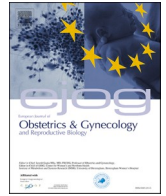


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## EUROPEAN ASSOCIATION OF PERINATAL MEDICINE (EAPM) EUROPEAN MIDWIVES ASSOCIATION (EMA) Joint position statement: Caesarean delivery rates at a country level should be in the 15-20 % range

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### ABSTRACT

While cesarean deliveries performed for health indications can save lives, unnecessary cesareans cause unjustifiable health risks for the mother, newborn, and for future pregnancies. Previous recommendations for cesarean delivery rates at a country level in the 10–15% range are currently unrealistic, and the proposed concept that striving to achieve specific rates is not important has resulted in a confusing message reaching healthcare professionals and the public. It is important to have a clear understanding of when cesarean delivery rates are deviating from internationally acceptable ranges, to trigger the implementation of healthcare policies needed to correct this problem. Based on currently existing scientific evidence, we recommend that cesarean delivery rates at a country level should be in the 15–20% range. This advice is based on the demonstration of decreased maternal and neonatal mortalities when national cesarean delivery rates rise to *circa* 15%, but values exceeding 20% are not associated with further benefits. It is also based on real-world experiences from northern European countries, where cesarean delivery rates in the 15–20% range are associated with some of the best maternal and perinatal quality indicators in the world. With the increase in cesarean delivery rates projected for the coming years, experience in provision of intrapartum care may come under threat in many hospitals, and recovering from this situation is likely to be a major challenge. Professional and scientific societies, together with healthcare authorities and governments need to prioritize actions to reverse the upward trend in cesarean delivery rates observed in many countries, and to strive to achieve values as close as possible to the recommended range.

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## Introduction

It is well established that, while cesarean deliveries performed for health indications can reduce maternal and fetal morbidity, and sometimes even save lives, unnecessary cesareans cause unjustifiable health risks. The increased risks of cesarean delivery, for both mother and newborn, are well documented in a large number of observational studies [1]. Among the maternal complications occurring more frequently in cesarean than in vaginal deliveries are abdominal pain, bladder injury, ureteric injury, hysterectomy, thromboembolic disease, readmission to hospital, and death. In future pregnancies there are increased incidences of placental abruption, placenta previa, placenta accreta, uterine rupture, stillbirth, preterm birth and hysterectomy. For the newborn, caesareans carry increased risks of hypoglycemia, respiratory distress, and diminished breastfeeding. They are also associated with a greater prevalence of type 1 diabetes, asthma and obesity in childhood [1], although whether this represents a causal relationship remains uncertain.

When a comparison is made between low-risk women intending to have a cesarean delivery and those intending to have a vaginal delivery, the former increases the risk of overall severe morbidity, hemorrhage requiring hysterectomy, anesthetic complications, cardiac arrest, postpartum venous thromboembolism, major postpartum infection, in-hospital wound disruption, and obstetric wound hematoma [2].

In 1985, the World Health Organization (WHO) convened a group of experts in Brazil who concluded that “there is no justification for any country or region to have a caesarean section rate higher than 10–15 %” [3]. Despite this recommendation, all high-resource countries, including northern European countries known for their low cesarean delivery rates, have had for many years rates exceeding 15 % [4]. The WHO convened a second expert meeting in Geneva in 2014, with the objective of establishing its current position on cesarean delivery rates or ranges [5]. The conclusion was that “every effort should be made to provide cesarean sections to women in need, rather than striving to achieve a specific rate”. A further conclusion was that “at population level, cesarean section rates higher than 10 % are not associated with reductions in maternal and newborn mortality rates” [6].

Several observational studies have compared cesarean delivery rates at a country level with maternal and neonatal mortality, both in high- and low-resource settings [7–9]. These studies have consistently shown that countries with cesarean delivery rates below the 10–15 % range have higher maternal and neonatal mortalities, but no further improvement is observed when the 15–20 % interval is exceeded. In a study evaluating delivery-related deaths due to fetal hypoxia in Scotland between 1988 and 2007, higher values were observed in the years when cesarean delivery rates were below 15 %, but no benefit was seen when these exceeded 20 % [10]. In a worldwide online survey of obstetricians’ opinions regarding the optimal cesarean delivery rate at a country level, the median reported value was 20 % (interquartile range 15–30 %) [11].

In contrast to these figures, a WHO evaluation of cesarean delivery rates in 2018 reported values in Europe of 25.7 %, North America 31.6 %, Northern Africa 32.0 %, Australia and New Zealand 33.5 %, Eastern Asia 33.7 % and South and Central America 42.8 % [12]. Projections for 2030 were for a cesarean delivery rate in North America of 33.8 %, Europe 36.5 %, Australia and New Zealand 45.0 %, Northern Africa 48.1 %, Latin America and the Caribbean 54.3 %, and Eastern Asia 63.4 %.

Leading scientific societies have recently published statements drawing attention to the worldwide increase in cesarean delivery rates, and classifying this as a major public health concern [13–16]. Unfortunately, they have had little effect in many countries. While cesarean delivery rates have stabilized in northern Europe and in North America, a similar trend was not observed in the rest of the world [12]. We believe that a part of this is due to the fact that a clear message is lacking on what are acceptable cesarean delivery rates at a country level. Unrealistic recommendations to aim for rates below the 10–15 % range, and

the concept that striving to achieve a specific rate is not important, have resulted in a confusing message reaching the healthcare community and the public. Policy makers have ceased to have a clear understanding of whether their countries’ rates are or not considered acceptable. This has led to hesitation in developing specific policies to combat the problem, and to a devaluation and disinterest in this topic. The first step in tackling a problem is recognizing that it exists. It is important to have a clear understanding of when national cesarean delivery rates are deviating from internationally acceptable ranges, to trigger the implementation of healthcare policies needed to revert the situation.

## Recommendation

Based on currently existing scientific evidence, we recommend that cesarean delivery rates at a country level should be within the 15–20 % range. This advice is based on observations of decreased maternal and neonatal mortalities when national cesarean delivery rates rise to *circa* 15 %, but values exceeding 20 % are not associated with further benefit [7–9]. It is also based on real-world experiences from northern European countries, where cesarean delivery rates in the 15–20 % range are associated with some of the best maternal and perinatal quality indicators in the world [17].

It is important to take into consideration that, with the increase in cesarean delivery rates projected by the WHO for the end of the current decade [12], knowledge and experience in provision of intrapartum care may come under threat in many hospitals. Once individual centers reach cesarean delivery rates in the 60–80 % range, it may be difficult to maintain intrapartum care skills, to preserve the experience and confidence of healthcare professionals in management of vaginal deliveries and their complications. Recovering from this situation is likely to be a major challenge. The obstetric community has already witnessed similar difficulties in attempts to reintroduce vaginal breech deliveries and twin vaginal deliveries. In some countries, there are great difficulties in introducing instrumental vaginal deliveries.

In many parts of the world, there are individuals and organizations that have time-management and financial benefits in performing cesarean deliveries, and therefore have little or no interest in opposing this epidemic. There needs to be a strong, clear, and unanimous message from the scientific community, alerting the public to the increased health risks of performing unnecessary cesarean deliveries. This message needs to be of sufficient magnitude to capture the attention of the public and policy makers.

There also needs to be increased awareness that the skills and the collective image of obstetricians and midwives are at stake. The interests of women and their babies need to be defended, financial interests need to be opposed, intrapartum care competencies need to be maintained, and the possibility of women having vaginal deliveries in the future needs to be protected. We urge other scientific institutions to support this position statement and to help disseminate a clear message that cesarean delivery rates at a country level should be in the 15–20 % range. Professional and scientific societies, together with healthcare authorities and governments need to prioritize actions to reverse the upward trend in cesarean delivery rates observed in many countries, and to strive to achieve values as close as possible to the recommended range.

## 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.

## References

- [1] Keag OE, Norman JE, Stock SJ. Long-term risks and benefits associated with cesarean delivery for mother, baby and subsequent pregnancies: systematic review and meta-analysis. *PLoS Med* 2018;15:e1002494.
- [2] Liu S, Joseph LRM, KS, Heaman, M., Sauve, R., Kramer, MS.. Maternal mortality and severe morbidity associated with low-risk planned cesarean delivery versus planned vaginal delivery at term. *CMAJ* 2007;176(4):455–60.
- [3] World Health Organisation. Appropriate technology for birth. *Lancet* 1985;2(8452):436–7.
- [4] Zizza A, Tinelli A, Malvasi A, Barbone E, Stark M, De Donno A, et al. Cesarean section in the world: a new ecological approach. *J Prev Med Hyg* 2011;52(4):161–73.
- [5] Betran AP, Torloni MR, Zhang JJ, Gülmezoglu AM for the WHO Working Group on Caesarean Section. WHO statement on caesarean section rates. *BJOG* 2016;123(5):667–70.
- [6] WHO statement on caesarean section rates. 14 April 2015. <https://www.who.int/publications/i/item/WHO-RHR-15.02> [accessed 14th May 2023].
- [7] Ye J, Zhang J, Mikolajczyk R, Torloni MR, Gülmezoglu AM, Betran AP. Association between rates of caesarean section and maternal and neonatal mortality in the 21st century: a worldwide population-based ecological study with longitudinal data. *BJOG* 2016;123(5):745–53.
- [8] Althabe F, Sosa C, Belizán JM, Gibbons L, Jacquerioz F, Bergel E. Cesarean section rates and maternal and neonatal mortality in low-, medium-, and high-income countries: an ecological study. *Birth* 2006;33(4):270–7.
- [9] Molina G, Weiser TG, Lipsitz SR, Esquivel MM, Uribe-Leitz T, Azad T, et al. Relationship between cesarean delivery rate and maternal and neonatal mortality. *JAMA* 2015;314(21):2263–70.
- [10] Pasupathy D, Wood AM, Pell JP, Fleming M, Smith GCS. Rates of and factors associated with delivery-related perinatal death among term infants in Scotland. *JAMA* 2009;302(6):660–8.
- [11] Cavallaro FL, Cresswell JA, Ronsmans C. Obstetricians' opinions of the optimal caesarean rate: a global survey. *PLoS One* 2016;11(3):e0152779.
- [12] Betran AP, Ye J, Moller AB, Souza JP, Zhang J. Trends and projections of caesarean section rates: global and regional estimates. *BMJ Glob Health* 2021;6(6):e005671.
- [13] American College of Obstetricians and Gynecologists, Society for Maternal-Fetal Medicine, Caughey AB, Cahill AG, Guise JM, Rouse DJ. Safe prevention of the primary cesarean delivery. *Am J Obstet Gynecol* 2014;210(3):179–93.
- [14] European Board and College of Obstetrics and Gynaecology. EBCOG position statement on caesarean section in Europe. *Eur J Obstet Gynecol Reprod Biol* 2017;219:129.
- [15] World Health Organisation. WHO recommendations on non-clinical interventions to reduce unnecessary cesarean sections. <https://www.who.int/publications/i/item/9789241550338> [accessed 14th May 2023].
- [16] International Federation of Gynecology and Obstetrics, Visser GHA, Ayres-de-Campos D, Barnea ER, de Bernis L, Di Renzo GC, Escobar Vidarte MF, et al. *Lancet* 2018;392(10155):1286–7.
- [17] EUROPERISTAT: European perinatal health report – core indicators of the health and care of pregnant women and babies in Europe from 2015 to 2019. [https://www.europeristat.com/images/Euro-Peristat\\_Fact\\_sheets\\_2022\\_for\\_upload.pdf](https://www.europeristat.com/images/Euro-Peristat_Fact_sheets_2022_for_upload.pdf) [accessed 14th May 2023].