

Magnitude and Determinants of Shifting from Private to Public Health Facilities Among Pregnant Mothers with Previous Caesarean Scars Attending Public Hospitals, Addis Ababa, Ethiopia, 2025: A Cross-Sectional Study

Abstract

Background: Maternal healthcare in low- and middle-income countries, particularly in urban settings such as Addis Ababa, often relies on out-of-pocket payments, leading patients to switch between the private and public health sectors. This study aims to assess burden of transition from Private to Public healthcare among Pregnant Women with Previous Cesarean Scars in Addis Ababa, Ethiopia (2025)

Methods: An institution-based cross-sectional study design was used to assess the magnitude and determinants of shifting from private to public health facilities among pregnant mothers with previous caesarean scars. The study was conducted from May 1, 2025, to June 15, 2025. A total of 422 women were taken. After taking four hospitals under Addis Ababa, administrative health bureau, Proportional allocation was done, and then each participant was selected systematically. Data was collected by structured questionnaire. The analysis was done by SPSS version 26 and in multivariable analysis those variables whose p-value was considered as statistically significant at p less than 0.05

Result: The study found that the magnitude of shifting from a private to a public health facility was 23.7% with a 95% CI: 19.4% to 27.8%). The multivariable analysis revealed that the Shifting behavior was significantly predicted by four key factors: Low family income ($\leq 10,000$ Br) was the strongest predictor, increasing the odds of shifting by nearly five times (AOR≈5); Higher educational attainment (above secondary) also showed a significant increase in the odds of shifting (over five times); Larger family size (≥ 3 members) was associated with approximately four times higher odds; and Advanced maternal age (≥ 35 years) significantly increased the likelihood of

Research Article

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shifting (AOR=3.20).

Conclusion: Shifting of pregnant women with prior Cesarean Sections (CS) from private to public facilities in Addis Ababa is driven by financial struggles, particularly low income and large family size. However, older, educated women are also opting for public services due to their zero-cost nature, indicating growing trust in public health quality. This shift may overwhelm public hospitals, risking care quality. Private health facilities should consider financial subsidies for low-income families seeking private care, while public hospitals need to improve capacity and service segmentation. Additionally, private facilities should adopt competitive pricing and highlight non-financial benefits to attract the evolving patient demographics.

Keywords: Shifting, Public Health Facilities, Pregnant Mothers, Previous Caesarean Scars.

Introduction

Shifting from private to public health facilities among pregnant mothers with previous Caesarean scars is an increasing public health concern, particularly in low- and middle-income countries (LMICs) where healthcare systems are often strained. Globally, the rising rate of Caesarean sections (CS) has led to an increase in pregnancies with previous Caesarean scars, which are associated with higher risks of maternal and neonatal complications [1]. In such cases, the choice of healthcare facility for delivery is critical, as it can significantly influence maternal and fetal outcomes. While private health facilities often provide more personalized care, public health facilities are typically better equipped to handle high-risk deliveries due to their access to specialized staff, emergency services, and advanced medical equipment [2].

In sub-Saharan Africa, where maternal mortality rates remain disproportionately high, the shifting of pregnant women from private to public health facilities has been observed as a response to the limitations of private healthcare providers in managing high-risk pregnancies [3]. Ethiopia, one of the countries in the region with a high maternal mortality ratio (MMR), faces significant challenges in providing equitable and quality maternal healthcare services. Despite efforts to improve healthcare access, disparities between private and public health facilities persist, particularly in urban centres like Addis Ababa [4].

Addis Ababa has a mix of private and public health facilities, yet the public sector remains the primary provider of maternal health services, especially for high-risk pregnancies. Pregnant mothers with previous Caesarean scars often face complex clinical decisions regarding their delivery options. While some initially seek care in private facilities due to perceived better service quality, many eventually shifting to public hospitals as their pregnancy progresses, particularly when complications arise [5]. This shifting pattern raises important questions about the magnitude and determinants of such transitions, as well as their implications for maternal health outcomes.

Understanding the factors driving this shifting is crucial for policymakers and healthcare providers to address gaps in service delivery and ensure that all pregnant women, regardless of their risk profile, receive appropriate care. Previous studies have highlighted factors such as cost, per-

ceived quality of care, availability of specialized services, and trust in healthcare providers as key determinants of facility choice among pregnant women [6]. However, there is limited evidence specifically focusing on pregnant mothers with previous Caesarean scars in Ethiopia, particularly in urban settings like Addis Ababa.

This study aims to fill this gap by examining the magnitude and determinants of shifting from private to public health facilities among pregnant mothers with previous Caesarean scars attending public hospitals in Addis Ababa, Ethiopia, in 2025. By exploring the reasons behind this shifting and its impact on maternal health outcomes, the findings of this study will contribute to the development of targeted interventions to improve maternal healthcare services and reduce the burden of maternal morbidity and mortality in Ethiopia.

In Ethiopia, particularly in Addis Ababa, the choice of health facility for delivery among pregnant mothers with previous Caesarean scars is a critical public health concern [7]. These mothers are at a higher risk of complications such as uterine rupture, hemorrhage, and other obstetric emergencies, making the quality and type of health facility they choose for delivery a matter of life and death [8]. While private health facilities are often perceived to offer more personalized care and shorter waiting times, public health facilities are generally better equipped to handle high-risk deliveries due to their access to specialized staff, emergency obstetric care, and lower costs for patients [3].

However, there is an increasing trend of pregnant mothers with previous Caesarean scars migrating from private to public health facilities for delivery. This shift raises several questions: What is the magnitude of this shifting? What are the key determinants driving this decision? Are private facilities inadequately equipped to handle high-risk pregnancies, or are there other factors such as cost, perceived quality of care, or referral systems influencing this shifting? Understanding the magnitude and determinants of this shifting is crucial for several reasons. First, it can inform policymakers and healthcare providers about the gaps in service delivery between private and public health facilities. Second, it can help identify the specific needs of pregnant mothers with previous Caesarean scars, ensuring that they receive appropriate care regardless of the type of facility they choose. Third, it can guide the development of targeted interventions to improve the quality of care in both private and public health facilities, ultimately reducing maternal and neonatal morbidity and mortality.

Despite the importance of this issue, there is a lack of comprehensive data on the magnitude and determinants of shifting from private to public health facilities among pregnant mothers with previous Caesarean scars in Addis Ababa. This study aims to fill this gap by providing evidence-based insights that can inform policy and practice, ultimately contributing to improve maternal and child health outcomes in Ethiopia.

The study focuses on the shifting of pregnant mothers with previous Caesarean scars from private to public health facilities in Addis Ababa, Ethiopia, 2025. This shifting is a significant factor in improving maternal health outcomes, addressing healthcare inequities, and strengthening health systems. The research will identify gaps in care and improve the quality of maternal health services for these women. It will also highlight disparities in healthcare access and utilization, which are critical for achieving equitable healthcare delivery.

The study will also provide evidence to strengthen both private and public health facilities by identifying the determinants of shifting. This can guide public hospitals in preparing for increased patient loads and improving service delivery to meet the needs of high-risk pregnancies. Policymakers and healthcare planners will generate evidence-based recommendations to address the factors driving shifting, such as regulating private healthcare providers, improving referral systems, or subsidizing care for high-risk pregnancies.

The study will also contribute to global knowledge by contributing to the global body of knowledge on patient shifting and healthcare-seeking behaviour among high-risk populations. It will empower women and communities by providing better information and support for making informed choices about their care and raising awareness about the importance of skilled care for high-risk pregnancies.

In Ethiopia, the study will provide context-specific data to address challenges in urban areas like Addis Ababa where private and public health facilities coexist. By focusing on this high-risk group, the study will contribute to strengthening health systems, reducing maternal mortality, and ensuring equitable access to quality healthcare for all women.

Methods and Materials

Study Area

The study was conducted in Addis Ababa's public hospitals.

The city has a population density of 5,535.8 inhabitants per square kilometre and occupies an estimated area of 174.4 square kilometers. There are also 11 sub-city health offices, which are directly accountable to their respective sub-city administration. There are also 52 hospitals in the metropolis of which 6 are owned by Addis Ababa regional health office AARHB, Five by federal government, 3 by NGO's, 3 by Defence force and police and 35 by the private owners. There are 116 health centres owned by the city administration, and 3 by NGOs at present. There are also more than 760 private clinics at different levels (22). According to estimates from Ethiopia's Central Statistical Agency, the Addis Ababa Region's total population is estimated to be 5.55 million in 2017. Females in the reproductive age group account for 35.5 percent of the overall population [9].

Study design

- An institutional based cross-sectional study design was used to assess the magnitude and determinants of shifting from private to public health facilities among pregnant mothers with previous caesarean scars from May 1, 2025 to June 15, 2025.

Study Period

- The study was conducted from May 1, 2025 to June 15, 2025.

Population

Source Population

- All Pregnant mothers with previous caesarean scars attending public hospitals in Addis Ababa, Ethiopia.

Study populations

- All selected pregnant mothers with previous caesarean scars attending selected public hospitals, Addis Ababa, Ethiopia, 2025

Inclusion and Exclusion Criteria

Inclusion Criteria

- Pregnant mothers with a history of at least one caesarean section and Mothers attending public hospitals for antenatal care or delivery in public hospitals, Addis Ababa, Ethiopia, 2025 during data collection period.

Exclusion Criteria

- Those participants who were severely ill were excluded

from the study

Sample Size and Sampling Procedure

The Sample size was determined using single population proportion formula considering the following assumption: 95% confidence level ($z \alpha/2$), 5% margin of error (d). Since there is no study found on expected proportion (p) of shifting from private to public health facilities among pregnant mothers with previous caesarean scars attending public hospitals. Therefor it was considered as 50% and sampling was determined by single population proportion formula as the following.

$$n = \frac{z^2 p (1-p)}{d^2}$$

$$N = \frac{(1.96)^2 * 0.5(1-0.5)}{(0.05)^2} = 384$$

Where, P= 50 %

Z=level of confidence at 95% certainty (1.96)

d= 5% marginal error

Therefore adding 10% of non-response rate it was 422

Sampling techniques and procedure

There are 6 public hospitals under Addis Ababa health bureau from those four hospitals (Tirunesh Beijing General Hospital (TBGH), Zewditu Memorial Hospital (ZMH), Minilk II hospital and Ghandi Memorial hospital) was taken by simple random sampling. After proportional allocation was done, each mother was selected every K interval in each hospital (k for ZMH = 3, GMH =3, TBGH = 3 and MIIH = 3).

Variables

Dependent Variable

- Magnitude of shifting from private to public health facilities among pregnant mothers with previous caesarean scars

Independent Variables

- Socio-demographic characteristics: Maternal Age, Occupation, Marital Status, Educational level, Household income.
- Experience with Private Health Facilities, Current Experience with Public Health Facilities: Reason for choosing of private facility, Level of satisfaction, Costs of private facility, Having health insurance .
- Reproductive History: Parity, Number of pregnancies,

Number of previous cesarean deliveries

- Reason for last cesarean, Experience complications from previous cesarean, Place of previous CS

Operational Definition

- Shifting from private to public health facilities: The movement or transition of pregnant mothers with previous C-section scars from private health facilities to public health facilities for antenatal care, delivery, or emergency obstetric services [8]
- Private Health Facilities: Non-governmental health institutions, including clinics, hospitals, and maternity centers, that operate on a for-profit or non-profit basis and provide maternal health services [10]
- Public Health Facilities: Government-owned and operated health institutions, including health centers, primary hospitals, and referral hospitals, that provide maternal health services, often at subsidized or no cost [11]
- Pregnant Mothers with Previous Caesarean Scar: Women who are currently pregnant and have a history of at least one previous Caesarean section delivery [8]
- Magnitude: The proportion or percentage of pregnant mothers with a history of Caesarean section at private health facilities but later shifting to public health facilities for subsequent care or delivery [12]

Data Collection Procedure and Quality assurance

Data Collection Procedure

A Pre-tested and interviewer-administered structured questionnaire, was prepared in English and translated to Amharic language was used to collect quantitative data. Twenty-four data collectors were participated to collect the data. Training will give to data collectors for three days. The training was focused on the study objectives, questionnaire and process of data collection. The principal investigator and coinvestigators were supervised the data collection process and checked filled questionnaire for consistency and completeness.

Data Quality Assurance

The data was collected by 24 data collectors, all of them are the investigators themselves and prior to the commencement, data collectors was given orientation by principal investigator on the objectives of the study, methodology of the study and, on issue of confidentiality of information gathered. Pre-test was done on St. Paul Hospi-

tal The data collection, application of standard procedures and accuracy of tests was supervised and checked daily for its completeness and consistency through close follow up of the advisor.

Data Management

Each questionnaire was checked for completeness, missing values then was manually clean up on such indication. Then coded data was entered on to computer using EPI data version 4.7 and analysis was by SPSS version 26.

Statistical Analysis

The data was double checked and all numerical values calculated by using excel. Principal component analysis was carried out for the reduction of variables involved in the magnitude of shifting from private to public health facilities among pregnant mothers with previous caesarean scars. Descriptive statistics was used to summarize categorical variables, whereas mean and standard deviations (SDs) was used to present continuous variables. A logistic regression model was employed to ascertain any significant association between independent variables and dependent variables.

Ethical Consideration

The research proposal was approved by the ethical clearance committee of TBGH. Then this formal letter was submitted Addis Ababa research and emergency management directorate and approved. Confidentiality was ensured by making the collected information anonymous and data was put secured and in place.

Plans for Dissemination of Findings

The study could be a tool for designing appropriate strategy for the Magnitude of shifting from private to public health facilities among pregnant mothers with previous caesarean scars and can be taken as a baseline for other studies related studies. Final findings of the study will be submitted to Addis Ababa Health bureau to each hospital. It will be disseminated through publications, presentations, and also disseminated in AA.

hospitals, Addis Ababa, Ethiopia, 2025

Out of 422 study participants 418 respondents participated in this study making a response rate of 99.05%. The mean age of the study subjects were 30.80 years (+4.14 SD). The minimum age of the study participants was 21 years and the maximum age was 40 years old.

The majority of participants (76.3%) were between the ages of 25 and 34; with 38.3% aged 25-29 and 38.0% aged 30-34. Only 3.1% were 24 or younger, while 20.6% were 35 years or older. Regarding marital status, an overwhelming majority (94.7%) were married. A small percentage was divorced (3.6%) or widowed (0.7%), and only 1.0% was single.

Education levels varied, with most participants having a secondary education (57.4%). Over a quarter (27.8%) had a primary education, 13.4% had education above the secondary level, and a small minority (1.4%) had no formal education.

In terms of occupation, nearly half of the participants (46.9%) were categorized under “other such as house wife” Governmental employees made up 29.4% of the sample, followed by merchants (17.5%), students (3.8%), and farmers (2.4%).

The income level for most participants (63.4%) fell within the 10,000 to 20,000 EBR range. Smaller proportions earned 10,000 EBR or less (17.0%) or more than 20,001 EBR (19.6%).

Virtually all participants (98.3%) resided in Addis Ababa (AA), with only 1.7% living outside the city. Finally, most participants (68.4%) reported having a family size larger than 3 persons, while 31.6% had a family size of 3 or fewer persons (Table 1).

Variables	Variable	Frequency	%
Age	≤ 24	13	3.1
	25-29	160	38.3
	30-34	159	38.0
	≥35 years	86	20.6
Marital status	Single	4	1.0
	Married	396	94.7
	Divorced	15	3.6
	Widowed	3	0.7

Result

Socio-demographic characteristics of pregnant mothers with previous caesarean scars attending public

Educational status	No education	6	1.4
	Primary education	116	27.8
	Secondary education	240	57.4
	Above secondary	56	13.4
Occupation	Government employee	123	29.4
	Merchant	73	17.5
	Farmer	10	2.4
	Student	16	3.8
	Other	196	46.9
Income level	≤10000 EBR	71	17.0
	10000 – 20000 EBR	265	63.4
	≥20001 EBR	82	19.6
Residence	AA	411	98.3
	Out of AA	7	1.7
Family size	≤ 3 persons	132	31.6
	> 3 persons	286	68.4

Table 1: Socio-demographic characteristics of pregnant mothers with previous caesarean scars attending public hospitals, Addis Ababa, Ethiopia, 2025, N = 418

Past Gynaecology and obstetrics related factors
Obstetric history of the mother in their 1st labour
 Of the 418 women, the vast majority (83.0%) delivered their first child via Cesarean section (CS), while 17.0% had a spontaneous vaginal delivery (SVD). The birth interval between the first and second pregnancy was most commonly 25-36 months (44.3%), followed closely by intervals of ≤24 months (42.8%). A smaller proportion had intervals of 37-48 months (11.0%) or greater than 48 months (1.9%). Following their first CS, most women (63.9%) did not use any family planning method. Among the 36.1% who did, the implant was the predominant choice (74.8%), followed by oral contraceptives (11.9%), injections (7.9%), Jadelle (3.9%), and the IUCD (1.3%). The first birth occurred primarily in a public health facility (84.4%) rather than a private one (15.6%). Most women had three or fewer pregnancies (86.6%), and the birth outcome of the first delivery was overwhelmingly a live birth (96.7%) (Table 2).

Variables	Variable	Frequency	%
Mode of delivery in their 1st labour	SVD	71	17.0
	CS	347	83.0

Birth interval between 1st and second pregnancy in months	≤ 24 months	179	42.8
	25 – 36 months	185	44.3
	37 – 48 months	46	11.0
	> 48 months	8	1.9
Family planning used after 1 st CS	Yes	151	36.1
	No	267	63.9
Types of family planning used	Implanon	113	74.8
	Injection	12	7.9
	IUCD	2	1.3
	Jadelle	6	3.9
	OC	18	11.9
Type of health facilities where the mother gave her 1st birth	Public Health Facility	353	84.4
	Private Health Facility	65	15.6
Gravidity	≤ 3	362	86.6
	> 3	56	13.4
Birth outcome	Live	404	96.7
	Dead	14	3.3

Table 2: First labour related history of pregnant mothers with previous caesarean scars attending public hospitals, Addis Ababa, Ethiopia, 2025, N = 418

Obstetric history of the mother in their 2nd labour

Regarding the mode of delivery, the vast majority of mothers (197, 75.48%) underwent a Cesarean section (CS) for their second birth, while a smaller proportion (64, 24.52%) had a Spontaneous Vaginal Delivery (SVD). The birth interval between the second and the subsequent pregnancy was also analyzed. More than half of the mothers (143, 54.79%) had an interval of 24 months or less. A longer interval of 25 to 36 months was reported by 97 mothers (37.16%), and only 21 mothers (8.05%) had a birth interval exceeding 36 months.

Concerning family planning practices after the second Cesarean section, a majority of mothers (161, 61.69%) reported using some form of family planning. However, a significant portion (100, 38.31%) did not. Among those who used contraception, the most common method was Implanon, used by 118 mothers (45.21% of all mothers, or 73.29% of users). Other methods were used less frequently: Injectable (INJECT) by 13 mothers (4.98%), Intrauterine Contraceptive Devices (IUCD) by 14 mothers (5.36%), and Oral Contraceptives (OC) by 16 mothers (6.13%). The data also shows that most second births (232, 88.89%) took place in a Public Health Facility, compared to a small-

er number (29, 11.11%) that occurred in a Private Health Facility. Finally, the birth outcome was overwhelmingly positive, with nearly all second births (258, 98.85%) resulting in a live birth. A very small number of cases (3, 1.14%) resulted in a fetal death (Table 3).

Variables	Variable	Frequency	%
Mode of delivery in their 2nd labour	SVD	64	24.52
	CS	197	75.48
Birth interval between 2nd and the second pregnancy in months	≤ 24 months	143	54.79
	25 – 36 months	97	37.16
	> 36 months	21	8.05
Family planning after 2nd CS	Yes	161	61.69
	No	100	38.31
Types of family planning used	Implanon	118	45.21
	Inject	13	4.98
	IUCD	14	5.36
	OC	16	6.13
Type of health facilities where the mother gave her 2nd birth	Public Health Facility	232	88.89
	Private Health Facility	29	11.11
Birth outcome	Live	258	98.85
	Dead	3	1.14

Table 3: Second labour related history of pregnant mothers with previous caesarean scars attending public hospitals, Addis Ababa, Ethiopia, 2025, N = 261

Obstetric history of the mother in their 3rd labour

Of the 77 mothers included in the study, the mode of delivery for their third labour was nearly evenly split, though Caesarean section (CS) was slightly more common. Specifically, 35 women (45.45%) had a spontaneous vaginal delivery (SVD), while 42 women (54.55%) delivered via Caesarean section.

A significant majority of the mothers, 50 women (64.94%), had a short birth interval of 24 months or less. A longer interval of 25 to 36 months was reported by 27 mothers (35.06%). The vast majority of mothers who had a third Caesarean section adopted family planning practices afterward. Out of the total, 63 women (81.82%) reported using contraception following their delivery. In contrast, 14

women (18.18%) did not use any family planning methods after their third CS.

For those who used contraception, the most prevalent method was Implanon, chosen by 43 women (55.84% of family planning users and 68.25% of all users). The injectable method was the second most common, used by 21 women (27.27% of users). Other methods were used less frequently; 6 women (7.79%) used an Intrauterine Contraceptive Device (IUCD), and 7 women (9.09%) used Oral Contraceptives (OC). All recorded third births in the study, 77 (100%), took place in a Public Health Facility. No births occurred in a Private Health Facility. Furthermore, all third birth outcomes were live births, accounting for 100% of cases, with no recorded stillbirths or early neonatal deaths in the dataset (Table 4).

Variables	Variable	Frequency	%
Mode of delivery in their 3rd labour	SVD	35	45.45
	CS	42	54.55
Birth interval between 3rd and the second pregnancy in months	≤ 24 months	50	64.94
	25 – 36 months	27	35.06
Family planning used after 3rd CS	Yes	63	81.82
	No	14	18.18
Types of family planning used	Implanon	43	55.84
	Injectable	21	27.27
	IUCD	6	7.79
	OC	7	9.09
Type of health facilities where the mother gave her 3rd birth	Public Health Facility	77	100
	Private Health Facility	0	0
Birth outcome	Live	77	100
	Dead	0	0

Table 4: Third labour related history of pregnant mothers with previous caesarean scars attending public hospitals, Addis Ababa, Ethiopia, 2025, N = 77

Obstetric history of the mother in their 4th labour

Of 14 mothers, the overwhelming majority, 12 (85.71%), delivered their third child via Cesarean section (CS). In contrast, only 2 mothers (14.29%) had a spontaneous vaginal delivery (SVD).

Regarding the birth interval between their second and third pregnancies, more than half of the mothers, 8 women (57.14%), had an interval of 25 to 36 months. A shorter interval of 24 months or less was reported by 6 mothers

(42.86%).

Following their third Cesarean section, most mothers adopted family planning methods. Ten women (71.43%) reported using contraception, while four women (28.57%) did not use any family planning.

Among the ten users of contraception, the preferred method was Implanon, used by 4 women (40% of users). The Intrauterine Contraceptive Device (IUCD) was the second most common choice, utilized by 3 women (30%). Two women (20%) used Oral Contraceptives (OC), and one woman (10%) used the Injectable method.

All recorded third births for this group, 14 (100%), took place in a Public Health Facility, with no births occurring in a Private Health Facility. Furthermore, the birth outcome for all 14 cases was a live birth, with no recorded stillbirths or early neonatal deaths (Table 5).

Variables	Variable	Frequency	%
Mode of delivery in their 3rd labour	SVD	2	14.29
	CS	12	85.71
Birth interval between 3rd and the second pregnancy in months	≤ 24 months	6	42.86
	25 - 36 months	8	57.14
Family planning used after 3rd CS	Yes	10	71.43
	No	4	28.57
Types of family planning used	Implanon	4	40
	Injectable	1	10
	IUCD	3	30
	OC	2	20
Type of health facilities where the mother gave her 3rd birth	Public Health Facility	14	100
	Private Health Facility	0	0
Birth outcome	Live	14	100
	Dead	0	0

Table 5: Fourth labour related history of pregnant mothers with previous caesarean scars attending public hospitals, Addis Ababa, Ethiopia, 2025, N = 14

Family planning utilized in inter pregnancy vs Gravidity

The highest utilization rate is observed among Gravida III mothers (third pregnancy), with 81.82% reporting "Yes" to using family planning in the inter-pregnancy period. This is followed by Gravida IV and above mothers (fourth or more

pregnancies), with a utilization rate of 71.43%. Gravida II mothers (second pregnancy) also show a relatively high utilization rate of 61.69%. In contrast, Gravida I mothers (first pregnancy) have the lowest utilization rate at 36.1%. Conversely, the data for those who did not utilize family planning ("No") shows an inverse relationship. Gravida I mothers have the highest percentage (63.9%) not utilizing family planning, which aligns with their low utilization rate. This percentage decreases sharply with higher gravidity, dropping to 38.31% for Gravida II, 18.18% for Gravida III, and 28.57% for Gravida IV and above.

It suggests that the likelihood of a mother utilizing family planning between pregnancies increases with the number of pregnancies up to the third, after which it sees a slight decline for mothers with four or more pregnancies. Gravida I mothers are the least likely to use inter-pregnancy family planning (as shown in the figure 1).

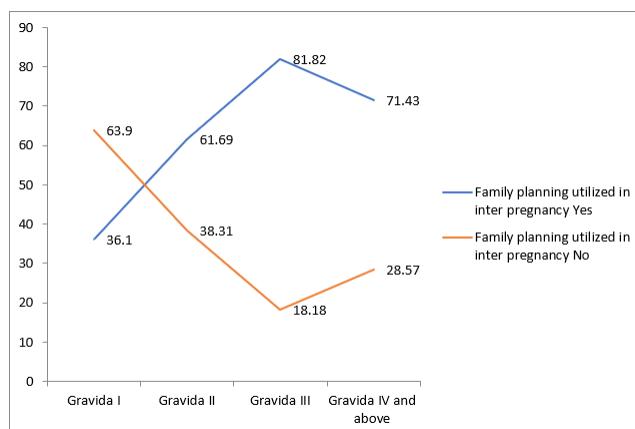


Figure 1: Family planning utilized in inter pregnancy vs Gravidity of pregnant mothers with previous caesarean scars attending public hospitals, Addis Ababa, Ethiopia, 2025

Scar related history of pregnant mothers with previous caesarean scars attending public hospitals

Nearly a quarter of the respondents (23.7%, n=99) reported having had a Caesarean delivery in a private health facility before, while the vast majority (76.3%, n=319) had not. Among those who had a CS in a private facility, the experience was overwhelmingly a one-time occurrence, with 92.93% (n=92) having had only one CS and a much smaller proportion (7.07%, n=7) having had two.

A significant number of women (27.8%, n=116) experienced complications from a previous caesarean delivery, though most (72.2%, n=302) did not report any complications. The primary reasons for the initial caesarean section were varied. The most common reason was fetal

distress, accounting for 33.01% (n=138) of cases. This was followed by "Other" reasons, such as fetal macrosomia (28.71%, n=120), failed augmentation or induction of labour (17.46%, n=73), maternal request (9.33%, n=39), and fetal malposition & mal presentation (11.48%, n=48). The data clearly shows that public health facilities were the predominant location for the last caesarean delivery, with 86.6% (n=362) of the procedures performed there. In contrast, a small minority (13.4%, n=56) had their last CS performed in a private health facility. This distribution is listed twice in the data, confirming the significant role of public health facilities in providing caesarean section services for this population (table 6).

Variables	Variable	Frequency	%
Did you have CS delivery in private health facilities before	Yes	99	23.7
	No	319	76.3
Frequency of CS delivery in private health facility	Only one time	92	92.93
	Two time	7	7.07
Did you experience complications from previous cesarean	Yes	116	27.8
	No	302	72.2
Primary reason for initial cesarean section	Maternal request	39	9.33
	Fetal distress	138	33.01
	Failed augmentation/induction	73	17.46
	Fetal malposition & mal presentation	48	11.48
	Others (e.g fetal macrosomia)	120	28.71
Where was your last cesarean performed?	private HF	56	13.4
	public health facility	362	86.6
Where was your last cesarean performed?	private HF	56	13.4
	public health facility	362	86.6

Table 6: Scar related history of pregnant mothers with previous caesarean scars attending public hospitals

Magnitude of shifting from private to public health facilities

The analysis reveals that 23.7% (n=99) of the total 418 respondents had a history of Cesarean section (CS) delivery

in a private health facility before shifting to a public facility for their current care. This proportion has a 95% confidence interval ranging from 19.4% to 27.8% (Figure 2).

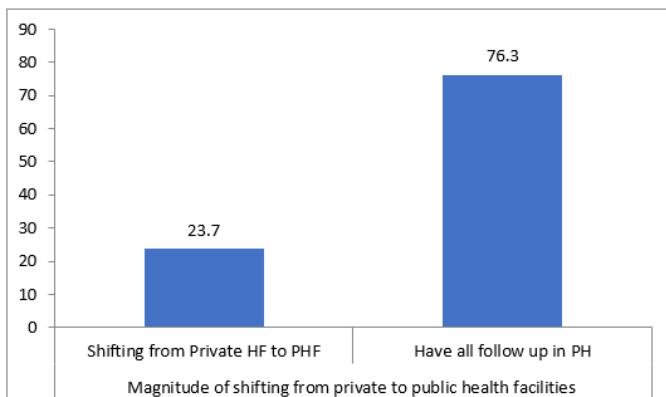


Figure 2: Magnitude of shifting from private to public health facilities of pregnant mothers with previous caesarean scars attending public hospitals, Addis Ababa, Ethiopia, 2025

Conversely, the vast majority of women, 76.3% (n=319), reported having all of their follow-up care conducted within the public health system from the outset, with no prior history of private facility CS delivery. The 95% confidence interval for this group is 72.2% to 80.6%.

This data indicates a clear pattern of patient movement within the healthcare system. While a substantial majority consistently use public health services for their obstetric care, a defined minority—approximately one in four women—transition from the private sector to the public sector. The narrow confidence intervals around these estimates provide a robust measure of precision, suggesting the sample provides a reliable reflection of this behavior in the broader population. This shifting could be influenced by various factors such as cost, perceived quality of care, insurance status, or complications in previous pregnancies.

History of current pregnancy of pregnant mothers with previous caesarean scars

Based on the provided data, the majority of current pregnancy referrals (89.7%) were made to government health facilities, while a smaller proportion (10.3%) were to private health facilities. Regarding previous cesarean sections, most mothers (62.4%) had a history of two or more CS scars, while 37.6% had one CS scar. For those with a single scar, the planned mode of delivery for the current pregnancy was predominantly a repeat Cesarean Section (78.34%), followed by a Trial of Labor After Cesarean (TOLAC) (15.29%); a small percentage (6.37%) had not

yet decided.

The gestational age (GA) of the current pregnancies was most commonly between 36+1 and 40 complete weeks (85.9%). Smaller proportions were at 32+1 to 36 weeks (6.2%), more than 40 weeks (4.1%), and 28 to 32 weeks (3.8%). A majority of respondents (62.4%) reported experiencing challenges, with the most significant issue being long waits (88.9% of those who faced challenges). Other challenges included staff attitude (10.3%) and resource shortages (0.8%) (Table 7).

Variables	Variable	Frequency	%
Place of current pregnancy referral	Government health facilities	375	89.7
	Private health facility	43	10.3
Number of PCS the mother have	1PCS scare	157	37.6
	2 and above CS scar	261	62.4
Plan for mode of delivery for the current pregnancy (those who have one scar)	CS	123	78.34
	TOLAC	24	15.29
	Not decided	10	6.37
GA of current pregnancy	28 - 32 complete weeks	16	3.8
	32+1 - 36 complete weeks	26	6.2
	36+1 - 40 complete weeks	359	85.9
	> 40 weeks	17	4.1
Did you experience any challenges here	Yes	261	62.4
	No	157	37.6
What was the challenge	Long waits	232	88.9
	Staff attitude	27	10.3
	Resource shortages	2	0.8

Table 7: History of current pregnancy of pregnant mothers with previous caesarean scars attending antenatal car at Addis Ababa Public hospital, 2025

Previous Experience with Private Health Facilities and reasons of shifting

Based on the data provided, the primary reason patients initially chose a private healthcare facility was a perceived better quality of care, cited by 21.8% of respondents. This was followed by referrals (16.7%) and shorter wait times (15.1%). The decision to switch from a private to a public facility was made by the vast majority (74.8%) during pregnancy, rather than before (25.3%). An overwhelming 91.9% reported that cost was a barrier to continuing care at the private facility.

When deciding to switch, over half of the respondents (56.6%) were assisted by their family, while a significant portion (15.2%) reported having no help. Most patients (89.9%) were unaware of the professional scope of the surgeon who performed their prior surgery in the private facility. Regarding the estimated cost of their last Caesarean section, the majority (54.6%) paid between 20,000 and 40,000 ETB, with 31.3% paying more than 40,000 ETB and 14.1% paying less than 20,000 ETB (Table 8).

Variables	Variable	Frequency	%
Why did you initially choose a private facility?	Perceived better quality	57	57.6
	Self-referral	10	10.1
	Shorter wait times	12	12.1
	Other	20	20.2
When did you decide to switch to a public facility?	Before pregnancy	25	25.3
	During pregnancy	74	74.8
Were costs a barrier in the private facility?	Yes	91	91.9
	No	8	8.0
Who help you before switching?	Health worker	12	12.1
	Family	56	56.6
	Friends	11	11.1
	No one	15	15.2
	Others reason	5	5.0
Did you know the professional scope of the surgeon did your surgery in private health facility?	Yes	10	10.1
	No	89	89.9
Estimated cost paid for the last CS (ETB):	< 20,000 EBR	14	14.1
	20,000 -40000 EBR	54	54.6
	> 40,000 EBR	31	31.3

Table 8: Previous Experience with Private Health Facilities and reasons of shifting of pregnant mothers with previous caesarean scars attending antenatal car at Addis Ababa Public hospital, 2025

Factors associated with shifted from private to public health facilities for delivery care

In bivariable analysis those who have a family size (> 3 persons) 3.564(1.938 – 6.555), Family income 5.864(2.492 - 11.802), age (≥ 35 years) 5.763 (3.531- 9.023), Cost paid for private HF (2000 br and below) 4.167(1.053 - 16.484), Educational status (above secondary) 4.108(2.009 –

9.903), Occupational status (Governmental employee) 2.152(1.309–8.645) were candidate for multivariable analysis. But GA, place of current referral and marital status were lost their significance.

In multivariable analysis, those predictors which showed statistical significance in bivariable analysis and p value less than 0.2 were used to run multivariable analysis. Participants who have family size 3 and more were about 4 times more likely shifted from private to public health facilities for delivery care as compared to those whose family size is below 3 (AOR= 3.564: CI= 2.432 – 8.432). Those

participants whose family income 10,000Br and below were about five times more likely to shift from private public health facilities as compared to those who get a family income 20001 Br and above AOR = 4.728: CI= 2.843 – 9.392). Participants aged 35 years and above had significantly higher odds of making this shift compared to their younger counterparts (AOR = 3.20; 95% CI: 2.10, 8.11). Individuals with an education level above secondary had significantly higher odds of making this shift compared to those with a secondary education or less (AOR = 5.23; 95% CI: 2.04 – 11.30) (as shown in table 9).

Variable	Shifting from private to public health facilities		95% CI		P Value
	Yes	No	COR	AOR	
Family size	≤3	85	201	1.00	
	> 3	14	118	3.564(1.938 – 6.555)*	
Family income	≤10000Br	8	63	5.864(2.492 - 11.802)*	0.00
	10000 – 20000 Br	56	209	2.779 (1.640 - 4.711)	
	≥20001 Br.	35	47	1.00	
Age	≤24 years	5	8	1.00	
	25 - 29 years	51	109	4.103(2.592 – 10.002)	
	30 - 34 years	36	123	2.002(1.421 – 8.841)	
	≥35 years	7	79	5.763 (3.531- 9.023)*	
Cost paid	<20000	7	7	4.167(1.053 - 16.484)	
	20000 - 40000	44	10	0.947(0.307 - 2.917)	
	>40000	25	6	1.00	
Educational status	No education	0	6	1.00	
	Primary education	16	100	0.893 (0.345 - 0.993)	
	Secondary education	76	164	3.640(1.221 – 8.054)	
	Above secondary	7	49	4.108(2.009 – 9.903)*	
Occupational status	Governmental employee	25	98	2.152(1.309–8.645)	
	Merchant	25	48	6.108(3.028 – 12.038)	
	Farmer	0	10	2.424(1.009-10.030)	
	Student	8	8	3.040(1.002–6.022)	
	Other	41	155	4.043(2.092–8.604)	

*Statistically significance in bivariable analysis, ** statically significance in multivariable analysis

Table 9: Bivariate and multivariate analysis of shifting of pregnant mothers with previous caesarean scars attending antenatal care at Addis Ababa Public hospital, 2025

Discussion

This study aimed to identify factors associated with the shift from private to public health facilities for delivery care among women in Addis Ababa. The level of shifting of pregnant women with history previous CS from private

to government health facilities and it reveals that 23.7% (n=99) with a 95% confidence interval ranging from 19.4% to 27.8% of the total 418 respondents had a history of Cesarean section (CS) delivery in a private health facility before shifting to a public facility for their current care.

Globally, in low and middle-income countries (LMICs) facing high out-of-pocket expenditures, similar shifting patterns are pronounced; for instance, a study in Sub-Saharan Africa countries reported a much higher magnitude, where 62% of women who had a previous CS in a private facility sought subsequent care in the public sector, primarily driven by cost [13].

The findings reveal that larger family size, lower family income, advanced maternal age, and higher educational attainment are significant predictors of this shift. The discussion contextualizes these findings within the broader landscape of maternal healthcare seeking behaviour, moving from global perspectives to the specific socio-economic realities of Addis Ababa.

This study aimed to identify factors associated with the shift from private to public health facilities for delivery care among women in Addis Ababa. The findings reveal that larger family size, lower family income, advanced maternal age, and higher educational attainment are significant predictors of this shift. The discussion contextualizes these findings within the broader landscape of maternal healthcare seeking behaviour, moving from global perspectives to the specific socio-economic realities of Addis Ababa.

The strongest predictor identified was low family income ($\leq 10,000$ Br), which increased the odds of shifting to public facilities by nearly five times which is corroborated by multiple other investigations across different contexts. For instance, a study in Nepal found that households in the lowest income quintile were 4.8 times more likely to use public health facilities compared to those in the highest quintile, a finding nearly identical to the near five-fold increase in odds reported here [14]. Similarly, research in Bangladesh demonstrated that economic constraints were a primary driver for choosing public hospitals, with cost being a more significant factor than quality of care for low-income households [15]. This pattern is further supported by a systematic review which concluded that catastrophic health expenditures often force poorer families to seek more affordable care in the public sector, even when preferences might lie elsewhere [12]. These consistent findings highlight how financial barriers profoundly shape healthcare-seeking behaviour, consistently making low income a dominant predictor of reliance on public health services across various settings.

At a national level in Ethiopia, this is strongly supported by the government's push for universal health coverage (UHC) through the expansion of primary healthcare and

the removal of user fees for maternal services in public facilities. Studies from other Ethiopian regions have consistently shown that financial constraints are a primary barrier to utilizing private health services [3]. The finding from Addis Ababa, 2025 underscores that even in the capital city, where private facilities are more prevalent, economic vulnerability remains a decisive factor. As the cost of living in Addis Ababa continues to rise, families with stagnant incomes are likely reallocating limited resources, choosing the free or subsidized delivery services in public hospitals despite potential concerns about quality or crowding.

Participants with a family size of three or more were about four times more likely to shift to public facilities. This can be interpreted through a life-course and economic lens. Globally, as families expand household expenses multiply, necessitating more prudent financial management. A delivery in a private facility represents a significant, one-time cost that becomes increasingly difficult to justify when resources must be spread across more dependents [4]. Furthermore, the significantly higher odds (AOR=3.20) among women aged 35 years and above align with this life-stage explanation. Older mothers are more likely to have larger families and may be facing concurrent financial pressures, such as educational expenses for older children. They may also possess more experience with the healthcare system, leading to a pragmatic decision to utilize a known, cost-effective public service for a routine delivery, especially if their previous pregnancies were uncomplicated. This contrasts with younger, first-time mothers who might prioritize perceived comfort and individualized attention in a private facility.

A particularly intriguing finding is that women with an education level above secondary had over five times higher odds of shifting to the public sector. This appears counterintuitive, as global literature often associates higher education with greater health literacy and a preference for higher-quality care, typically sought in the private sector [5]. However, in the specific context of Addis Ababa, this finding can be explained by several factors.

Firstly, higher education likely correlates with better knowledge of the Ethiopian government's flagship health programs, such as the Health Extension Program and the network of public hospitals. Educated women may be more aware of the improved capabilities and specialized services available in leading public hospitals like Tikur Anbessa or St. Paul's. Secondly, they may make a more calculated, informed trade-off, choosing to save substantial financial

resources for postnatal and child-rearing expenses by opting for a free public delivery. This reflects a strategic allocation of household resources based on long-term planning rather than a simple preference for private care. This nuanced decision-making by educated women has been observed in other LMIC urban settings, where the quality gap between top-tier public and mid-range private facilities is narrowing [6].

The confluence of these factors paints a clear picture of the evolving maternal healthcare landscape in Addis Ababa. The shift from private to public facilities is not merely a default option for the poor but a conscious, strategic choice for a growing segment of the urban population, including older, more educated women with larger families. This trend suggests a possible increasing confidence in the public health system's ability to handle normal deliveries. However, it also raises critical questions for policymakers. This influx of patients with potentially higher expectations could strain the already overburdened public hospitals, potentially impacting the quality of care and waiting times.

Recommendation for Stakeholders

The summary of recommendations to manage the shift of patients from private to public health facilities in Addis Ababa is structured across four key stakeholders. The Addis Ababa Regional Health Bureau (AARHB) should focus on systemic solutions, including introducing a targeted health subsidy for low-income families and a rapid public capacity expansion to relieve strain on public hospitals. Public Hospitals are advised to manage the influx by improving operational efficiency, such as establishing dedicated Low-Risk Delivery Units (LRDUs) for routine cases and improving the non-clinical aspects of care like privacy and communication to meet the expectations of educated patients. Private Health Facilities are primarily encouraged to address cost barriers by introducing bundled, fixed-price maternity packages and developing CSR discount programs for larger, lower-income families. Finally, Healthcare Professionals (HCPs) across both sectors should be trained to adopt a "Financial Reality" counseling approach to proactively discuss cost-benefit trade-offs with patients and improve inter-facility communication for seamless and safe care, particularly for high-risk patients.

Strength and limitation of the study

The study possesses significant strengths, primarily its focus on the high-risk population of pregnant women

with a previous Cesarean Section (CS), providing robust quantitative evidence of the magnitude of the patient shift (23.7%) and identifying strong predictors like the nearly five-fold increased odds of shifting due to low family income. Furthermore, it offers a nuanced contextual interpretation that re-frames the finding of higher educational attainment as a predictor, suggesting a strategic allocation of resources by informed women, making the findings highly policy relevant for Addis Ababa's health systems. However, the study is subject to several limitations, including a potential selection bias as it only included women who had already shifted to public facilities, which limits the generalizability of the predictor findings. Additionally, the research lacked a quantitative public quality metric to measure the actual impact of the patient influx on quality of care or waiting times in public hospitals, and it provided limited exploration of the prior CS experience in the private sector, failing to deeply investigate how specific details of that care might have influenced the subsequent decision to shift.

Conclusion

This study examines the determinants influencing pregnant women in Addis Ababa to transition from private to public health facilities for delivery care. Key findings indicate that economic vulnerability, primarily tied to low family income, significantly increases the likelihood of this shift. Additional factors such as larger family sizes and advanced maternal age further necessitate careful financial planning. Interestingly, higher educational attainment correlates with this shift, suggesting that educated women strategically choose public services for cost-saving benefits. This trend challenges the common perception that such shifts are solely indicative of poverty; instead, it reflects informed decision-making in healthcare. The public sector's rising patient volume, including those with prior Cesarean sections, raises concerns regarding quality of care and demands innovative solutions from policymakers and private facilities, such as targeted subsidies and fixed-price delivery packages. Addressing these shifts requires recognition of underlying socio-economic complexities to balance quality and access in maternal care.

Abbreviations

ANC Antenatal care

AARHB	Addis Ababa Regional Health bureau
AOR	Adjusted Odds Ration
COR	Crude Odds Ratio
CS	Caesarean sections
EDHS	Ethiopian demographic and health survey
GMH	Ghandi Memorial hospital
HEP	Health Extension Program
LMICs	Low- and middle-income countries
MIIH	Minilk II hospital
MMR	Maternal mortality ratio
NGO	nongovernmental organization
SDGs	Sustainable Development Goals
TBGH	Tirunesh Beijing General Hospital
WHO	World Health Organization
ZMH	Zewditu Memorial Hospital

Declaration

Ethical approval and consent to participate

Ethical approval and clearance were obtained from research and ethical committee of Tirunesh Beijing General Hospital and Addis Ababa research and emergency management directorate Institutional Review Board. Informed written consent was obtained from all study participants. Participants were informed about the objective of the study. After information is provided about purpose of the study, confidentiality of the information and all the participants were reassured of the anonymous (unnamed), and as personal identifiers was not used.

Availability of data and materials

All data included in this manuscript can be accessed from the corresponding author upon request through the email address.

Competing interests

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Consent for publication

Not applicable

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