties documents was that in addition to the block transfers the hospitals receive 30-50% of DRG tariffs in selected areas of activity. Naturally, it was observed that in consecutive years hospital departments might attempt to increase their budgets by reclassifying patients into higher paying DRGs. In order to prevent such undesired change in practice patterns, a so-called creep-correction mechanism was adopted. The creep-correction sets a 1.5% limit on the annual increase in hospital revenue per contact.

Generally, after the reform of 2000, the activity above the targets was still not

reimbursed. Only for selected high priority procedures with long waiting times, e.g. dialysis, some counties made commitments to reimburse activity above the targets with DRG tariffs (only), usually applied at a reduced rate, e.g. 80% of a full tariff. Yet, in order to retain the control over the total expenditures, the counties employed the old method of the targeted initiative, i.e. as earlier, a limited increase in activity was simply agreed in advance with selected hospitals and the corresponding sum of money added as a one-time lump sum to the budget.

The most pronounced amendment implemented in 2000 is a change in the consequences of a negative difference between the realised activity and a target. In such a scenario, for those areas of activity, for which a distinction was made between the block and the DRG-based revenue, the block part of a hospital budget was no longer subject to reductions and only the DRG-based component could be cut proportionally to the 'missing' activity. Another factual change of the 2000 reform, regarded reimbursement for the treatment of the cross-county patients, which was no longer based on rates per bed-day but on full DRG tariffs instead.

In 2002, the state made another attempt to strengthen the incentives for activity expansion by initiating an additional fund (the so-called state fund), which amounted to approximately 1.5% of the annual global budget for hospital care. The counties could receive a share of the new fund under the condition that they achieved a certain annual activity increase – usually around 1.5% - at their own expense (Ministry of Health, 2005). The counties transferred this requirement onto their hospitals by increasing accordingly the longstanding efficiency requirement, i.e. instead of the standard 1-2%, the hospitals were required to increase their

activity by 2.5-3.5% annually at their own expense. The counties received their share of the new fund in advance. The share was determined by activity prognosis (based on historical activity as well as gender and age structure of the population in a given county) projected on full DRG tariffs. Also, some of the counties divided their share of the new fund between the hospitals in advance by increasing their primary budgets and activity targets by fixed amounts. The extra activity was predominantly planned for treatments, for which long waiting times existed. Other counties simply announced DRG-based reimbursement for any activity above the targets – full tariffs, occasional reduced by 10-20%. In general, the amendments of 2002 resulted in an activity increase beyond the budget possibilities of the counties. The increase in activity between 2001 and 2002, measured as a number of inpatient and outpatient operations (excluding emergency activity), is reported to be approximately 10%. However, the number has to be interpreted with care due to major changes in the methodology of activity registration that occurred between the two years (Ministry of Health 2010, 2011). Based on the collected documents, it is not possible to recap fully how the resulting budget deficits of the counties were financed. It is, however, certain that the money reserved in the state fund for funding further activity increase in 2003 were at least partially used to cover the counties' deficits of 2002. Simultaneously, the 2003 activity targets, both at the level of the counties and the hospitals, were reset to historical levels. Moreover, strict secondary ceilings set official limits on total reimbursed activity for the hospitals. In 2003 the state decided also to reimburse the counties for the extra activity with DRG tariffs reduced to 80% of their full value. The tariffs were further reduced to 70% in

2004. Consequently, the hospitals faced substantially reduced fractions of DRG tariffs for the activity above the primary targets.

Starting from 2004, the state obliged the counties to increase the share of the DRG-based component to at least 20%. However, the method for determining whether the required share of the DRG-based component was met remained unaffected. Thus, in 2004 the hospitals received budgets and activity targets based on their previous year's budgets and activity (or targets) with the usual adjustments. The new obligation was met by simply increasing the share of the budgets that was expressed in DRG tariffs. As earlier, this was achieved by stating that for each or for some groups of patients hospitals received 20-75% of the applicable DRG tariff. How the way of accounting was changed in detail differed from county to county. These differences were often the subject of debates about which county employs the best system (Ankjær-Jensen, Rosling, & Bilde, 2006; Roed & Sjuneson, 2008). In reality, the differences were just a paper exercise aimed at achieving a given share of the DRG-based component within fixed primary budgets and targets.

The scope for reimbursing activity above the targets remained limited - the state continued to offer the additional fund for the activity above targets, but its value amounted only to 1-1.5% of the annual global budget for hospital care. Moreover, the activity above the targets continued to be predominantly planned, i.e. as earlier, it was realised through targeted initiatives in selected hospitals by simply adding one-time lump sums to their budgets. The general intention was to reimburse the activity above the targets with DRG tariffs only (usually reduced). This rule, however, has not applied to the targeted initiatives, in case of which the hospitals

frequently negotiated not only the applicable rate of DRG tariffs, but also a fixed increase in the block part of the hospital budget. Outside the targeted initiatives, which continued to focus on areas with long waiting times, majority of the counties allowed also for unplanned activity above the targets. The reimbursement of the unplanned activity was, however, often subject to narrow secondary targets and the unit reimbursement was 10-20% of DRG tariffs. Occasionally, counties did not introduce any official limits for the unplanned activity above the targets and increased reimbursement rate to 50-55% of DRG tariffs. Yet, in case the total activity exceeded the budgets of these counties, again special limits on activity were imposed in consecutive years by resetting the hospitals' activity targets to past (lower) levels and suspending the reimbursement of activity above the targets.

Indeed, the main amendment of 2004 was that the reimbursement for treatment of the cross-county patients was no longer transferred directly from the hospital in a patient's catchment area to a hospital of treatment, but instead between the counties. Consequently, there was no financial advantage/disadvantage to a hospital from treating a patient from another county.

In 2007, the state obliged the regions (which replaced the counties) to increase the share of the DRG-based component to at least 50%. Nevertheless, the method of determining what the 50% share really means remained unchanged. Consequently, the regions' reimbursement systems were based on the time-honored principles employed by the counties and have changed little so far. The hospitals budgets and targets of 2007 were based on the budgets and activity (or targets) of 2006 with the usual adjustments. Increasing the share of DRG tariffs in each hospital's budget was

again mostly a paper exercise.

The agreement of 2007 emphasizes the use of differentiated rates of DRG tariffs with the idea that with the higher rates, e.g. 70-80%, the regions can induce the hospitals to prioritize the activity in the areas with long waiting times. Correspondingly, the regions are expected to gain a tool to suppress the activity in other areas. As before, however, the differentiated rates matter little for most of the activity up to the main targets, for which the unit rate of reimbursement continue to reflect their historical costs. Also, in case of the targeted initiatives for activity above the targets, the hospitals continue to negotiate not only the rates of DRG tariffs but also an increase in the block part of the budget. Interestingly, a number of targeted initiatives failed to result in the agreed activity increase. As mentioned earlier, in such a case, a hospital faces a budget reduction but only according to the applicable rate of DRG tariffs, while the corresponding block part of the budget for the initiative remains unaffected. Most regions reimburse also unplanned activity above the targets, usually subject to secondary targets. The rates of the DRG tariffs applicable to this activity are between 10-55% and vary from year to year. The regional documents underline that the extra revenue generated by a hospital through activity above the targets in a given year should add to the budget and the target of the following year. Yet, the targeted initiatives are not subject to this rule as they are principally of a single year character. Moreover, if the unplanned activity in a given year results in a regional budget deficit, hospitals' targets and budgets for the following year are again frequently reset to historical levels until the deficit is balanced. Alternatively, the regions increase the efficiency requirement in the

course of the year depending on the observed activity growth, i.e. the share of the activity growth that the hospitals are expected to finance themselves is increased by another 1-2%. The regions also happen to reduce the rate of DRG tariffs for the activity above the targets during a year. Yet, since both the problem of 'missing' activity and hospital's budget deficit continues to be resolved through negotiations between the respective hospital and region, the budget constraints can be soft. For example, regarding 2007, the rule of accounting for the deficits and/or 'missing' activity in the consecutive budget were suspended for a number of hospitals arguing that the latter need more time to adapt to the reimbursement reform.

Concerning quality targets for the hospitals, their use has been increasing between 2000 and 2010 and encompasses a wide range of initiatives, most of which employ public reporting as a motivational tool (Christiansen, 2009). Hence, the direct impact of the quality targets on the hospitals budgets remains marginal.

Discussion

Following the theory of the firm (Stieglitz, 1986), Health Economics postulates that there are certain inherent inefficiencies in the operations of hospitals, i.e. hospital management/physicians do not automatically minimise costs. Making hospital operations more efficient requires higher effort, which causes disutility to those who exert it. Hence, without adequate inducement, the hospital management/physicians minimise the efficiency increasing effort (Hodgkin & McGuire, 1994; McGuire, 1985; Pope, 1989; Robinson, 2001). Therefore, the system of block budgets coupled with activity targets has been seen as suffering from two

major problems. First, in negotiations with a third party payer, hospitals might try to commit to the lowest possible activity for the highest possible budget, depending on their bargaining power (Hagen, 1997). The second problem is of a dynamic nature and arises due to the fact that the hospitals might be reluctant to increase activity and by the same means reveal their true production possibilities, because they anticipate that the payer will respond by cutting the rate of reimbursement and setting steeper activity targets. In other words, any activity or efficiency improvement would limit the hospitals bargaining power in the subsequent round of negotiations. Thus, even the relatively efficient hospitals might choose to mimic the less efficient ones by restricting the activity early in the relationship and avoiding the existence of unspent funds at the end of a budgeting year since it would reveal the excessive allocation. This process is referred to as the ratchet effect (Carmichael & MacLeod, 2000; Charness, Kuhn, & Villeval 2010; Levinthal, 1988;) or the efficiency trap of the block budget system (Barnum, Kutzin, & Saxenian, 1995; Hagen, 1997;).

In Denmark, the implementation of the mixed reimbursement was expected to release the system from these problems by some combination of increasing activity and reducing unit cost (Ministry of Health, 2005). However, the transition from global budgets to the mixed reimbursement resulted in no major change in the incentives faced by the hospitals. This is because, whether the share of the DRG-based reimbursement was stated amount to 10, 20 or 50%, the increase of the DRG-based component of the total budget and the accompanying reduction in the 'old' block budget were of exactly the same magnitude, which allowed the hospitals to

produce unchanged sort and volume of activity at an unchanged unit cost (abstracting from the standard annual budget corrections for inflation, etc.). Also, the activity targets that traditionally accompanied block budgets prevail and continue to reflect historical trends. Thus, the mixed reimbursement has not induced any significant departure from historical patterns of costs and activity. In practice, the reimbursement was amended only for activity above the historical targets, which is, however, subject to narrow secondary ceilings and amounts to few per cent of the total annual hospital activity. Moreover, a significant part of the annual activity increase is still realised with the use of the same tools as already in the late 1990s, i.e. the targeted initiatives. Such initiatives are outcomes of negotiations between the hospitals and the third party payers on the additional volume of activity in selected areas and the corresponding additional lump sum transfer. In other words, the activity increase is predominantly planned and not spontaneous. Similarly, the efficiency concerns continue to be addressed by the same longstanding efficiency requirement. Therefore, the problems such as limited potential for activity and efficiency improvements inherent to block budgets and targets (Barnum, 1995; Hagen, 1997) prevail under the mixed reimbursement instead of being removed.

Even though, there exists only a very limited scope for the unplanned annual activity increase, it is occasionally suspended. This is because even when the additional activity is reimbursed by DRG tariffs employed at a reduced rate, the 'unplanned' activity increase happens to cause global budget deficits. This illustrates, that employing DRG tariffs at a reduced rate does not automatically create a balance

between the activity expansion and global cost control. The third party payers in Denmark seem to attempt learning the optimal rate of DRG tariffs for the activity above the targets through a process of trial and error, i.e. reducing rates from one year to another or even during a year. This strategy produces, however, a signal that the spontaneous activity increase might not necessarily be in the interest of the hospitals. The planned activity increase, i.e. the targeted initiatives, is relatively more attractive, since the hospitals can negotiate conditions and receive money in advance. Yet, the targeted initiatives might produce undesired effects. The initiatives are focused on the areas with long waiting times thus, it is rewarding for the hospitals to maintain long waits to attract additional funding. In such circumstances reduced efficiency can be expected (Iversen, 1993). Also, the variations in the rates of DRG tariffs between the different initiatives may induce hospitals to subsidize losses resulting from one type of treatment with revenue from other, more profitable treatments, rather than improving efficiency (Broyles, & Rosko, 1985). Additionally, Jakobsen (2010) points out that efficiency improvements are strongly conditioned on the assumption that hospital deficits and/or missing activity are transferred between budget periods. One of the arguments against the system of block budgets was that the hospitals were often bailed out from the deficits (missing activity) and this lack of discipline seriously harmed the efficiency. The mixed reimbursement does not, however, remove the political willingness to bail out the hospitals. In fact, the complexity of the mixed reimbursement seems to have created further distortions in incentives: in case of activity below target (missing activity), a hospital faces a corresponding reduction in the DRG-based component of the total

budget, while the related block part of the budget remains unaffected.

The mixed reimbursement forfeits also another attraction of DRG tariffs, i.e. fairness and transparency in funding, which is thought to contribute to increased efficiency. Under the mixed system, the unit rates of reimbursement continue to differ between hospitals and are even more difficult to determine than under the previous system due to the complicated manner of expressing the budgets.

Studies analysing developments in hospitals activity/efficiency in Denmark do not report significant improvements following the reforms of 2000 and 2004 (Ankjær-Jensen & Rath, 2004; Bech, Lauridsen, & Pedersen, 2006; Jakobsen, 2010; Pedersen, Bech, & Hansen, 2006). Regarding the remaining period up to 2010, official figures provided by the Ministry of Health suggest an average annual activity increase of 2.3%, measured as a number of inpatient and outpatient operations in the regional hospitals (Ministry of Health, 2010, 2011). This does not represent a major departure from the activity growth trends reported at the end of 1990s (Danish Health and Medicines Authority, 2002). However, the direct comparison of the data is difficult due to a number of the changes in the methodology of activity registration, which occurred between 1999 and 2010. As mentioned earlier, the most striking increase in activity occurred between 2001 and 2002, when the additional state fund was initiated for activity above the targets and the reimbursement rate was equal to full DRG tariffs. The hospitals could easily expand activity, perhaps because they had under-utilised resources available. Yet, as the result of the activity expansion, the third party payers experienced global budget deficits. In the following years, narrow secondary ceilings were imposed on the

unplanned activity above the targets along with 20-80% reductions in the value of DRG tariffs applicable to this volume activity. In essence, the hospitals received a signal that activity increase is a risky business.

Regarding DRG tariffs, the extent to which they incentivise the hospitals to minimise cost within the unit of reimbursement depends on how they are set. If, for example, DRG tariffs reflect the costs of selected efficient providers, their use can shift the pattern of service provision away from historical costs. If, however, the tariffs simply reflect the average cost of the existing practice, the DRG-based payment is in danger of reducing to cost reimbursement (Street et al., 2007; Street & Maynard, 2007; Street et al, 2011). The latter should be considered in Denmark, where DRG tariffs are updated annually based on activity and cost information from all hospitals (for details see Ankjær-Jensen, Rosling, & Bilde, 2006).

Finally, it is interesting to notice that the documents of the third party payers do not provide any rationale for the choice of the particular proportions, in which the DRG-based and the block components are mixed in hospitals' budgets. In other words, it remains unclear why the share of the DRG-based component was initially set to 10% or whether it should increase beyond 50%.

Conclusions

Finding the balancing point between the need to increase activity and the need to control global costs has been perceived as the largest problem with regard to the use of DRG-based reimbursement in Denmark. Adding DRG tariffs to the existing system of the block budgets coupled with activity targets has been expected to

address the problem by some combination of increasing activity and reducing its unit cost. The resulting mixed reimbursement of hospitals has not, however, produced a meaningful mix of incentives for activity and cost control. The cautious way of implementing DRG tariffs in Denmark resulted in a system, which in fact hardly uses DRG-based reimbursement in its proper sense. The mixed reimbursement is simply a veiled version of the former system, which, due to certain added complications might even distort activity/efficiency improvements in a new way. Taking stock, the mixed reimbursement as implemented in Denmark does not present any innovation. It suffers from both the typical problems of the block budgets and the DRG-based reimbursement instead of removing them. In general, what is called mixed forms of reimbursement should be considered with caution unless a sufficient level of detail is made available. In case of Denmark, any empirical research based on the assumption that the incentive scheme for the entire volume of hospital activity was changed by the transition to the mixed reimbursement might produce false conclusions.

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