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# The role of GP's compensation schemes in diabetes care: Evidence from panel data



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## ABSTRACT

We investigate the impact of the implementation of Diabetes Management Programs with financial incentives in the Italian Region Emilia-Romagna between 2003 and 2005. We focus on avoidable hospitalisations for diabetic patients for whom GPs receive additional payments exceeding capitation. We estimate a panel count data model to test the hypothesis that those patients under the responsibility of GPs receiving a higher share of their income through ad-hoc payments, are less likely to experience avoidable hospitalisations. Our findings indicate that financial transfers may help improve the quality of care, even when they are not based on the ex-post verification of performance. The estimated effect indicates that, at sample averages, an increase of 100 Euros of the financial incentives paid to GPs (around 17% of the yearly payment received by GPs for diabetes programmes) is expected to reduce the number of diabetic ACSCs by 1%, around 100 cases when projected on the entire region.

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## 1. Introduction

The effectiveness of financial incentives in improving public sector performance has been widely debated over the last fifteen years, and incentive schemes designed to increase the efficiency and quality of services have often been the target of internationally implemented reforms within various areas of public administration. Findings would seem to indicate that incentives do in fact influence behaviour, although not always as hoped for by the scheme's designer (e.g. Burgess and Ratto, 2003). In particular, economic theory suggests that optimal incentives in the public sector should differ from those used in the private sector, since they may lead to dysfunctional and counterproductive forms of behaviour due to imperfections in measurement indicators, multi-tasking, multiple principals and the intrinsic motivation of workers. For all of these reasons, even if a number of recent studies have highlighted the presence of quality improvements associated with the adoption of pay-for-performance (P4P) incentive schemes, a frequently encountered view suggests that these schemes should be

used cautiously in the public sector where low-powered schemes may in some cases represent a viable alternative.

Within this context, the healthcare sector is characterised by some of the most significant difficulties encountered when measuring public sector productivity, as a result of the sector's complexity, widespread information asymmetries and the considerable risk of unintended side-effects of payment schemes (Goddard et al., 2000; Glasziou et al., 2012; Eijkenaar, 2013). Nevertheless, not only countries with insurance-based systems, but also those with a National Health Service (NHS), have recently witnessed the extensive introduction of performance-based payments designed to improve both the quantity and the quality of care. The best-known example of such NHS schemes is probably the "Payment by Results" programme of the British NHS, designed for the financing of hospital trusts, although the UK has also extended target payments to primary care through its Quality and Outcomes Framework (e.g. Campbell et al., 2009; Gravelle et al., 2010; Sutton et al., 2010; Dusheiko et al., 2011). The British experience in this area is not unique, however, as shown by the implementation of similar schemes in Australia (Scott et al., 2009; Greene, 2013) Canada (Kantarevic and Kralj, 2012), Italy (Lippi Bruni et al., 2009), New Zealand (Buetow, 2008) and Taiwan (Lee et al., 2010; Chen et al., 2010; Lai and Hou, 2013), just to cite some of the most relevant initiatives. These programmes typically compensate general

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practitioners (GPs) with extra-payments in excess of standard capitation.

The increasing attention to the design of an effective governance of primary care within NHS systems is the consequence of the pivotal role of GPs as providers of ambulatory care, and as gatekeepers to secondary care. In this case changes in the payment schemes have usually the purpose to incentivise GPs to take part in care-improving activities promoted by public authorities, including appropriate use of medical services and cost containment. The range of activities involved is widely diversified. Special bonuses may be provided for meeting targets, designed to encourage the alignment of GPs' referral and prescription decisions to general health policy goals, which are usually associated with the appropriate use of resources. Nevertheless, financial incentives may also reward the direct provision of treatment, the assumption of responsibility for patients affected by diseases that require additional effort on the part of the physician (e.g. diabetes, hypertension), or the adoption of organisational routines designed to improve cooperation among providers, such as participation in medical networks, or adherence to evidence-based guidelines.

Most of the existing programmes are designed according to a P4P structure that typically subjects payment to the achievement of verifiable targets that have been agreed upon beforehand. Alternatively, a scheme may simply reward participation in care improvement activities, without necessarily linking bonuses to the attainment of objectives based on specific indicators. The first approach has the advantage of introducing a more stringent incentive structure, aimed at aligning GPs' behaviour to policymakers' expectations (high-powered incentives). The second approach, on the other hand, affects physicians' professional independence to a lesser extent (low-powered incentives). Under certain circumstances, the latter is believed to be an effective tool for fostering cooperation between independent providers, such as GPs, and the different actors within the public system, although empirical studies based on this approach are still at an early stage of development.

In this paper we consider a low-powered incentive scheme aimed at improving outcomes of diabetes care introduced in the Italian Emilia-Romagna region. Our dataset covers a three-year period (2003–2005). In order to encourage GPs to carry out a number of activities designed to improve the quality of diabetes care, local Healthcare Districts (HDs) are allowed to provide specific remuneration to their GPs for activities such as regular check-ups of patients, the regular measurement of glycosylated haemoglobin, and involvement in the local Diabetes Management Program (DMP). Those activities eligible for financial incentives, and the extent of the corresponding incentives, are negotiated at the district level by the HD and the GPs' representative bodies. Consequently, there are considerable differences in the entity of financial incentives from one district to another. Our measure of the quality of care is given by the Ambulatory Care Sensitive Conditions (ACSCs) associated with diabetes. Insofar as hospital admissions for such conditions reflect monitoring and prevention in an outpatient setting, the high frequency of such admissions can be taken as an indicator of the poor quality of primary care (e.g. Billings et al., 1993; Purdy et al., 2009).

The aim of our study is to analyse the impact of DMPs based on a series of tasks the physician is expected to perform and for which he receives an additional compensation that tops up capitation. To this end, the number of diabetic ACSCs represents a good benchmark for assessing the impact on health outcomes of a DMP based on financial incentives, because a reduction in their frequency is not explicitly set out in physicians' contracts in any of the districts that we consider. This ensures that the outcome indicators used in the analysis accounts for a broad measure of quality of care which is also independent from the remunerated activities.

The paper tests the hypothesis that, other things equal, the higher the fraction of professional income a GP receives in the form of special payments for diabetes care, the lower the number of avoidable hospitalisations (i.e. diabetic ACSCs) experienced by his type 2 diabetic patients. By doing so, we verify whether physicians' enrolment into the programme and the associated financial incentives improve quality of care and patient supervision, as measured by a reduction in (avoidable) adverse outcomes. Since in our data GP participation in the programme is always associated with extra payments, the variable "financial incentives" captures the combined impact of participation in a DMP and of the associated financial component.

Our work contributes to the literature on the relationship between financial incentives and physicians' behaviour from several points of view. Firstly, unlike most of the experiences analysed to date, the incentive scheme implemented in this specific case is designed to reward participation in care-improvement activities, such as the assumption of responsibility for patients, and adherence to care guidelines, rather than rewarding high levels of performances and therefore falls under the relatively unexplored case of low-powered incentives. Secondly, we employ a rich panel based on administrative data that covers the entire regional population and which allows us to use as dependent variable measure of final outcomes of care (rather than process indicators) together with a large set of controls for patients, physicians and area characteristics. Finally, the use of longitudinal data enables us to establish a more precise link between the financial incentives and the outcomes of care than was possible in previous studies (Lippi Bruni et al., 2009). In particular, by taking advantage of variation over time, we can better control for unobserved individual heterogeneity at the GP level.

## 2. The role of financial incentives in improving the quality of health care

Financial incentives aimed at improving the quality of health-care services are usually part of P4P programmes where remuneration is conditional on achieving measurable targets that reflect clearly identified policy goals. While empirical evidence suggests that physicians respond to changes in financial rewards, recent surveys of P4P programmes highlight that the effects on care quality encompass the entire spectrum of possible outcomes, ranging from negative or absent to positive or very positive, and conclude that the evidence in support of P4P schemes is mixed and not yet conclusive (e.g. Christianson et al., 2009; Van Herck et al., 2010; Wilson, 2013).

Such mixed evidence has been often attributed, in part, to the lack of a stringent design of the incentives and, in part, to the problems encountered by the empirical studies in providing comprehensive evaluations of the programmes sometimes flawed also by methodological shortcomings in the evaluation strategies (Emmert et al., 2012; Eijkenaar, 2013). Firstly, incentive schemes are often complicated and nuanced, introduced on top of, or blended with, payment mechanisms designed for different purposes, which makes it difficult to assess their independent effect. Secondly, financial incentives can be manipulated, due to the incompleteness of many indicators, leading to a concentration of effort on those areas that are explicitly rewarded. Thirdly, paying for performance could reduce the intrinsic motivation to perform a task for its own sake, a problem which foremost affects publicly financed health systems (Le Grand, 2003; Siciliani, 2009).<sup>1</sup>

<sup>1</sup> As regards the Quality and Outcome Framework, McDonald et al. (2008) report that the financial incentives in the pay-for-performance programme have not

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