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Demand and supply factors affecting the rising overmedicalization of birth in India



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ABSTRACT

Objective: To understand the interaction between health systems and individual factors in determining the probability of a cesarean delivery in India. **Methods:** In a retrospective study, data from the 2007–2008 District Level Household and Facility Survey was used to determine the risk of cesarean delivery in six states (Punjab, Delhi, Maharashtra, Andhra Pradesh, Kerala, and Tamil Nadu). Multilevel modeling was used to account for district and community effects. **Results:** After controlling for key risk factors, the analysis showed that cesareans were more likely at private than public institutions ($P < 0.001$). In terms of demand, higher education levels rather than wealth seemed to increase the likelihood of a cesarean delivery. District-level effects were significant in almost all states ($P < 0.001$), demonstrating the need to control for health system factors. **Conclusion:** Supply factors might contribute more to the rise in cesarean delivery than does demand. Further research is needed to understand whether the quest for increased institutional deliveries in a country with high maternal mortality might be compromised by pressures for overmedicalization.

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1. Introduction

Low- and middle-income countries need to deliver quality maternal health care, but some are faced with persistently high levels of maternal mortality and morbidity alongside rising levels of overmedicalization, which is most commonly measured by rates of nonemergency cesarean delivery [1]. The proportion of all deliveries conducted by cesarean is used as an indicator of the level of complications and access to quality obstetric care [1]. However, concerns raised about nonclinical reasons for performing this procedure are often ignored [2].

Many low- and middle-income countries are currently experiencing a double burden of inefficiency within maternal healthcare. On one hand, there is a struggle to meet the demands of Millennium Development Goal 5 (MDG 5) for increased skilled attendance at birth and institutional deliveries (MDG 5 aims to reduce maternal mortality; MDG 5b specifically uses the maternal mortality ratio and percentage of institutional deliveries as target indicators). On the other hand, increasing rates of cesarean in both the private and public sectors raise concerns about the generalized overmedicalization of delivery, which might ultimately affect the ability of countries to improve the quality of intrapartum care [3]. Lack of regulation and indiscriminate use of healthcare services are possible side effects that the push toward

meeting targets might create; they are increasing in many low- and middle-income countries [1,4].

Unnecessary cesareans place an extra burden on women and households [5], particularly in financial terms. Even in cases when the procedure is nominally free, under-the-table payments are likely; in addition, more days are spent in hospital, which can mean higher loss of earnings for the family and extra accommodation costs if the woman lives out of town, as well as the extra burden if she is cared for in a private institution [6]. The burden on institutions is also clear in terms of the extra need for equipment, infrastructure, and personnel [7]. Furthermore, the increasing incidence of cesarean delivery might hinder attempts to increase institutional deliveries (currently 67% in India) because, as demonstrated in Bangladesh, women fear that they will have a cesarean if they deliver in a hospital [8].

In India, the number of maternal healthcare interventions in general (and cesarean rates specifically) has risen sharply, but persistently high levels of maternal mortality remain [9]. In 2012, there were an estimated 67 000 maternal deaths among 28 million pregnancies in India [10]; thus, maternal morbidity and mortality are key health issues.

The current National Rural Health Mission program [11] includes interventions to improve the use of reproductive and child health services. Health service interventions include the use of conditional cash transfers to pregnant women with low incomes for institutional delivery (e.g. the Janani Suraksha Yojana [JSY] program in India [12]), with higher payments for cesarean delivery. An initial evaluation [12] showed that 4% of respondents did not use JSY services because they were afraid of unnecessary cesarean—a finding that is in line

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with women's perception of risk when using hospitals [8]. However, state-level variations notwithstanding, the JSY program resulted in an increase in the overall number of women using institutional delivery facilities in 2005–2006 and 2009–2010 [13], but many women still do not deliver in facilities. Given the surge in available obstetric services over the past decade in India, there is a need to capitalize on the gains to improve the quality of obstetric care, much of which does not meet government targets [14].

The rate of cesarean in India has increased in recent years: in some areas, it is now over 30% (unpublished data) and in many other areas it is greater than the previously WHO recommended rate of 5%–15% (Fig. 1). Whereas the proportion of women delivering by cesarean has increased, the perinatal mortality rate has not declined, which sheds doubt on the medical necessity of the increased number of procedures being performed [9].

Advances in surgical techniques have made cesarean delivery much less risky, encouraging Indian obstetricians to perform more of them [18]. Previous research in India [19] has also found that high rates of cesarean are associated with several factors: availability of facilities and trained obstetricians; source of payment for delivery (through insurance) and place of birth (private institutions); physician practice styles; obstetrician's clinical attitude and fear of litigation; and emphasis on the astrologic calendar with the demand for neonates to be born at a certain time [18,20]. However, the choice to do a cesarean is often made by the obstetric surgeon, who might be partly motivated by profit. In addition—as is happening in other countries where cesarean is becoming popular—a lack of midwives supervising deliveries may also have a role [1].

What is unclear is the balance between supply (health system) and demand (from the individual) in both public and private contexts. A study by Hopkins [21] in Brazil highlighted how rising overmedicalization of intrapartum care is often mistaken as a woman's choice. In India, few studies highlight issues regarding quality of care and decision making at the time of delivery and during the pregnancy.

The primary aim of this study was to analyze the determinants of cesarean delivery in India to examine the extent to which the increasing trend is driven by supply or demand. Secondary aims were to determine how communities affect rising cesarean rates, whether gender preference for boys matters, and how individual and health systems affect the likelihood of cesarean delivery.

2. Materials and methods

In a retrospective study, data were analyzed from the third District Level Household and Facility Survey (DLHS) done between December, 2007, and December, 2008. Births in the 3 years prior to the survey

were considered for six states or union territories: Punjab, Delhi, Maharashtra, Andhra Pradesh, Kerala, and Tamil Nadu [22]. No ethical clearance or informed consent was needed for the present study because it used secondary data that had undergone clearance [23].

The states were chosen for their cesarean rates (at least 10% at state level), regional divide (north/south), health systems' features, and gender preference for boys (Punjab, Delhi, and Maharashtra show strong boy preference [23]). Kerala, Tamil Nadu, and Andhra Pradesh are traditionally states with a low gender preference, have a large share of public expenditure as a percentage of the overall public expenditure, and also have the highest rates of caesarean delivery in the country (e.g. 31% in Kerala).

The DLHS represents a unique source of data because it allows incorporation of district-level data currently not available in standard Demographic and Health Surveys. Each state is divided into 50 primary sampling units (PSU), each containing an average of 15 districts. It is particularly important to consider district-level data, because districts are the key units in India administering the tertiary hospitals that are in charge of most cesarean deliveries. In addition, many of the public health campaigns and services are decided at district level.

Data extracted from the DLHS included socioeconomic characteristics at the household (e.g. wealth quintile) and maternal (e.g. education, residence, religion, caste, and sex of child) levels, and information on risk factors (e.g. mother's age, birth weight, previous cesarean, parity, pregnancy complications) and health-system factors (e.g. private vs public, distance to health center, and prenatal care program). For the present analysis, wealth quintiles were calculated separately for rural and urban areas in each state by the Filmer and Pritchett asset indicator, using principal component analysis to account for the weights that each asset had in the two areas [24].

Indicators of prepregnancy and postpregnancy risk factors included whether the woman received at least one warning about pregnancy complications, if the respondent was advised on where to go in case of pregnancy complications, and if the respondent had at least one complication during delivery. Age and parity were included as risk factors because evidence suggests that maternal age is positively correlated with risk of cesarean, and women with lower parity or who have had a previous cesarean are usually at higher risk of cesarean [1]. High birth weight and maternal obesity were also included as they have been associated with a high risk of cesarean [2,18]. These risk factors were included to account for all cesarean deliveries that might have been medically necessary; the net effect after controlling for these factors indicates procedures that were not necessarily needed and might be a sign of overmedicalization.

Variables describing the provision of information to women—such as whether the respondent had heard of government family-planning

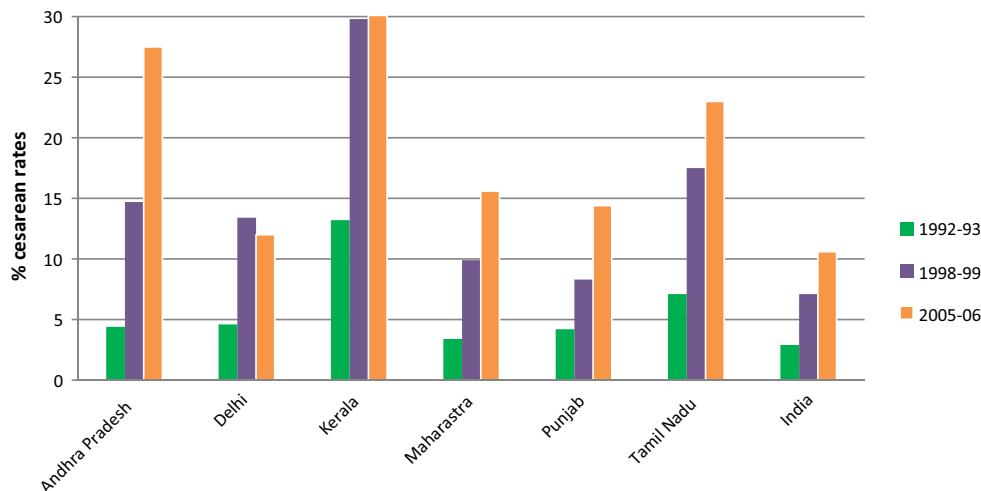


Fig. 1. Rate of cesarean delivery in selected Indian states 1992–2006. Calculations were based on data from the National Family and Health Survey (NFHS) I [15], NFHS-2 [16], and NFHS-3 [17].

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