



# **MAGNITUDE AND PATTERN OF CESARIAN SECTION DELIVERIES IN PRIVATE FACILITIES IN ADDIS ABABA**

Private Health Sector Project



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# CONTENTS

Acronyms.....	iv
1. Introduction .....	1
2. Problem Statement.....	1
3. Literature Review .....	3
4. Objectives.....	4
5. Methodology.....	5
5.1 Study Area .....	5
5.2 Operational Definitions.....	5
5.3 Facility selection .....	6
5.4 Data collection .....	6
5.5 Data entry and analysis .....	6
5.6 Ethical issues.....	6
5.7 Limitations .....	7
6. Results.....	7
6.1 Cost of spontaneous vaginal delivery (SVD), CS procedure, and post-operative hospital stay .....	7
6.2 Caesarian section rates .....	8
7. Mode of delivery .....	9
8. Age at delivery .....	10
9. Fetal outcomes.....	10
10. Charts review for Caesarian Section.....	12
11. Facility contribution to Addis Ababa CS rates.....	12
12. Age of the mothers' who underwent CS .....	13
13. Reproductive history of mothers .....	13

14.	Gestational age at delivery .....	14
15.	Type of previous deliveries .....	14
16.	Number of previous CS operations.....	15
17.	History of medical, surgical and obstetric illnesses in the past .....	15
18.	ANC, birth preparedness counseling and partograph use .....	16
19.	CS types (primary / secondary, elective / emergency) .....	17
20.	Reason for current CS .....	17
21.	Fetal and maternal health outcomes.....	18
22.	Discussion.....	18
23.	Conclusion .....	22
24.	Recommendations.....	22
	Annex I. List of facilities selected for the study .....	24
	Annex II. Data collection instrument.....	25
	Annex III. Selected Studies Conducted on magnitude of CS delivery and indications .....	29
	References .....	30

## LIST OF TABLES

Table 1: General type of information of the private facilities selected for determinants of caesarian section January – December 2018.....	8
Table 2: CS rate by facility Jan. 2018-Dec. 2018 .....	9
Table 3: Mode of deliveries at the private health facilities for selected months of studies, January – December 2018 .....	9
Table 4: Maternal age at the time of delivery, Addis Ababa, January - December 2018 .....	10
Table 5. Maternal Health Outcomes, January - December 2018. ....	10
Table 6: The fetal outcome by the time of delivery from delivery registers at the private health facilities, Addis Ababa, January-December 2018. ....	11
Table 7: CS rate chart review contribution from private health facilities, Addis Ababa, December – January 2018. ....	12

Table 8: Age of mothers delivering via CS at the private health facilities, Addis Ababa, January - December 2018. ....	13
Table 9: Reproductive history of the mothers having CS for the current pregnancy at the private facilities. ....	14
Table 10: The gestational age in weeks of CS births in private facilities, Addis Ababa, January - December 2018. ....	14
Table 11: The mode of deliveries of the mothers for the previous pregnancies at the private health facilities, January - December 2018. ....	15
Table 12: Total number of CS done for mothers in their previous pregnancies at the private facilities, January - December 2018. ....	15
Table 13: History of medical, surgical and other Obstetric conditions of the mothers with Caesarian section, January - December 2018. ....	16
Table 14: ANC follow up, birth preparedness counselling and use of partograph at the facilities for CS Clients, January - December 2018. ....	16
Table 15: Caesarian section schedule and pattern for clients having CS, January - December 2018.....	17
Table 16: Reasons for the CS at the private health facilities, January - December 2018. ....	17
Table 17: Fetus weight CS delivery at private facilities, Jan. Dec. 2018.....	18

## ACRONYMS

ANC	Antenatal Care
APH	Antepartum Hemorrhage
CPD	Cephalopelvic Disproportion
CS	Caesarean Section
Chronic HTN	Chronic Hypertension
EDHS	Ethiopian Demographic and Health Survey
FMoH	Federal Ministry of Health
GA	Gestational Age
HTN	Hypertension
MCH	Maternal and Child Health
MNCH	Maternal Newborn and Child health
NRFHRP	Non-Reassuring Fetal Heart Rate Pattern
NGO	Non-Governmental Organization
OR	Operating Room
PE	Preeclampsia
PROM	Premature Rupture of Membranes
PIH	Pregnancy Induced Hypertension
PHSP	Private Health Sector Project
PPH	Postpartum Hemorrhage
RHB	Regional Health Bureau
SNNPR	Southern Nations Nationalities and People's Region
SVD	Spontaneous Vaginal Delivery
USAID	United States Agency for International Development
USD	United States Dollar
WHO	World Health Organization

## **1. INTRODUCTION**

The Private Health Sector Project (PHSP), funded by the United States Agency for International Development (USAID), works with private health facilities in Ethiopia to contribute towards the mitigation of impact of diseases of public health importance through the engagement of the private health sector. PHSP works closely with 341 private health facilities in Ethiopia (52 with maternal, newborn, and child health (MNCH) service provision capabilities), including 51 in Addis Ababa (27 of which provide MNCH services) providing technical support to increase the provision and quality of health services, including MNCH services.

As part of routine data collection in project-supported facilities, PHSP observed high rates of caesarian section (CS) deliveries, especially in Addis Ababa facilities. The project conducted a study to better understand the magnitude and pattern of CS deliveries in private facilities in Addis Ababa.

## **2. PROBLEM STATEMENT**

CS deliveries can be life-saving for both the mother and child when it is medically required. However, there is a growing concern regarding the increasing rate of selective CS deliveries globally where there is not an immediate medical need. The risks and costs associated with CS deliveries are significant, and evidence shows that caesarean delivery and maternal death are positively associated largely due to bleeding, infection and anesthesia related complications. Cesarean delivery is a marker of access to, and availability and utilization of obstetric services but, where rates are extremely high, it may also indicate a mismatch between evidence and practice in obstetrics.

According to the 2010 Ethiopian Federal Ministry of Health (FMoH) annual report, the CS rate in Addis Ababa was 36%. A study investigating caesarean delivery practices in teaching public and non-government/private maternal and child health (MCH) hospitals in Addis Ababa, found that the CS rate documented in public hospitals was 31.1%, and in private hospitals 48.3% (Hussen, Shiferaw, and Lukman 2014)). Additionally, according to the PHSP project data collected from the 52 PHSP-supported MNCH facilities, the CS rate increased by nearly doubled between April 2017 and December 2018 from 25% (1066/4234) to 47% ( 3318/ 6849).

The World Health Organization (WHO) recommends an ideal CS rate between 10-15%, which has recently been supported by study results from a review of 137 countries. According to this guidance, when rates fall below 10%, it indicates mothers are not able to access what can be a lifesaving procedure (Yibeltal 2016). Further research shows that CS rates beyond 15% are considered medically unjustified or unnecessary, with

negligible benefits for most mothers, and are costly and often unequally distributed amongst the population. In Ethiopia, the national CS rate stands at 3.79%, which is significantly below the WHO recommended rate, signifying barriers in access. There are also significant regional variations, ranging as low as 0.76% in Somali region to a high of 41 % in Addis Ababa (Ethiopian FMoH 2011), which may indicate unequal access across different groups.

The contrast between the extremely low cesarean rates for most of the population of the country and the high institutional rates in Addis Ababa and the private for-profit hospitals is a dramatic indicator of a country in transition; struggling to ensure equitable and appropriate access to comprehensive obstetric and newborn care.

The Ethiopian FMoH states that every pregnant woman in Ethiopia has the right to information about her health, to discuss her concerns with a provider, to know in advance about any planned procedure to be performed, privacy, confidentiality, and to express her views about the services she receives. To fulfil these rights, in 2010 the Government of Ethiopia developed an Obstetrics Management Protocol (the only available protocol to date) based on the WHO's goal-oriented model. The protocol focuses on a limited set of essential antenatal, delivery, postnatal and newborn care services, and prescribed statements about indications in the use of procedures such as CS (Ethiopian FMoH 2010).

Moreover, in the above mentioned document, it was established that “caesarean section is performed when safe vaginal delivery is either not feasible (absolute) or would impose undue risks to the mother and/or fetus (relative)” (Ethiopian FMoH 2010). The protocol further states that appropriate indications, and the presence of a trained provider and appropriate equipment and facilities are the prerequisites for CS (Ethiopian FMoH 2010). It also requires that providers explain the procedure to the client or relatives to seek informed consent. The protocol has details of the possible complications of the procedure and it states that maternal mortality is higher after CS than after vaginal delivery. Although the protocol does not discuss high rates of inappropriate CS that can be due to maternal requests, provider misjudgment, or an overall failure to properly counsel on birth preparedness during ANC, the protocol does caution about the possible inappropriate and excessive reliance on technology or procedures that can ultimately increase complications and cost (Ethiopian FMoH 2010).

Moreover, a WHO survey on maternal and perinatal health carried out in 24 countries and 373 facilities (using data from 289,635 deliveries), added to the growing body of evidence regarding the harmful effects of excessive cesarean rates on maternal and newborn health outcomes. These studies showed higher cesarean rates associated with increased maternal mortality and morbidity in Latin America and Asia, but did not reveal this association in Africa, where rates were lower (Souza et al. 2010).

More alarming is that the increased cesarean rates were associated with poor newborn health outcomes in all three regions, after controlling for many factors. In Africa, increasing emergency cesarean rates were associated with increased intrapartum stillbirths, neonatal deaths, and severe neonatal morbidity (Souza et al. 2010).

Therefore, the decision to perform CS should be based on clear, compelling, and well-supported medical justifications. Clients/patients should be clearly informed about the benefits and the risks of the procedure and be guided ethically for either informed consent or informed refusal for the procedure.

CS rates in private Addis Ababa facilities currently stand unacceptably high (47 % according PHSP data of the last quarter, Oct-Dec. 2018) indicating a likely discrepancy in access when compared to the extremely low rates of CS in more rural areas, and the overall national average. This statistic raises alarms of likely high rates of the performance of the procedure without justifiable medical indications. This study aims to explore the magnitude and the pattern of CS deliveries in private facilities in the city.

### **3. LITERATURE REVIEW**

A literature review was conducted on both published and unpublished documents through an online search with key words (“caesarean section”, “magnitude of caesarean section”, and “factors affecting caesarean section delivery”) using the google search engine. The goal of the review was to review studies that have been conducted to understand the CS rates, indications, fetal and maternal outcomes, rates at public versus private health facilities in Ethiopia, and comparisons across African settings and globally to compare our study findings and to reach plausible conclusions and establish a reasonable recommendation.

A study conducted at Felegehiwot Referral Hospital in Amhara regional state found that among the 2,967 eligible mothers, 25.3% had CS delivery (Abebe, Ashebir, and Gizachew 2018). An institutional-based cross sectional study at Mizan-Aman General Hospital in Southern Nations Nationalities and People’s Region (SNNPR) documented a prevalence of CS of 21.1% (Daniel and Singh 2018). Another cross-sectional study was conducted in private and government hospitals in Harar town and showed an overall prevalence of CS 34.3% (Linn and Siril 2018). Moreover, a cross-sectional retrospective study in Attat Hospital, Gurage zone of SNNPR, registered a CS rate of 27.6% (Moges, Ade, and Akessa 2018).

When looking at clients’ demographics related to CS delivery, a cross-sectional survey conducted in Addis Ababa in 2017 by Tsegaye Hiwot found that women older than 30 years are more likely to have CS delivery when compared to younger age group mothers. However, contrary to that, another study based on the three Ethiopia Demographic and Health Survey (EDHS) data (2000, 2005 and 2011), the national CS rate did not

show significant variation across the categories of maternal age groups (Central Statistical Agency and ICF International 2012).

When it comes to maternal educational level, according to the study based on the three EDHS, the CS rate increases with rise in maternal education and household wealth index (Central Statistical Agency and ICF International 2012).

When looking at indications for CS delivery, a study conducted at Felegehiwot Referral Hospital found that women having a history of CS deliveries and fetal weight of 4,000g were 3.93 and 13.68 times more likely to give birth by CS (Abebe, Ashebir, and Gizachew 2015).

Further, a study conducted in Addis Ababa teaching public and non-governmental (NGO) MCH hospitals, the leading indications in the NGO hospitals were: history of CS delivery (29.7%), Non-Reassuring Fetal Heart Rate Pattern (17.8%), and cephalopelvic disproportion (CPD) (12.5%) (Yibeltal 2016).

When it comes to the differences in CS rates between the teaching government hospitals and the NGO MCH hospitals, the difference was found to be statistically significant; 31.1% and 48.3% ( $P < 0.05$ ) respectively (Yibeltal 2016). And according to the study based on the three EDHS, women who delivered in private health facilities were twice as likely to have a CS as women who gave birth in the public health facilities (20.6%) (Central Statistical Agency and ICF International 2012).

In conclusion, different studies in different parts of Ethiopia have identified relatively higher rates of CS in private facilities when compared to public facilities, and certain medical histories and age were found to be other factors related to a woman's likelihood of delivering via CS (see Annex III for more information on CS studies conducted worldwide and regionally.). However, the literature review found that when it comes to other factors including ANC attendance, preexisting medical conditions, labor follow up, CS outcomes, counselling, and average cost of the procedure, limited studies were available. Therefore, this study on the magnitude and pattern of CS in private facilities in Addis Ababa will be a valuable addition to the evidence base on this subject.

## **4. OBJECTIVES**

General Objective:

1. To assess the number of CS deliveries and the associated determining factors in private health facilities in Addis Ababa

Specific Objectives:

1. To determine the rate of CS delivery in the private facilities
2. To determine the reasons for CS delivery

## 5. METHODOLOGY

This is a retrospective descriptive, cross-sectional study based on retrieval of information from registration books (delivery, operating room (OR), and other facility registers) for the number and reasons for CS delivery using a standardized data collection tool.

### 5.1 Study Area

The study was conducted in Addis Ababa, the capital city of Ethiopia which is located in the central part of the country with a total area of 527 km<sup>2</sup>. According to the Central Statistics Agency estimate of July 2015, the population is approximately 3.238 million. Women of reproductive age make up about 23.4% (757,692) of this population, with an estimated 81, 915 (2.33%) pregnancies occurring each year. The city has ten sub cities and 116 Woredas. There are 51 hospitals of which; 34 are privately owned, for-profit; six are owned by the Addis Ababa City Administration Health Bureau; four by the FMOH; three are non-profit and run by NGO; three by the Ethiopian Defense Force and Police; and one by Addis Ababa University. There are about 727 private facilities total across varying categories, 35 fall into the category of hospital, MCH center, and/or obstetrics and gynecology clinic. According to the Regional Health Bureau (RHB) of Addis Ababa, about 60 facilities perform CS deliveries, 42 are private facilities while the remaining 18 are public facilities. The private facilities account for nearly 20% of the total deliveries conducted in 2017 (FMOH 2017 annual report).

### 5.2 Operational Definitions

**Cesarean Section (CS)** - Is an operation performed by abdominal incision and on an intact uterus to deliver a fetus and placenta after 28 completed weeks or fetal weight of 1000grams.

- **Prematurity**- gestational age (GA) of 28-37 weeks of GA.
- **Post-date**- GA after 40 weeks of gestation till 42 weeks.
- **Post- term**-GA after 42 weeks of GA.
- **APH-(Antepartum hemorrhage)** - bleeding after 28 weeks of pregnancy and before the delivery of the fetus.
- **PPH (post-partum Hemorrhage)** -Bleeding after delivery of the fetus till 42 days.

- **PIH (Pregnancy induced hypertension)** a hypertensive disorder related to pregnancy including preeclampsia (PE), eclampsia, chronic hypertension (Chronic HTN), and gestational HTN.

### 5.3 Facility selection

To select facilities for this study, PHSP obtained facility profiles from the Addis Ababa City Administration Health Bureau. Based on this information, a total of 60 facilities were found to be capable of CS deliveries (36 private for-profit, 20 government, and 4 non-profit NGO facilities). All government facilities were excluded from the study. To ensure included facilities had sufficient numbers of CS deliveries for study, all private facilities (including NGO's) reporting less than 100 CS deliveries per 6 months, between July and December 2018 were eliminated from study inclusion. Based on this inclusion criteria, 24 facilities were selected for the study (see Annex 1).

### 5.4 Data collection

To collect all information related to deliveries and ANC visits within the study time period (January 2018-December 2018), one month from each quarter in 2018 was randomly selected, assuming there could be seasonal variation in the number of deliveries and, hence CS deliveries. Accordingly, the months of March, May, August, and November 2018 were selected (source document is the delivery and ANC registration books).

All deliveries conducted in the above months were reviewed from the 24 selected facilities from Addis Ababa (based on those with more than 100 CS per 6 month). From each month, 10% of the CS deliveries charts were randomly selected, and data was abstracted at the facilities using a standardized tool (see Annex 2).

### 5.5 Data entry and analysis

Data entry and analysis was conducted at PHSP offices using the latest version of SPSS (25.0). Data abstracted at the facilities using the standardized tool was entered into SPSS. The CS rate in the sample facilities was determined, and analysis conducted to identify major determinants and reasons for CS.

### 5.6 Ethical issues

- **Confidentiality of information:** collected data was kept confidential, the data collection tool did not abstract patient names or any other individual identifiers.
- **Ethical clearance:** Ethical clearance was obtained from Abt's Internal Review Board and was submitted to the Addis Ababa Health Bureau, together with data collection instruments for review

and endorsement. A written support letter from the Addis Ababa RHB was presented to the respective facility heads.

## 5.7 Limitations

The study is a retrospective assessment based on facility registers and client charts, and may not have all the desired information; ethnic group, religion, and educational status were not available as they may have been in a prospective study design. Moreover, only 24 of the 60 facilities met the study inclusion criteria of at least 100 CS deliveries during the study time period. This small sample size may not be representative of the overall study population. The fact that only 10% of the CS delivery charts were obtained due to PHSP resource constraints is also a potential limitation of this study. Of the charts that were reviewed, most had incomplete data. Incomplete data prevented deeper analysis to identify nuanced socio-cultural and/or socio-economic trends among women receiving CS in private facilities in Addis Ababa. In addition to missing client data, some facilities were unwilling to share facility cost data with PHSP.

Another limitation is the fact that this study did not implement a qualitative component to capture client and providers perspectives which could have provided more information to enrich the findings.

## 6. RESULTS

### 6.1 Cost of spontaneous vaginal delivery (SVD), CS procedure, and post-operative hospital stay

Twenty four private health facilities were included in the study. Eleven (45.9%) were hospitals and 13 (54.1%) were MCH centers. According to the information from facility administrators and owners, the amount of birr clients paying for CS procedure ranges from 2500.00-7000.00 ETB (\$87.00 - \$242.40 USD with conversion rate of \$1 USD to 28.88 ETB) with mean and median costs to conduct the procedure of 4905.00 ETB and 4900.00 ETB ( \$169.84 and \$169.67 USD) respectively. Conversely, the cost for normal SVD ranges from 1000.00 ETB to 10,000.00 ETB (\$34.63 - \$346.26 USD) with mean of 4404.00 ETB (\$152.50 USD). If episiotomy is performed, the price increased up to 12,000.00 ETB (\$415.50 USD) with mean of 5315.00 ETB (\$184.03 USD). The total cost including procedure, beds, medication, physician rounds, and meals that clients pay at discharge at 48 hours in uncomplicated cases ranges from 3500.00 ETB- 22,000 ETB ( \$121 - \$761.77 USD) with a mean of 14,657.00 ETB, and median of 16,000 ETB (\$507 and \$554 USD) respectively, see Table 1.

## 6.2 Caesarian section rates

One year's worth of retrospective data on the pattern of deliveries at the 24 facilities were collected from January 1, 2018-December 31, 2018. The results showed that from all the 24 facilities, a total of 22,781 deliveries occurred with a CS rate of 57.8% (13,703), while 34.9 % ( 8,223) were SVDs, and 3.9% (855) instrumental assisted vaginal deliveries.

The CS rates during the one year study period in individual facilities ranged from as low as 41.0 % to as high as 99.0 % with a mean rate of 64.0 .0%. The very high rate was likely due to the fact that this specific facility was involved in CS deliveries referred from other obstetrics and gynecology specialty clinics nearby.

The CS rates for the months of March, May, August and November 2018 had a similar pattern which was as low as 40.0 % in one facility to as high as 98.0 % with mean of 64.0 .0% . The CS rates from one year data and the selected months is depicted in Table 2.

**Table 1: General type of information of the private facilities selected for determinants of caesarian section January – December 2018.**

	Characteristic measured	Number (n=24)	Percent
1	Type of facility		
	Hospital	11	45 %
	MCH Specialty center	13	54 %
2	Payment for C/S procedure only		
	2500-4000 birr	3	13 %
	4001-5500 birr	13	54 %
	5501-7000 birr	4	17%
	No data	4	17%
3	Payment for all services related to C/S including procedure, bed, medications, meal, physician rounds, etc.)		
	3550 birr	1	4%
	7500-10,000 birr	4	17%
	10,001-17,000 birr	9	38 %
	Above 17,000 birr	7	29%
	No data	3	13%
4	Payments for SVD		
	Mean =4404 birr		
	1000-3000 birr	10	42 %
	3001-6000 birr	9	38 %
	Greater than 6000 birr	5	21%
5	Payments for SVD with Episiotomy		
	Mean =5315 birr		
	1000-3000 birr	5	21 %
	3001-6000 birr	11	46 %
	Greater than 6000 birr	7	29%
	No data	1	4%

Table 2: CS rate by facility Jan. 2018-Dec. 2018

No	Name of facilities	CS rate in calendar year 2018	CS rate across sampled months
1	Afran Primary Hospital	47 %	53 %
2	Denbera MCH center	63 %	51 %
3	Girum General Hospital	59 %	58 %
4	Besega MCH Center	89%	85%
5	Kadisco General Hospital	56%	57%
6	Tezena General Hospital	99%	98 %
7	BGM MCH Center	86%	84%
8	Meri Stops MCH Center Arada	41%	40%
9	Semah MCH Center	69%	68%
10	Abebech Gobena MCH Center	62%	61%
11	Brass MCH Center	58%	53%
12	Grace MCH Center	78%	77%
13	Hemen MCH Center	78%	89%
14	Nain MCH Center	58%	69%
15	Ananiya MCH Center	64%	62%
16	T/Haymanot General Hospital	54%	63%
17	Bethel number 2, MCH Center	67%	67%
18	Landmark, General Hospital	72%	69%
19	Addis Hiwot General Hospital	67%	64%
20	Migbare Senay General Hospital	65%	65%
21	Ethio Tebib General Hospital	44%	40%
22	Marie Stops Got Era MCH Center	41%	40%
23	Korea General Hospital	71%	72%
24	Betezata General Hospital	59 %	55%
	Average for all facilities	64 %	64

## 7. MODE OF DELIVERY

Information from delivery books was abstracted from the facilities for the months of March 2018, May 2018, August 2018 and November 2018. A total of 7,522 deliveries were documented. The majority of deliveries were CS at 4,350 total (57.8%), followed by SVD for 2,623 (34.9%), and instrumental deliveries for 291 (3.0%). These details are depicted in Table 3.

Table 3: Mode of deliveries at the private health facilities for selected months of studies, January – December 2018

	Mode of Deliveries	Number	Percent
	Caesarian section	4350	57.8%
	SVD	2623	34.9%
	Instrumental Deliveries	291	3.9%
	SVD with episiotomy	229	3.0%
	Not documented	29	0.4%

## AGE AT DELIVERY

From the total of 7,522 deliveries recorded in the registers, age was documented for 98.0 % of clients. The average age of the mothers was 28.2 years and the majority of them (56.0 %) were in the age range of 21-29 years, followed by 30-39 years of age which was 39.0 %. The details are in Table 4. See section 6.3 for CS-specific age details.

Table 4: Maternal age at the time of delivery, Addis Ababa, January - December 2018

Age ( years )	Number (n=X)	Percent
15-20 years	192	3%
21-29 years	4203	56%
30-39 years	2896	39%
40 and above	85	1%
No age recorded	146	2%

From the total of 7,522 deliveries documented, the maternal outcome data shows that in 97.2% (7308) of cases mothers experienced stable outcomes, and nine deliveries (0.1 %) resulted in maternal death. Six mothers were unstable and referred for further care. Nearly 3% of mothers, 199 (2.6 %), had no record of their outcome at the time of delivery. The primary maternal complications (22 total, 0.03%) included pre-eclampsia, or PPH, and APH. See Table 5.

Table 5. Maternal Health Outcomes, January - December 2018.

Maternal outcome	Number (n=7522)	Percent
Stable	7308	97.2 %
Unstable	6	0.1 %
Death	9	0.1%
Not documented	199	2.6%
<b>Maternal complications documented ( stable mothers )</b>		
No complications	7286	99.7%
Pre-Eclampsia /Eclampsia	12	0.16%
APH	2	0.03%
PPH	6	0.08%
PIH	1	0.01%
Others	1	0.01%

## 8. FETAL OUTCOMES

Fetal outcome data was abstracted from the delivery registers for the first and second newborns (in instances where mothers delivered twins, or more than one child during one parity). For the first newborns, 7,398 (98.3 %) were live births, and 91 (1.2 %) were still births, with very few, 27 (0.4%) with unknown status. More than 91.0 % of the first newborns weighed more than 2,500 grams at birth. The Apgar score of the

first newborns at first and fifth minutes was analyzed for live births. The majority (87.2 %) of these newborns have Apgar scores of 8-10 at first minutes which shows improvements at fifth minutes, 96.2%, see Table 6.

A total of 136 twin deliveries were recorded, in which 93.0 % were live, 47 % weighed more than 2,500 grams, and 71% had Apgar scores of 8-10 at the first minutes which indicates improvements in 87.0 % at the fifth minutes. Details of the fetal outcomes are depicted in Table 6.

**Table 6: The fetal outcome by the time of delivery from delivery registers at the private health facilities, Addis Ababa, January-December 2018.**

	<b>Fetal outcome</b>	<b>Number</b>	<b>Percent</b>
	<b>Fetal outcome first baby</b>		
	Live birth	7398	98.4 %
	Stillbirth fresh	52	0.7%
	Still birth macerated	27	0.4%
	Still birth not labelled	18	0.2%
	not documented	27	0.4%
	<b>Fetal outcome second baby</b>		
	Live birth	133	98%
	Still birth (fresh and macerated)	3	2.0 %
	<b>Fetal weight (first baby ) n=7488</b>		
	Less than 1500 grams	94	1.2 %
	1500-2500 grams	543	7.2 %
	2501-3500 grams	4592	61.0 %
	Greater than 3500 grams	2259	30.0%
	<b>Fetal weight (second baby) n=136</b>		
	Less than 1500 grams	14	10%
	1500-2500 grams	58	43%
	2501- 3500 grams	61	45%
	Greater than 3500 grams	3	2%
	<b>Apgar score of first baby ( live birth ) n=7398</b>		
	<b>at 1<sup>st</sup> minutes</b>		
	Apgar score of 1-7	881	11.9 %
	Apgar score of 8-10	6454	87.2 %
	No record of Apgar	63	0.9 %
	<b>at 5<sup>th</sup> minutes</b>		
	Apgar score of 1-7	147	2 %
	Apgar score of 8-10	7118	96.2%
	No record of Apgar	131	1.8%
	<b>Apgar score of second baby live birth (n=133)</b>		
	<b>at 1<sup>st</sup> minutes</b>		
	Apgar score of 1-7	33	25 %
	Apgar score of 8-10	94	71 %
	No record of Apgar	6	4%
	<b>at 5<sup>th</sup> minutes</b>		
	Apgar score of 1-7	10	8%
	Apgar score of 8-10	116	87%
	No record of Apgar	7	5%

## 9. CHARTS REVIEW FOR CAESARIAN SECTION

A detailed charts review was conducted at the selected private health facilities to answer the research questions about the various contributing factors of high caesarian sections rates at the private health facilities in Addis Ababa. The socio demographic and medical histories of the mothers were reviewed, as well as the maternal and fetal outcomes post-operation.

## 10. FACILITY CONTRIBUTION TO ADDIS ABABA CS RATES

A total of 460 charts, representing nearly 11.0% of all CS deliveries were reviewed. Nearly 30.0% of the total CS delivery cases reviewed were from three facilities; 12% from Betsega MCH Center, 10% from Grace MCH Center, and 8.5 % from Marie Stopes MCH Center - Gotera Branch. Details of the contributions by each facilities are depicted in Table 7.

Table 7: CS rate chart review contribution from private health facilities, Addis Ababa, December – January 2018.

No.	Name of Health facility	Total number of charts reviewed (n=460)	Percent contribution
1	Abebech Gobena MCH Center	10	2.1
2	Addis Hiwot Hospital	10	2.1
3	Afran Primary Hospital	9	2.0
4	Ananiya MCH Center	10	2.2
5	Betezata General Hospital	16	3.5
6	Bethel#2 MCH Center	13	2.8
7	Betsegah MCH Center	55	12.0
8	BGM MCH Center	8	1.7
9	Brass MCH Center	16	3.5
10	Denberwa MCH center	19	4.1
11	Ethio Tebib General Hospital	21	4.6
12	Girum General Hospital	16	3.5
13	Grace MCH Center	46	10.0
14	Hemen MCH Center	33	7.2
15	Kadisco General Hospital	12	2.6
16	Korea General Hospital	20	4.3
17	Landmark General Hospital	9	2.0
18	Marie Stopes MCH Center Gotera	39	8.5
19	Meri Care MCH Center Arada	20	4.3
20	Migbare Senay General Hospital	12	2.6
21	Nain MCH Center	26	5.7
22	Semah MCH Center	14	3.0
23	T/Haimanot G.Hospital	10	2.2
24	Tezena General Hospital	16	3.5
	Total	460	100.0

## 11. AGE OF THE MOTHERS' WHO UNDERWENT CS

The maternal age at the time of the CS procedure showed that the mean age was 29.6 with a standard deviation of  $\pm 4.3$  years and a median and mode of 29 and 26 years respectively. The minimum and maximum age of the mothers who had CS in this survey were 19 and 43 years respectively. The majority, 339 (74.0 %) were in the age range of 25-34 years. Within this group, nearly 10.0 % were at or below 24 years, details depicted in Table 8.

Table 8: Age of mothers delivering via CS at the private health facilities, Addis Ababa, January - December 2018.

Age (in years )	Number of mothers (n=460)	Percent
15-19 years	1	0.2%
20-24 years	45	10%
25-29 years	195	42%
30-34 years	144	31%
35 years and above	73	16%
No data	2	0.4%
<b>Total</b>	<b>460</b>	<b>100 %</b>

## 12. REPRODUCTIVE HISTORY OF MOTHERS

Information regarding the parity of the mothers, number of current live children and the total number of abortions experienced by the mother in their reproductive years was collected from client charts.

**Parity of the mother:** Data on parity of the mother was available in 451 ( 98.0 % ) of the charts reviewed and the results showed 158 ( 35.0 % ) were prime paras, 148 ( 33.0 % ) were para one, 86 ( 19.0 % ) were para two, 41 ( 9.0 % ) were para three and 18 ( 4.0 % ) were para four and above The details are summarized in Table 9.

**Number of currently live children:** Data on the total number of currently alive children was documented in 449 (97.6 %) charts reviewed and the results showed that 186 mothers (41.4 %) have no currently alive children, 143 (32.0 %) had only one child, 73 (16.3 %) were with two children and 47 (10.5 %) were with three or more children (Table 9).

**Number of past abortions:** Information on the total number of abortions the mothers had ever experienced were documented in 448 (97.3%) charts. Accordingly, nearly 75.0% of the mothers had no history of abortion and the rest (25.0%) had at least one or more abortion before the current pregnancy.

Table 9: Reproductive history of the mothers having CS for the current pregnancy at the private facilities.

Number	Parity (n=460)	Live children currently available (n=460)	Abortion (n=460)
0	158	186	335
1	148	143	78
2	86	73	27
3	41	35	7
4	13	8	1
5	4	3	0
6	0	0	0
7	1	1	0
No data	9	11	12

### 13. GESTATIONAL AGE AT DELIVERY

The majority of the CS deliveries (84%) occurred during the GA category of 38-42 weeks followed by 28-37 weeks and  $\geq 42$  weeks of gestation, accounting for 13% and 1.0% of the cases respectively (Table 10).

Table 10: The gestational age in weeks of CS births in private facilities, Addis Ababa, January - December 2018.

Gestational age ( weeks )	Number of mothers with C/S	Percentage
28-37	62	13.0
38-42	386	84.0
$\geq 42$	3	1.0
No data	9	2.0
Total	460	100.0%

### 14. TYPE OF PREVIOUS DELIVERIES

**Type of delivery for the first baby:** Out of 258 mothers in which previous delivery type data was available, 180 (70.0 %) gave birth to their first children by CS, 76 (29.4 %) by SVD with episiotomy.

**Type of delivery for the second baby:** Data was available for 117 mothers on mode of delivery for their second baby. The majority of this group 88 (75.0%) delivered by CS, with the remaining mothers through SVD and episiotomy.

**Type of delivery for third, fourth and fifth deliveries:** CS was the most frequently documented mode of delivery for the third, fourth and fifth deliveries in 26.0%, 50.0% and 100% of the mothers respectively (see Table 11).

Table 11: The mode of deliveries of the mothers for the previous pregnancies at the private health facilities, January - December 2018.

Order of Delivery	SVD		SVD and Episiotomy		Instrumental		C/S		Total	
	n	%	n	%	n	%	n	%	n	%
First delivery	74	29 %	2	0.8%	2	0.8 %	180	70 %	258	100 %
Second delivery	28	24 %	1	0.9%	0	0	88	75 %	117	100 %
Third delivery	16	35 %	0	0	0	0	30	26 %	46	100 %
Fourth delivery	4	50%	0	0	0	0	4	50%	8	100%
Fifth delivery	0	0	0	0	0	0	4	100%	4	100%

## 15. NUMBER OF PREVIOUS CS OPERATIONS

The mode of the previous delivery may influence the decision at the time of the procedure such as elective or emergency for caesarian section. The details are depicted in Table 11.

Charts were reviewed to find out the total number of CSs mothers had before the current CS delivery. Information was available for 456 (99.1%) of the cases, in which 47.0% had no history of previous CS and 52.4% had one or more CS deliveries. The details are depicted in Table 12.

Table 12: Total number of CS done for mothers in their previous pregnancies at the private facilities, January - December 2018.

Total number of CS	Number of mothers	Percent
None	215	47.0
One	155	34.0
Two	66	14.0
Three	15	3.3
Four	5	1.1
No data	4	0.8
Total	460	100.0

## 16. HISTORY OF MEDICAL, SURGICAL AND OBSTETRIC ILLNESSES IN THE PAST

During chart review, history of medical and surgical conditions were reviewed if documented. Unfortunately, a significant number of charts did not have data on mothers' medical histories (76%). Mothers with a history of either post-date, post-term, pre-eclampsia or Gestational Diabetes Mellitus (GDM) comprised 10.1% of the reviewed charts. A total of 2.8% and 3.5% of the cases had a history of medical and surgical conditions respectively documented in their charts. See Table 13.

Table 13: History of medical, surgical and other Obstetric conditions of the mothers with Caesarian section, January - December 2018.

Variables	Number ( n=460 )	Percentage
Had history of chronic medical problem	13	2.8%
Had prior abdominal /pelvic or other surgeries	16	3.5%
Had GDM	6	1.3%
Post Date pregnancy	15	3.2%
Pre term pregnancy	12	2.6%
Pre-eclampsia /Eclampsia	14	3%
Others	34	7.4%
Not documented	350	76.0%

## 17. ANC, BIRTH PREPAREDNESS COUNSELING AND PARTOGRAPH USE

From a total of 460 mothers who had a CS for the current pregnancy, 401 (87.0%) had ANC appointments at the same facility in which the procedure was performed. Birth preparedness counselling was provided for very few; 54 mothers (12.0%). Only 95 (20%) cases had a documented partograph.

Table 14: ANC follow up, birth preparedness counselling and use of partograph at the facilities for CS Clients, January - December 2018.

Variables	Number ( yes )	Percentage
ANC follow up at same facility	401	87 %
Birth preparedness counselling	54	12 %
Used partograph	95	20%

## 18. CS TYPES (PRIMARY / SECONDARY, ELECTIVE / EMERGENCY)

According to the chart review, 59.0 % of mothers had an elective CS operation, while 40.0% had the CS as an emergency procedure. More than half (52.4%) of the mothers underwent the procedure for the first time (primary CS), while in 46.1% of cases it was a repeat CS.

Table 15: Caesarian section schedule and pattern for clients having CS, January - December 2018.

Variables	Number (n=460)	Percentage
<b>Caesarian section schedule</b>		
Elective	273	59 %
Emergency	182	40%
Unknown	5	1%
<b>Cesarean section type ( based on Number)</b>		
Primary	241	52.4%
Repeat	212	46.1
Unknown	7	1.5%

## 19. REASON FOR CURRENT CS

The charts review showed that 207 (45.0%) of the CS deliveries were performed with an indication of previous CS, followed by non-reassuring fetal heart rate pattern (NRFHR) (8.3%), and maternal request (6.1%). The details for CS indications are depicted in Table 16.

Table 16: Reasons for the CS at the private health facilities, January - December 2018.

Indication for C/S	Number	Percent
Previous CS	207	45.0%
NRFHR	38	8.3%
Maternal request	28	6.1%
Breech presentation	23	5.0%
Failure to progress	21	4.6%
Failed induction	21	4.6%
CPD	20	4.3%
Poor Bio physical profile	14	3.0%
Pre-eclampsia/eclampsia	13	2.8%
Post term	11	2.4%
APH	9	2.0%
Obstructed Labor	7	1.5%
Multiple pregnancy	6	1.3%
Others	28	6.1%
Mal-presentation/malposition(other than breech)	3	0.7%
Cord prolapsed	4	0.9%
Unfavorable cervix	2	0.4%
Not documented	5	1.1%
<b>Total</b>	<b>460</b>	<b>100 %</b>

## 20. FETAL AND MATERNAL HEALTH OUTCOMES

Of the 460 mothers who delivered by CS, nearly 99.5% of the first deliveries were born live and only two (0.05%) fetuses were documented as still birth (the still births were not labeled as fresh or macerated). More than 529 (94.9 %) of the births weighted above 2,500 grams, while 26 (5.7%) were above 4,000 grams. The Apgar scores at the first minutes were above five for all deliveries which had improved to more than eight at the fifth minutes. Only seven twin deliveries were documented and all were alive with weights greater than 1,500 grams, and had an Apgar score of seven and above at the first and fifth minutes.

Following the CS procedure, it was found that all mothers were alive with no documented maternal deaths. However, two mothers had PPH as a complication and were managed appropriately.

Table 17: Fetus weight CS delivery at private facilities, Jan. Dec. 2018.

No	Fetal weight of first baby (n=456)	Number	Percent
	<=1500 grams	1	0.2%
	1500-2500 grams	24	5.3%
	2500-4000 grams	505	88.8%
	>=4000 grams	26	5.7%

## 21. DISCUSSION

The cost of SVD ranges from 2,500.00-7,000.00 ETB (\$87.00 - \$242.40USD with conversion rate of 1 USD to 28.88 ETB -based on June 2019 conversion rate) while CS procedures with a 48 hours stay (which is the usual practice in private facilities in Ethiopia) payment ranges from 3,500 ETB-22, 000.00 ETB (\$121.29 - \$761.77). The mean CS procedure cost and 48 hours payment were \$169.8 and \$507.1 respectively. This finding was three times higher than costs that were documented in Fishea et al. study which documented an average cost of \$155 USD across nearly all NGOs (nationally), and the private wing of Jimma University specialized hospital (\$129.0 USD). However, the Fishea et al. study did not compare CS costs to SVD costs. The higher cost found in our study could be explained by the fact that there were official devaluations and increased costs of living which happened since 2009.

The CS rate in our study was found to be 57.8% ( see Table 3) with SVD rates standing at 34.9%, and 3.9% instrument assisted vaginal delivery. The CS rate from our study is somewhat similar to the study conducted in Mexico and a cross-sectional study performed at the university hospitals of Niknafs and Ali-Ibn Abi Talib of Rafsanjan, Iran, in 2014. The Mexico study found a CS rate of 57.3%, and the Iran study found a 52.6% rate. The rate found in this study is higher than the rate on a retrospective study done in government

maternity hospitals in India 2014 and a retrospective study done in maternity hospital at Albania, with rates of 25.66 and 32.3% respectively. This is likely due to the fact that all the later three studies were public facilities (Neuman, Alcock, and Azard 2014) (Gjonej et al. 2015).

When compared with other African contexts, the rate found in this study is also higher. The two year cross-sectional study carried out in a public tertiary hospital in Northwestern Nigeria found the caesarean section rate to be 11.3%, and an analytic study conducted at the NGO and government-run Tanzania St. Joseph Medical Hospital found the CS rate was 18% (Daniel and Singh 2016) (Linn and Stokke 2009).

The CS rate finding of 57.8% is higher than the 2010 Ethiopian Calendar annual report, and 2011 semiannual report of the Federal Ministry of Health which documented a CS rate in Addis Ababa as 36%, and 41 % respectively. It is also higher than the study conducted on caesarean delivery practices in teaching public and non-government/private MCH hospitals in Addis Ababa where the CS rate in private hospitals was 48.3% (Hussen, Shiferaw, and Lukman 2014). Similarly our CS rate is higher than the rates reported from the PHSP collected data from its 52 supported MNCH facilities where the CS was between 25-47.0%, from April 2017-Dec. 2018.

Moreover it is also more than what was found in Yebeltal et al. study which was 41.1% in 2013-2014. Additionally, the CS rate from this study was higher than what was reported from that of the Felegehiwot Referral Hospital, Mizan-Aman General Hospital, and Eastern Ethiopia Hospital based study in Harar, 21.1%, 34.35%, 27.6%, and 34.3% respectively (Yibeltal T. Bayou 2016) (Abebe F, Ashebir N, Gizachew A 2015) (Moges A, Ade me B, Akessa G 2015) (Central Statistical Agency [Ethiopia] 2011 2012).

Higher rates found in this study may be due to higher rates of CS in big cities like Addis Ababa as a result of the availability of technology for advanced obstetric services, high rates of maternal healthcare utilization, and availability of private healthcare facilities. The higher rate in this study could be due to the fact that our study only enrolled private facilities from Addis Ababa, where there is more capacity to perform CS and the clientele are typically of a higher socio-economic group with more ability to pay for the service.

When it comes to the reasons for CS, the majority of procedures occurred because of the mothers' history of delivering through this method (45.0%). The next most prominent reason for CS delivery was because of NRFHR (8.3%), and finally because of maternal request (6.1%). The prevalence of previous CS in our study is higher than what was found by Hiwot et al. In this study, a history of CS accounted for only 27.2%, but NRFHR was 21.0%. Also in Hussen et al. study it is similarly documented that pervious CS delivery accounted for 29.3% of the reasons in NGO hospitals. However, this finding was different from the study

conducted in Felegehiwot Referral Hospital in Northwest Ethiopia where the most frequent indication was obstructed labor (30.7 %), followed by fetal distress (15.9%), and abnormal presentation (13.4%). In Attat Hospital, Gurage Zone SNNPR, the leading causes for caesarean birth were CPD (38.1%), previous CS (18.9%), and fetal distress (Abebe Ashebir, and Gizachew 2015) (Moges, Ade, and Akessa 2015). This difference might be due to a decrease in the trend to consider vaginal birth after CS in the private facilities, similar to what was documented in our study. This indicates that more mothers inclined for CS on their own. This can likely signify the failure of medical personnel to give appropriate birth preparedness counselling for possible vaginal delivery (Abebe, Ashebir, and Gizachew 2015) (Moges, Ade, and Akessa 2015).

The majority of mothers who delivered through CS in this study were between 21 and 29 years old (56.1%). This is different from what was reported in a cross-sectional survey conducted in Addis Ababa where women older than 30 years were found to be more likely to have CS delivery than a younger age groups. Similarly, the study findings also contradicted the age structure reported from the three most recent EDHS data (2000, 2005 and 2011), where the CS rate did not show significant variation across the categories of maternal age groups. Moreover, the findings from this study are also contrary to the findings from the Yebetal et al. study where compared with young mothers ages 15–24 years, older mothers aged 30–49 years had greater odds of CS delivery, (odds ratio = 2.56) (Hussen, Shifewaw, and Lukman 2014). Based on researcher observations and the current focus of the Ethiopian FMOH to increase use of epidurals and other pain management medications during SVD, the lack of provision of pain management drugs in study facilities could increase fear of pain by younger mothers and drive a higher demand among this group for CS delivery.

When it comes to parity, 35.1% of the CS cases were primiparous which is somewhat similar to the Hiwot et al. study that found 48.7 % to be primiparous. Regarding GA at CS, the majority (91.0%) occurred during GA category of 37-42 weeks in our study which is similar to Hiwot et al. study of 85.2 % for GA of 37-42 weeks.

Regarding CS timing, 59.0% were elective in our study which is somewhat higher than Hiwot's et al. study which documented a CS performed on elective bases to be 41.2% of cases. Moreover, our emergency CS rate of 41.0% is less than Hiwot's study finding of 58.8%. Our finding is also contrary to the findings from a study conducted in a Pakistani teaching hospital which found 61.35% emergency and 38.6% elective(Maimoona Hafeez,et al.) .

However, the rate of elective CS operations in this study was lower than a study conducted in Atata Hospital, Gurage Zone SNNPR, Ethiopia which found 90.4% emergency CSs, and only 9.6% elective. A

similar trend was identified in Felegehiwot referral hospital in Northwest Ethiopia; 90.3% emergency, and 9.7% elective. The observed discrepancy could be the increasingly large number of previous CS and availability of private healthcare facilities in Addis Ababa unlike the other study findings mentioned above.

This study found that about 52.4% of CSs were primary, which is less than the study conducted in Addis Ababa, Attat Hospital, and Gurage Zone SNNPR which documented rates of primary CS at 64.0%, 68.7%, 65.1% rates respectively (Hiwot 2017) (Abebe, Ashebir, and Gizachew 2015) (Moges, Ade, and Akessa 2015). The repeat CS rate in this study was 60.0%, which is higher than the study conducted in Addis by Hiwot , in Attat Hospital, Gurage Zone SNNPR, and a study in Harar which documented rates of repeat CS at 46.1% , 36.0% and 31.3 % respectively (Hiwot 2017) (Abebe, Ashebir, and Gizachew 2015) (Moges, Ade, and Akessa 2015) .

Regarding the timing of CS, CS was electively performed in 59.0 % of mothers unlike the studies in Addis Ababa (by Hiwot), the Felegehiwot Referral Hospital and Attata Hospital where elective CS rates of 41.2%, 9.6%, and 9.7% respectively were documented. This could be due to the fact that most public hospitals receive and manage referred clients and have to provide more emergency CS's rather than elective unlike the private care facilities who largely manage mothers who were not in actual labor.

Moreover, the high elective CS rate could be influenced by many non-medical factors such as cultural norms, personal characteristics of the woman, and socioeconomic factors (Hiwot 2017) (Abebe, Ashebir, and Gizachew 2015) (Moges, Ade, and Akessa 2015, (Can ONER, Binali CATAK, Sevinç and Selçuk 2016).

Regarding outcomes of CS deliveries, of the 460 mothers who delivered by CS in this study, nearly 98.4% of the first born baby was born alive, and only 1.6 % were documented as still birth. Ninety-eight percent of second delivered twins were born alive, while 2.0% were still birth. This finding is higher than the 81% live birth documented in Fesseha et al. study. No maternal deaths were documented in this study, unlike the findings in the above mentioned study where two women out of the 267 cases of cesarean delivery reviewed died. (Fesseha et al. 2011).

The percentage of births having birth weight of 2,500-3,999 grams (88.8%) is somewhat higher than the Hiwot study of 76.2%. This could be due to the fact that the private for-profit clients included in this study are from better socioeconomic groups with better maternal health and nutritional status, resulting in better birth weight.

Finally, while the standard practice and recommendation is to follow all laboring mothers using partograph, this only occurred for one out of every five (20%) of the laboring mothers included in this study. However,

this figure is higher than what was found by Fishier et al. group which documented 12%. While 87.0% of mothers had ANC visits in the same facility, only 12% of cases received some form of counselling on birth preparedness.

## 22. Conclusion

The study describes the current level, pattern and magnitude of CS delivery in private health facilities in Addis Ababa, Ethiopia.

There was a relatively higher cost for a CS procedure and 48 hour post-operation hospital stay when compared to costs for SVD services; (the mean CS procedure cost and 48 hours stay payment were found to be \$169.8 and \$507.1 USD respectively).

The study shows a CS rate of 57.8% across included private facilities, which is extremely high compared to the WHO recommendation of 10-15%. These high rates could indicate unjustified overuse, which is of equal concern as underuse. Underuse of planned/ elective and overuse of emergency CS could indicate issues related to suboptimal counselling and birth preparedness counselling during antenatal care (ANC), and at the time of labor and delivery.

Use of CS was highest amongst relatively young age groups (21-29 years) and prim parous women. The majority of cases occurred at GA of 37-42 weeks. Elective and repeat CS cases accounted for the majority of the cases reviewed in this study. While a history of CS was the most common reason for the CS reviewed for this study, the other two most common reasons were NRFHR and maternal request.

In conclusion, we have provided evidence of substantially higher CS rates in private facilities in Addis Ababa compared to the available literature on CS rates in facilities in other low- and middle-income countries, and public facilities in Addis Ababa. Factors such as suboptimal client birth preparedness and counselling on safe delivery options could be the drivers for the observed high CS rate in this study.

## 23. Recommendations

We highly recommend carrying out a detailed study to document factors that might affect CS rates by using a prospective study design with qualitative component. Moreover, exploration of the clients', providers', managers' and facility owners' perspectives regarding the ever increasing rate of CS delivery in private health care facilities in Ethiopia is recommended.

In addition, providers must be advised to inform expectant mothers about birth preparedness in general and the risks and benefits of CS in particular, provide pain relief medications during labor and delivery, provide

trial of vaginal birth as per the standard recommendation for previous CS, and also try to refrain from unnecessary increased medicalization of labor and delivery by decreasing intervention as recommended by WHO.

And finally, we also recommend the FMoH and AARHB to monitor the CS rates to make sure that it is within the acceptable limits so as to avert maternal, fetal and newborn mortality without causing significant risk following unnecessary procedure.

## ANNEX I. LIST OF FACILITIES SELECTED FOR THE STUDY

No	Name of facilities	Sub city	PHSP supports Yes/No	C/S done for six month	Charts for Review
1	Abebech Gobena MCH Center	Arada Sub City	No	175	18
2	Addis Hiwot Hospital	Bole Sub City	Yes	246	25
3	Afran primary Hospital	Kolfe Sub City	No	148	15
4	Ananiya MCH Center	Arada Sub City	Yes	170	17
5	Betel No.2 MCH Hospital	Lideta Sub City	Yes	132	13
6	Bethzatha General Hospital	Kirkos Sub City	Yes	205	21
7	Betsega Mothers and Pediatrics Center	Bole Sub City	Yes	1168	117
8	BGM Mothers and Pediatrics Center	Bole Sub City	Yes	145	15
9	Brass Hospital	Bole Sub City	Yes	283	28
10	Dinberua MCH Center	Yeka Sub City	Yes	324	32
11	Ethi Tebib General Hospital	Addis Ketema Sub City	Yes	322	32
12	Girum General Hospital	Addis Ketema Sub City	No	180	18
13	Grace MCH Center	Bole Sub City	Yes	1007	101
14	Hemen MCH Center	Arada Sub City	Yes	240	24
15	Kadisko General Hospital	Bole Sub City	Yes	292	29
16	Koria Hospital	Bole Sub City	no	562	56
17	Landmark General Hospital	Kirkos Sub City	No	124	12
18	Marie Stopes MCH Specialty Center	Kirkos Sub City	No	849	85
19	Marie Stopes MCH Center	Arada Sub City	No	432	43
20	Migbare Senay General Hospital	Yeka Sub City	yes	110	11
21	Naine MCH Specialty Center	Nifas Silk Lafto Sub City	yes	254	25
22	Semah GYN and OBS Center	Bole Sub City	yes	200	20
23	Tekelhaimanot General Hospital	Arada Sub City	Yes	160	16
24	Tzana General Hospital	Kolfe Sub City	No	348	34
<b>Total</b>				<b>8076</b>	<b>807</b>

## **ANNEX II. DATA COLLECTION INSTRUMENT**

### **Information Sheet and Consent Form**

#### **PURPOSE**

Hello. My name is \_\_\_\_\_ and I am working for the USAID-funded Private Health Sector Project for Abt Associates Inc. This project provides support to improve access to health services in Ethiopia, working with the private sector and the Government of Ethiopia.

The purpose of this study is to gather relevant data and information determine the pattern and magnitude of CS deliveries in Addis Ababa.

#### **PROCEDURES**

If you agree to participate we shall collect general facility information, information about clients from ANC and Delivery books, and retrieve 10% of the clients charts to collect information about past Obstetric history, labor follow up, and the fetal outcome,

#### **RISKS/DISCOMFORTS**

The information you provide will not be associated with you personally and will be treated with confidentiality. The company I work for, Abt Associates, Inc., has experience in conducting studies like this one around the world. I can assure you that the results of this assessment will be not be reported for you individual facility but in a combined form, with answers from multiple facilities together. However, we will share the data with USAID; your facility name and other information will not be included in the data we share.

#### **BENEFITS**

Your participation in this assessment will inform policy makers on the magnitude and pattern of Cesarean section in Addis Ababa.

#### **VOLUNTARY PARTICIPATION**

The participation of your facility in this study is completely voluntary. You do not have to agree to be in this assessment, and you may change your mind at any time. Your facility will not receive any payment or compensation for your participation in this assessment.

#### **PERMISSION TO PROCEED**

Do you agree to participate in study? Yes \_\_\_\_\_ No \_\_\_\_\_

Signature of Person Obtaining Consent \_\_\_\_\_

Print name of Person Providing Consent \_\_\_\_\_

**QUESTIONNER ONE: DATA COLLECTION FORMAT**

**(FOR ALL FACILITIES)**

No.	Facility Information	Response	Code
1	Name of facility	_____	
2	Type of facility	1 General Hospital 2 MCH center	
3	Average payment of C/S in Ethiopian Birr	_____birr	
4	Average payment of SVD in Ethiopian Birr	_____birr	
	<b>II Data from labour and Delivery Book</b>		
5	Total No. of deliveries in the past one yea	_____deliveries	
6	Total No. of CS deliveries in the past one year	_____deliveries	
7	Other instrumental assisted deliveries in the past year	_____deliveries	
8	Total number of deliveries in the months (March, May, August and November	_____deliveries	
9	CS delivery proportion in the months (March, May, August and	_____deliveries	
10	Other instrumental deliveries or interventions (March May, August and November	_____deliveries	

**QUESTINNER NO. TWO: FOR ALL DELIVERIES (FROM DELIVERY BOOK)**

No.	Information	Response	Code
<b>1</b>	<b>Client / patient information</b>		
1.1	MRN	_____	
1.2	Age	_____	
<b>2</b>	<b>Mode of Delivery</b>	1. SVD 2. SVD with episiotomy 3. CS 4. Instrumental delivery	
<b>3. Maternal and fetal Outcome and complications</b>			
3.1	<b>Maternal outcome</b>	1. Stable 2. Unstable 3. Referred	
3.2	<b>Fetal outcome</b>	1. Live birth 2. Stillbirth	
3.3	Weight in grams		
3.4	Apgar score	_____ 1 <sup>st</sup> & _____ 5 <sup>th</sup> minutes	
3.5	Maternal complication	1. Pre-eclampsia/eclampsia 2. APH 3. PPH 4. Others	

**QUESTIONNER NO. THREE:**

**(CS CLIENT CHART REVIEW & OR BOOK)**

No.	CLIENT'S/MOTHER'S INFORMATION		Code
1	Client Card No	_____	
2	Mother's Age	_____years	
<b>3. OBSTETRIC AND MEDICAL HISTORY</b>			
3.1	Parity	_____	
3.2	Number of currently live children	_____children	
3.3	Number of abortion	_____abortion	
3.4	Gestational Age at delivery ( index) pregnancy	_____weeks	
3.5	Mode of previous delivery	_____1 <sup>st</sup> _____2 <sup>nd</sup> _____3 <sup>rd</sup> _____4 <sup>th</sup> _____5 <sup>th</sup>	
3.6	Has previous C/S	1. Yes 2. No	
3.7	If yes for the above , what is the total number of C/S	_____C/S	
3.8	Chronic medical problem	1. Yes 2. No	
3.9	Have previous uterine surgeries	1. Yes 2. No	
3.10	Have previous uterine surgeries other than C/S	1. Yes 2. No	
3.11	Have Any other major Abdominal surgery previously	1. Yes 2. No	
<b>4. CURRENT OBSTETRIC HX</b>			
4.1	Gestational DM	1. Yes 2. No	
4.2	PIH/ PE/Eclampsia/ Chr. HTN	1. Yes 2. No	
4.3	Postdate ( >42 weeks)	1. Yes 2. No	
4.4	Premature	1. Yes 2. No	
4.5	Others	1. Yes 2. No	
<b>5. ANTENATAL CARE ( ANC)</b>			
5.1	In the same facility	1. Yes 2. No	
5.2	Child birth preparedness advise/discussion	1. Yes 2. No	
<b>6. LABOR FOLLOW UP</b>			
6.1	Using partograph	1. Yes 2. No	
<b>7. MODE OF DELIVERY AND INDICATION FOR CS</b>			

No.	CLIENT'S/MOTHER'S INFORMATION		Code
7.1	Timing if CS	1. Elective 2. Emergency	
7.2	Number of CS	1. Primary(first time) 2. Repeat	
7.3	Indication for CS of current	1. Obstructed Labor 2. CPD 3. APH 4. Previous C/S 5. Malpresentation/ malposition (other than breech) 6. Breech presentation 7. Pre-eclampsia /eclampsia 8. Failure to progress 9. Failed induction 10. Cord prolapsed 11. Post-term (> 42 completed weeks) 12. Multiple pregnancy 13. Unfavorable cervix 14. Non-reassuring HR 15. Poor BPP 16. Maternal request 17. Other specify	
<b>8. Maternal and fetal Outcome and complications</b>			
8.1	Maternal outcome	1. Alive 2. Dead	
8.2	Fetal outcome	1. Alive 2. Dead	
8.3	Weight in grams	_____	
8.4	Apgar scores( 1 <sup>st</sup> and 5 <sup>th</sup> minutes)	_____ & _____	
8.5	Maternal complications	1. Pre-eclampsia/eclampsia 2. APH 3. PPH 4. Others	

### ANNEX III. SELECTED STUDIES CONDUCTED ON MAGNITUDE OF CS DELIVERY AND INDICATIONS

No	Study done in Country	Timing of CS	Indications	Remark
1.	Government Maternity hospital in India	Emergency CS 44.48% Elective CS 55.52%	- Fetal distress - CPD - Big baby	See ref. # 9
2.	Iran university hospitals of Niknafs and Ali-IbnAbiTalib of Rafsanjan)	Elective CS-52.90% Emergency CS 47.10%	- On maternal request, 7.5% - Meconium stained (6.1%), - Fetal distress (5.0%)- - Breech presentation 4.5%	See ref. # 10
3.	Tertiary hospital, North western Nigeria		- Prolonged obstructed labor-27.70% - Preeclampsia 10.70% - Previous CS 39.80% - Breech 17.60%	See ref.# 11
4.	Tanzania, St. Joseph medical hospital		- Prolonged, obstructed labor-33.30%	See ref. # 12
5.	Medicines sans Frontiers Multi-country analysis In sub-Sahara Africa		- Obstructed Labor 31% - Malpresentation 18% - Previous CS 14% - Fetal distress 10% - APH 9%	See ref. # 13
6.	Maternity hospital in Albina		- Previous CS 36.50% - Fetal suffering 13.90% - PROM 9.80% - Preeclampsia 9.20%	See ref. # 14
7.	Prevalence and Indications of CS in Lahor, Pakistan a Teaching Hospital.	Elective CS-38.6% Emergency CS- 61.35%		-See ref. # 22
8.	Jimma University specialized thirty hospital		-Cost for CS -3,733.00 ETB( 129.0 USD)	

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