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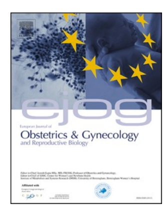

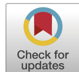

How to influence rising caesarean section rates in Europe? An invited scientific review by European Board and College of Obstetrics and Gynaecology (EBCOG)

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ABSTRACT

Over the past two decades, caesarean section rates have been steadily increasing with rates are now approaching 55% in some European countries. While caesarean section remains one of the most critical obstetric interventions, often lifesaving for both mother and newborn, it also carries significant risks for maternal and neonatal health. The growing reliance on caesarean birth is further linked to a marked decline in instrumental births, thereby limiting opportunities for future obstetric trainees to acquire essential clinical skills. This invited review offers evidence-based recommendations aimed at safely reducing the incidence of caesarean sections, without compromising the quality of care provided during childbirth.

Introduction

Caesarean section (CS) is one of the most important obstetric interventions saving health and lives in many clinical situations. Caesarean birth has become relatively safe [1,2], and therefore the threshold to opt for this mode of birth has been lowered. This paper analyses the current obstetrical practice to evaluate the possibilities of balancing the pros and cons of this operation for the continuing benefit of women and their children. Together with unquestionable positive contribution of this intervention to positive pregnancy outcomes, there are also negative consequences for mothers and babies born by CS [3–5]. Therefore, in an environment of increasing and heterogeneous trends of CS in many countries, the task to evaluate the necessity of this intervention has become very important and attempts to limit unnecessary CS are being made [6].

According to the European Perinatal Health Report 2015–2019, the median CS rate was 26.0 % in 2019 (with IQR 20.3 %, 32.7 %). However, there are remarkable differences in CS rates, ranging from 16.4 % to 53.1 % in participating countries which were able to provide nationwide data [7]. A recent systematic review and *meta*-analysis from

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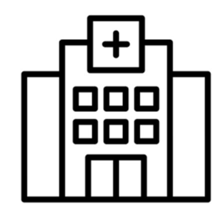
El Radaf and colleagues, encompassing almost 7 million births in Europe, found substantial regional differences in CS rates ranging from 16.9 % in Northern Europe to 43.6 % in Southern Europe [8]. The authors found that the highest contribution came from women with previous CS along with nulliparous women with breech presentation [8].

The substantial variation in CS rates across countries suggests that thresholds for opting for this mode of birth differ significantly. In countries with high CS rates, the threshold for performing a CS may be considerably lower than in those with lower rates. However, it is also important to consider that biological, social, and medicolegal factors may differ between high- and low-rate settings, potentially influencing these decisions. Therefore, the overall CS rate alone is not a sufficiently sensitive indicator to evaluate the appropriateness of CS use. A more nuanced analysis, focusing on specific subgroups of childbearing women, is necessary to better understand underlying drivers of variation. The World Health Organization (WHO) has recommended the Robson classification system [9] as the standard approach for such analyses [10]. By evaluating CS rates within clearly defined groups, it becomes possible to assess the extent of unnecessary procedures and to develop targeted interventions aimed at reducing overall CS use. The European Board and College of Obstetrics and Gynaecology (EBCOG) strongly advocates for the routine and systematic application of the Robson classification in the compilation of obstetric statistics [11].

This review aims to address some of the most important clinical and non-clinical factors that are generally involved in the decision to undertake a surgical birth. These factors play different roles in different environments, resulting in great heterogeneity of CS use across the world [12]. Table 1 elucidates several aspects in the womańs and healthcare provideŕs that influence common decision making on the mode of birth in a particular case using modified frameworks for description of patient-centred health care provision under specific environments [13–17]. Any potential interventions must consider healthcare provider and health system factors while keeping in mind the womańs personal decision about the preferred mode of birth.

Table 1
Factors influencing patient and healthcare provider decisions on mode of birth.

Patient / Client factors	Healthcare Provider factors	Environmental factors
		
• Convenience and need for control of birth process • Previous obstetric experiences • Fear of pain • Concerns about foetal harm from a vaginal birth • Concerns about safety of instrumental vaginal birth and/or emergency CS • Concerns about consequences of pelvic floor trauma during vaginal birth	• Medicolegal concerns and fears of litigations • Healthcare service insufficiencies o Insufficient staffing o Insufficient trained personnel • Convenience and financial incentives	• Perception of local population towards mode of birth • Demographic issues related to: o Biological characteristics: age, obesity, parity, low fertility rate, etc. o Woman's low fertility potential, recourse to fertility treatment o Multiple gestations • Migrant population issues

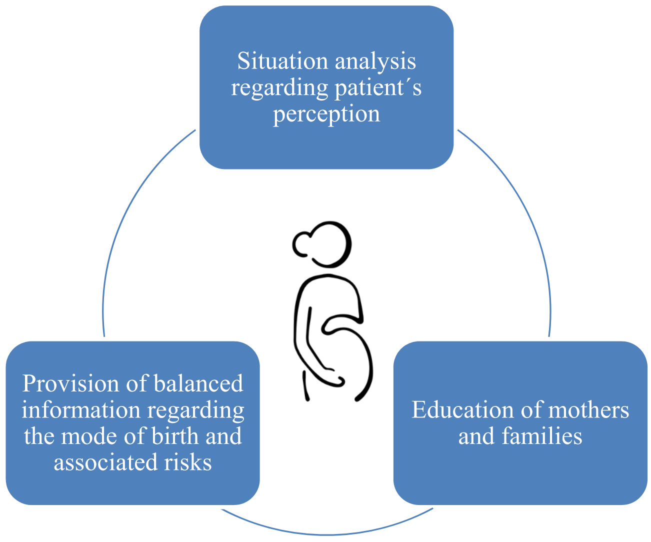
Patient/client factors

There are several patient/client factors that may influence the decision to give birth by CS. These can range from the simple need to feel in control of the birth process to sincere concerns about the potential maternal and foetal adverse consequences of a vaginal birth. These concerns need to be addressed by the healthcare provider by presenting evidence-based information highlighting that a plan for vaginal birth is safe with appropriate monitoring during the process. The potential maternal and foetal complications of vaginal birth should be fairly presented along with a balanced presentation of the short and long-term risks of embarking on a CS. While Caesarean Deliveries on Maternal Request (CDMR) should be discouraged [18], the patient must be reassured that her personal final decision about mode of birth will be respected [19]. FIGO Childbirth and Postpartum Haemorrhage Committee recommends against CDMR and highlights the importance of counselling of women and partners. Health education should be mandatory. Evidence based intrapartum care guidelines and proper reporting of CDMR are important parts of strategies to reduce CDMR [20,21]. Several factors may be influencing the patient/client's preference to undergo a non-clinically indicated surgical birth.

A. ***Convenience of scheduled birth***: For some women, it is psychologically unacceptable to go through the natural course of vaginal birth [22]. The psychological profile and support of such women needs to be assessed by appropriate professionals. There are also individuals who strongly need to continuously feel in control of the birthing process causing them to request birth on a specific day and time. This need-to-control may arise from a variety of pragmatic and practical reasons related to issues such as family-life management, work schedule of the client/patient or of her partner and other supporting relatives. These women may with sympathetic support and appropriate advice may be enticed to choose to undergo an elective induction of labour with a plan for a vaginal birth in lieu of a planned CS. It is recommended that in the absence of clinical indications, embarking on a timed birth, either through induction of labour or by planned CS, on maternal request should not be performed before a gestational age of 39 + 0 weeks [23].
B. ***Fear of pain***: Some women may request birth by CS because of an underlying morbid fear of the pain associated with the birthing process. These women should be reassured during the antenatal period about the easy availability of effective analgesia provision during vaginal birth. Such reassurance may entice the patient/client to embark on a vaginal birth process rather than opt for a CS.
C. ***Previous childbirth experiences***: Women with a history of difficult childbirth, particularly those complicated by maternal or neonatal adverse outcomes, may request a planned CS as a protective measure to avoid a recurrence of such traumatic experiences. Some may also seek a timed birth to reduce the perceived risk of unexpected late foetal death [24–26]. In these cases, a thorough analysis of the previous birth should be conducted to assess the clinical course, while the woman's personal perception and emotional response to that experience should be acknowledged with empathy. While it may be appropriate to offer reassurance regarding the low likelihood of recurrence, persistent fears and convictions expressed by the patient should be taken seriously, appreciated, and always respected.
D. ***Concerns about the need for and risks of emergency caesarean or instrumental vaginal birth***: Some women request planned CS to avoid situations during childbirth requiring the need for an intervention such as emergency CS or an instrumental vaginal birth [27].
E. ***Concerns about potential foetal complications from labour and vaginal birth***: Pregnant women are generally concerned about the health and well-being of their unborn child. There is a common perception that vaginal birth may carry a higher risk of foetal morbidity or mortality. As a result, some women may opt for a planned CS as a precautionary measure to reduce perceived risks

associated with complications such as foetal hypoxia due to prolonged labour or physical trauma during birth. This preference is more pronounced when additional risk factors, such as breech presentation, are present [28].

F. ***Concerns about trauma to the pelvic floor from labour and vaginal birth, and subsequent development of symptoms associated with pelvic organ prolapse***: Other concerns raised by women relate to trauma to the pelvic floor during vaginal birth with potential short and long-term consequences especially as this relates to sexual function, urinary continence and genital prolapse. Such issues need to be discussed with the patient/client and put into their true relative risk perspective.



ACTION POINTS AIMED AT PATIENTS/CLIENTS

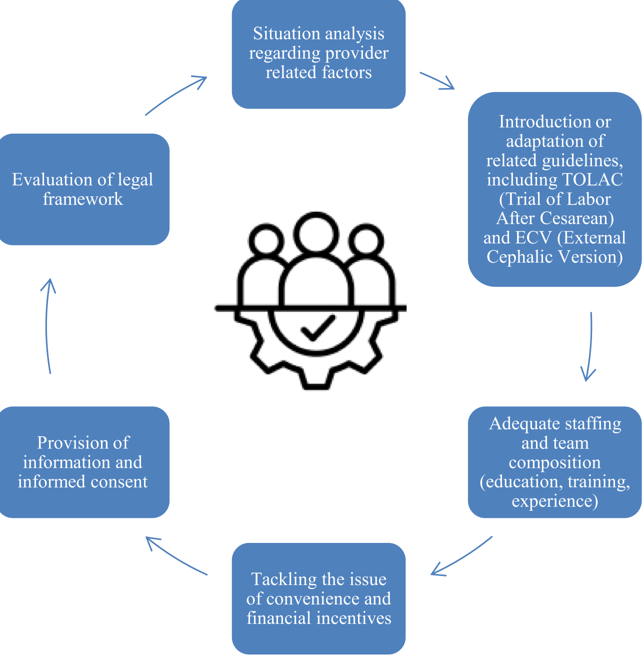
Healthcare provider related factors

Healthcare providers may also play a direct or indirect role in contributing to elevated CS rates under various circumstances. These factors may include the practice of so-called "safe obstetrics," driven by fear of litigation, as well as a lack of sufficient training or experience in managing instrumental vaginal births or interpreting intrapartum cardiotocography tracings.

A. ***Defensive care in the environment of insufficient legal protection of providers***: Healthcare providers are increasingly under pressure to ensure the birth of a "perfect" baby under all circumstances. With the sharp rise in obstetric-related litigation over recent decades [29], clinical obstetric practice has become increasingly defensive in nature. Caesarean birth is often perceived by the public as the option that involves the least trauma and risk to the newborn, as it avoids the potential complications associated with vaginal birth. Performing a CS is therefore frequently viewed as the healthcare provider's way of doing everything possible to safeguard both mother and baby. As a result, providers may feel compelled to agree to CDMR, particularly due to fears that, should complications arise during a vaginal birth, they could be held liable and face legal consequences. This pressure may not only come from the pregnant patient herself, but also from her partner or family members, further influencing the decision toward a CS. The influence of these medico-legal and social pressures can be mitigated through the use of clear, evidence-based, and locally endorsed guidelines, which offer healthcare professionals structured support in complex decision-making. Citing such standards or professional recommendations can also serve as a legal safeguard in the event of adverse outcomes. In the absence of such frameworks, providers may feel vulnerable, unsupported, and more likely to choose quick, definitive solutions, such as a CS, to manage their own uncertainty and anxiety.

B. ***Lack of sufficient expertise or services to deal effectively with obstetric complications***: The increasing tendency to perform CS in complex situations, rather than attempting instrumental vaginal birth, has contributed to the emergence of a new generation of specialists who may lack the necessary skills and confidence to manage such scenarios without resorting to CS. This is particularly evident in the management of breech presentations and twin pregnancies [28,30]. This issue is often compounded by the absence of guaranteed, round-the-clock access to adequately trained personnel and essential support services, such as anaesthesiologists, obstetricians, midwives, and neonatal care teams. Any actual or perceived gaps in this "enabling environment" can place additional pressure on providers to choose a timed caesarean, often during daytime hours when full teams are available, and the clinical setting feels more controlled and predictable. In this context, planned or early indicated caesareans during the early stages of labour may be perceived as a safer and more efficient option, minimizing time spent managing uncertain or prolonged labours and reducing perceived risks. Furthermore, the organisation of healthcare services and the functionality of referral systems play a critical role in determining service *availability* and *accessibility* across different regions. The assurance of a structured on-call schedule, including the availability of a specialist obstetrician and an operative support team, can significantly influence the eventual mode of birth [26].

C. ***Financial incentives***: It has also been hypothesized that financial incentives linked to the mode of birth may contribute to rising CS rates [31]. The WHO recommends implementing financial strategies, such as insurance reforms that equalise physician reimbursement for vaginal births and CS, only within the context of rigorous research and evaluation [32]. These strategies aim to eliminate economic biases that may inadvertently favour CS over vaginal birth. The FIGO Committee on Childbirth and Postpartum Haemorrhage recommends that differences in compensation between caesarean and vaginal births should be minimized, except in cases where the procedure involves elevated complexity or requires additional resources [33].

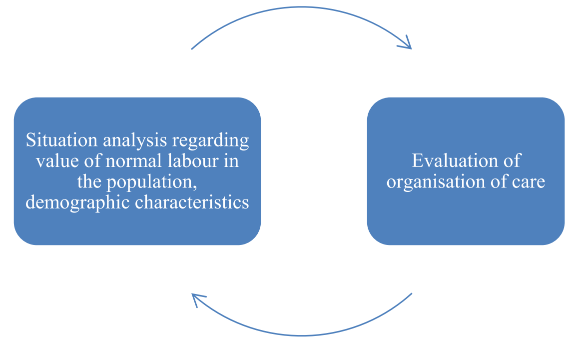


ACTION POINTS AIMED AT PROVIDERS

Environment-related factors

Several factors related to prevailing obstetric beliefs and cultural attitudes within a community can influence CS rates. These include the population's perception of operative births, the medicolegal climate, and various demographic factors.

A. ***Attitude towards operative births vis-a-vie normal vaginal births:*** Cultural and societal perceptions regarding caesareans versus normal vaginal births significantly impact CS rates, with varying effects across populations. These attitudes are shaped by community and family beliefs, particularly their acceptance or fear of instrumental vaginal births. In communities where instrumental births are viewed negatively or associated with fear and complications, there is a stronger inclination to opt for a caesarean, even in cases where a trial of labour or assisted vaginal birth may be medically appropriate. These preferences are dynamic and may evolve over time due to shifting societal norms, media influence, and personal or shared birth experiences.
B. ***Demographic and socioeconomic factors:*** The characteristics of the maternal population also play a crucial role in influencing the decision between vaginal and caesarean birth. Maternal age is a key consideration, with higher caesarean rates consistently reported among older mothers. This trend partly reflects the increased incidence of obstetric and medical complications associated with advanced maternal age [34]. Maternal age is also indirectly linked to community fertility rates; in populations with lower fertility, the implications of a primary CS on future pregnancies may carry less weight [35]. Furthermore, the use of assisted reproductive technologies (ART) is associated with an increased likelihood of CS [36]. This is partly due to the cautious approach often adopted in managing ART pregnancies and the higher prevalence of multiple gestations among ART users, both of which can increase the perceived or actual risk of vaginal birth [37]. Migration background has also been examined in relation to CS rates. Although some studies suggest that women with a migration background may have a higher risk of emergency CS, the evidence remains inconclusive. No consistent association has been demonstrated between emergency CS and migration status or maternal education level [38].



ACTION POINTS AIMED AT THE ENVIRONMENT

Curtailing unnecessary caesarean sections

Before implementing interventions to reduce unnecessary CS, it is essential to understand the specific context and the underlying factors influencing CS rates in a given region or population. There is no single universal solution. Instead, interventions should be tailored and targeted toward the three main components influencing CS rates: client-related, health care provider-related, and environment-related factors (see Table 1).

Client-related interventions should focus on promoting balanced decision-making and elevating the value of vaginal birth, particularly in the absence of medical indications for CS. One evidence-based strategy is the integration of midwife-led continuity models of care, which have been shown to reduce intervention rates and improve maternal satisfaction with care [39]. A woman's preference for a particular mode of birth is shaped by her perceptions of vaginal versus caesarean birth, influenced by cultural norms and the values of her community or sub-population. When making her decision, she also considers whether services are available and reachable (*accessibility*), financially feasible (*affordability*), culturally or personally appropriate (*acceptability*), and relevant to her clinical and emotional context (*appropriateness*). Concerns about her own and her baby's health are usually paramount, making clear, unbiased, and accessible information from healthcare providers crucial.

Healthcare providers should engage in open, respectful dialogue with their patients to understand individual preferences and the reasons behind them (*ask*). They must assess clinical and psychological factors and, based on this assessment, offer professional guidance on the most appropriate mode of birth (*advise*). Providing balanced, evidence-based information on both the benefits and risks of different delivery modes is a key component of this process. Provider-related considerations include awareness of service availability and accessibility, as well as the provider's own attitudes, values, and potential biases. Once a mutual, informed decision is reached (*agree*), the provider should support the practical arrangements for the chosen birth plan, which may include their personal involvement (*assist*). If disagreement arises, the option for a second opinion or referral to another provider must be offered. Throughout this process, respect for the woman's autonomy and adherence to ethical principles, including beneficence, non-maleficence, and justice, must be upheld [40,41].

Recommendations

In summary, the recommendations aiming at reduction of perceived unnecessary caesarean birth should consider a number of steps.

1. **Identification of the need for change:** Overall CS rates for obstetric units are generally available, but these figures represent aggregated data that fail to capture the complexity of this critical obstetric intervention. Recognising that the same rate may reflect very different scenarios, it is logical to break down the data and analyse caesarean use within specific, standard sub-groups. The WHO has endorsed the Robson Ten Groups Classification for worldwide use, as it provides well-defined, easily replicable, and mutually exclusive categories [10]. While the system effectively identifies "*who*" (obstetric or maternal characteristics), it does not address the "*why*" (the clinical reasons for the procedure, which may or may not be medically necessary) [42,43]. This approach enables the identification of subgroups with unusually high or excessive CS rates compared to other hospitals, regions, or countries, serving as an initial step before conducting more detailed analyses. However, this requires reliable data on various variables, and it is crucial that such measures be identified before any intervention is implemented.
2. **Classification of factors involved and their hierarchy:** Information regarding demographic factors, organisation of health care services and legal framework for provision of services is important and may point out factors that influence increasing CS rates. Possible interventions should be aimed at health care system and legal framework in that area.
3. **Suggestion of group-specific interventions:**
   A. *Clients' education:* Women should be well-informed about the various modes of birth, along with their associated risks and benefits. They should have clear knowledge of the available

services, with no barriers hindering their decision-making. Interventions should focus on broad population education, comprehensive antenatal care, and fostering open dialogue between women and healthcare providers. In 2018, the WHO made several context-specific recommendations for women, including childbirth training workshops, nurse-led applied relaxation programs, psychosocial couple-based prevention programs, and psychoeducation [32,44].

B. *Healthcare training provision:* Healthcare workers should be thoroughly educated and trained in all modes of birth, with special focus on trainees and young specialists [45]. They should be able to work in an enabling environment with adequate professional support, as well as with necessary technical and material resources. Updated guidelines and recommendations for specific clinical situations, endorsed by relevant authorities, should always be available. Healthcare workers should be free to exercise their professional expertise without fear of unjustified litigation. Their decisions should not be influenced by differential remuneration for different modes of birth. Additionally, factors that contribute to provider decisions based on personal convenience should be minimised. The WHO recommends the implementation of evidence-based clinical practice guidelines, CS audits, and timely feedback to healthcare professionals to reduce unnecessary caesareans. When appropriate, this should be combined with a structured, mandatory second opinion for CS indications [32,44]. FIGO emphasises the need to educate physicians, staff, and patients that caesarean birth should only be performed when vaginal birth is not safely feasible [33].

C. *Environmental community factors*: To reduce unnecessary CS, it is essential to promote positive attitudes toward vaginal and instrumental births by addressing community and familial fears and misconceptions, thereby minimising the default preference for CS in non-medically indicated cases. Increasing both public and professional awareness of how demographic factors, such as advanced maternal age and low fertility rates, can also influence CS decisions and support more balanced, individualised counselling. Clear, evidence-based guidelines should be developed for pregnancies conceived through ARTs to prevent unnecessary surgical interventions, particularly in singleton pregnancies. Disparities in emergency CS rates among migrant populations should be carefully monitored and addressed through culturally sensitive care, without making assumptions about causality based on migration status. Importantly, communication and birth planning strategies must evolve in response to shifting societal trends and expectations to ensure that maternity care remains responsive and equitable.

4. **Evaluation of impact:** All interventions mentioned above should have a measure to evaluate an impact under the framework of surveillance cycle. It requires a system of data collection, analysis and reporting.

Conclusion

Caesarean rates vary widely across the globe, reflecting differences in clinical practice, healthcare systems, cultural norms, and access to services. While there is no universally accepted “safe” threshold for CS rates, there is strong consensus that surgical intervention should not be performed unless it is medically justified. Efforts to reduce unnecessary caesarean births must focus on identifying and addressing situations where surgery can be safely avoided without compromising maternal or neonatal outcomes. As amply mentioned in this review, multiple factors contribute to the overuse of CS, and these can be categorised into patient/client centred, healthcare provider related, and environmental influences. The potential for change within each category varies depending on the local context. Therefore, any policy or intervention aimed at reducing CS rates should be evidence-based, context-specific, and strategically focused on areas with the greatest potential for positive impact. Such targeted approaches are more likely to result in sustainable improvements in CS rates, while ensuring the highest possible standard of maternal and newborn care.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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