What are the implications of using Robson's classification system in a Moroccan case study?

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Abstract. Today, cesarean section rates are increasing worldwide for varied and complex reasons. To examine this more closely, several countries have adopted the 10-group classification of cesarean sections, also known as the Robson classification. This classification aims to monitor and compare cesarean section rates in a standard, reliable, and indication-based way. In the vision of improving the quality of care and especially rationalizing cesarean section rates, this descriptive and retrospective study, which lasted ten months, considered a population of parturients who had given birth by cesarean section at the maternity ward of the Cheikh Khalifa Hospital in Casablanca. Using Robson's classification system, data on deliveries can be compared between different regions of Morocco or between different time periods. This allows assessment of trends, geographic outcomes, and temporal variations in environment-related obstetric outcomes, which can help identify specific maternal health issues and develop targeted policies. We first listed all cesarean deliveries and then classified them into ten groups (Robson's classification) to highlight the contribution of each group to the overall cesarean rate and to explain the discrepancies for which we proposed recommendations. This study considered 890 cases, of which 541 required a cesarean section, a 61% rate higher than that recommended by the WHO (15%) and the national rate (21%). Robson's classification identified group 10 as contributing most to the overall cesarean rate (43.4%). Namely, this group included singleton pregnancies with a cephalic presentation, gestational age < 37 weeks, and a scarred uterus. This group's relative size and cesarean section rate were 68% and 63%, respectively. Cesarean section should be considered a surgical procedure, considering the potential maternal and neonatal risks involved and ensuring that the indication for cesarean section is tangible, based on the Robson classification, among other things.

Keywords: Cesarean section, Cesarean section rate, Robson classification, maternal and neonatal health.

1. INTRODUCTION

Several efforts have been made to improve maternal and neonatal health in Morocco. Thus, achieving a successful pregnancy and giving birth to a healthy child is now a health priority to reduce maternal and neonatal mortality [1].

It must be said that pregnancy and childbirth put women at mortal risk [2]. And this risk has not ceased to haunt obstetricians. It has led to ongoing research to achieve the best conditions for a favorable outcome of pregnancy and childbirth [3]. The use of the Robson classification system in an environment-related case study in Morocco can facilitate data collection, maternal health surveillance, data comparison, health service planning and research in the field of maternal health. This allows for a better understanding of the implications of the environment. The possibility of using several medical techniques, such as Cesarean section, has allowed Morocco to make significant progress in the field [4].

The main objective of a Cesarean section is to prevent maternal and neonatal mortality and morbidity [3]. It used to be reserved for significant dystocia and has become a standard intervention. Indeed, its frequency has been steadily increasing in recent decades despite the World Health Organization (WHO) recommendations not to exceed 15% [5].

In Morocco, the Cesarean section rate has increased significantly from 8.6% to 21% between 2005 and 2018. According to National Population and Family Health Survey data [6], the C-section rate in Morocco was 21% (26.3% in urban areas and 12.9% in rural areas). It should be noted that Cesarean sections are much more practiced in the private sector than in the public sector (62.2% in the private sector and 12.2% in the public sector) [6]. More specifically, at the Grand Casablanca site of Sheikh Khalifa Hospital, the location of this study, this rate rose from 13.6% to 20.5% between 2005 and 2018 [6,7]. It should be noted that this rate varies not only from one country to another but also from one hospital to another and even from one team to another within the same hospital.

Faced with an alarming increase in the rates, which inevitably lead to increased costs, several questions are being asked about the abuse of Cesarean sections. In Morocco, the rise in Cesarean deliveries is a cause for concern, given the additional and unnecessary risk they represent as a surgical intervention [5] and their potential risks for maternal and neonatal health [8,9]. Unnecessary cesarean sections represent a significant expense for overburdened and weakened health systems. As a result, their cost is a barrier to ensuring equitable maternal and newborn care access. The lack of an internationally accepted classification with a standard system for monitoring and comparing Cesarean section rates consistently and action-oriented prevented a better understanding of the trend of increasing Cesarean Sections (CS) [10].

The Robson classification has been adopted since 2015 as a universal classification system for Cesarean sections [5,10]. It consists of classifying Cesarean sections into ten groups and remains based on simple obstetric parameters (previous CS parity, gestational age, onset of labor, fetal presentation, and several fetuses). In this sense, our study used Robson's classification to study doctors' practices regarding Cesarean sections in the maternity ward of Sheikh Khalifa Hospital and to identify areas for improvement that could rationalize the method of Cesarean sections.

2. METHODS

The design of our study is descriptive and retrospective on the population of parturients who gave birth by cesarean section at the maternity ward of the Sheikh Khalifa Hospital in Casablanca. The choice of the Sheikh Khalifa Hospital in Casablanca was guided by the considerable increase in the cesarean section rate in the Greater Casablanca region. Indeed, this rate increased from 13.6% to 20.5% between 2005 and 2018 [6, 7, 11, 12].

Our study used Robson's 10-group classification at Sheikh Khalifa Hospital in Casablanca, the largest private hospital in the Kingdom, to investigate cesarean section practices.

First, we listed all deliveries performed at Sheikh Khalifa Hospital, including cesarean sections. According to Robson's classification, we classified the cesarean deliveries into ten groups. We then identified the contribution of each group to the overall cesarean section rate while noting potential discrepancies.

Data were extracted from the operating theatre and delivery room registers. Using a questionnaire containing socio-demographic data (identity, age, socio-economic level,

etc.), gynaeco-obstetrical history (specifying parity, previous modes of delivery, etc.), and Robson's classification criteria, the ten categories of women who had a cesarean section were defined. Following a pre-test of the questionnaire it was filled out for all women who gave birth at the maternity ward of the Sheikh Khalifa Hospital in Casablanca. Note that Robson's classification, recognized by several experts as the most reproducible and most accessible to use [13,14], allows the comparison of cesarean section rates within ten mutually exclusive groups and is based on five obstetrical characteristics: 1) parity (nulliparous, multiparous with and without previous cesarean); 2) onset of labor (spontaneous, induced, or no labor after a scheduled cesarean section); 3) gestational age; 4) fetal presentation; 5) and several fetuses. All the information collected was categorized into variables, entered into SPSS v22, and analyzed according to the Robson classification. The Review Board Institution approved our study under No. 8245/2020.

3. RESULTS

Our study recruited 890 parturients, with an average age of 30 years 15; 47. Approximately 90% of the women were Moroccan, with 2.2% of the women sub-Saharan. Casablanca women represent 92% of Moroccan women giving birth. More than 98% of women in labor are married, and 94% of women in labor have medical coverage.

All women in labor have less than two children. It should be noted that 48% of women in labor are primiparous and that 86% of women in labor have never had a cesarean section. This section will present the results relating to the epidemiological aspects specific to our study population, whose most predominant age group, 75%, is 20-34 years. During the study period, 890 parturients attended the maternity ward of Sheikh Khalifa Hospital in Casablanca for delivery, i.e., a monthly average of 49 deliveries, corresponding to 1.6 deliveries per 24 hours. The number of cesarean sections performed during this period was 541, or 61%. This is still higher than that recommended by the World Health Organization. By adopting Robson's classification, out of 890 parturients, 541 cesareans were classified according to Robson's ten classification groups, as shown in Table N°1.

Table N°1: *Ranking of cesarean women in our series according to Robson's ten ranking groups*

		group			
Group 1	Nulliparous, single pregnancy, cephalic presentation, gestational age ≥ 37 weeks, spontaneous labor	13/59	59/890 (6,6%)	22%	13/890(1,5%)
Group 2	Nulliparous, single pregnancy, cephalic presentation, gestational age ≥ 37 weeks, with an induction of labor or scheduled cesarean section before labor	42/52	52/890 (6%)	81%	42/890 (4,7%)
Group 3	Multiparous, no scarred uterus, single pregnancy, cephalic presentation, gestational age ≥ 37 weeks, spontaneous labor	3/47	47/890(5,3%)	6,4%	3/890(0,3%)
Group 4	Multiparous, no scar uterus, single pregnancy, cephalic presentation, gestational age ≥ 37 weeks, with induction of labor or scheduled cesarean section before labor	12/27	27/890(3%)	44,4%	12/890(1,3%)
Group 5	All multiparous women with at least one uterine scar, single pregnancy, cephalic presentation, gestational age ≥ 37 weeks	43/51	51/890 (5,7%)	84%	43/890(4,8%)
Group 6	All nulliparous, single pregnancy, breech presentation	18/18	18/890(2%)	100%	18/890(2%)
Group 7	All multiparous, single pregnancy, breech presentation, including scar uterus	7/7	7/890(0,8%)	100%	6/890 (0,8%)
Group 8	All multiple pregnancies, including scar uterus	16/19	19/890 (2,1%)	84%	16/890 (1,8%)
Group 9	All single pregnancies with a transverse or oblique presentation, including women with a history of cesarean section	1/1	3/890 (0,1%)	100%	3/890(0,1%)
Group 10	All singleton pregnancies with a cephalic presentation, gestational age < 37 weeks, including scar uterus	386/609	609/890(68%)	63%	386/890(43,4%)

We obtained a different cesarean rate in each of the 10 Robson groups, as follows: Group1(22%), Group2(81%), Group3(6.4%), Group4 (44.4%), Group5(84%), Group6 (100%), Group7(100%), Group8(84%), Group9(100%), Group10(63%). The contribution of each group to the overall cesarean rate is: Group1(1.5%), Group2(4.7%), Group3(0.3%), Group4(1.3%), Group5(4.8%), Group6(2%), Group7(0.8%), Group8(1.8%), Group9(0.1%), Group10(43.4%).

Group 10 contributed the most to the overall cesarean rate, 43.4%.

4. DISCUSSION

The increase in the cesarean section rate

The cesarean section rate in our study is 61%. It remains very high compared to several national series (Rabat, Casablanca) [6,12], i.e., out of 10 deliveries, 6 are cesarean sections with expenses increasing by ten times from 2006 to 2017 estimated losses of 70 MDH per year.

Compared to international series, especially in African countries, this rate remains very high [15]. Moreover, according to the OECD report published in 2017, unnecessary cesarean sections and the waste they generate represent 20% of health expenditure.

Indeed, this rate contrasts with the WHO recommendations (maximum rate of 15%), the average of the 36 countries adhering to the Organisation for Economic Co-operation and Development (27.9%) according to a WHO report published in 2018 with their expenditure rising from 13 MDH in 2006 to 130 MDH in 2017 [16]. We note that cesarean deliveries are gaining ground in Morocco. Thus, they evolved from 13.6% to 20.5% between 2005 and 2018 [6, 12].

Internationally, this trend is also marked by variations in the increase in the cesarean section rate across different countries worldwide. In Africa, for example, the rate is only 3.5% on average, and for structural reasons, these rates remain abnormally low and therefore dangerous [17,18]. However, in other countries, such as Latin America, these rates are becoming unusually high (29.2%) due to a particular fashion effect [19].

In this sense, and according to a WHO report published in 2018, the average of the 36 countries adhering to the Organisation for Economic Co-operation and Development is 27.9%, including Turkey, France, Japan, Germany, Spain, etc. and countries such as Egypt (55.5%), Argentina (43.1%) or Colombia (36.9%) [16].

The increase in the cesarean section rate is a phenomenon that is now a public health priority because it influences social security and health insurance funds but also on the state of health of particular women; cesarean sections are considered, when not indicated, as morbidity according to the international classification ICD-11 (Code 034.21).

Indeed, a cesarean section is a surgical act that exposes the woman to the risk of maternal and sometimes even neonatal complications. A cesarean section in a primiparous woman condemns her to undergo other cesarean sections for future pregnancies [20].

The inflation of the C-section rate can be explained by factors other than medical causes. These factors can be explained by poor practices of doctors and social pressure from the patient and her relatives [21]. Other determinants may be related to the fear of malpractice penalties associated with possible negative results in a standard delivery [22, 23].

Interpretation of the results with the reference framework

To better interpret the results of our study, we used Robson's ten-group classification [24] as a framework. This table details the comparison of our results to this framework.

Table N°2: *Comparative table with a reference framework*

Groups	Number of CS out of total women in each group	Relative group size (%)	Norm	CS rate in each group (%)	Norm	Contribution of each group to the overall CS rate of 61%	Norm
Group 1	13/59	59/890 (6,6%)	GR1+GR2= 35-42%	22%	<10%	13/890(1,5%)	Groups 1, 2, and 5 usually contribute to two-thirds of the overall cesarean rate.
Group 2	42/52	52/890 (6%)		81%		42/890 (4,7%)	
Group 3	3/47	47/890(5,3%)	GR3+GR4= 30 to 40%	6,4%	< or equal to 3%	3/890 (0,3%)	
Group 4	12/27	27/890(3%)		44,4%	5 à 8%	12/890(1,3%)	
Group 5	43/51	51/890 (5,7%)	A rate<10% means a low cesarean rate	5,7%	50 à 60%	43/890(4,8%)	
Group 6	18/18	18/890(2%)	GR6+GR7= 3-4%	100%		18/890(2%)	
Group 7	7/7	7/890(0,8%)		100%		6/890 (0,8%)	
Group 8	16/19	19/890 (2,1%)	1,5 to 2% of women	84%	should be 60%	16/890 (1,8%)	
Group 9	1/1	3/890 (0,1%)	0,4 to 0,8%	100%		3/890(0,1%)	The contribution to the overall rate is small but essential for assessing the quality of data collection.
Group 10	386/609	609/890(68%)	4 to 5%	63%	100%	386/890(43,4%)	

Robson's classification distinguishes women according to several levels of obstetrical risk. The first 4 groups can be considered women at low risk of the cesarean section, while the other 6 are at high risk [20,25].

In our study, the relative size of parturients with spontaneous labor is 6.6%, which is a small size rate. Its contribution to the overall cesarean section rate was 1.5%. The small size of this group can be explained by dysfunction (under-reporting) and very restrictive

indications for cesarean section. The cesarean section rate of this group 1 should be less than 10%. However, it 22% in our study corresponds a high cesarean rate.

According to the standards, groups 1, 2, and 5 contribute to two-thirds of the overall cesarean section rates. In our study, they contribute 11%.

Women with labor induction or cesarean section before labor have a cesarean section rate of 81%, which means more labor inductions or scheduled cesarean sections before delivery. This group 2 contributes 4.7% to the overall cesarean rate.

According to standards, group 1 plus 2 usually contains 35-42%. This rate is 12.6% of our study's total number of parturients. This small size may be due to inappropriate data collection. The standard cesarean section rate should be less than 3% in multiparous women without a scarred uterus with spontaneous labor. In our study, it is 6.4% indicating a high cesarean rate.

According to the standard, groups 3 and 4 combined usually contain 30-40% of parturients. In our study, these groups represent a rate of 8.3%.

In multiparous women, without a scarred uterus, with an induction of labor or scheduled cesarean section before labor, the cesarean section rate should be 5 to 8%. Our study corresponds to 1.3%. This indicates that the number of pre-labor cesarean sections is low in this group 4. This may be due to inappropriate data collection.

In parturients with at least one previous cesarean section, the size of this group 5 is 5.7%, less than 10%, signifying a low cesarean section rate in the history. This group represents the 2nd highest C-section rate contributing to the overall C-section rate during the study period. The C-section rate should be 50-60%, but it is 84% in our study.

In nulliparous women, the cesarean rate is 2%, and the contribution to the overall cesarean rate is low, at 2%. The norm is that groups 6 and 7 combined rates should be between 3-4%. In our study, the relative size is 2.63%.

In multiparous, single pregnancy, breech presentation, scar uterus included, the cesarean rate is similar to group 6.

The group of parturients with multiple pregnancies, including the scarred uterus, is heterogeneous. The relative size of this group is 2.1%, in line with the norm of 1.5-2%. The cesarean rate should be 60% in this group, but 84% in our study. It contributes to the overall cesarean rate with a rate of 1.8%.

In parturients with single pregnancies and transverse or oblique presentation, including women with a history of cesarean section, the relative size of this group should be 0.2 to

0.6%, and the cesarean section rate should be 100%. Our study's relative height is 0.1%, but the cesarean rate is similar to the norm (100%).

The contribution to the overall rate is small but essential for assessing the quality of data collection.

In parturients with singleton pregnancies, cephalic presentation, gestational age < 37 weeks, and scarred uterus included, the size of this group is 3.58%, which is lower than the average 4-5%.

The cesarean rate in this group is 63%. It is considered excessive as this rate should not usually exceed 10%. It contributes with a rate of 43.4% to the overall cesarean rate in our study.

Our results show that collecting the necessary data and applying Robson's classification can be done efficiently.

Indeed, the Robson classification of the obstetric dataset allows an assessment of trend factors in using cesarean section and an evaluation of the data quality available in the medical records [24].

In this sense, efforts to reduce unnecessary obstetric interventions and wait for spontaneous labor should be considered [24,26]. Therefore, actions should be taken at this level to have an optimal cesarean section rate adapted to the characteristics of Sheikh Khalifa Hospital.

Comparative status of the different Robson groups in other series

In this country comparison, the CS rate is higher in our series (61%), close to that of the Indian study with a rate of 60.52%, followed by Brazil and Ethiopia with recorded rates of (55.6% and 34.7%).

In our series, group 10 (composed of all singleton pregnancies with the cephalic presentation, gestational age < 37 weeks, including scar uterus) contributed significantly to the overall CS rate with 43.4% and a cesarean rate in this group of 63%.

Compared to Brazil and Ethiopia, this rate is at most 6%, let alone India, where the rate does not exceed 4%. This could be explained by Cheikh Khalifa Hospital being a private hospital. Namely, in Morocco, the C-section rate in private clinics is relatively high, with an average of 61% [6].

Group 5 (composed of all multiparous women with at least one uterine scar, single pregnancy, cephalic presentation, gestational age ≥ 37 weeks) is the group that contributed with the highest proportion to the overall cesarean section rate in Brazil (21.40%), India

(9.09%), Ethiopia (5.90%), and Morocco (4.80%) with cesarean section rates of 83.73%, 95.67%, 62.70%, and 5.70% respectively.

Usually, groups 1, 2, and 5 contribute to the overall cesarean section rates in one way or another depending on the countries present in this comparison with different rates. Indeed, we found that this contribution did not exceed 20% for Morocco, while in Brazil, it is over 60% with a rate of 75%, followed by India and Ethiopia with respective rates of 50% and 46%.

This low proportion in our series is explained by the predominance of group 10 in the contribution to the overall cesarean rate. This group represents non-indicated cesarean sections. This situation could be related to non-medical factors. These factors would be related to bad practices and especially social pressure often exerted by the patient and her relatives [21] concerning desired pregnancies and the increasingly delayed age of marriage [30]. Also, other determinants may be related to the fear of malpractice penalties related to possible untoward consequences in a standard delivery [22].

Countries		**Ethiopia [27]**	**Brazil [28]**	**India [29]**	**Morocco (study series)**
Overall C-section rate (%)		**34.7**	**55.6**	**60.52**	**61**
Group 1	**Relative size (%)**	26.7	17.21	38.08	6.6
	CS rate (%)	13.9	19.10	41.75	22
	Contribution to the overall CS rate (%)	3.7	3.29	15.9	1.5
Group 2	**Relative size (%)**	8.8	21.69	6.69	6
	CS rate (%)	72.6	74.59	60.52	81
	Contribution to the overall CS rate (%)	6.4	16.18	4.04	4.7
Group 3	**Relative size (%)**	22.2	14.05	23	5.3
	CS rate (%)	7.1	5.50	24.48	6.4
	Contribution to the overall CS rate (%)	1.6	0.77	5.63	0.3
Group 4	**Relative size (%)**	7.8	5.45	3.28	3
	CS rate (%)	70.6	42.6	33.92	44.4
	Contribution to the overall CS rate (%)	5.5	2.32	1.11	1.3
Group 5	**Relative size (%)**	9.5	25.56	9.5	5.7
	CS rate (%)	62.7	83.73	95.67	5.7
	Contribution to the overall CS rate (%)	5.9	21.40	9.09	4.8
Group 6	**Relative size (%)**	2.2	1.80	1.87	2
	CS rate (%)	51.1	92.86	65.62	100
	Contribution to the overall CS rate (%)	1.1	1.68	1.23	2
Group 7	**Relative size (%)**	2.4	1.84	1.34	0.8
	CS rate (%)	55.4	94.74	56.52	100
	Contribution to the overall CS rate (%)	1.3	1.74	0.8	0.8
Group 8	**Relative size (%)**	4.2	2.22	1.76	2.1
	CS rate (%)	54.0	89.86	60	84
	Contribution to the overall CS rate (%)	2.3	2.00	1.05	1.8
Group 9	**Relative size (%)**	0.3	0.23	0.41	0.1
	CS rate (%)	100.0	100.0	100.0	100
	Contribution to the overall CS rate (%)	0.3	0.23	0.41	0.1
Group 10	**Relative size (%)**	15.9	9.96	14.02	68
	CS rate (%)	41.6	60.52	27.61	63
	Contribution to the overall CS	6.6	6.03	3.87	43.4

Table N°3: *Comparative status of the different Robson groups in other series*

This rate needs to be analyzed deeply to identify the determinants of this trend and consequently find adequate solutions to correct this situation in the framework of an improvement plan. Increasing cesarean section rates may be linked to improved maternal and perinatal morbidity. This is because cesarean delivery is associated with short- and long-term risks that can persist even years after delivery and affect the health of the woman and her child and subsequent pregnancies. In addition, high cesarean section rates are also associated with increased healthcare costs.

Recommendations

This study provided an analysis that clarified that there are areas where relevant interventions and preventive actions can be taken to reduce the cesarean section rate, including:

Table N°4. *The primary interventions recommended for reducing the cesarean section rate in the KH.*

Critical interventions are recommended for reducing cesarean section rates at KHC.
Prenatal follow-up of parturients (at least 04 prenatal consultations).
Reminder and adoption of "good practices" with the harmonization of practices.
To safely reduce the rate of primary cesarean deliveries [31].
The daily discussion of obstetrical files on a case-by-case basis by the obstetricians and their staff [32].
Implementing the internal clinical audit is essential in the quality approach to parturient care activities, especially for primiparous women, thus contributing to the management of perinatal care.
More open acceptance of vaginal delivery trials.
Questioning our definitions of stagnation of dilation, failure to trigger, etc., in the light of new data in the literature [33].
Limitation convenience deliveries through open communication with parturients by explaining the issues and risks. The mother-caregiver dialogue is essential to understand the underlying maternal demand and provide the most appropriate response, not necessarily a cesarean section [34].
Setting up an information system to collect the databases useful for Robson's classification.
Staff training on data collection and analysis.
Training of gynaeco-obstetricians and midwives on the indications for cesarean section [35].
Communication and awareness-raising with staff and parturients.
Providing legal advice to health professionals in malpractice cases during and after childbirth.

Strengths of the study

Despite some limitations, this classification is characterized by its ease of implementation and interpretation, simplicity, and clinical relevance. Also, mutually exclusive and fully inclusive population classes based on the characteristics of parturients, routinely collected in maternity hospitals when women are admitted for delivery, make it easy to monitor and evaluate cesarean sections. This makes monitoring and assessing cesarean sections manageable and compares rates in both institutional and population settings. In addition, Robson's classification allows women to be distinguished according to different levels of obstetrical risk. Indeed, the first four groups are women at low risk of cesarean section, while the other 6 are high-risk women at high-risk [20].

The routinely collected data set showed excellent quality in terms of completeness and consistency. The method of adopting Robson's classification itself can be adapted universally.

Diagnostic codes (ICD) and standardized variables such as gestational age are used in the obstetric record.

Limitations of the study

Manual extraction of information relevant to Robson's classification from the parturient's medical record must be considered, given the potential for error in data collection.

The verification of the method is based on data and groups of parturients from a single hospital.

The design limitation is that only the group of parturients who had a cesarean section was analyzed. Therefore, the study is limited to conclusions regarding the distribution of Robson's classes within the cesarean section group. To this end, findings regarding the distribution of cesarean sections in all birth modes cannot be drawn.

5. CONCLUSION

The increase in the use of cesarean sections has contributed significantly to the improvement of maternal-fetal prognosis. However, it remains a surgical procedure with consequences and risks, both maternal and neonatal.

Robson's classification is not a requirement for health care facilities to achieve a specific rate, but rather to ensure that Cesarean sections are performed on women who need them.

Specifically, Robson's classification system identified group 10 (comprising all singleton pregnancies with a cephalic presentation, gestational age < 37 weeks, including a scarred

uterus), which significantly influenced the overall cesarean section rate (43.4%) at Sheikh Khalifa Hospital in Casablanca.

It is for this reason that the implementation of Robson's classification within maternity units should be generalized, as it is an easy-to-use tool that can optimize cesarean section practices. It offers the possibility to assess, monitor and compare cesarean section rates within maternity units. Ultimately, it helps improve C-section practices by identifying women with high and unjustified C-section rates.

Declaration of interest

We do not declare any conflicts of interest.

Patient consent for publication

It is not required.

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