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Wealth Index Association with Elective or Choice of Pre-Labor Caesarean Section among Thai Women

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Abstract

The prevalence of caesarean section in Thailand is increasing every year along with the growing capability of women to work. This study examined the correlation between wealth index and caesarean section decision (decided in advance or after labour). This study used secondary data from the Multiple Indicator Cluster Survey (MICS) Thailand in 2022. The sample consisted of women who had at least one child. The dependent variable is the caesarean section decision, and the main independent variable is the wealth index. The data was analyzed for univariate, bivariate (t-test and Chi-square), and multivariate (binary logistic regression). The findings revealed that around 70% of women decided to deliver by caesarean section in advance (not after labour). The multivariate analysis found the richest women were 2.88 times more likely to decide to deliver by caesarean section in advance compared to lower wealth index quantiles. This study contributed to the current phenomenon that the richest women tend to deliver by caesarean section as an elevated social status compared to vaginal birth.

INTRODUCTION

In recent years, there has been a notable increase in the rate of caesarean section deliveries worldwide (Angolile et al., 2023). This trend is particularly evident in Southeast Asia, including Thailand, where elective pre-labor caesarean sections have become increasingly common (Etcheverry et al., 2024). The decision to undergo a caesarean section before labor is influenced by various factors, including socioeconomic status, cultural beliefs, and personal preferences (Nuampa et al., 2023). Omprehending these factors is essential for healthcare professionals and policymakers to effectively manage the increasing rates of caesarean sections and to ensure that such procedures are conducted primarily for medical indications rather than convenience or apprehension (Panda et al., 2018).

The wealth index, which measures the economic status of households, is a significant determinant in the choice of elective caesarean sections (Islam et al., 2022). Studies have shown that women from wealthier households are more likely to opt for caesarean deliveries compared to those from lower-income backgrounds (Dankwah et al., 2019). This disparity can be attributed to better access to healthcare facilities, higher levels of education, and the ability to afford the costs associated with elective surgeries. Additionally, wealthier women may have more access to information and resources that influence their decision-making process (Idris et al., 2023).

Age is another critical factor that influences the decision to undergo a caesarean section

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(Chen et al., 2018). Older women are more likely to choose caesarean deliveries due to concerns about the risks associated with natural childbirth at an advanced maternal age (Adams et al., 2022). This preference is often reinforced by healthcare providers who may recommend caesarean sections for older mothers to mitigate potential complications (Johansson et al., 2023). The increasing maternal age in many societies contributes to the rising rates of elective caesarean sections(Begum et al., 2023).

Educational attainment and access to health insurance are additional factors that influence the decision to undergo a caesarean section(Adewuyi et al., 2024). Women with higher education levels are more likely to have the knowledge and resources to make informed decisions about their childbirth options (Coates et al., 2020). Similarly, having health insurance can alleviate financial concerns associated with elective surgeries, making it more feasible for women to choose caesarean sections (Bam et al., 2021). These factors highlight the importance of addressing educational and economic disparities to ensure equitable access to appropriate maternal healthcare. The objective of this study is to analyze the association between the wealth index and the choice of elective pre-labor caesarean section among Thai women. By examining the influence of socioeconomic status, age, geographic location, education, and health insurance on the decision-making process, the study aims to provide insights that can inform healthcare policies and interventions to promote safe and equitable maternal healthcare practices in Thailand.

METHOD

Study design

This research adopts a cross-sectional design, drawing upon data from the 2022 Thailand Multiple Indicator Cluster Survey (MICS). The MICS, a comprehensive household survey initiative led by UNICEF in partnership with national statistical agencies, applies a multi-stage, stratified cluster sampling approach. The sampling framework encompasses households from both urban and rural regions throughout Thailand.

Setting

The data collection for the MICS Thailand 2022 was carried out between June and October 2022. Interviewer training was conducted in two separate phases: the first from June 9 to 17, and the second from June 30 to July 8, 2022. The survey encompassed all major regions of the country, including Bangkok, Central, Northern, Northeastern, and Southern Thailand, ensuring national representativeness. Prior to the main survey, validity and reliability assessments were conducted as part of a pre-test in Pathum Thani Province in April 2022.

Sample/Participants

The sampling framework for this study was derived from the 2022 Household Basic Information Survey (HBIS). Of the 34,540 households initially selected, 30,008 were successfully interviewed, yielding a response rate of 94.7%. The sampling design employed stratification by urban and rural areas within each province, which served as the primary strata. A two-stage sampling process was implemented: first, enumeration areas (EAs) were systematically selected within each stratum using Probability Proportional to Size (PPS); second, following household listing within the chosen EAs, households were classified based on whether they included children under the age of five. This study specifically targeted women who had at least one child at the time of the survey, which constituted the inclusion criterion. Women with missing data for any variables of interest were excluded. The final analytical sample consisted of 1,049 women.

Instrument

This study utilized data from the women's questionnaire, which targeted respondents aged 15 to 49 years. The standardized questionnaire was translated into Thai and underwent pretesting in Pathum Thani Province from April 5 to 7, 2022. Revisions to wording and translation were made based on insights gained from the pretest. The outcome variable in this analysis was the mode of delivery by caesarean section, classified as either planned or decided upon after labor had begun. The key independent variable was the wealth index, while control variables included age, residential location, educational attainment, health insurance coverage, marital status, place of delivery, and geographic region.

Data Collection

The MICS surveys utilized Computer-Assisted Personal Interviewing (CAPI) methods. Data collection was implemented through an application developed with CSPro (Census and Survey Processing System) Version 7.6, in conjunction with a MICS-specific data management platform. Standardized procedures and software programs from the global MICS framework were adapted to align with the Thailand MICS 2022 questionnaires. A total of 98 field teams, each

comprising two to four interviewers and one supervisor, conducted the data collection. In areas with a significant proportion of non-Thai households, translators were included in the teams. Fieldwork began in June 2022 and was completed by October 2022. Tablet computers running Windows 10 were used for data entry, with Bluetooth-enabled applications facilitating the transfer of assignments and completed forms between interviewers and supervisors.

Data Analysis

Data were transmitted to the National Statistical Office's central system via the CSWeb platform, which was integrated into the supervisory tablet management application. Synchronization was conducted daily when conditions allowed. Through this system, the central office also distributed application updates to field teams. Throughout and following data collection, data editing was carried out in accordance with procedures specified in the Guidelines for Secondary Editing, an adapted version of the standard MICS6 documentation. Data analysis was initially designed using SPSS Version 24, with UNICEF-provided syntax and tabulation plans customized for this dataset. Nevertheless, this study employed STATA Version 17 to perform univariate, bivariate, and multivariate analyses. Bivariate analysis was conducted using Chi-square and t-tests, while multivariate analysis utilized binary logistic regression.

Ethical Considerations

All participants were informed that their involvement in the survey was entirely voluntary, and assurances were provided regarding the confidentiality and anonymity of their responses. Participants were also made aware of their right to decline to answer specific questions or to withdraw from the interview at any stage. The MICS surveys are conducted in accordance with national and local ethical standards in Thailand, including adherence to guidelines established by the National Health Security Office and other pertinent regulatory bodies.

RESULT AND DISCUSSION

The results in this section consist of findings from univariate, bivariate, and multivariate analyses. Table 1 below describes the description of study sample characteristics including outcome and predictors. According to the decision made to have a caesarean section, more than half of respondents reported that the decision was made in advance (69.88%) and the rest decided after labour (30.12%). Wealth index as the main independent variable in this study revealed that almost one-fourth of the samples were in the fourth quartile (23.93%), followed by the richest (23.83%). Age in this study is continuously described by years, in which the mean age was 31.27 years old, the standard deviation was 6.11, the minimum age was 16 years old and the maximum age was 46 years old. More than half of the women in this study lived in rural areas (50.91%), and the highest educational level was a higher degree (48.81%). The majority of women in this study had health insurance (96.85%), and are currently married (93.38%). Based on the type of health facility during delivery, the majority of them delivered in public health facilities (88.85%). The geographical factor in this study found the two highest percentages of respondents were from the South region (38.23%), followed by the Northeast (24.98%).

The result from bivariate analysis is presented in Table 2. In that table, some independent variables are significantly associated with the decision to caesarean section including wealth index, age (in years), educational level and type of place of delivery. However, other independent variables such as place of residence, health insurance ownership, marital status, and region were found insignificantly associated with planned caesarean section in advance.

The multivariate binary logistic regression results are presented in Table 3 below. In the table, it was found the variables of wealth index, age, and place of residence were significantly associated with having a plan to caesarean section in advance after adjusting to all independent variables. In detail, compared to the poorest ones, the richest ones were 2.88 times more likely to decide on the caesarean section delivery in advance after adjusting to other independent variables. In terms of age, increasing one year of a woman's age increases 1.06 odds more likely of delivery by caesarean section in advance. The women who lived in rural areas were found 1.38 times more likely to plan the caesarean section compared to those who lived in urban areas. The findings also revealed that some independent variables were insignificantly associated with the decision of caesarean section.

The findings in this study revealed that women who experienced caesarean section (C-section) decided in advance before labour were more than half. The main predictor in this study are wealth index. The results found a significant association between being the richest and the odds to decide caesarean section even before the labor.

Table 1. General characteristics of the study sample (n = 1,049)

Variables	Frequency	Percentage
Decision made to have a caesarean section		
After labour	316	30.12
Planned in advance	733	69.88
Wealth index		
Poorest	152	14.49
Second	168	16.02
Middle	228	21.73
Fourth	251	23.93
Richest	250	23.83
Age (in years)		
Mean 31.27, std 6.11, min-max, 16-46		
Place of residence		
Urban	515	49.09
Rural	534	50.91
Educational level		
Pre-primary or none	19	1.81
Primary	86	8.2
Lower Secondary	185	17.64
Upper Secondary	247	23.55
Higher	512	48.81
Insurance ownership		
Yes	1,016	96.85
No	33	3.15
Marital status		
Currently married	1,011	96.38
Formerly or never married	38	3.62
Type place of delivery		
Public	932	88.85
Private	117	11.15
Region		
Bangkok	69	6.58
Central	145	13.82
North	172	16.40
Northeast	262	24.98
South	401	38.23

Studies have consistently shown that wealth index plays a significant role in determining the likelihood of opting for a C-section during childbirth (Kathuria & Tp, 2021; Miani et al., 2020; Nahayo, 2024; Ravit et al., 2018). Moreover, the literature suggests that while higher incomes are associated with higher rates of elective C-sections, lower socioeconomic status may be linked to higher rates of emergency C-sections. This indicates a complex interplay between socioeconomic factors and the type of C-section performed. Additionally, the reason behind this is the fear of harm to either the mother or the baby during childbirth, which was reported by a substantial percentage of women in the absence of any medical indications for a C-section (Puramban, 2023). This fear factor is

Table 2. Correlation of each predictor and decision of caesarean section (n = 1,049)

Variables	Decision to SC		Total	Chi2 value (p-value)
	After labour	Planned in advance		
Wealth index				38.05***
poorest	41.45	58.55	152	
Second	38.1	61.9	168	
Middle	34.21	65.79	228	
Fourth	27.49	72.51	251	
Richest	16.8	83.2	250	
Age (in years)				43.56***
mean 31.27, std 6.11, min-max, 16-46				
Place of residence				1.12
Urban	31.65	68.35	515	
Rural	28.65	71.35	534	
Educational level				21.44***
Pre-primary or none	21.05	78.95	19	
Primary	36.05	63.95	86	
Lower Secondary	41.62	58.38	185	
Upper Secondary	31.58	68.42	247	
Higher	24.61	75.39	512	
Insurance ownership				0.63
Yes	29.92	70.08	1016.00	
No	36.36	63.64	33.00	
Marital status				0.85
Currently married	29.87	70.13	1,011	
Formerly or never married	36.84	63.16	38	
Type place of delivery				6.85**
Public	31.44	68.56	932	
Private	19.66	80.34	117	
Region				5.8041
Bangkok	28.99	71.01	69	
Central	34.48	65.52	145	
North	29.65	70.35	172	
Northeast	33.97	66.03	262	
South	26.43	73.57	401	

*Note: ***p-value<0.001, **p-value<0.01, *p-value<0.05*

crucial as it underscores the psychological aspect of decision-making regarding the mode of delivery. Additionally, concerns about the safety of the baby have emerged as another primary reason for women opting for caesarean sections, particularly among pregnant women (Gao et al., 2019).

Moreover, the preference for caesarean sections among women in the wealthiest wealth index could also stem from a desire to avoid the perceived pain associated with vaginal delivery. Studies have shown that some women opt for C-sections to circumvent the discomfort and pain of labor (Amjad et al., 2020). This avoidance of labor pain is a significant factor contributing to the rising rates of C-sections globally, particularly among women who may have the means to choose their preferred mode of delivery. Furthermore, the availability of healthcare services and the in-

Table 3. Odds ratio of decision to caesarean section using logistic regression (n = 1,049)

Variables	Adj odd ratio	p-value	95% CI	
			lower	upper
Wealth index (ref: poorest)				
Second	1.13	0.616	0.70	1.82
Middle	1.28	0.288	0.81	2.04
Fourth	1.62	0.054	0.99	2.65
Richest	2.88	0.000	1.65	5.01
Age yearsyear)	1.06	0.000	1.03	1.08
Place of residence (ref: urban)				
Rural	1.38	0.033	1.03	1.85
Educational level (ref: pre-primary or none)				
Primary	0.43	0.178	0.13	1.47
Lower Secondary	0.39	0.125	0.12	1.30
Upper Secondary	0.55	0.324	0.17	1.80
Higher	0.50	0.245	0.15	1.62
Insurance ownership (ref: yes)				
No	1.00	0.994	0.46	2.17
Marital status (ref: currently married)				
Formerly or never married	0.99	0.972	0.48	2.02
Type place of delivery (ref: public)				
Private	1.41	0.201	0.83	2.40
Region (ref: Bangkok)				
Central	0.77	0.459	0.39	1.52
North	1.10	0.781	0.55	2.19
Northeast	1.07	0.832	0.56	2.05
South	1.35	0.351	0.72	2.56

fluence of healthcare policies, such as free C-section initiatives, can impact women's decisions, especially those in wealthier households who may have better access to such services (Ravit et al., 2018). This trend is particularly notable among women who have undergone a C-section for their first delivery, as they may perceive it as a safer option based on their past experience. Furthermore, guidelines that focus on pregnant women with previous C-sections, higher incomes, and specific health conditions like obesity can also contribute to the preference for C-sections among women in the wealthiest wealth index (Dwaib, 2022). In conclusion, the decision of women in the wealthiest wealth index to opt for delivery by caesarean section is influenced by a combination of factors such as fear of harm, concerns about safety, avoidance of labor pain, previous birth experiences, and healthcare policies. These factors interact to shape individual preferences and choices regarding the mode of delivery, highlighting the complex nature of decision-making in maternal healthcare, particularly among women with higher socioeconomic status. Another research has shown that women in higher socioeconomic classes may view caesarean sections as a symbol of their elevated social status and may opt for this mode of delivery even without medical necessity (Amjad et al., 2020).

The control variables that were found significantly associated with the choice of pre-labor of caesarean section included being older age and residence in rural area. In terms of the age, the similar finding was found that typically defined as 35 years or older, has consistently been linked to an increased likelihood of caesarean sections (Pavlidou, 2023; Tian et al., 2022). This trend indicates that advanced maternal age is a significant factor influencing the choice of delivery method, with older women more inclined to opt for a caesarean section compared to younger women (Roy et al., 2021). Moreover, research has

reported that the rate of caesarean sections is higher among older and more educated women (Paixão et al., 2021). Additionally, older women may view caesarean sections as a safer option to protect the fetus, especially after experiencing challenges with conception or facing fears related to delivery pains and potential adverse outcomes (Gilbert et al., 2020). This perception of safety and protection for the unborn child can be a motivating factor for older women to choose caesarean sections, reflecting a complex interplay of emotional, psychological, and medical considerations in decision-making. Furthermore, the decision-making process for caesarean sections among older women may involve factors such as previous caesarean sections, which can impact the duration of the decision-making process .

Lived in rural areas also found significantly associated with decision to deliver by caesarean section in advance. However, the finding in this study is not in line with the previous study which showed that there is a disparity in caesarean section rates between rural and urban areas, with women residing in rural regions generally having lower odds of undergoing a caesarean section compared to their urban counterparts (Gedefaw et al., 2021; Nahayo, 2024). This disparity highlights the impact of geographical location on the choice of delivery method and suggests that access to healthcare services and resources may differ between rural and urban settings, influencing decision-making processes. Furthermore, research indicates that women in urban areas are more likely to have caesarean section deliveries compared to those in rural areas (Kang et al., 2019). This finding underscores the influence of residence status on the likelihood of opting for a caesarean section, with urban women having a higher probability of undergoing this procedure. Additionally, the research conducted in Southwest Ethiopia revealed that mothers residing in urban areas had significantly higher odds of opting for a caesarean section compared to those in rural areas. Factors such as multiple pregnancies, malpresentation, and a history of previous caesarean sections were associated with the decision to undergo a caesarean delivery (Mose & Abebe, 2021). Additionally, the study in Angola found that women who underwent caesarean deliveries were more likely to reside in periurban areas and disclose lower family income compared to women who had vaginal deliveries (Nimi et al., 2019). Furthermore, research in Maharashtra, India revealed significant correlations between caesarean sections and various socio-economic factors, including the place of residence. The study identified associations between C-sections and age, religion, tribe, BMI, and the place of habitation for delivery (public/private) (Khadse, 2024). With the result of this study, qualitative studies have identified themes such as understanding, fears, decision-making, after-care, and prevention related to caesarean sections among women in rural areas (Attokaran et al., 2020). The higher odds of having elective or pre-labor caesarean section among rural women might be influenced by healthcare services and cultural perceptions.

The decision to undergo a caesarean section before the onset of labor, known as an elective or pre-labor caesarean section, is a topic of interest in maternal healthcare. Previous studies have explored various aspects related to this decision-making process, shedding light on factors influencing the choice of pre-labor caesarean sections. The caesarean sections can be performed before the onset of labor or during the first or second stage of labor, emphasizing the flexibility in timing for this procedure (Sharma et al., 2021). Similarly, it was reported that a significant percentage of women opted for pre-labor elective caesarean sections, indicating a proactive decision-making process even before the onset of labor (Puramban, 2023). Factors influencing the decision for pre-labor caesarean sections include maternal characteristics, obstetric history, and pregnancy complications. The primary caesarean sections among multigravida women, providing insights into the clinical aspects of this decision (Kumar et al., 2023). Furthermore, certain risk factors have been identified as contributing to the need for a caesarean section during the second stage of labor following a previous caesarean delivery, including maternal weight gain during pregnancy and the occurrence of diabetes (Zaręba-Szczudlik et al., 2021). The importance of scheduling elective repeat caesarean deliveries before 39 weeks gestation to avoid emergency caesarean deliveries due to spontaneous onset of labor (Nitahara et al., 2020). This proactive approach aims to reduce the risks associated with emergency procedures and ensure optimal maternal and neonatal outcomes. Additionally, the medical and clinical implications that found in this study can be considered as factors of delivery choice. The socioeconomic factors found significant in this study revealed the clinical and health policy, especially for caesarean section and its consideration. Further study should be considered to improve the model building to explain the potential confounder with more clarification and justification.

CONCLUSION

The study reveals that socioeconomic factors, particularly the wealth index, play a significant role in the decision to opt for elective pre-labor caesarean sections among Thai women. Wealthier women, older mothers, and those with higher educational attainment and health insurance coverage are more likely to choose caesarean deliveries. Additionally, the finding that rural women are more inclined towards elective caesarean sections challenges previous assumptions and highlights geographic disparities in healthcare access. These insights underscore the need for targeted healthcare policies and interventions that address these socioeconomic and geographic disparities, ensuring that caesarean sections are performed based on medical necessity rather than socioeconomic status or convenience, thereby promoting equitable and informed maternal healthcare practices in Thailand.

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