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Does free choice of hospital conflict with equity of access to highly specialized hospitals? A case study from the Danish health care system

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ABSTRACT

Equity of access to health care is a central objective of European health care systems. In this study, we examined whether free choice of hospital, which has been introduced in many systems to strengthen user rights and improve hospital competition, conflicts with equity of access to highly specialized hospitals. We chose to carry out a study on 134,049 women who had uncomplicated pregnancies from 2005 to 2014 in Denmark because of their homogeneity in terms of need, the availability of behavioral data, and their expected engagement in choice of hospital. Multivariate logistic regression was used to link the dependent variable of bypassing the nearest non-highly specialized public hospital in order to “up-specialize”, with independent variables related to socioeconomic status, risk attitude, and choice premises, using administrative registries. Overall, 16,426 (12%) women were observed to bypass the nearest hospital to up-specialize. Notably, high education level was significantly associated with up-specialization, with an odds ratio of 1.50 (95% CI: 1.40–1.60, $p < 0.001$) compared to low education group. This confirms our hypothesis that there is a socioeconomic gradient in terms of exercising the right to a free choice of hospital, and so the results indicate that the policy exacerbates inequity of access to health care.

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1. Introduction

During the last two decades, a common trait in public sector governance reforms in the Nordic countries has been the implementation of “free choice of hospital” policies, which seek to accommodate patients’ preferences for provider characteristics and create market conditions that incentivize hospitals to compete. In addition, choice in itself represents a value for individuals [1–3].

How patients’ choices influence equity has been debated in the scientific literature. Proponents contend that by giving choice to individuals who previously had none, one may in fact reduce the inequalities in service use that arise from differences in individuals’ capabilities [4–6]. Opponents argue that the greater the freedom to choose amongst providers, the greater the risk of inequalities, as less resourceful patients will be less likely to exercise the right to bypass the standard choice in order to reach a provider that better

satisfies their preferences [7–10]. If this were the case, inequity of access to health care would be exacerbated. The literature refers to horizontal equity of access, which is defined by equal access to hospitals for individuals with equal need [11–13].

There is limited evidence on the effect of free choice of hospital policies on equity of access to health care. One of the few studies on this topic is the London Patient Choice Project, which found no evidence of inequalities in access to, or use of, alternative hospitals by education, income, or ethnic group. However, individuals in paid employment were more likely to opt for an alternative hospital than those not in paid employment [14]. Another study from the UK found that patients with higher levels of education were more likely to exercise their right to choose [15]. Similar results were found in a Norwegian study that showed that education was associated with using the opportunity of choice [6]. This evidence suggests that the introduction of free choice of hospital in publicly financed health care systems that are based on free and equal access might introduce a conflict between the different goals.

In this study, we examined whether a free choice of hospital policy benefits more resourceful citizens, focusing on pregnant women. Pregnant women are amongst the hospital users who

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are known to be both able and willing to choose which hospital they attend and who have previously demonstrated engagement by articulating their preferences [3]. Furthermore, women with uncomplicated pregnancies represent a homogeneous group with equal needs in terms of delivery hospital and the lack of complications is identifiable in the present research context due to the existence of detailed national register data [16].

In the present study, we focused on women living near a non-highly specialized hospital who selected a highly specialized hospital for delivery. Some women opted for a hospital with a higher level of specialization (referred to as “up-specialization” hereafter) despite having the same level of need as others. If these women were from more socioeconomically advantaged groups, this would result in socioeconomically related inequity of access. Hence, the aim of the study was to assess whether a free choice of hospital policy conflicts with equity of access to highly specialized hospitals.

Our data set enabled us to make a number of contributions to the existing literature. A particular feature of our study population is that all members of the population had the same level of need for hospital services, thereby improving the validity of our results. In addition, to the best of our knowledge, the study is the first of its kind to describe the association between individual risk attitude and using the opportunity of free hospital choice.

1.1. Institutional setting

The Danish health care system offers universal coverage and is primarily publicly funded. It is based on free and equal access for all citizens, with general practitioners acting as gatekeepers to hospitals for patients with non-acute needs. The right to free choice of hospital was introduced in 1992. This policy provided patients with the option to choose between different public hospitals, and also private or foreign hospitals that have an agreement with the Danish Regions if the public hospitals are unable to provide a service within a maximum waiting time (1 month as of October 2007) [3,17].

The homebirth rate in Denmark is <2% [18] and obstetric services are provided only at public hospitals. Hospitals level of speciality is based on the guideline for gynaecology and obstetrics functions provided by the Danish Health and Medicines Authority (www.sst.dk). The guideline presents information about hospital functions in gynaecology and obstetrics speciality, and categorises hospitals into regional functions and highly specialized functions. University hospitals located in Copenhagen, Aarhus, Aalborg and Odense provide highly-specialized services.

Pregnant women can freely choose among different birthing hospitals if there are no limitations in access. At the first prenatal visit to her GP, the woman will be referred to hospital of choice. This hospital, offers a program for prenatal control and support. If the referral does not indicate special risk factors, the program includes a nuchal translucency scan at gestational week 12, an anomaly scan at gestational week 19, and a number of midwife visit. In the Danish system, pregnant woman will not visit an obstetrician unless she has a risk factor or suffers from pregnancy complications.

Due to excess demand for giving birth at highly specialized hospitals, the Capital Region suspended the free choice policy in relation to its university hospitals in December 2010. A similar suspension was enacted in the Central Denmark Region in 2013.

1.2. Analytical framework

Expected utility theory is the standard framework used to predict choice under uncertainty [19]. According to this theory, an individual will choose a specific hospital if the expected utility they derive from that choice is greater than the expected utility associated with choosing other hospitals in their choice set. Furthermore,

socioeconomic status (SES) is also reported to be associated with access to health care [e.g. 6,14–15]. We tested the following hypothesis:

Hypothesis 1. Up-specialization is associated with high SES

The preferred level of specialization is likely to be determined by risk attitude such that risk-averse individuals will express higher demand for highly specialized care. Individuals' *risk attitude* is an important concept within the health domain. Firstly, because medical decisions are generally made under the condition of uncertainty, the optimal treatment from a patient's perspective will depend on, amongst other things, their risk attitude. Secondly, there is evidence that more risk-averse individuals are less likely to engage in unhealthy behavior such as smoking [20]. A person's attitude toward risk may thus help to explain health care utilization and outcomes as well as treatment decisions [21]. While risk attitude is rarely monitored on a routine basis, smoking has previously been used as a proxy [22]. Furthermore, women's experience of giving birth has been found to be a relevant proxy for risk [23,24]. We tested the following hypothesis:

Hypothesis 2. Up-specialization is, holding SES constant, associated with risk aversion proxied by not smoking during the first trimester and by having no birth experience

In Denmark, the geographical distribution of hospitals is different across regions, which means that travel investment (in terms of time and cost) varies across choice sets. For this reason, all the analyses were adjusted for a) the baseline investment associated with reaching the nearest hospital and b) the additional investment required to reach a highly specialized hospital. Finally, as mentioned, two regions suspended the free choice policy for some of their citizens during parts of the study period, and this was also controlled for in all analyses.

2. Materials and methods

2.1. Study design and population

The study is a retrospective cohort study of consecutive women who gave birth at Danish hospitals during the period 2005–2014 after an uncomplicated pregnancy (referred to as “women” hereafter). International Classification of Diseases (ICD)-10 codes were used to identify the women in the Danish National Birth Register and the Danish National Patient Register. Women were excluded from the study if they developed complications during pregnancy or birth. Fig. 1 illustrates the identification of the study population.

2.2. Data

The study was based on five national registries. The National Registration of Danish Residents involves the collection of individual-level information concerning each individual's unique personal identification number, marriage/partnership status, citizenship, municipality, and place of residence [25]. The Danish National Birth Register (NBR) provides information about the hospital at which each birth took place in addition to the women's age when she gave birth, parity, number of visits to health care providers during pregnancy and smoking behavior at the beginning of pregnancy. The Danish National Patient Register (NPR) includes information on the hospital ward and date and time of activity, and the clinical data include diagnoses and surgical procedures [16]. The Danish Education Registry [26] and Danish Registries on Personal Income [27] provide information about education level, employment status, and personal and family income.

We extracted information related to pregnancy from NBR and NPR. Individuals' education status was categorized in order to allow

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