Research Article

Women's caesarean section preferences: A multicountry cross-sectional survey in low- and middle-income countries

Camille Etcheverry [a,*], Ana Pilar Betrán [b], Myriam de Loenzien [a], Charles Kaboré [c], Pisake Lumbiganon [d], Guillermo Carroli [e], Quoc Nhu Hung Mac [f], Celina Gialdini [e,g], Alexandre Dumont [a], the QUALI-DEC research group

[a] CEPED, Institute for Research on Sustainable Development, IRD-Université de Paris, ERL INSERM SAGESUD, Campus Saint-Germain-des-Prés, 45 rue des Saints-Pères, Paris 75006, France
[b] Department of Sexual and Reproductive Health and Research, UNDP/UNFPA/UNICEF/World Bank Special Program of Research, Development and Research Training in Human Reproduction (HRP), World Health Organization, Geneva, Switzerland
[c] Institut de Recherche en Sciences de la Santé, Ouagadougou, Burkina Faso
[d] Department of Obstetrics and Gynaecology, Faculty of Medicine, Khon Kaen University, Khon Kaen, Thailand
[e] Centro Rosarino de Estudios Perinatales, Rosario, Argentina
[f] Pham Ngoc Thach University, Ho Chi Minh City, Viet Nam
[g] Facultat de Ciències de la Salut Blanquerna, Universitat Ramon Llull, Barcelona, Spain

ARTICLE INFO

ABSTRACT

Objective: To measure the proportion of women's preferences for CS in hospitals with high caesarean section rates and to identify related factors.

Design: A cross-sectional hospital-based postpartum survey was conducted. We used multilevel multivariate logistic regression and probit models to analyse the association between women's caesarean section preferences and maternal characteristics. Probit models take into account selection bias while excluding women who had no preference.

Setting: Thirty-two hospitals in Argentina, Thailand, Vietnam and Burkina Faso were selected.

Participants: A total of 1,979 post-partum women with no potential medical need for caesarean section were included among a representative sample of women who delivered at each of the participating facilities during the data collection period.

Findings: The overall caesarean section rate was 23.3 %. Among women who declared a preference in late pregnancy, 9 % preferred caesarean section, ranging from 1.8 % in Burkina Faso to 17.8 % in Thailand. Primiparous women were more likely to prefer a caesarean section than multiparous women (β=+0.16 [+0.01; +0.31]; $p = 0.04$). Among women who preferred caesarean section, doctors were frequently cited as the main influencers, and "avoid pain in labour" was the most common perceived benefit of caesarean section.

Key conclusions: Our results suggest that a high proportion of women prefer vaginal birth and highlight that the preference for caesarean section is linked to women's fear of pain and the influence of doctors. These results can inform the development of interventions aimed at supporting women and their preferences, providing them with evidence-based information and changing doctors' behaviour in order to reduce the number of unnecessary caesarean sections.

Statement of significance

Problem: The unprecedented rise in the number of caesarean sections can be attributed to many multidimensional factors. Among these, the women's preference and demand for CS could contribute to this phenomenon.

What is Already Known: Women's preference and demand for CS, as well as the associated factors, vary considerably from one context to another.

What this Paper Adds: This study in 32 hospitals with high CS rates, showed that women's preference for CS was low, more frequent in nulliparous women, and based on fear of pain and childbirth, showing the importance of providing support to women during pregnancy and childbirth.

Introduction

Caesarean section (CS) rates have significantly increased over the past 30 years worldwide, from 7 % in 1990 to 21 % in 2018, with large variability among regions (Betran et al., 2021). On one side, the latest estimates show that many low-income countries, particularly in sub-Saharan Africa, have an average CS rate of 5 % or less (Betran et al., 2021), reflecting poor access to care, inadequate or unavailable resources and substandard care ("too little, too late") (Miller et al., 2016). Conversely, many middle-income countries, particularly in Latin America and Asia, are faced with an over-medicalisation of childbirth ("too much, too soon") (Miller et al., 2016), leading to average CS rates in these regions of 42.8 % and 23.1 %, respectively (Betran et al., 2021). However, the two situations often coexist in the same country, even in low-income countries where the most privileged women may have unnecessary CSs (Miller et al., 2016). This trend leading to increasing CS rates has raised global concern among healthcare professionals and political decision-makers in both low- and middle-income countries (Betran et al., 2016; Miller et al., 2016). Indeed, in the absence of effective interventions, estimates show that the average global rate will continue to increase from 21 % in 2018 to 29 % in 2030 and that low- and middle-income countries (LMICs) will be the major contributors to this increase, with CS rates reaching higher than 50 % in some regions of Asia and South America (Betran et al., 2021). This phenomenon is due to both an increasing number of deliveries in health facilities and an increasing use of CS (Boerma et al., 2018). There is no evidence that shows benefits of CS without medical indications; however, in many settings, some women may undergo CS even though it is not necessary (Betran et al., 2016; Chen et al., 2018; Betrán et al., 2018; Betran et al., 2021).

According to the ecological model proposed by Betrán et al. (2018), women's preference and demand for CS is associated with overuse of this intervention. However, this factor alone cannot explain the increasing number of CS worldwide (Gamble and Creedy 2000; McCourt et al., 2007). The proportion of women preferring CS varies widely across countries from 5 % to 20 % in high-income countries and from 1 % to 50 % in LMICs (Coates et al., 2020) but the methodology differs across studies as well.

The determinants of women's preference for CS are numerous, multidimensional and, in many cases, country-specific (Betrán et al., 2018). Existing knowledge is based on studies mainly conducted in high-income countries (Coates et al., 2020) and shows that the main factors associated with a preference for CS are: a negative perception of

vaginal delivery (as being uncertain or risky) (Colomar et al., 2021; Coates et al., 2020), a history of infertility (Chigbu et al., 2007; Yilmaz et al., 2013) or previous CS (McCourt et al., 2007; Béhague et al., 2002; Coates et al., 2020; Takegata et al., 2020; Yilmaz et al., 2013; Mungrue et al., 2010; Mazzoni et al., 2011). Findings from studies conducted in LMICs are less extensive and heterogeneous (Coates et al., 2020). For example, poor knowledge about the risks and benefits of vaginal birth increased the preference for CS in Bangladesh (Akhter and Schech 2018), while a high level of knowledge about the risks and benefits of different modes of delivery increased the preference for CS in Trinidad and Tobago (Mungrue et al., 2010). Several studies conducted in China have shown that advanced maternal age and low education level were associated with a greater probability of preferring CS (Ming et al., 2019; Deng et al., 2021; Loke et al., 2015; Liang et al., 2018), whereas in Nigeria, neither the level of education nor maternal age was associated with maternal demand for CS (Akintayo et al., 2014). In Brazil, women who were engaged in household decision-making and who had their own money or took money without asking partners or family members were more likely to request a CS (Béhague et al., 2002). In contrast, a systematic review of qualitative studies on women's preferences showed that some women who prefer vaginal delivery can apply strategies to ensure that their choice is respected (Colomar et al., 2021; Litorp et al., 2015).

In addition to maternal factors, the literature shows that factors related to healthcare professionals and systems can also play a role in determining women's preferences in LMICs. The recommendation of a delivery route by a healthcare professional (McCourt et al., 2007; Coates et al., 2020; Kingdon et al., 2006; Litorp et al., 2015; R. Deng et al., 2021) and the perception or expectation of low quality of care (Colomar et al., 2021) are also determining factors of women's preferences for CS in many settings; similarly, shortages in the availability of pain management options during labour affected women's preferences for CS in China (Long et al., 2018). Finally, evidence suggests that privately funded health facilities, which women consider to offer a better quality of care than public hospitals, encourage women to give birth by CS in order to increase their revenue (Vieira et al., 2015; Begum et al., 2017; Mia et al., 2019).

QUALI-DEC project

In response to the significant increase in CS rates worldwide and the important contribution of nonclinical factors to this increase, a consortium of researchers developed the QUALI-DEC project (Appropriate use of CS through QUALIty DECision-making by women and providers). The QUALI-DEC project was designed to implement and evaluate evidence-based nonclinical interventions to reduce the number of unnecessary CSs that are performed among low-risk women in LMICs (Dumont et al., 2020). This project was conducted in 32 facilities with high CS rates in Argentina, Thailand, Vietnam and Burkina Faso. The QUALI-DEC project included four nonclinical interventions: (1) opinion leaders to implement evidence-based clinical guidelines; (2) CS audits and feedback to help providers identify potentially avoidable CSs; (3) a decision-analysis tool to help women make informed decisions regarding mode of birth; and (4) implementation of WHO recommendations on companionship during labour to support women during vaginal birth (Dumont et al., 2020).

The Decision-Analysis Tool (DAT) is a way of informing women at low risk of CS and a tool to initiate and support dialogue between these women and their healthcare providers (Dumont et al., 2022). Utilized during antenatal care (ANC) visits, the first section of the DAT aims to

inform women about the risks and benefits of each mode of birth. The second section helps women clarify what is important to them regarding childbirth and thus prepares them to discuss their preferences with healthcare professionals during subsequent ANC visits. In a context of CS overuse, the DAT may be particularly relevant for women with a preference for CS but who can be considered to be at low risk of CS because it can encourage discussion with providers and eventually change this preference.

Given the heterogeneity of studies and results concerning the level of preference for CS in LMICs and the related factors, we need reliable and comparable data on this question to know which women will be able to benefit from the DAT. Using a homogeneous and standardized method, this study aims to measure the proportion of women's preferences for CS in participating hospitals of QUALI-DEC project before the intervention implementation and to identify related factors. We want to answer two specific questions: Is there a common profile of women who prefer a CS in LMICs? What are the main reasons to prefer a CS in these countries?

Material and methods

Study design and settings

This study is an ancillary analysis of the QUALI-DEC project, which is a type III hybrid efficacy-multi-site trial conducted in Argentina, Thailand, Vietnam and Burkina Faso (Dumont et al., 2020). The QUALI-DEC trial is registered on the Current Controlled Trials website (ISRCTN67214403). For more details on the trial protocol, see Dumont et al. (2020). The primary objective of this trial is to evaluate the effect of the QUALI-DEC strategy on CS rates and maternal and perinatal outcomes (primary outcomes). Secondary outcomes, such as change in preference for mode of delivery, will also be evaluated. The effectiveness of these interventions will be evaluated, among other methods, using a comparative cross-sectional before-and-after study of a representative sample of postpartum women (before and after the intervention period). This ancillary study presented in this manuscript used data from the baseline cross-sectional survey.

Data was collected during the baseline period in 32 hospitals in Argentina, Burkina Faso, Thailand and Vietnam (8 per country). The reason why these countries took part in the Quali-Dec project was operational, firstly because of the concern of the local scientific and medical authorities about the significant increase in CS rates in their hospitals, and secondly because of a clear determination among policy-makers to revert this trend. Burkina Faso is a low-income country in West Africa, which had a CS rate of 3 % in 2018, six times higher than in 2000, as a result of public health policies in favour of free CS (Sombié et al., 2017). However, this progress has also been accompanied by major inequalities and inappropriate use of CS (Kaboré et al., 2016). Argentina is an upper-middle-income country in South America with steadily increasing CS rates between 2010 and 2018, reaching an average of 35.7 % in Argentine public health facilities in 2018 (Dirección Nacional de Maternidad, Infancia y Adolescencia, 2019). Vietnam, which is located in Southeast Asia, has gone from a low-income country to a lower-middle-income country over the last decade, with a parallel rise in its CS rates (from 3.4 % in 1997 to 27.5 % in 2013–2014) (de Loenzien et al., 2019). Thailand, an upper-middle-income country in Southeast Asia, is one of the countries that have seen the highest increases in CS rates over the last two decades. It has one of the highest CS rates in Southeast Asia, with some provinces having CS rates above 40 % (National Statistical Office, 2017).

The participating hospitals were purposely selected by the ministries of health of the participating countries because of their high CS rates. The aim was to select hospitals with different levels of care and organization in order to reflect the diversity of health facility contexts in each country. The average CS rates and the characteristics of the participating hospitals per country are presented in Table S1 (Supplementary Table S1). The geolocation of the hospitals is shown on the maps in the

Supplementary Figs. S1–S4.

Participants and sample size

The study design was based on the WHO Global Health Survey of Maternal and Perinatal Health (Shah et al., 2008). Postpartum women who had delivered a live-born child beyond 22 weeks of gestation (26 weeks in Burkina Faso) and who agreed to participate were eligible. Women who presented with a major health problem following childbirth, those who gave birth to a stillborn child, those who gave birth to a child lost to neonatal death, or those whose newborn children presented severe morbidity were not eligible. Women who delivered at home or in another health facility (postnatal transfer) were excluded from the study.

The sample size estimate was not calculated specifically for this study but for the effectiveness-implementation research (Quali-Dec). Sample size estimation was based on the expected difference in satisfaction scores between the period before and after the intervention (Dumont et al., 2020). The required number of women was a total of 470 women per country. Assuming a 10 % nonresponse rate and 10 % of women being ineligible, we aimed to approach 564 women in each country (71 women per hospital).

For the present study, we did not included women with a potential medical need for CS. For this reason, additional exclusion criteria were: women with previous history of CS, multiple pregnancy, noncephalic presentation and women who had a complication or preexisting condition with the current pregnancy (chronic or pregnancy-induced hypertension; prelabour rupture of membranes; suspected fetal growth restriction; diabetes type I/II/gestational; haemoglobinopathy and severe anaemia; and other obstetric or medical conditions).

Recruitment and data collection procedures

The minimum data collection period was defined as two weeks. In each hospital, data collection for the baseline cross-sectional survey of postpartum women took place daily, including weekends. If the required number of participants was reached ($n = 71$ per hospital) before the two-week period, data collection continued until the end of the pre-defined period, or until the required number of participants was reached otherwise. Between 5 and 6 postpartum women had to be interviewed each day to achieve the required sample size. For hospitals with a high volume of activity, a randomisation factor was applied each day to all women who had given birth the previous day in order to obtain a random sample of 10 women, assuming that between 4 and 5 women would refuse to participate or would not be eligible.

Selected women were identified by a data collector who assigned them an identification number and assessed their eligibility using a screening form. If a woman was eligible, she was approached by a social scientist and invited to participate in the study during her stay in the postnatal ward. If she agreed to participate, the consent form was completed, and the woman was interviewed face-to-face by the social scientist using a tablet-based data collection form. The questionnaire was developed based on a literature review followed by discussion and consensus with the QUALI-DEC research team. The questionnaire was piloted in the four countries and modified as necessary. The information collected was organized into seven modules: women's characteristics, antenatal care and preference for mode of birth; birth outcomes; women's knowledge about modes of birth, including the risks and benefits; labour companionship; women's birth experience and satisfaction; gender dimensions and social equity; wealth characteristics and out-of-pocket expenses. For all the selected women, medical history and information about pregnancy, labour and delivery were extracted by one clinical data collector from the medical records and input into a standard data collection form. The data were double-entered in each country into an electronic system designed for this study with validation checks (REDCap®). Consistency checks were managed centrally by the

principal data management, with regular communication with the country-level data managers in Thailand, Burkina and Vietnam. In Argentina, ongoing consistency checks were managed by the country-level team.

Outcomes and explanatory variables

The principal outcome of interest was the "preferred mode of birth" in late pregnancy as reported by women in the immediate postpartum period. Women were asked: "What was your preferred mode of birth towards the end of pregnancy?" (answers: vaginal delivery or CS).

Two secondary outcomes were investigated: the two most important factors that influenced women's preference (as stated by the women) and the benefits of CS as perceived by the surveyed women.

Among the variables collected in the survey, we focused on some maternal sociodemographic, pregnancy-related and childbirth-related characteristics that were explored as explanatory variables for the preferred mode of birth. The sociodemographic variables included country of residence, living environment (urban or rural), marital status, woman's age at delivery, maternal level of education, maternal and partner's occupation and wealth index. The wealth index was built as a context-specific composite index. Variable selection and component analysis were performed in consultation with each country's principal investigators. The pregnancy-related factors included parity, body mass index (BMI) based on the latest weight before delivery, number of antenatal care visits, and whether the women attended ANC visits in another private facility (outside the hospital where the woman delivered).

Birth-related factors included the final mode of birth and institutional factors: academic status, reference level and birth volume (number of deliveries per year) of the hospital where the woman gave birth and the organization of care (maternity unit with private ward or not). We selected these factors as potential confounders of the association between women's characteristics (sociodemographic variables and pregnancy-related factors) and the preferred mode of birth in late pregnancy as stated by women in the immediate postpartum period.

Data analysis

All the analysis were performed using the statistical analysis software Stata/SE® version 17. In order to analyse the main outcome, we proceeded in two stages due to our questionnaire structure. First, the women were asked: "Did you have a preferred mode of birth in late pregnancy" (answers: Yes/No/Don't know). Then, the women who answered "Yes" were asked about their preferred mode of birth: "What was your preferred mode of birth in late pregnancy" (answers: vaginal delivery or CS). The first stage of the analysis was therefore to study the selection of women who had a preference via the first question, before being able to perform the analyses on the main outcome, i.e. the preference for CS, as the two questions were linked.

First, frequencies and percentages were used to describe the characteristics of participants in the entire study population. Chi-squared tests were performed to analyse differences between women who had a preferred mode of birth and women who had no preference and to analyse differences between women who preferred vaginal birth and women who preferred CS.

The multivariate analysis was performed using a two-step procedure. As the first step, we examined the association between women's characteristics and having a preference for mode of birth in the whole sample (four countries combined). We used mixed-effects logistic regression models with random intercepts and a forward stepwise procedure to model the dependence of having a preference between women who delivered in the same hospital. A variable was included in the model if it was significantly associated in the bivariate analysis (*p* value < 0.2). Statistical significance was set at the type I error of 0.05 by two-tailed tests. In the second step of the multivariate analysis, we examined the

association between women's characteristics and the preference for CS late in pregnancy in the total sample. As this analysis included only women who stated a preference, there was a potential selection bias. To control for this bias, we used Heckman's method, which allowed us to model the probability of having a preference for CS (substantive equation), while taking into account the probability of having a preference (selection equation) (Sales et al., 2004; Heckman 1977). We used the *heckprobit* command to apply Heckman's method to the multilevel multivariate model measuring the probability of preferring CS as mode of birth. Associations between preferred mode of birth and explanatory variables were estimated using the regression coefficients of the *probit* models.

Variables with more than 10 % missing data were not included in the models to avoid excluding a large number of women; these variables included partner's occupation, number of antenatal visits and body mass index. We did not impute data. Cases where the response to a preference was "I don't know" were considered missing data because of the small number of these responses (*n* = 20, 1.0 %). As we asked postpartum women about their preference in late pregnancy, we adjusted the analysis on the actual mode of delivery to address potential response bias. Based on a risk of collinearity, we excluded the reference level and teaching status of the hospital from the models, and we only kept organization of care (maternity ward with or without private ward) as potential confounding variables.

Results

The duration of the survey depended on the birth rate of each hospital and varied from 14 days to 18 days in Burkina Faso (from 8 December to 26 December 2020), from 14 days to 20 days in Thailand (from 6 March 2021 to 3 January 2022) and from 14 days to 46 days in Argentina (from 15 December 2021 to 23 June 2022). All eight hospitals in Vietnam were surveyed for 14 days (from 8 October to 21 October 2021). A total of 5840 women gave birth in the 32 hospitals during the data collection period, and 3127 were randomly selected, were eligible, and provided consent (Supplementary Fig. S5). According to the extra exclusion criteria that we specifically applied in this analysis, we further excluded 1148 women because of their high risk of undergoing CS, and 1979 women were included in our analysis (440 women in Burkina Faso, 354 women in Argentina, 543 women in Thailand and 642 women in Vietnam).

Preference for a mode birth and associated factors

A total of 87 % of women had a preference regarding mode of birth late in pregnancy, ranging from 77 % in Burkina Faso to 96 % in Thailand (Table 1). Table 1 shows the association between the statement of preference and women's sociodemographic characteristics. Combining data from the four countries, the richest women, women older than 25 years, women with a high level of education, and employed women were more likely to have a preference regarding mode of birth. Table 2 shows the association between preference statement and antenatal and birth characteristics. Only women who attended ANC visits in another private facility were more likely to have a preference for mode of birth in late pregnancy.

Table 3 shows adjusted odds ratios (ORa) for having a preference late in pregnancy. Having a preferred mode of birth was positively associated with university level of education (ORa = 2.05 [1.28; 3.29], *p* < 0.01), urban residency (ORa = 1.73 [1.03; 2.89], *p* = 0.04), and attendance of ANC visits in another private facility (ORa = 2.15 [1.33; 3.46]; *p* < 0.01). Although the wealth index was retained in the model, this variable does not significantly explain the probability of having a preference in late pregnancy. Adjusted for individual maternal variables, there was no significant effect of the native country on this outcome (not retained in the model).

Table 1

Sociodemographic characteristics of women according to their preference regarding mode of birth in all countries combined (Quali-Dec project).

Variables	Statement of preference N = 1959		Preference for CS N = 1721	
	n/N (%)	p-value	n/N (%)	p-value
Country		<0.001		<0.001
Burkina Faso	337/439 (76.8)		6/337 (1.8)	
Argentina	284/342 (83.0)		31/284 (10.9)	
Thailand	522/543 (96.1)		93/522 (17.8)	
Vietnam	578/635 (91.0)		28/578 (4.8)	
Marital status		0.15		0.85
Married/Living with a partner	1618/1836 (88.1)		148/1618 (9.2)	
Separated/Single/Widow	103/123 (83.7)		10/103 (9.7)	
Maternal age		<0.01		0.49
< 25 years	594/701 (84.7)		57/594 (9.6)	
25–35 years	907/1009 (89.9)		77/907 (8.5)	
≥ 35 years	220/249 (88.4)		24/220 (10.9)	
Level of education		<0.001		<0.001
Secondary and lower	1193/1398 (85.3)		90/1193 (7.5)	
University	526/559 (94.1)		68/526 (12.9)	
Place of residency		0.13		<0.001
Rural	502/560 (89.6)		26/502 (5.2)	
Urban	1212/1390 (87.2)		132/1212 (10.9)	
Maternal occupation		<0.01		0.91
Unemployed/housewife	606/712 (85.1)		55/606 (9.1)	
Employed	1115/1247 (89.4)		103/1115 (9.2)	
Wealth index		0.04		0.25
Poorest	383/429 (89.3)		29/383 (7.6)	
Poorer	379/435 (87.1)		36/379 (9.5)	
Middle	416/492 (84.6)		32/416 (7.7)	
Richer	256/279 (91.8)		27/256 (10.5)	
Richest	287/324 (88.6)		34/287 (11.9)	

Table 2

Prenatal and delivery characteristics of women according to their preference regarding mode of birth in all countries combined (Quali-Dec project).

Variables	Statement of preference N = 1959		Preference for CS N = 1721	
	n/N (%)	p-value	n/N (%)	p-value
Parity		0.37		<0.001
Nulliparous	807/926 (87.2)		102/807 (12.6)	
Multiparous	913/1032 (88.5)		56/913 (6.1)	
Attended ANC in another private facility		<0.001		0.40
No	969/1153 (84.0)		84/969 (8.7)	
Yes	752/806 (93.3)		74/752 (9.8)	
Delivered in tertiary level hospital		0.45		<0.001
No	939/1075 (87.3)		53/939 (5.6)	
Yes	782/884 (88.5)		105/782 (13.4)	
Delivered in a maternity unit with private ward*		0.49		<0.001
No	800/905 (88.4)		47/800 (5.9)	
Yes	921/1054 (87.4)		111/921 (12.1)	
Delivered in a teaching hospital**		0.94		<0.001
No	401/457 (87.8)		16/401 (4.0)	
Yes	1320/1502 (87.9)		142/1320 (10.8)	
Volume of birth in 2020		0.10		0.51
< 1500 deliveries	217/236 (91.9)		24/217 (11.1)	
1500–5000 deliveries	987/1126 (87.7)		85/987 (8.6)	
≥ 5000 deliveries	517/597 (86.6)		49/517 (9.5)	
Actual mode of birth		0.77		<0.001
Caesarean section	405/459 (88.2)		87/405 (21.5)	
Vaginal delivery	1316/1500 (87.7)		71/1316 (5.4)	

* Hospitals with private ward: public facilities with private practice and private hospitals. Hospitals without private ward: public facilities with only public practice.

** A teaching hospital provides medical education and training to future health professionals.

Preference for CS, influencers and associated factors

Among the women who declared a preference in late pregnancy, 9 % preferred CS, ranging from 1.8 % in Burkina Faso to 17.8 % in Thailand (Table 1). Among women who preferred CS, the main influencers varied among the countries. In Vietnam, 75 % of women declared that doctors were the most important influencers, and 25 % of women in Thailand made the same statement (Fig. 1- A); however, in Argentina and Burkina Faso, respectively 75 % and 67 % of women responded that nobody had influenced their preference for CS (no other influence was reported by these women). In contrast, only 25 % of women who preferred vaginal delivery in Vietnam said they were influenced by their doctor (Fig. 1- B). At least 50 % of women in each country declared that nobody had influenced their preference for vaginal delivery (ranging from 53 % in Thailand to 93 % in Burkina Faso).

Bivariate analysis shows that women who resided in urban settings and those with a high level of education were more likely to prefer CS (Table 1). Nulliparous women and those who gave birth in a teaching or tertiary level hospital or in a maternity unit with a private ward were more likely to prefer CS in late pregnancy (Table 2).

Table 4 shows the adjusted probabilities (and 95 % CI) of having a preference for CS towards the end of pregnancy. Nulliparous women were 16 % more likely to prefer CS than multiparous women (β=+0.16 [+0.01; +0.31]; p = 0.04). Argentinian and Thai women were more likely to prefer CS than women in Burkina Faso (respectively β=+0.67 [+0.22; +1.11]; p < 0.01 and β=+0.69 [+0.20; +1.18]; p < 0.01). It seems that urban women tended to prefer CS more than those living in rural areas but this result was marginally significant (β=+0.21 [−0.03; +0.45]; p = 0.08).

Perceived risks and benefits

Avoiding pain due to labour, avoiding prolonged labour, better time management for doctors/patients and the possibility of planning delivery for an auspicious date were the benefits of CS that were most frequently perceived by women who had a preference for CS (Fig. 2). These benefits were less likely to be perceived among women who had a

Table 3
Adjusted odds ratio* [95 % CI] for having a preference in late pregnancy (four combined countries, Quali-Dec project).

Variables	ORa* [95 % CI] N = 1947	p-value
Level of education		
Secondary and lower	Ref	
University	2.05 [1.28; 3.29]	<0.01
Place of residency		
Rural	Ref	
Urban	1.73 [1.03; 2.89]	0.04
Wealth index		
Poorest	Ref	
Poorer	0.96 [0.57; 1.61]	0.87
Middle	0.64 [0.38; 1.08]	0.10
Richer	1.44 [0.73; 2.83]	0.29
Richest	0.84 [0.46; 1.56]	0.59
Attending antenatal care in another private facility		
No	Ref	
Yes	2.15 [1.33; 3.46]	<0.01

* Mixed-effects logistic regression model with random intercept to model dependence of having a preference.

preference for vaginal birth.

Discussion

Our analysis of 1979 pregnant women in Argentina, Burkina Faso, Thailand and Vietnam shows that most women who were considered low-risk had a preference regarding mode of birth in late pregnancy and that vaginal birth was overwhelmingly preferred by these women. Doctors were the most important influencers of the preference for CS in Vietnam, whereas the preference for CS among most women in Argentina and Thailand was not influenced by anyone. Primiparous women are more likely to prefer a CS than multiparous women. Avoiding pain or prolonged labour, and convenience for women and doctors were the main perceived benefits of CS among women who prefer this mode of birth.

Our results are consistent with previous studies showing that women's preference for CS was low around the world (Coates et al., 2020; Mazzoni et al., 2011; Liu et al., 2013; Deng et al., 2014; Ji et al., 2015; Perrotta et al., 2022; Aziken et al., 2007; Liang et al., 2018; Long et al., 2018; Yamasmit and Chaithongwongwatthana 2012). A systematic review of observational studies in 2010 estimated that between 17.6 % and 26.9 % of women in LMICs preferred CS (Mazzoni et al., 2011). Two studies in China reported that 90 % of surveyed women had a preference in late pregnancy and that most women preferred vaginal delivery (W. Deng et al., 2014; Liang et al., 2018). In Shanghai, the preference for CS was 28.4 % (W. Deng et al., 2014) compared to 8.8 % in a study conducted in a central Chinese region (Liang et al., 2018). A recent Argentinean study that interviewed 621 postpartum women in five public hospitals reported that 75 % of them had a preference for vaginal birth during pregnancy (Perrotta et al., 2022). A systematic review of studies conducted in LMICs using different designs also shows that CS preference rates greatly vary by country (Coates et al., 2020), ranging from 1.4 % in Nigeria to 50 % in Turkey.

Vaginal delivery is viewed as a natural and empowering way to give birth and to become a mother, whereas CS can be associated with a feeling of fear, risk and lack of control (Liu et al., 2013; Richard et al., 2014; Colomar et al., 2021). According to an Argentinian qualitative study, vaginal delivery is mainly preferred by women because of cultural or social factors, and CS is viewed as a medical decision (Liu et al., 2013). In Burkina Faso, CS is also perceived as an unpredictable decision that women fear and that is made by medical staff without providing information to women; this explains the extremely low rate of CS preference in this country (Richard et al., 2014).

Our results show that being a nulliparous woman was significantly associated with a preference for CS. This finding raises questions insofar as nulliparous women's preference for this mode of birth may lead them to give birth by CS and significantly increase their risk of also undergoing CS in future pregnancies, accelerating increasing CS rates in LMICs. This result is consistent with another study conducted in China, showing that being a primiparous woman increased the probability of having a CS on maternal request (R. Deng et al., 2021). The authors explained this results as previous childbirth experience reduces fears about vaginal birth. Other studies have shown that the preference for CS depends more on factors relating to previous experience and fear of childbirth than on parity (Ryding et al., 2016; Fuglenes et al., 2011; Coates et al., 2020; Takegata et al., 2020; Suwanrath et al., 2021). Our results are consistent with the perceived benefits of CS by women (avoid pain during vaginal delivery). We can assume that women with no experience of childbirth may be more inclined to fear the pain of childbirth and therefore prefer CS than women with previous experience of childbirth.

Indeed, our analysis identified reasons for CS preference that are consistent with those described in the literature. Previous studies and reviews have reported fear of labour and pain as one of the main reasons for preferring CS (Coates et al., 2020; Takegata et al., 2020; Perrotta et al., 2022; Colomar et al., 2021; Loke et al., 2015). In our sample, approximately 45 % of the women who preferred vaginal birth and 70 % of those who preferred CS reported the avoidance of labour pain as a benefit of CS. Efforts should be made to understand and address this fear and its source by providing comprehensive education and guidance during ANC care, such as psychological support for women who fear childbirth or prenatal birth preparation classes (Opiyo et al., 2020).

The Decision-Analysis-Tool (DAT) developed as part of the QUALI-DEC project has the potential to change healthcare professionals' and women's behaviour. Our results show that doctors are the main influencers of women's preference in Vietnam and to a smaller degree in Thailand. Healthcare providers' preference for CS may be explained by fear of litigation in case of unfavourable outcomes after vaginal deliveries (Takegata et al., 2020; Long et al., 2018; Shi et al., 2016; Elaraby et al., 2023); financial incentives associated with CS (Panda et al., 2018); lack of skills and training for vaginal birth (Long et al., 2018; Panda et al., 2018); and easier management of care (Shi et al., 2016; Panda et al., 2018). The DAT could therefore increase healthcare providers' awareness of the risks and benefits of both modes of birth and encourage them to question their practices regarding women's preferences. Moreover, the DAT administered by caregivers to low-risk women during ANC visits could enable women to access unbiased and evidence-based information about the risks and benefits of both modes of birth and serve as a reliable source for decision-making and discussion. In the context of the participating hospitals, where the CS rates are very high, women who prefer vaginal birth could find this tool a support in their preference, helping them to find the motivation and raise this topic with their doctor. This tool would also allow women who prefer CS to discuss this preference and their motivations. Comparing the risks and benefits of the two modes of birth could lead these women, particularly nulliparous women, to change their minds. The DAT may have a greater impact in Argentina and Thailand, where more than 10 % of women declared that they had a preference for CS, compared with Burkina Faso and Vietnam where less than 10 % of women preferred CS.

The strength of this study lies in its large-scale, standardized measurement of women's preference for delivery mode in 32 hospitals with high CS rates. To our knowledge, this is the first study that measured women's preferences in a comparable and rigorous way in four LMICs. The quality of the survey data was assured based on the WHO's data
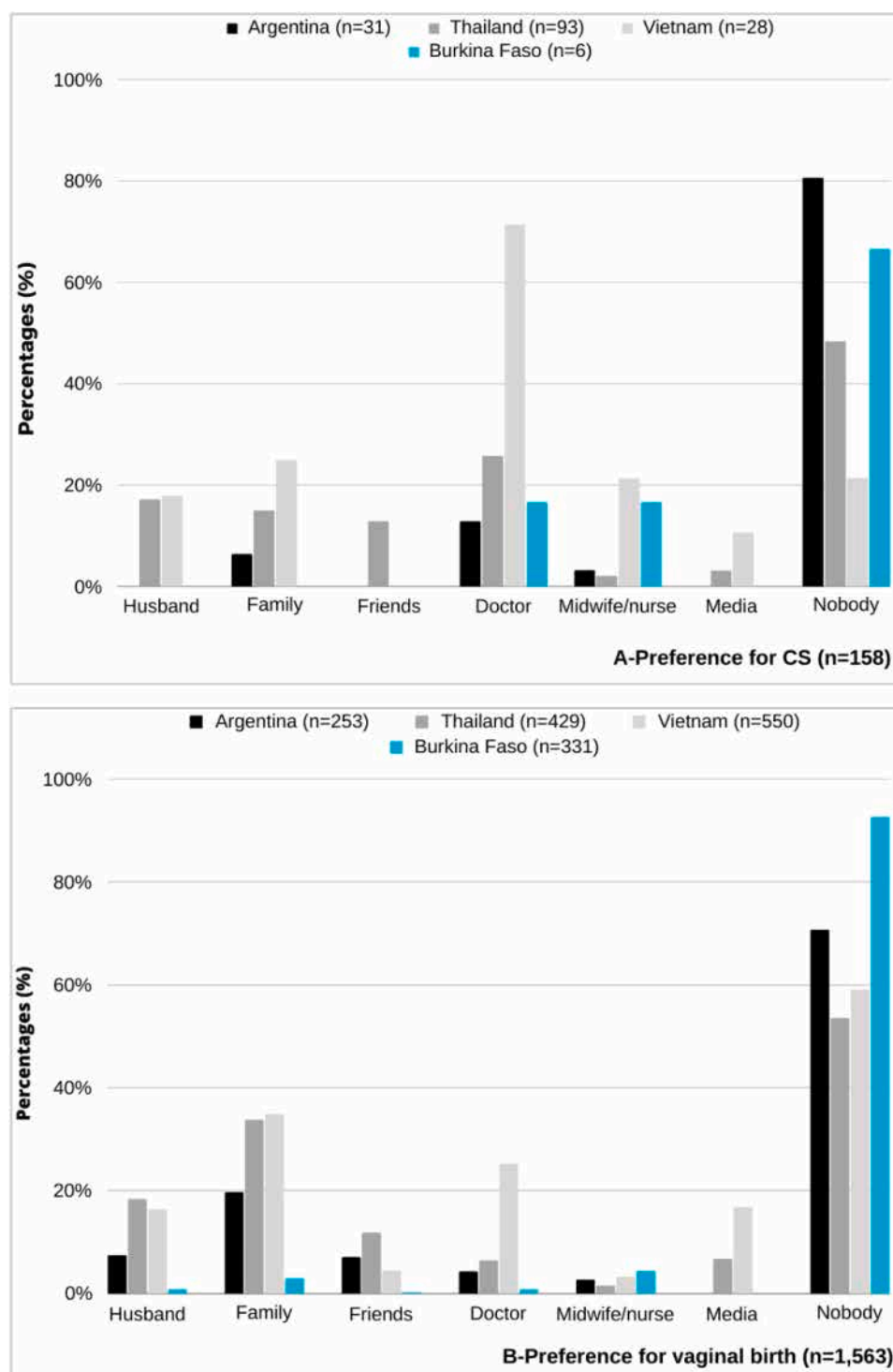
Fig. 1. Main influencers of preference in late pregnancy among women who preferred CS (A) and women who preferred vaginal birth (B) in Argentina, Thailand and Vietnam.*

management and collection system for maternal and perinatal health surveillance (Shah et al., 2008). The collection of a large volume of data across several dimensions and the quality of analysis also resides in the examination of many dimensions that can influence women's preferences. Finally, the analysis methodology that was used allowed us to take into account the structure and characteristics of data and to make rigorous estimates while avoiding selection bias and controlling for confounding factors.

Our analysis has some limitations. Our hospital-based study

population is not representative of the general population in each country as the hospitals included in the QUALI-DEC project are not representative of the country or even of the hospitals with high CS use. The selection was purposely based on programmatic activities, priorities and consent. Presumably, the hospital leaders who agreed to be included in this project are motivated to ensure good practices and may not represent all hospitals with high CS rates in Burkina Faso, Argentina, Thailand and Vietnam. Moreover, only two private hospitals were included (in Vietnam) compared to 30 public hospitals with or without a

Table 4
Adjusted probability [and 95 % CI] of having a preference for caesarean section in late pregnancy (four combined countries, Quali-Dec project).

Variables	β [95 % CI]* N = 1711	p-value
Country		
Burkina Faso	Ref	
Argentina	+0.67 [+0.22; +1.11]	<0.01
Thailand	+0.69 [+0.20; +1.18]	<0.01
Vietnam	+0.05 [-0.30; +0.41]	0.76
Level of education		
Secondary and lower	Ref	
University	-0.19 [-0.42; +0.04]	0.10
Place of residency		
Rural	Ref	
Urban	+0.21 [-0.03; +0.45]	0.08
Parity		
Multiparous	Ref	
Nulliparous	+0.16 [+0.01; +0.31]	0.04
Delivered in a maternity unit with private ward		
No	Ref	
Yes	+0.15 [-0.09; +0.38]	0.22

* Using multivariate *probit* models adjusted based on the actual mode of birth and the organization of care (maternity ward with or without private ward), controlling for selection bias (Heckman's method).

private ward. Since there is a potential association between the private care sector and women's preference, we may have underestimated women's preference for CS in the participating countries. Finally, we asked postpartum women about their preference late in pregnancy. The women's responses regarding their preference were therefore based on questions asked in post-partum and not in late pregnancy. This approach presents a risk of recall bias. Additionally, the reported preference may be influenced by the birth outcome and experience. We tried to address these biases by adjusting the results according to the actual delivery mode.

Conclusion

Among women who are at low risk of CS, the preference for this mode of delivery was low in the participating hospitals or almost non-existent in Burkina Faso. Our findings show that the preference for CS was based on the fear of pain and labour, which indicates the importance of providing comprehensive support to women during pregnancy and ensuring access to adequate analgesia during labour and childbirth. Additionally, a decision aid providing unbiased and evidence-based information about the risks and benefits of both modes of birth has the potential to empower women in choosing the most appropriate mode of birth. The use of such a tool could support women in their preferences, be crucial for encouraging discussion with healthcare providers, and foster informed and shared decision-making regarding mode of birth, thus ultimately reducing the number of unnecessary CSs that are performed.

Ethical approval

Ethical clearance for the study was obtained from the local and institutional review boards from the Centro Rosarino de Estudios Perinatales of Rosario, Argentina (Record Notice No. 1/20), Pham Ngoc Thach University of Ho Chi Minh City in Vietnam, Khon Kaen University in Thailand, the Ethics Committee for Health Research of Burkina Faso (Decision No. 2020-3-038), the Research Project Review Panel (RP2) in the UNDP/UNFPA/UNICEF/WHO/World Bank Special Programme of Research, Development and Research Training in Human Reproduction (WHO study No. A66006), and the French Research Institute for Sustainable Development (coordinator of QUALI-DEC project).

Funding sources

The QUALI-DEC project is co-funded by the European Union's Horizon 2020 research and innovation program under grant agreement No. 847567 and by the UNDP-UNFPA-UNICEF-WHO-World Bank Special Programme of Research, Development and Research Training in Human Reproduction (HRP), a co-sponsored program executed by the World
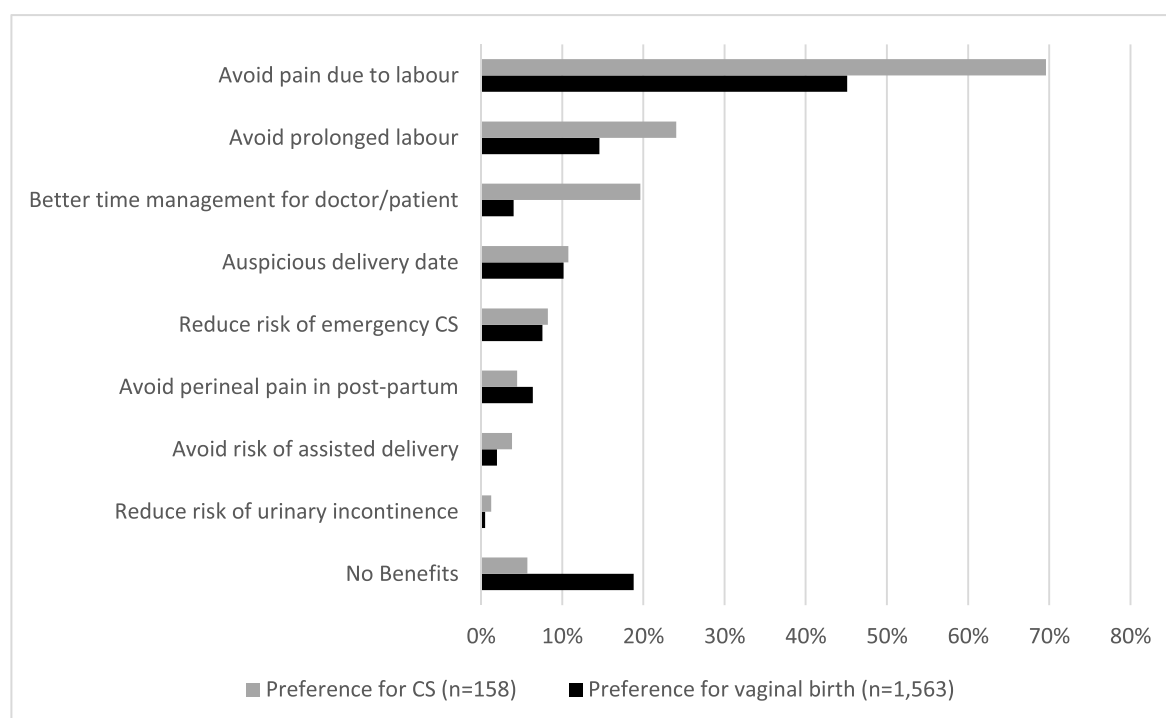

Fig. 2. Benefits of CS as perceived by women according to their preference regarding mode of birth in late pregnancy (n = 1721).

Health Organization (WHO) in the Department of Sexual and Reproductive Health and Research (SRH). The contents of this article are solely the responsibility of the authors and do not reflect the views of the EU, UNDP, UNFPA, UNICEF, WHO, or the World Bank or their respective institutions. The first author (C.E.) received salary support from the Ecole Doctorale Pierre Louis de Santé Publique (Sorbonne Université - Université Paris Cité) as part of a thesis funding.

CRediT authorship contribution statement

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.

Acknowledgments

Supplementary materials

Supplementary material associated with this article can be found, in the online version, at doi:10.1016/j.midw.2024.103979.

References

Akhter, S., Schech, S., 2018. Choosing caesareans? The perceptions and experiences of childbirth among mothers from higher socio-economic households in Dhaka. Health Care Women Int. 39 (11), 1177–1192. https://doi.org/10.1080/07399332.2018.1470181.

Akintayo, A.A., Ade-Ojo, I.P., Olagbuji, B.N., Akin-Akintayo, O.O., Ogundare, O.R., Olofinbiyi, BA., 2014. Cesarean section on maternal request: the viewpoint of expectant women. Arch. Gynecol. Obstet. 289 (4), 781–785. https://doi.org/10.1007/s00404-013-3063-x.

Aziken, M., Omo-Aghoja, L., Okonofua, F., 2007. Perceptions and attitudes of pregnant women towards caesarean section in urban Nigeria. Acta Obstet. Gynecol. Scand. 86 (1), 42–47. https://doi.org/10.1080/00016340600994950.

Begum, T., Rahman, A., Nababan, H., Hoque, DMdE, Khan, AlF, Ali, T., Anwar, I., 2017. Indications and determinants of caesarean section delivery: evidence from a population-based study in Matlab, Bangladesh. PLoS One 12 (11), e0188074. https://doi.org/10.1371/journal.pone.0188074.

Béhague, D.P., Victora, C.G., Barros, F.C., 2002. Consumer demand for caesarean sections in Brazil: informed decision making, patient choice, or social inequality? A population based birth cohort study linking ethnographic and epidemiological methods. BMJ 324 (7343), 942–945. https://doi.org/10.1136/bmj.324.7343.942.

Betrán, A.P., Temmerman, M., Kingdon, C., Mohiddin, A., Opiyo, N., Torloni, M.R., Zhang, J., et al., 2018. Interventions to reduce unnecessary caesarean sections in healthy women and babies. Lancet 392 (10155), 1358–1368. https://doi.org/10.1016/S0140-6736(18)31927-5.

Betran, A.P., Torloni, M.R., Zhang, J.J., Gülmezoglu, A.M., WHO Working Group on Caesarean Section, 2016. WHO Statement on Caesarean Section Rates. BJOG Int. J. Obstet. Gynecol. 123 (5), 667–670.

Betran, A.P., Ye, J., Moller, A.B., Souza, J.P., Zhang, J., 2021. Trends and projections of caesarean section rates: global and regional estimates. BMJ Glob. Health 6 (6), e005671. https://doi.org/10.1136/bmjgh-2021-005671.

Boerma, T., Ronsmans, C., Melesse, D.Y., Barros, A.J.D., Barros, F.C., Juan, L., Moller, A. B., et al., 2018. Global epidemiology of use of and disparities in caesarean sections. Lancet 392 (10155), 1341–1348. https://doi.org/10.1016/S0140-6736(18)31928-7.

Chen, I., Opiyo, N., Tavender, E., Mortazhejri, S., Rader, T., Petkovic, J., Yogasingam, S., et al., 2018. Non-clinical interventions for reducing unnecessary caesarean section. Cochrane Database Syst. Rev. 2018 (9), CD005528 https://doi.org/10.1002/14651858.CD005528.pub3.

Chigbu, C.O., Ezeome, I.V., Iloabachie, G.C., 2007. Cesarean section on request in a developing country. Int. J. Gynaecol. Obstet. 96 (1), 54–56. https://doi.org/10.1016/j.ijgo.2006.09.032.

Coates, D., Thirukumar, P., Spear, V., Brown, G., Henry, A., 2020. What are women's mode of birth preferences and why? A systematic scoping review. Women Birth 33 (4), 323–333. https://doi.org/10.1016/j.wombi.2019.09.005.

Colomar, M., Opiyo, N., Kingdon, C., Long, Q., Nion, S., Bohren, MA., Betran, A.P., 2021. Do women prefer caesarean sections? A qualitative evidence synthesis of their views and experiences. PLoS One 16 (5), e0251072. https://doi.org/10.1371/journal.pone.0251072.

Deng, R., Tang, X., Liu, J., Gao, Y., Zhong, X., 2021. Cesarean delivery on maternal request and its influencing factors in Chongqing, China. BMC Pregnancy Childbirth 21 (1), 1–12. https://doi.org/10.1186/s12884-021-03866-7.

Deng, W., Klemetti, R., Long, Q., Wu, Z., Duan, C., Zhang, W.H., Ronsmans, C., Zhang, Yu, Hemminki, E., 2014. Cesarean section in Shanghai: women's or healthcare provider's preferences? BMC Pregnancy Childbirth 14 (1), 285. https://doi.org/10.1186/1471-2393-14-285.

Dirección Nacional de Maternidad, Infancia y Adolescencia., 2019. Sistema Informatico Perinatal Para La Gestion (SIP-G) - Indicadores Basicos 2018. Ministerio de Salud y Desarrollo Social, Buenos Aires.

Dumont, A., Betrán, A.P., Kaboré, C., de Loenzien, M., Lumbiganon, P., Bohren, MA., Mac, Q.N.H., et al., 2020. Implementation and evaluation of nonclinical interventions for appropriate use of cesarean section in low- and middle-income countries: protocol for a multisite hybrid effectiveness-implementation Type III trial. Implement. Sci. IS 15 (1), 72. https://doi.org/10.1186/s13012-020-01029-4.

Dumont, A., Loenzien, M., Nhu, H.M.Q., Dugas, M., Kabore, C., Lumbiganon, P., Torloni, M.R., et al., 2022. Caesarean section or vaginal delivery for low-risk pregnancy? Helping women make an informed choice in low- and middle-income countries. Edited by Melissa Morgan Medvedev PLOS Glob. Public Health 2 (11), e0001264. https://doi.org/10.1371/journal.pgph.0001264.

Elaraby, S., Altieri, E., Downe, S., Erdman, J., Mannava, S., Moncrieff, G., Shamanna, B. R., Torloni, M.R., Betran, A.P., 2023. Behavioural factors associated with fear of litigation as a driver for the increased use of caesarean sections: a scoping review. BMJ Open 13 (4), e070454. https://doi.org/10.1136/bmjopen-2022-070454.

Fuglenes, D., Aas, E., Botten, G., Øian, P., Sønbø Kristiansen, I., 2011. Why do some pregnant women prefer cesarean? The influence of parity, delivery experiences, and fear. Am. J. Obstet. Gynecol. 205 (1), 45.e1–45.e9. https://doi.org/10.1016/j.ajog.2011.03.043.

Gamble, J.A., Creedy, D.K., 2000. Women's request for a cesarean section: a critique of the literature. Birth 27 (4), 256–263. https://doi.org/10.1046/j.1523-536x.2000.00256.x.

Heckman, J., 1977. Sample Selection Bias as a Specification Error (With an Application to the Estimation of Labor Supply Functions). National Bureau of Economic Research, Inc. NBER Working Paper 0172. https://econpapers.repec.org/paper/nbrnberwo/0172.htm.

Ji, H., Jiang, H., Yang, L., Qian, X., Tang, S., 2015. Factors contributing to the rapid rise of caesarean section: a prospective study of primiparous Chinese women in Shanghai. BMJ Open 5 (11), e008994. https://doi.org/10.1136/bmjopen-2015-008994.

Kaboré, C., Ridde, V., Kouanda, S., Agier, I., Queuille, L., Dumont, A., 2016. Determinants of Non-Medically Indicated Cesarean Deliveries in Burkina Faso. Int. J. Gynaecol. Obstet. 135 (Suppl 1 (November)), S58–S63. https://doi.org/10.1016/j.ijgo.2016.08.019.

Kingdon, C., Baker, L., Lavender, T., 2006. Systematic review of nulliparous women's views of planned cesarean birth: the missing component in the debate about a term cephalic trial. Birth 33 (3), 229–237. https://doi.org/10.1111/j.1523-536X.2006.00108.x.

Liang, H., Fan, Y., Zhang, N., Chongsuvivatwong, V., Wang, Q., Gong, J., Sriplung, H., 2018. Women's cesarean section preferences and influencing factors in relation to China's two-child policy: a cross-sectional study. Patient Prefer Adherence 12, 2093–2101. https://doi.org/10.2147/PPA.S171533.

Litorp, H., Mgaya, A., Kidanto, H.L., Johnsdotter, S., Essén, B., 2015. 'What about the mother?' Women's and caregivers' Perspectives on caesarean birth in a low-resource setting with rising caesarean section rates. Midwifery 31 (7), 713–720. https://doi.org/10.1016/j.midw.2015.03.008.

Liu, N.H., Mazzoni, A., Zamberlin, N., Colomar, M., Chang, O.H., Arnaud, L., Althabe, F., Belizán, J.M., 2013. Preferences for mode of delivery in nulliparous Argentinean women: a qualitative study. Reprod. Health 10 (1), 2. https://doi.org/10.1186/1742-4755-10-2.

de Loenzien, M., Schantz, C., Luu, B.N., Dumont, A., 2019. Magnitude and correlates of caesarean section in urban and rural areas: a multivariate study in Vietnam. PLoS One 14 (7), e0213129. https://doi.org/10.1371/journal.pone.0213129.

Loke, A.Y., Davies, L., Li, S., 2015. Factors influencing the decision that women make on their mode of delivery: the health belief model. BMC Health Serv. Res. 15 (1), 1–12. https://doi.org/10.1186/s12913-015-0931-z.

Long, Q., Kingdon, C., Yang, F., Renecle, M.D., Jahanfar, S., Bohren, MA., Betran, A.P., 2018. Prevalence of and reasons for women's, family members', and health professionals' preferences for cesarean section in China: a mixed-methods systematic review. PLoS Med. 15 (10), e1002672 https://doi.org/10.1371/journal.pmed.1002672.

Mazzoni, A., Althabe, F., Liu, N.H., Bonotti, A.M., Gibbons, L., Sánchez, A.J., Belizán, J. M., 2011. Women's preference for caesarean section: a systematic review and meta-analysis of observational studies. BJOG Int. J. Obstet. Gynaecol. 118 (4), 391–399. https://doi.org/10.1111/j.1471-0528.2010.02793.x.

McCourt, C., Weaver, J., Statham, H., Beake, S., Gamble, J., Creedy, D.K., 2007. Elective cesarean section and decision making: a critical review of the literature. Birth 34 (1), 65–79. https://doi.org/10.1111/j.1523-536X.2006.00147.x.

Mia, M.N., Islam, M.Z., Chowdhury, M.D.R., Razzaque, A., Chin, B., Shafiqur Rahman, M., 2019. Socio-demographic, health and institutional determinants of caesarean section among the poorest segment of the urban population: evidence from selected slums in Dhaka, Bangladesh. SSM Popul. Health 8 (August), 100415. https://doi.org/10.1016/j.ssmph.2019.100415.

Miller, S., Abalos, E., Chamillard, M., Ciapponi, A., Colaci, D., Comandé, D., Diaz, V., et al., 2016. Beyond too little, too late and too much, too soon: a pathway towards evidence-based, respectful maternity care worldwide. Lancet 388 (10056), 2176–2192. https://doi.org/10.1016/S0140-6736(16)31472-6.

Ming, Y., Huang, R., Zhou, W., Wang, B., Yu, H., Zhang, J., Shanghai Birth Cohort, 2019. Is age and socioeconomic status associated with preference for birth mode in nulliparous women in China? Arch. Gynecol. Obstet. 300 (1), 33–40. https://doi.org/10.1007/s00404-019-05140-w.

Mungrue, N., David, D., Durga, G., Mohammed, 2010. Trinidadian women's knowledge, perceptions, and preferences regarding cesarean section: how do they make choices? Int. J. Women's Health November, 387. https://doi.org/10.2147/IJWH.S12857.

National Statistical Office, United Nations Children's Fund, 2017. Thailand 14 Provinces Multiple Indicator Cluster Survey (MICS) 2015-2016. NSO and UNICEF, Bangkok. Final Report.

Opiyo, N., Kingdon, C., Oladapo, O.T., Souza, J.P., Vogel, J.P., Bonet, M., Bucagu, M., et al., 2020. Non-clinical interventions to reduce unnecessary caesarean sections: WHO recommendations. Bull. World Health Organ. 98 (1), 66–68. https://doi.org/10.2471/BLT.19.236729.

Panda, S., Begley, C., Daly, D., 2018. Clinicians' views of factors influencing decision-making for caesarean section: a systematic review and metasynthesis of qualitative, quantitative and mixed methods studies. PLoS One 13 (7), e0200941. https://doi.org/10.1371/journal.pone.0200941.

Perrotta, C., Romero, M., Sguassero, Y., Ingram, C., Righetti, N., Gialdini, C., Betrán, A. P., Ramos, S., 2022. Women's mode of birth preferences and preparedness of

hospitals to support vaginal birth in the public health sector in Argentina. Reprod. Female Child Health 1 (October), 111–121. https://doi.org/10.1002/rfc2.16.

Richard, F., Ouattara, F., Zongo, S., 2014. Fear, guilt, and debt: an exploration of Women's experience and perception of cesarean birth in Burkina Faso, West Africa. Int. J. Women's Health May, 469. https://doi.org/10.2147/IJWH.S54742.

Ryding, E.L., Lukasse, M., Kristjansdottir, H., Steingrimsdottir, T., Schei, B., and on behalf of the Bidens study group, 2016. Pregnant women's preference for cesarean section and subsequent mode of birth – a six-country cohort study. J. Psychosom. Obstet. Gynecol. 37 (3), 75–83. https://doi.org/10.1080/0167482X.2016.1181055.

Sales, A.E., Plomondon, M.E., Magid, D.J., Spertus, J.A., Rumsfeld, J.S., 2004. Assessing response bias from missing quality of life data: the Heckman method. Health Qual. Life Outcomes 2 (September), 49. https://doi.org/10.1186/1477-7525-2-49.

Shah, A., Faundes, A., Machoki, M.I., Bataglia, V., Amokrane, F., Donner, A., Mugerwa, K., et al., 2008. Methodological considerations in implementing the WHO global survey for monitoring maternal and perinatal health. Bull. World Health Organ. 86 (2), 126–131. https://doi.org/10.2471/blt.06.039842.

Shi, Y., Jiang, Y., Zeng, Q., Yuan, Y., Yin, H., Chang, C., Pang, R., 2016. Influencing factors associated with the mode of birth among childbearing women in hunan province: a cross-sectional study in China. BMC Pregnancy Childbirth 16 (1), 1–9. https://doi.org/10.1186/s12884-016-0897-9.

Sombié, I., Méda, Z.C., Savadogo, G.B.L., Sanou, G., Dadjoari, M., 2017. Trends in caesarean section rates and places of delivery in Burkina Faso]. Sante Publique 29 (1), 133–139.

Suwanrath, C., Chunuan, S., Matemanosak, P., Pinjaroen, S., 2021. Why do pregnant women prefer cesarean birth? A qualitative study in a tertiary care center in Southern Thailand. BMC Pregnancy Childbirth 21 (1), 23. https://doi.org/10.1186/s12884-020-03525-3.

Takegata, M., Smith, C., Nguyen, H.T., Thi, H.H., Minh, T.N.T., Day, L.T., Kitamura, T., Toizumi, M., Dang, D.A., Yoshida, L.M., 2020. Reasons for increased caesarean section rate in Vietnam: a qualitative study among Vietnamese mothers and health care professionals. Healthcare 8 (1), 41. https://doi.org/10.3390/healthcare8010041.

Vieira, G.O., Fernandes, L.G., Oliveira, N.F., Silva, L.R., Vieira, T.O., 2015. Factors associated with cesarean delivery in public and private hospitals in a city of Northeastern Brazil: a cross-sectional study. BMC Pregnancy Childbirth 15 (June), 132. https://doi.org/10.1186/s12884-015-0570-8.

Yamasmit, W., Chaithongwongwatthana, S., 2012. Attitude and preference of thai pregnant women towards mode of delivery. J. Med. Assoc. Thail. 95 (5), 619–624. = Chotmaihet Thangphaet.

Yilmaz, S.D., Bal, M.D., Beji, N.K., Uludag, S., 2013. Women's preferences of method of delivery and influencing factors. Iran. Red Crescent Med. J. 15 (8), 683–689. https://doi.org/10.5812/ircmj.11532.