



Did hospitals respond to changes in weights of Diagnosis Related Groups in Norway between 2006 and 2013?



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ABSTRACT

It has been argued that activity based payment systems make hospitals focus on the diagnostic groups that are most beneficial given costs and reimbursement rates. This article tests this hypothesis by exploring the relationship between changes in the reimbursement rates and changes in the number of registered treatment episodes for all diagnosis-related groups in Norway between 2006 and 2013. The number of treatment episodes can be affected by many factors and in order to isolate the effect of changes in the reimbursement system, we exclude DRGs affected by policy reforms and administrative changes. The results show that hospitals increased the number of admissions in a specific DRG four times more when the reimbursement was increased, relative to the change for DRGs with reduced rates. The direction of the result was consistent across time periods and sub-groups such as surgical vs. medical, and inpatient vs. outpatient DRGs. The effect was smaller, but remained significant after eliminating DRGs that were most likely to be affected by upcoding. Activities that the hospital had little control over, such as the number of births, had small effects, while activity levels in more discretionary categories, for instance mental diseases, were more affected. This demonstrates that contrary to the wishes of policy makers the economic incentives affect hospital reporting and priority setting behavior.

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1. Introduction

Hospitals in many countries are financed partly by payments for each treatment in a specific diagnosis-related group (DRG). By using a system of DRG-payments instead of fixed transfers, policy makers want to increase the number of treatments, reduce unit costs and stimulate innovation [1]. At the same time, it is often claimed that the incentives produce undesirable consequences [2]. For example,

it has been argued that the system encourages up-coding of patients into the DRGs that are most profitable [3], that it makes hospitals select patients who are relatively easy to treat [4,5] and that it makes hospitals focus too much on the DRGs with the highest financial rewards [6,7]. Policy-makers want the system to reward efficiency, but they do not want the incentives to affect prioritization between patients, treatments or diseases. As expressed by the Norwegian health authorities: “the main aim is to make the funding system as neutral as possible in terms of decisions regarding choice of form of treatment” [8].

In this paper, we test the hypothesis that the payment system is neutral with respect to hospital reporting behavior and decisions about the number of treatments they provide in different diagnosis-related groups. We do this by estimating whether, and to what extent, changes in

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the reimbursement for different DRGs affect the reported number of treatment episodes. The main result from our analysis is contrary to the explicitly stated policy that financial incentives should not influence hospital behavior. Instead we show that increasing the DRG-weight by ten percent will lead to an increase of about one percent in the reported level of activity and that the annual increase in the number of treatments for DRGs with an increase in reimbursement was four times larger than for the DRGs with a reimbursement decrease.

1.1. Background

The relationship between changes in DRG-weights (i.e. reimbursements) and the level of recorded activity in the DRG has previously been explored using many different approaches. Some studies have focused on changes over time in a single DRG, such as a large increase or reduction in the treatment of a specific diagnosis following a change in the reimbursement or the cost of treatment. For instance, one study showed that during the period of 1999–2002 the number of treatments for sleep apnea increased by 110% when the costs of the intervention sank while the reimbursement remained high [9]. In another case study, Kuwabara and Fushimi [10] have shown that the introduction of a new DRG affected the choice between surgery and chemotherapy for breast cancer patients in Japan.

A second approach in the literature has been to focus on up-coding and in particular on admissions for diagnoses that are closely related [11,12]. For instance, some diseases have separate reimbursement codes for the same condition depending on whether it is classified as with or without complications. By examining how coding practice changes in response to relative changes in reimbursements, it is possible to analyze how hospitals react to incentives. In this case the focus is mainly on changes in the coding, and the concern is that the hospitals adapt to the system by using the most profitable DRG. However, while changes in closely related DRGs are useful for identifying financially motivated switches in reporting practice, it does not capture the extent to which changes in DRG reimbursements affect the actual priority given to some diseases or treatments.

In contrast to the focus on changes in a single DRG category, our aim is to examine overall average changes in hospitals' behavior in response to changes in reimbursement rates. This will consist partly of reporting changes and partly of changes in actual priorities. The analysis captures the net effect of both mechanisms, but in order to learn more about the importance of reporting change vs. prioritization, we also provide an analysis of sub-groups of DRGs that are less likely to be affected by upcoding.

The results are relevant for the design of financial systems in general since upcoding causes a financial burden and changes in prioritization affects patients and waiting times. In addition, the effect of reimbursement changes is of particular policy interest in systems such as the Norwegian one, which explicitly state that hospitals should not let DRG reimbursement affect the reporting or prioritization of treatments.

2. Data and method

2.1. Data and identification

We collected data on rates of reimbursement for all DRGs in every year between 2002 and 2013 in Norway. For the same time period we gathered the annual number of recorded events in the different DRGs at the national level from the Norwegian Directorate of Health and the Norwegian Patient Registry. The registry contains aggregate information about all hospital treatment episodes, inpatient and outpatient, from all hospitals in Norway.

The monetary reimbursement hospitals receive for each hospital stay is the product of three factors: the specific DRG-weight assigned to the DRG for the stay, the general monetary value of one unit of the DRG-weight, and the importance placed on activity-based payment relative to the global budget. Since the introduction of activity-based financing in Norway in 1997, the activity-based share of the budget has varied between 30% and 60%. In order to avoid biases introduced by changes in the share of the budget using activity based funding, we use the time period from 2006 to 2013 when the share remained constant at 40%. The monetary reimbursement for a unit of the DRG-weight increases every year, but the increase reflects the average cost of a hospital stay, and increases in the general reimbursement affects all DRGs equally. Consequently, when investigating the effect of changes in reimbursement rates on hospital prioritization, the key remaining component of relevance of the reimbursement is the DRG-weight.

A major problem for identifying the effect of financial incentives is that the financially favorable and unfavorable DRGs are not directly observable. The weight for a DRG in a given year is known, but since the hospitals' true costs are unknown, we do not know which DRGs have the most favorable relationship between costs and reimbursements. Because of this, it was necessary to find a more indirect way of identifying the effect of financial incentives. Instead of relying on information about the absolute levels of the (un)profitability of DRGs, we will use information about changes in the profitability. The key that makes it possible to identify these empirically, is the fact that changes in DRG-weights are lagged. If the reimbursement for a specific DRG was increased compared to the previous year, this demonstrates that the reimbursement was too low for at least part of the previous year. Similarly, a decrease in a DRG-weight identified DRGs that were too high for some time until they were revised. The change does not identify profitable and unprofitable DRGs, but it identifies DRGs that were marginally better or worse financially in one year relative to the next year. These changes in the DRG reimbursements are observed in the dataset and can be used to test whether hospitals adjust priorities based on changes in reimbursements as represented by the changes in the DRG-weights. If hospitals do not use reimbursements to prioritize between DRGs, changes in activity should not be related to the changes in DRG-weights in the DRGs. On the other hand, if they consider changes in reimbursements, one would expect the hospitals to have larger activity increases in the DRGs where the reimbursement increased, than in the DRGs where the reimbursement decreased.

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