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Resources allocation and health care needs in diabetes care in Danish GP clinics

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ABSTRACT

Background: In several countries, morbidity burdens have prompted authorities to change the system for allocating resources among patients from a demographic-based to a morbidity-based casemix system. In Danish general practice clinics, there is no morbidity-based casemix adjustment system.
Aim: The aim of this paper was to assess what proportions of the variation in fee-for-service (FFS) expenditures are explained by type 2 diabetes mellitus (T2DM) patients' co-morbidity burden and illness characteristics.
Methods and data: We use patient morbidity characteristics such as diagnostic markers and co-morbidity casemix adjustments based on resource utilisation bands and FFS expenditures for a sample of 6706 T2DM patients in 59 general practices for the year 2010. We applied a fixed-effect approach.
Results: Average annual FFS expenditures were approximately 398 euro per T2DM patient. Expenditures increased progressively with the patients' degree of co-morbidity and were higher for patients who suffered from diagnostic markers. A total of 17–25% of the expenditure variation was explained by age, gender and patients' morbidity patterns.
Conclusion: T2DM patient morbidity characteristics are significant patient related FFS expenditure drivers in diabetes care. To address the specific health care needs of T2DM patients in GP clinics, our study indicates that it may be advisable to introduce a morbidity based casemix adjustment system.

1. Introduction

Caring for patients with multi-morbidity – the presence of several chronic diseases in one individual – is an important challenge facing health services in developed countries [1]. Currently, the management of patients with multi-morbidity is the norm rather than the exception and presents a challenge to the single-disease and fragmented focus in the health system [1]. Due to the ageing of

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populations and new technologies, this challenge is expected to continue and grow in the future [2]. Primary care is considered a more cost-effective place to begin addressing multi-morbidity rather than waiting for patients to appear in secondary care [3,4].

Multi-morbidity may not be adequately addressed in the current structures of primary care systems [4,5]. Primary care is often organised around single diseases with limited time allocated to a consultation rather than systems supporting multi-morbidity-based guidance. Primary care health professionals often have to apply the evidence from single disease guidelines when treating multi-morbidity patients. For instance in Denmark, more could be done to develop clinical guidelines and indicators that fully address the realities of patients with multi-morbidity conditions [6]. The OECD has reported that Danish general practice has not been reorganised to deliver a new set of functions in care co-ordination and integration that it ought to perform. This implies a need to redesign general practice consultation and conceptualisation of multi-morbidity in the organisational structures of the health care system [7,8]. Inappropriate coordination and integration may be driven by inappropriate economic incentives in remuneration systems to encourage the treatment of more chronic diseases in a single consultation.

Several countries with publicly funded general practice (GP) clinics have reoriented their remuneration systems towards a morbidity-based casemix adjustment system [9]. Denmark has yet to reorient its resource allocation system in the general practice sector towards morbidity-based casemix systems [3]. Prior to potential reforms of the remuneration system in Danish GP clinics, it is relevant to investigate the extent to which public resources are allocated according to morbidity status. A recent study focusing on all types of GP patients concluded that morbidity measures were significant patient-related fee-for-service (FFS) expenditure drivers [10]. Morbidity characteristics explained 18-31%, age and gender 13% and volume of activity explained about 35% of the resource allocation through FFS. However, that study did not explore the association between morbidity and FFS within a specific chronic disease area in primary care. Because diabetes patients have one of the highest co-morbidity rates with other chronic diseases and represent an increasing economic burden to the health care system, this study limits its focus to diabetes patients in primary care [11]. Almost all of these patients are type 2 diabetes mellitus (T2DM) patients. Type 1 diabetes patients are treated in the hospital sector. In addition to missing morbidity adjustment, the FFS component may be too dominant in Denmark [12,13]. We anticipate that lack of morbidity-adjusted remuneration and the dominant FFS component lead to short GP visits focused on one problem. The average T2DM patient with co-morbidities may not come back to the GP over and over again in a way that reflects their health-care need. This means that the present resource allocation for T2DM patients may not reflect health care needs. The aim of this study was to describe and analyse the extent to which negotiated patient-level fee-for-service (FFS) expenditures are associated with T2DM patients' co-morbidity burden.

1.1. The Danish general practice sector and the allocation of resources for diabetes patients

Danish GPs are self-employed professionals who contract with one of five regions that have the overall operational and planning responsibilities for the health care system [12]. GP services are financed by taxes, and there are no user fees for GP services. GPs are gatekeepers, and the main coordinators of care for patients. The regions compensate GPs through a combination of per capita fees (30%) and FFS (70%), and nearly all citizens are registered with a specific GP [12,13]. This mix of FFS and capitated payment systems is expected to balance the incentives for over-provision of services inherent in FFS against the incentives for under-provision of services inherent in capitation [14,15]. The Danish Regions and the Danish Organisation of GPs (PLO) negotiate per capita and FFS compensation for GPs. Fees are used strategically to form incentives for specific services such as preventive care [13]. The present remuneration system that lacks morbidity adjustments (except concerning fees for supplementary services) incentivises the GP to follow a one disease or procedure approach per visit. There is no additional payment for diagnosis coding; the only incentive for GPs to code diagnoses is to encourage better organisation and quality improvements. Nevertheless, many Danish GPs have used the International Classification of Primary Care code (ICPC-2) for several years [16,17]. In 2006, Danish GPs were encouraged to implement a Data Capture module called "Sentinel Data Capture". Data collected include, e.g. all diagnoses of patient contacts and all disbursement codes [18]. These new data offer an opportunity to examine the association between the present allocation of resources and diabetic patients' morbidity burden. Actual cost data on Danish GP clinics are unavailable [10].

2. Methods

Descriptive statistics and a regression approach were employed to explore the association between FFS expenditures per capita in diabetes care and the patients' morbidity burden in general practice. Due to the nested nature of the data and the results of a Hausmann test, we applied a fixed-effects data model that recognises the stratification of patients within GP clinics [19,20]. The model takes the following form:

$$FFSE_{ij} = \alpha + X_{ij}\beta + u_j + v_{ij}, \quad i = 1, \ldots I, j = 1, \ldots N \qquad (1)$$

where $FFSE_{ij}$ represents patient level FFS expenditures for T2DM patient i registered with general practice clinic j, and $FFSE_i$ is the sum of GP services (s_{ik}) weighted by politically negotiated fees for each service (p_k). Thus, $FFSE_i = \sum p_k s_{ik}$, where $k = 1, \ldots, M$. T2DM patients were identified using the patient's personal identification number and ICPC code T90 listed in chapter T (Endocrine/Metabolic and Nutritional). The parameter X_{ij} is a row vector of explanatory variables containing the characteristics of patient i in clinic j. The parameter u_j is the clinic-specific effect referring to the conditional mean of the annual expenditures per individual treated by clinic j. This GP clinic fixed effect