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Understanding inappropriateness in health spending: The role of regional policies and institutions in caesarean deliveries☆

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ABSTRACT

We analyze the determinants of caesarean sections and the role that regional policies and institutions can play in controlling for inappropriateness in healthcare. We consider Italy as a case study, given that: at the national level caesarean sections are above OECD average but regional variation is significant; almost all childbirths are managed within the National Health Service, in a public or a private hospital; regional governments are in charge of managing and funding (at least partially) health care services. Controlling for average patients' characteristics and the riskiness of births, in the attempt to separate "appropriate" from "inappropriate" treatments, we find that regional policies and institutions do matter. In particular, our results suggest that decentralised DRG tariffs might be an effective policy tool to control inappropriateness, once the role of private providers is taken into account. Also the degree of fiscal autonomy in funding regional health expenditure, and the experience of regional government's president are important.

1. Introduction

The expected growth in public health expenditure is a relevant policy issue in almost all developed countries. Not surprisingly, improving spending efficiency while guaranteeing (or enhancing) citizens' health is becoming a key challenge for policy-makers. A common suggestion coming from the policy-oriented literature is to foster service appropriateness: delivering appropriate services would produce cost savings, while contemporaneously ensuring at least the same level of citizens' health (e.g., OECD, 2004). The incidence of caesarean sections on total childbirths is an indicator of inappropriateness commonly considered in the literature, and by policy-makers (see, e.g., OECD, 2009; for Italy, the indicators regularly published by the Italian Health Ministry in its annual report on hospital production, and Fortino et al., 2002). Being a surgical treatment, a caesarean section is characterised by a large cost (and risk) differential with respect to the alternative classical vaginal delivery (a medical treatment). In the absence of any clinically necessary reasons which justify the use of a caesarean section, vaginal delivery is

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generally considered an appropriate (and less risky) way of childbirth, which can clearly help in containing health care costs.[1]

However, despite these considerations, an upward trend in the incidence of caesarean deliveries is a well documented stylised fact at the international level, which is intrinsically connected with the rise of medical intervention in childbirth in many nations (e.g., Johanson et al., 2002). The main explanations for this increasing tendency proposed by the literature focus mostly on microeconomic issues, which have been analyzed by considering patient-level data, leaving the relation between inappropriateness and spending at the *aggregate* level substantially unexplored. In particular, the literature claims a role for: technological changes improving the potential quality of maternity care (for instance, the possibilities to treat pain during labour, or the electronic foetal monitoring techniques); changes in patients' characteristics (for example, the increase of the age of the mother at her first delivery); physician and provider behaviours (clearly influenced not only by the payment system, but also by the fear of litigation).

Considering the aggregate level, Italy represents an interesting case study. First, at the national level, the caesarean section rate has more than trebled from 1980 to 2007, from about 10 to about 40%, taking Italy well above the OECD average. Unsurprisingly, the necessity to monitor its dynamics has drawn the attention of national policymakers. The 2003–2005 National Health Plan defined by the Italian government (Ministero della Salure, 2003) stated the objective of containing the average share of caesarean deliveries at about 20% by the end of the planning period.[2] Over those years, however, the increasing trend in the incidence of caesarean births did not stop. Second, almost all childbirths are managed within the National Health Service, in a public or private hospital working for the NHS. Hence, the choice of vaginal versus caesarean delivery is basically a medical decision, influenced – beyond the patient conditions – by many organisational variables affecting providers' behaviour. Third, regional variations both in the growth rate and in the incidence rate of caesarean deliveries are significant (cf. infra par. 4.3). As regions represent in Italy the level of government in charge of providing and funding (at least partially) health care services, the observed variations in caesarean section rates could be explained, at least in part, by different management practices across regional governments. For instance, caesarean deliveries are above 50% and 60% in Sicily and Campania respectively, two regions characterised by relatively high deficits, and where the room for cost savings is estimated to be large (e.g., Piacenza and Turati, 2014). These savings are likely to be obtained – without reducing or limiting the quantity or the quality of health care services – by improving appropriateness, which has been shown to be strongly correlated with the expenditure differentials observed across regions (e.g., Francese and Romanelli, 2014).

This paper addresses the issue of which factors drive the observed regional variations in inappropriateness, providing an analysis of the determinants of caesarean section rates in Italy. In particular, we study the impact of both organisational variables affecting providers' behaviour and the characteristics of regional governments on "unwarranted" caesarean sections, i.e., those sections that cannot be explained by legitimate causes, such as a risk to child or mother health. To do so, we follow the approach by Baicker et al. (2006), and try to separate "appropriate" caesarean sections from "inappropriate" ones, controlling for structural aggregate indicators linked to clinical factors, like the (average) mother's age at delivery and the rate of neonatal mortality, that could make a caesarean section needed from a medical point of view. We then disentangle the impact of three groups of variables on "unwarranted" sections: 1) supply structure indicators, to take into account the role of different organisational arrangements of the hospital network, and the ability of different groups of producers to influence regional governments; 2) pricing policy indicators, such as the setting of DRG fees, to capture the role played by hospital reimbursement mechanisms; 3) political economy variables, catching some distinguishing features of regional governments, such as the political alignment with the central government and the composition of health care funding in terms of decentralised own resources and transfers from the central government. Indeed, given a constitutionally defined national regulatory framework, health policies in Italy are implemented and managed by regions in a way that reflects a complex net of intergovernmental relationships between the central and the regional governments. And the modern fiscal federalism theory suggests that the way in which different layers of government interact affects policy outcomes.

Consistently with Baicker et al. (2006), our results suggest that "appropriate" caesarean sections only partly explain regional variation in caesarean deliveries. The "unwarranted" residual variation appears to be related to policy choices and political economy variables: the pricing policy, the weight of different types of producers (public versus private), and the "quality" of regional governments are all related to inefficient spending, as proxied by caesarean sections.

The paper is linked to two different strands of literature. First, by taking an aggregate approach, it adds to patient level studies on the determinants of caesarean deliveries (see recent examples of different approaches in Maso et al., 2013a; Maso et al., 2013b; Bragg et al., 2010; Dranove and Watanabe, 2010; Ecker and Frigoletto, 2007; Fantini et al., 2006; Baicker et al., 2006; Johanson et al., 2002). Second, proposing an analysis at the regional level, the present work is also related to papers on regional variations in health care and in medical practice (e.g., Skinner, 2012, and Chandra et al., 2012 for recent surveys). In both cases, it emphasises the importance of the policies and the characteristics of local governments in a regional health care system as drivers of the observed variability in caesarean section rates.

The remainder of the paper is structured as follows. Section 2 provides a brief survey of the available literature on caesarean sections. Section 3 sets the stage, giving essential background information on the Italian case. The empirical strategy and the data are presented in Section 4, while the econometric results are discussed in Section 5. A brief section of concluding remarks follows.

2. Why are caesarean sections on the rise? A brief survey

According to recent statistics provided in the OECD (2011) Health Data, caesarean deliveries have increased at an annual growth rate of 3.2% among the OECD countries during the 2000–09 decade, reaching an average of 25.8 per 100 live births in 2009. Brazil and China are the two countries recording the highest use of caesarean sections, with about half of the total deliveries. Among Western countries, Italy, the USA, and Germany are all well above the OECD average, with 38.4, 32.3 and 30.3 of caesarean sections per 100 live births, respectively. Given this evolution over time, it is not surprising that the impact of caesarean sections on maternal and perinatal health has drawn the attention of international organisations and national policymakers (see, e.g., Lumbiganon et al., 2010 on the 2007–08 WHO global survey), as well as of academics.

Economists have been concentrated on identifying the drivers of the observed upward trend mainly taking a microeconomic approach. According to this view, many factors can help explain the increase in the incidence of caesarean deliveries (e.g., Ecker and Frigoletto, 2007). These factors can be grouped under three main categories.

[1] As we discuss below in more details, the presence of elevated risks to child or mother health is a primary reason for a caesarean section to be an *appropriate* treatment. The evaluation of such risks heavily relies upon the quality of prenatal and maternity care. Good quality can bring about early detection of complications during birth (changes in foetal heart rates, breached birth, amniotic fluid, blood pressure and oxygen changes), hence allowing for more *appropriate* caesarean sections. On the contrary, a poor prenatal and maternity care, combined with an overly interventionist medical management, can raise the number of *inappropriate* caesarean sections, increasing both the risks for mother and child, as well as inefficient spending.

[2] In particular, the Plan included among its objectives the decrease of the frequency of caesarean deliveries and the reduction of the regional differentials (p. 82). The stated goal was to achieve – by the end of the three year period – a national average equal to 20%, in line with the average values for other European countries. The reduction was to be obtained also through a revision of the DRG reimbursement fees.

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