

# **FACTORS CONTRIBUTING TO INCREASING CAESAREAN SECTION RATES IN UGANDA A LITERATURE REVIEW**

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**Master of Science in Public Health**

**12th September 2022 – 1st September 2023**

**KIT (Royal Tropical Institute)**

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# Attestation of Authorship

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## **FACTORS CONTRIBUTING TO INCREASING CAESAREAN SECTION RATES IN UGANDA – A LITERATURE REVIEW**


A thesis submitted in partial fulfilment of the requirements for the award of the degree of  
Master of Science in Public Health

**By:**

**Elijah Ssemaganda**

Declaration:

I declare that this thesis “**Factors Contributing to Increasing Caesarean Section Rates in Uganda: A Literature Review**” presented herein is my own work, and that where I have used other people’s work from various sources in print format, from the internet or other sources, I have acknowledged this fact by properly referencing their work in accordance with the required academic standards.

Signature: 

Master of Science in Public Health (MPH)

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*My wife Immy and children Erinah, Elsie and Elisha deserve special mention; they have had to endure an entire year of separation from their husband and father, but have nonetheless been my number one support, inspiration and cheerleading team. I am so grateful to them for inspiring me when times got hard, very hard. They remained a big reason and motivation for my academic journey.*

*May you all be richly blessed with the Heavenly blessings of the Lord God, in mighty Name of Jesus Christ our Lord, Saviour and Redeemer, Amen.*

## Abstract

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**Title:** Factors contributing to increasing caesarean section rates in Uganda: a literature review

**Background:** Ugandan and global Caesarean section (C/S) rates have been increasing in the last few decades but rates above 10% are not associated with better maternal and neonatal outcomes. Whereas the current national C/S rate for Uganda stands at 6.2%, health facility rates exceeding 90% in some private care facilities have been reported. This points to potential overuse of the procedure and may be contributing to poor maternal and neonatal health indicators in a resource-limited country with inadequate health sector funding.

**Research Aim:** To identify causes of rising C/S rates in Uganda and propose ways of reducing unnecessary C/S.

**Methods:** A review of the literature published in English between 2000 and 2023 from databases including Google Scholar, PubMed and VU Library, search engines like Google as well as organisational websites such as WHO, World Bank and the Ugandan Ministry of Health. Ghosh's adapted analytical framework was used to structure and present the results.

**Results:** Financial motivation, poor clinical care decisions, the poorly-monitored and expanding private health sector, women's higher socio-economic status, increasing maternal obesity and use of herbal remedies contribute to high C/S rates. Gender, the media, litigation fears, maternal age and parity were indeterminate factors affecting C/S rates. Cultural belief and TBA have mitigating

**Conclusion and recommendations:** Unnecessary C/S need to be reduced or eliminated using a multi-faceted strategy to free up resources and optimize maternal and neonatal health service delivery in Uganda.

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## List of Abbreviations

Abbreviation	
<b>BEmONC</b>	Basic Emergency Obstetric and Neonatal Care
<b>C/S</b>	Caesarean Section
<b>CEmONC</b>	Comprehensive Emergency Obstetric and Neonatal Care
<b>DHIS</b>	District Health Information System
<b>HC</b>	Health Centre
<b>HCWs</b>	Health Care Workers
<b>HF</b>	Health Facility
<b>HICs</b>	High Income Countries
<b>LMIC</b>	Low and Middle Income Country
<b>MoH</b>	Ministry of Health, Uganda
<b>RMC</b>	Respectful Maternity Care
<b>SBA</b>	Skilled Birth Attendant
<b>UDHS</b>	Uganda Demographic and Health Survey
<b>UGX</b>	Uganda Shillings
<b>VBAC</b>	Vaginal Birth After Caesarean Delivery
<b>WHO</b>	World Health Organization

## Glossary of Terms

TERM	DEFINITION
<b>Caesarean Section (C/S)</b>	The surgical delivery of a foetus which has/had reached the age of viability <sup>1</sup> through an incision made on the uterus.
<b>Caesarean Section Rate</b>	The number of caesarean deliveries over the total number of live births, expressed as a percentage.
<b>Facility-based C/S rate</b>	The proportion of caesarean deliveries among live births in facilities
<b>Un-necessary C/S</b>	Caesarean Sections that are not medically indicated or justified
<b>Tokophobia</b>	“A psychological disorder which ranges from insignificant to extreme fear of childbirth, affecting women from childhood to old age”
<b>Skilled Birth Assistance</b>	The births delivered with the assistance of a person who is trained and equipped with skills to do so.
<b>Medicalization</b>	“The process by which formerly normal biological processes or behaviours come to be described, accepted, or treated as medical problems” <sup>2</sup>
<b>Maternal Mortality</b>	Death of a woman while pregnant or within 42 days of termination of pregnancy, irrespective of the duration and site of the pregnancy, from any

<sup>1</sup> Foetal Viability varies from country to country; in Uganda, it is set at 26 completed weeks of gestation.

<sup>2</sup> Various definitions and perspectives exist; for this work, this is the chosen working definition. Details [Here](#).

	cause related to or aggravated by the pregnancy or its management, but not from accidental or incidental causes <sup>3</sup>
<b>Labour Dystocia</b>	Difficult labour or abnormally slow progress of labour <sup>4</sup> . May involve inadequate cervical dilatation poor descent of the baby through the maternal pelvis or difficulty in delivering the shoulders (shoulder dystocia)
<b>Gender</b>	Refers to the characteristics of women, men, girls and boys that are socially constructed, and includes norms, behaviours and roles associated with being a woman, man, girl or boy, as well as the relationships with each other <sup>5</sup> .
<b>Respectful Maternity Care</b>	Refers to care organized for and provided to all women in a manner that maintains their dignity and confidentiality, ensures freedom from harm and mistreatment, and enables informed choice and continuous support during labour and childbirth -WHO

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<sup>3</sup> Definition by World Health Organization

<sup>4</sup> Definition from Medscape. Details [Here](#).

<sup>5</sup> According to [WHO](#).





## CHAPTER 1: INTRODUCTION AND BACKGROUND

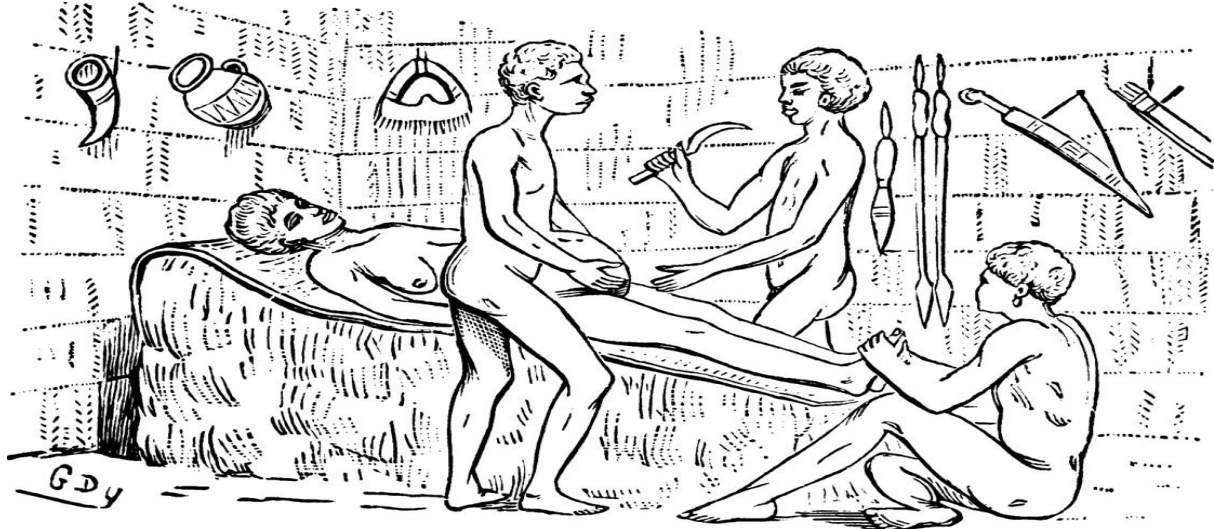


Figure 1: A Caesarean delivery being conducted in Uganda in the year 1879, as described by Robert Felkin (1).

### Introduction

#### About the author:

The author is a medical doctor in Uganda with 14 years of experience, six of which were clinical work during which he conducted hundreds of caesarean sections. In the last eight years, he has been working to monitor healthcare delivery in government health facilities in Uganda and has witnessed first hand negative consequences of unnecessary caesarean sections in the country. This motivated his interest since his future career is likely to be in the same field.

### Background

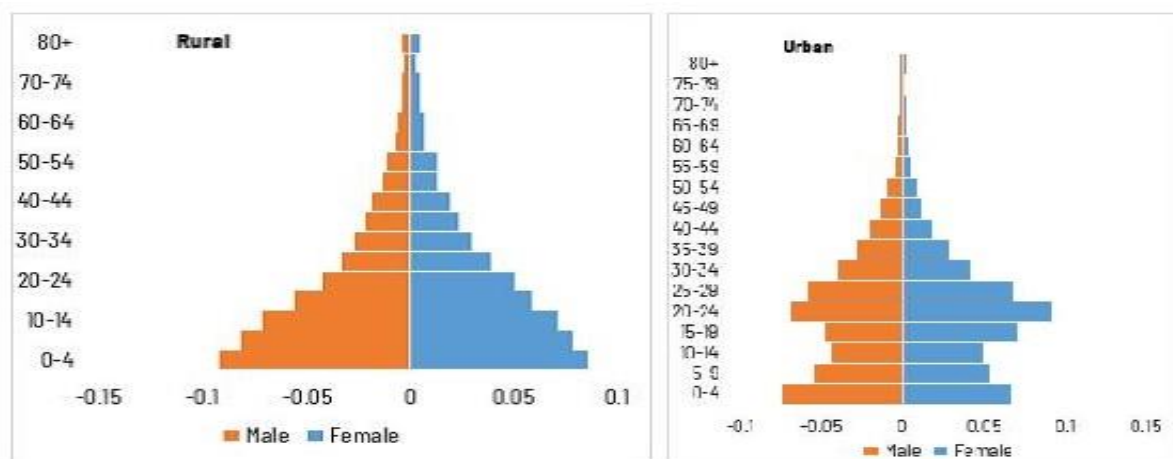
A caesarean section (C/S) is a surgical procedure in which a (viable) pregnancy is delivered through an incision in the lower abdomen as well as the lower segment of the uterus (2). It can be a life-saving procedure where various situations and complications would make a normal vaginal delivery either extremely risky for the mother and/or baby(ies); or where vaginal delivery is simply not feasible (3). It is one of the commonest major surgical procedures globally (4) and has made the process of child birth much safer for some women whose physical situations such as pelvic abnormalities or severe fractures, among others, would make normal vaginal delivery nearly impossible or extremely dangerous (5). The medical indications for C/S are many and varied but are generally categorized into three including; maternal, uterine or anatomic, as well as foetal (6). Details of indications are in annex 1.

The procedure is generally categorized into two: elective C/S and emergency C/S. An elective C/S is that which is planned to be conducted at a time that is suitable for the mother as well as the maternity service providers, before the onset of labour. Emergency C/S is the one done with varying degrees of urgency when there is some degree of threat to the life of the mother or foetus (2).

C/S rates globally are rising and show no signs of reducing (7). Population level C/S rates below 10% have been associated with reductions in maternal and perinatal mortality, while rates above 10% have no demonstrable benefit mortality rates (8). Whereas these rates were initially used as a guide to optimal C/S rates, the WHO has since further guided that instead countries focussing on achieving specific C/S rates, it is better to ensure that C/S are optimally used and that every woman who needs to have one gets it given the prevailing circumstances and the clinical judgement (7).

## Demographics

Uganda is an East African land-locked country covering an area approximately 241,550 Km<sup>2</sup> (9), and is bordered to the north, east, south, south-west and west by South Sudan, Kenya, Tanzania, Rwanda and the Democratic Republic of Congo respectively. It is with a population of about 40.9 million people, which reflects an increase by about 3.2 million between 2016/17 and 2019/2020 (10). After Angola, Equatorial Guinea and Niger, Uganda has the highest population growth rate in Africa at 3.4% (11). Nearly three quarters (73%) of the population lives in rural areas, although there was observed to be a slight increment of 2 percentage points, from 25%, of the people living in urban areas between the years 2016/17 and 2019/20. However, this observed increase in urban population is partially explained by the assignment of city statuses to towns and some areas that were initially considered rural then became urban (10). The country is in the early stages of the demographic transition (where the mortality and fertility rates drop), and managed to achieve an increase in life expectancy from 43 years in 1991, to the current 63.3 years (12). The vast majority of Uganda's population is young and this is associated with both high fertility and mortality rates. 44% of Uganda's population is below 14 years, while the working age group (14 to 64 years) constitutes about 52%. Some slight differences exist between the urban and rural population pyramids to reflect the dependant proportions of the population. The urban population pyramid is slightly different, showing a bigger 'bulge' in the working group, and a smaller dependent population (12).



**Figure 2: The Rural and Urban population pyramids for Uganda in 2014 depicting the varying proportions of the working and dependent populations. Source (12).**

## The Health Administrative Structure

Uganda's public healthcare system (figure 3 below) is organized hierarchically with the ministry of health (MoH) at the top. The ministers offer the political oversight role and are tasked with policy formulation, coordination of the health sector activities as well as bringing together stakeholders at different levels to ensure quality health service delivery (13). The ministry is responsible for the national and regional referral hospitals where specialized services are offered. At the district level, the district council is the top decision making organ which approves annual health department work plans on top of offering the general oversight role of service delivery at the district (14). Services of the general hospitals, HC IVs, IIIs, and IIs are managed by the district local governments (15), through a decentralized arrangement. At the bottom of the structure are the community health workers called Village Health Teams (VHTs) who form the link between the communities and the formal health systems.

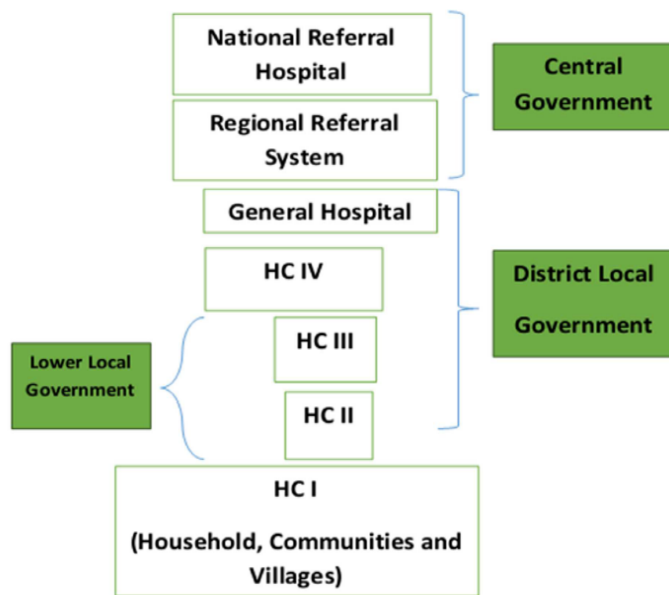


Figure 3: Structure of the Ugandan Health care system and their respective levels of government. Source: (16).

Access to healthcare services

People’s access to healthcare services (within 5km) in Uganda was seen to improve between 2014 and 2017 from 83% to 86% (13), and got even better in 2020 at 91% (10). Disparities in access to healthcare still exist where people in rural and non-mountainous areas generally have to cover larger distances to access care compared to their counterparts living in urban and mountainous areas. Some of the major factors cited as impeding access

to healthcare services in government facilities are: unavailability of medicines; long waiting times; limited range of the services offered, and the long distances to reach health centres among others. For private facilities, the two commonest reasons for limited access are high costs as well as a limited range of services. Over 60% of people walk to access healthcare facilities in Uganda, and the average time taken to reach the health facility is thirty minutes (10).

Overall, 58.6% of Ugandan women aged 15-49 years face some form of obstacle in accessing healthcare services and the four commonly cited reasons are: getting money for treatment (44.7%); long distance to the health facility (37.4%); not wanting to go alone (20.9%) and needing permission to go for treatment (5.4%) (17). Sixteen percent of Uganda’s HC IVs (total of 240) do not offer caesarean section (C/S) services, while about 30% of them conduct C/S but without the option of offering a blood transfusion if and when it is needed (18).

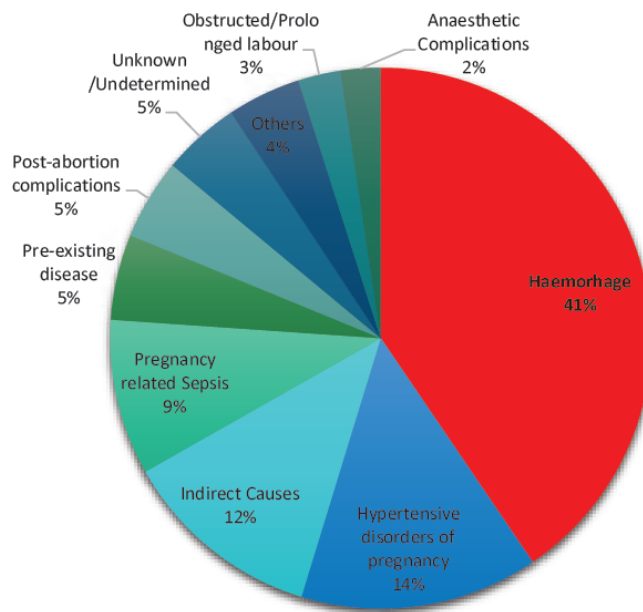
Health Sector Financing

Uganda is one of the countries that do not have a national health insurance scheme, through with it would be able to finance a significant part of its healthcare budget (15) and offer financial risk protection to its population. Services are often paid for through user fees and the out-of-pocket expenditure is estimated at about 37.3% of the total health expenditure (11). User fees in the public health facilities were abolished in 2001 (19) as a way of improving access to healthcare services. Since the government funding of public health system only stands at 17%, of the current health expenditure, the resultant insufficiencies has enabled expansion of private healthcare providers and individual expenditure on private healthcare (20).

## Maternal and Perinatal Health

Uganda still has one of the world's highest maternal and perinatal mortality indicators. The maternal mortality ratio (MMR) is estimated at 336/100,000 live births and the neonatal mortality rates is estimated at 27/1,000 live births, an indicator which remained virtually unchanged for over two decades (21).

According to MoH (22), the commonest causes of maternal deaths (figure 4) are excessive bleeding;



disorders of hypertension in pregnancy; indirect causes such as HIV/AIDS, malaria and anaemia; sepsis in pregnancy; complications of abortion; prolonged or obstructed labour; complications of anaesthesia and other unknown causes.

Relatedly, the commonest causes of early neonatal deaths in the financial year (FY) 2021/22 were birth asphyxia, complications related to prematurity, septicaemia; congenital abnormalities and birth trauma among others which were either not documented or were unknown (22).

Uganda is also one of the countries with the highest unmet need for family planning (28% of currently married women and 32% of unmarried women who are sexually active), as well as a high total fertility rate of 5.4 children per woman (17). A combination of such statistics with offers good ground for many unwanted pregnancies that may result into maternal and perinatal morbidity and mortality.

Uganda set for herself a target of reducing the maternal mortality rate to <140/100,000 live births, the infant mortality rate to < 12/1,000 live births and the under-5 mortality rate to <25 per 1,000 live births by 2030 (23).

### Trends in Maternal, Newborn, and Child Mortality (1995-2016)

Source: Uganda Demographic Health Surveys 1995;2000/1;2006;2011; 2016



Figure 5: Trends in maternal, new-born and child mortality indicators for Uganda between 1995 and 2016 (21).

The East and Southern African (ESA) Region, where Uganda lies, has made progress in reducing the death of pregnant women and girls and enhancing the survival of new-born babies. According to UNFPA, the 23

countries in this region registered a 49% reduction in maternal and perinatal deaths between the years 2000 and 2017 and thus beat the global average of 38% (24).

Uganda set for itself a target of reducing its national MMR to < 140/100,000 live births by 2030 (23). One of the strategies for achieving this goal is to ensure that every birth is attended by a skilled birth attendant (SBA). Health facility deliveries in Uganda have been increasing since the year 2,000 as reflected in the figure below. Despite this increase, one quarter of Ugandan women still deliver outside of health facilities and almost the same proportion of deliveries are not attended by a skilled birth assistant/provider (17).

The trends in health facility births have also been increasing as shown in figure 6 below. In the financial years 2020/21 and 2021/22, the proportion of health facility deliveries dropped to 64% and 62% respectively.

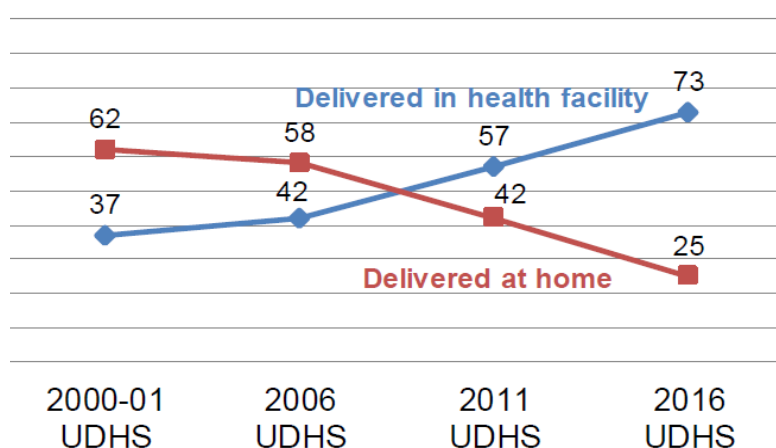


Figure 6: Trends in the place of birth in Uganda, 5 years preceding the survey (17). Figures are in percentages.

## CHAPTER 2: STATEMENT OF THE PROBLEM AND JUSTIFICATION

### The Problem Statement

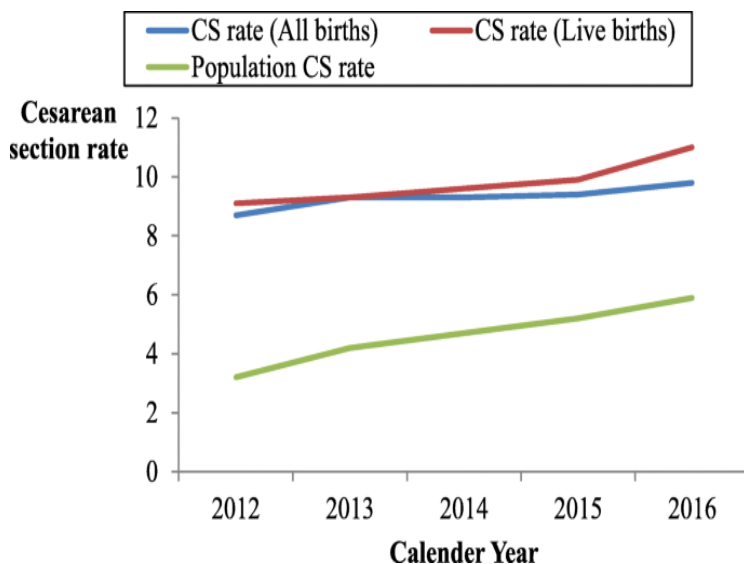
With the worldwide increase in C/S rates, now every one in five babies is delivered through C/S, and a 19 percentage point average increase in C/S was registered between 1990 and 2018 (25). This increase has been especially marked in the recent decades with regional and continental variations. In terms of absolute percentage increases between 1990 and 2014, Latin America and the Caribbean led the way with a 19.4% increase, followed by Asia, Oceania, Europe, North America and Africa at 15.1%, 14.1%, 13.8%, 10%, and 4.5% respectively (3). Current estimations place C/S rates at 32% in the USA and Oceania, 40% in Latin America as well as Europe at about 25% (26), and 4% in Sub-Saharan Africa (4). Whereas no specific C/S rate is recommended for any given population, it has been demonstrated that C/S rates beyond 10% at population level are not associated with reductions in maternal and neonatal mortality (27).

Some African countries have witnessed a sharp rise in the C/S rates without a corresponding improvement in the maternal and perinatal mortality indicators. Such is the case with Egypt whose C/S rates more than doubled in less than a decade from 20% in 2005 to 52% in 2014, and it is among the top five countries that have the highest C/S rates in the world (25,28).

The subject of C/S rates stirs up a complicated debate since in any given country and situation, the rate is determined by a complex interplay of various factors including the capacity of a health facility to offer the service, the availability (and use) of clinical case management guidelines, nature of the population (29),

and the case mix (3). Furthermore, in countries, especially the LMICs, this problem can be double-pronged where both overuse and underuse can co-exist and concurrent solutions must be implemented. In countries (and areas or health facilities) where C/S are very high, simply aiming at reducing the rates without due consideration for safety and adverse outcomes is not advisable. Conversely, in countries (and areas) with low rates and insufficient human and material resources to safely offer C/S, focussing only on increasing C/S rates without the necessary safety measures is also not advisable (27). Uganda finds itself in such a situation. The C/S rates among health facilities in Uganda vary a lot and are unequally distributed, but the median rate is estimated to be about 17.9% among the HC IVs, general hospitals as well as regional referral hospitals (30). While quoting the WHO, Anuj Kumar Pandey et al. highlighted the importance of providing a C/S only to women in need, as opposed to focussing on attaining specific C/S rates (29).

In Uganda, the national C/S rate increased from 3% (2006) through 5.3% (2011) to 6.2% (2016) (17). These national figures may reflect an improvement in access to C/S services for deserving women. However, such aggregated national figures mask inherent inequities between various segments of the population. For example, a wide gap exists between the urban and rural populations; in 2011, the rural C/S rate was 3.9% against 13.7% in urban areas (31) and in 2016 rates stood at 4.9% in rural areas against 11% in urban areas (17). Between 2012 and 2016, a detailed analysis of the Ugandan situation further highlighted this inequity in access to C/S. Among the then 112 districts in the country, only 29% had C/S rates of at least 5%, and among those with rates below 5%, 34% had C/S rates below 1% and 3.4% had no C/S reported during the period of study (32).



**Figure 7: Caesarean Section trends in Uganda between 2012 and 2016 (32).**

Thirty five percent of all the C/S done in Uganda are elective, that is, they are performed before the onset of labour (17). Elective C/S contribute more to those surgeries that may be categorized as unnecessary since comparatively few of them may have medical indications (such as two or more previous scars, previous uterine rupture, previous obstetric fistula among others). Since one in every three C/S is elective (see annex 2), this

may be indicative of a significant proportion of the unnecessary ones that serve to consume the (limited) resources and add extra morbidity and mortality burden to the healthcare system in the country. Elective C/S make up 50%, 50.5% and 52.1% of the those conducted in greater Kampala region, the south central region, and among women with a greater-than-secondary education, respectively, in Uganda (17). When compared with the emergency ones, elective C/S are better planned and conducted when the pregnant woman, the healthcare team and health facility are well prepared. Despite this preparedness, the surgeries are not without complications and negative outcomes. Out of the maternal deaths that were audited (1,096) in Uganda in the FY 2021/22, over 25% had been delivered by C/S, as opposed to 16.7% delivered vaginally (22). Relatedly one third of all the reviewed perinatal deaths (11,403) in Uganda during the same financial year were delivered through C/S.

Every year nearly six million unnecessary C/S are conducted globally, with the majority of them being in China and Brazil (4). Sancheeta Ghosh submits that while the use of medical technologies in childbirth have certainly contributed to a reduction in the maternal and child deaths in the last century, there is a possibility

of abuse of this technology to reduce or avoid risk (possibly litigation) but also for gaining profit (33). This is a very likely scenario in Uganda where rates of C/S in some private health centres have exceeded 90% as noted above.

C/S are major surgeries and can be associated with risks including heavy bleeding, infections, a more protracted recovery time, delays in initiating breastfeeding and mother-baby skin-skin contact (34). There are short and long term negative effects of C/S on both women and children, some of which are additive and increase in a dose-response manner (35). This means that the more C/S a woman has, the greater the risk of some complications such as uterine rupture, abnormal placentation, she may encounter. Details of these complications are presented in annex 2. Psychological and behavioural complications of especially elective C/S on children including inattention, hyperactivity/impulsivity, having social problems such as acting young, having clingy behaviour, having difficulty in getting along with others, have also been demonstrated (36).

## Justification

A C/S, like other major surgeries is expensive in terms of human capital, materials and equipment, as well as time spent. At least six primary staff are needed for a C/S including: the surgeon, surgeon's assistant, the anaesthesiologist or anaesthetist, a scrub nurse or technician, a circulating nurse, and someone to attend the new born child (6). However in Uganda, the theatre team at a caesarean operation comprised four staff including one medical officer, two midwives or nurses and an anaesthetic officer (37). The cost of a vaginal delivery in Uganda's public health facilities ranges between \$25 and \$57, whereas that of a C/S lies between \$140 and \$337 (38). This is a significant cost for the procedure given that Uganda currently spends only about \$33.9 as total health expenditure per capita on its citizens (39), a drop from \$36.9 it spent in the financial year 2018/2019 (11). This total health expenditure per capita falls far short of the \$80 recommended by WHO for low income countries to offer quality health care services (11). Therefore, in a poorly funded healthcare system such as Uganda's, it is essential that costs associated with unnecessary C/S are avoided.

These figures illustrate part of the problems that are associated with major surgical operations such as C/S in low resource settings such as Uganda and therefore should serve to galvanise efforts aimed at reducing such procedures to only the absolute necessary ones.

The factors for both underuse and overuse of C/S in Uganda, whereas partially studied, need to be investigated further if concrete interventions are to be implemented to achieve an optimum balance - where women in need of the procedure have unhindered access, and practices of unjustified use are reduced, if not entirely eliminated (40). This study aims to contribute towards this goal. The factors contributing to inadequate access to C/S in some areas in Uganda are important but lie besides the scope of this work.

## Research Aim and Objectives

### Research Aim

This study aims to identify the factors contributing to rising trends of C/S in Uganda and to propose recommendations that could help to reduce the unnecessary use of C/S for delivery and thus improve maternal and neonatal health outcomes.

### Research Objectives

1. To analyse factors contributing to increasing C/S rates in Uganda.
2. To identify effective evidence-based interventions aimed at reducing unnecessary C/S.
3. To make recommendations to reduce unnecessary C/S in Uganda so as to improve maternal and neonatal health outcomes.



## CHAPTER 3: METHODOLOGY

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### The Search Strategy

For this work, literature was sourced from both the published peer-reviewed articles as well as the grey sources. Initial search was through the Google search engine from where relevant websites were further explored and these included: the World Health Organization (WHO), United National Population Fund (UNFPA), United Nations, Ugandan ministry of Health (MoH), The World Bank. Grey literature data was also sourced from published national guidelines, strategic direction and policy documents, periodical reports, e-books, the Uganda National Household Survey (UNHS), the Uganda Demographic and Health Surveys 2000, 2006, 2011 and 2016, and others. All the sources used for this study were internet-based; no books or journals in physical print were used.

Published journal articles were selected from databases including Google Scholar, PubMed, and the Vrije University (VU) Amsterdam library. Within the databases, the most relevant articles were searched using key terms such as caesarean section, caesarean section, C-section and others as listed in the detailed search table (**Annex 3**). The Boolean operator 'OR' was used to search for key words and their synonyms, followed by the Boolean operator 'AND' to link the results to the relevant contextual search terms as well as to the appropriate jurisdiction such as Uganda, Africa, sub-Saharan Africa (SSA) and others. The initial screening of these articles was done by reading their titles and abstracts, and the most fitting ones were read in full. Additionally, for the selected articles and sources, some of their references were tracked to extract more information for use in this work.

This study included only articles that were published between the year 2000 and 2023 (except one (1)) which carries with it interesting historical facts about C/S in Uganda. Despite this time bracket, majority of the used articles were published within the last fifteen years. Articles published in a language other than English were not considered for this study.

Further details about the search strategy can be found in the search table in Annex 3

### Conceptual Framework

Sancheeta Ghosh (33), while studying the role medicalization of maternal health is having on the increasing trends of C/S in India, considered three broad categories namely: Clinical reasons, Medicalization and Demand by women. She presented them in a framework, which this study has adapted for use. Under her framework, Ghosh described how socioeconomic, Institutional and different risk factors are associated with C/S rates in India. The context under which Ghosh studied this topic in India over a decade ago can be compared to Uganda since both are developing countries. These countries are undergoing important changes including demographic transitions, urbanisation, proliferation of the private sector and increase in the proportion of institutional births.

According to Ghosh's theory, non-clinical factors influence doctors' and women's decisions to perform or request unnecessary C/S, which have far-reaching consequences on the women, their children as well as the healthcare systems (41). Ghosh's framework is structured in a more coherent way showing clearly how the different factors relate with each other and eventually lead to unnecessary C/S.

Two other analytical frameworks were considered but not eventually used due to some limitations. The one proposed by Omona (42), for analysing determinants of C/S rates in a private-not-for-profit (PNFP) hospital in Uganda, was limited in scope. The second one designed by Ana Pilar Betrán and colleagues (43), whereas comprehensive enough, is too complex for use in this work, with little room for adaptation, but has huge overlaps with Ghosh's proposal. While Ghosh's framework is fairly comprehensive, some of the descriptions of the factors and concepts of influence were limited.

Therefore Ghosh's framework has been adapted to expound upon the institutional and clinical factors, and to incorporate the role of the media as a unique stand-alone factor in this study. The process of adapting

the framework was informed by the results of the literature search which unveiled various other determinants.

Presented in figure 8 below is the adaptation of Ghosh's framework which will be used in this study to structure and present findings relating to the first research objective. The original framework as used by Ghosh in her work is presented in Annex 4.

### **The Analytical Framework:**

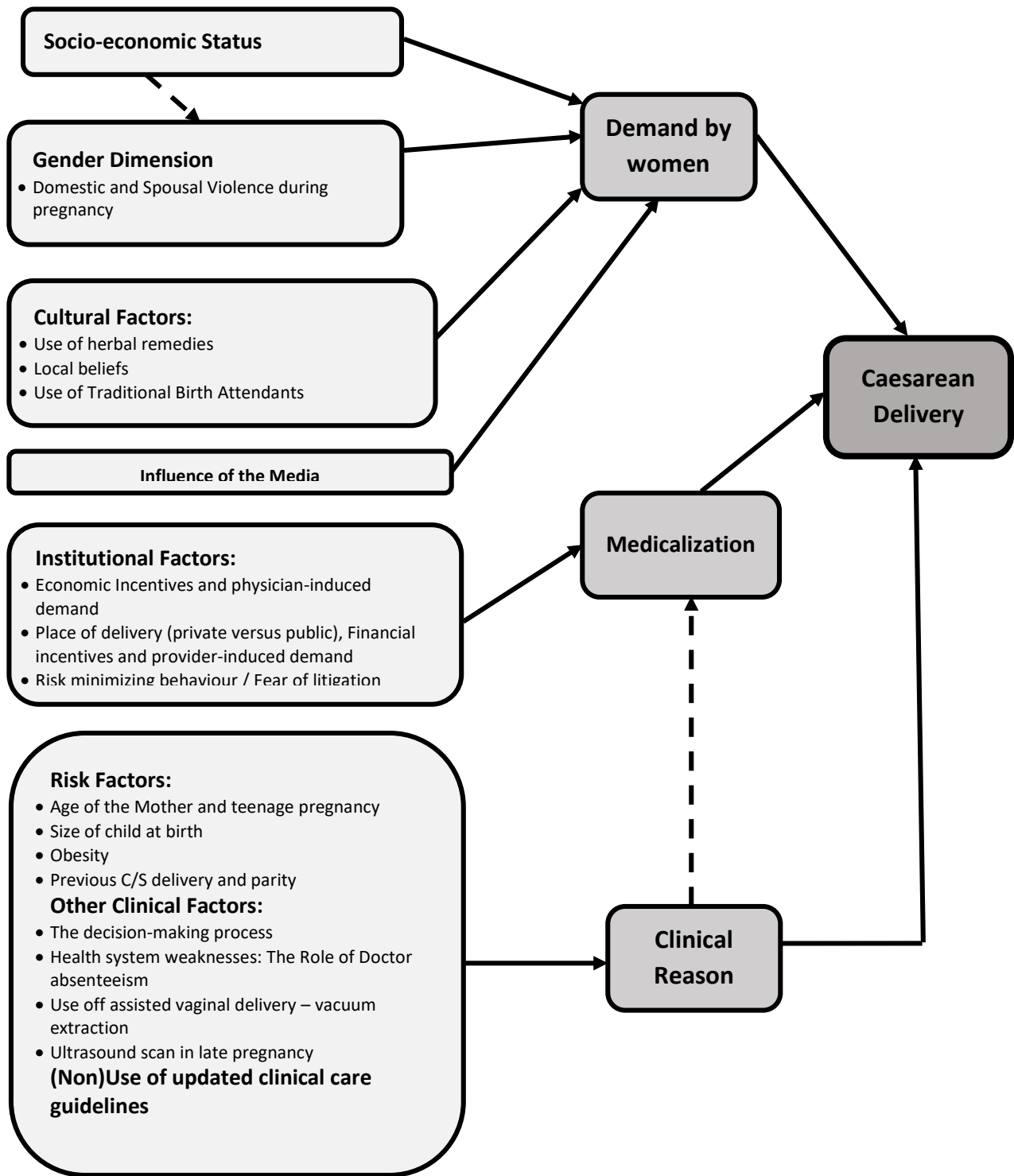


Figure 8: The Analytical Framework for studying the factors contributing to increasing C/S rates in Uganda. Adapted from Sancheeta Ghosh's framework (33).

## CHAPTER 4: FINDINGS

This section is organized in two broad themes, one looking at factors contributing to increasing C/S in Uganda, and the second at what other countries have done in an attempt to reduce unnecessary C/S.

The findings for the first broad theme addressing the first study objective are presented under the major categories of the framework that include; Demand by Women; Medicalization, and Clinical Reason. With adaptation, these are broken down into smaller sub categories under which the Ugandan context will be discussed and compared to the regional and global perspectives.

### Demand by Women

Ghosh described the non-medical factors as some of those on the demand side that contribute to increasing trends of C/S in India (33). Factors that can influence women to demand for C/S even without medical indication are varied and some of those what could be relevant in the Ugandan context are shared below.

#### Socio-Economic Status<sup>6</sup>

The 2016 demographic and health survey in Uganda (17) shows that C/S rates are higher among women who live in urban areas, at 11% (against 4.9% in rural areas); those with a higher than secondary school education, at 21.7% (against 3.2% with no education); and those within the highest wealth quintile, at 14.2% (against 2.7% in the lowest quintile). It is worth noting that in the greater Kampala region, 50% of the C/S are done before the onset of labour, and this is a strong indication that demand for the procedure by the more educated wealthier women may be a critical factor in this finding. More details are presented in the table below.

Background characteristics	Time of decision to conduct C/S (%)		Percentage of births delivered by C/S
	Before Labour onset	After Labour onset	
<b>RESIDENCE</b>			
Urban	4.7	6.3	11.0
Rural	1.5	3.4	4.9
Greater Kampala Region	6.6	6.6	13.2
<b>MOTHER'S EDUCATION</b>			
No Education	0.6	2.6	3.2
Primary	1.2	3.3	4.5
Secondary	3.0	4.9	7.9
More than Secondary	11.3	10.4	21.7
<b>WEALTH QUINTILE</b>			
Lowest	0.6	2.1	2.7
Second	0.9	2.5	3.4
Middle	1.3	4.0	5.3
Fourth	1.5	4.6	6.1
Highest	6.9	7.3	14.2

Table 1: C/S rates among Ugandan women according to socioeconomic background characteristics. Extracted from UDHS, 2016 (17). The full length table is in Annex 5.

The findings above are collaborated by Nakinobe and colleagues who also found that C/S delivery was more likely among wealthier women (those in the highest wealth quintile were more than 3 times as likely to delivery by C/S as those in the lowest); among those living in urban areas compared to the ones in rural

<sup>6</sup>Refers to the position of an individual on the socioeconomic scale, which is determined by a combination of social and economic factors such as income, amount and kind of education, type and prestige of occupation, place of residence, and in some societies, ethnic origin or religious background. Details [here](#).

areas, and among those with a higher than secondary education compared to those with no education; (41).

These Ugandan findings also agree with those presented by Islam et al. who demonstrated an association with higher C/S rates among people with higher education level and wealth index, as well as among those living in urban areas in sub-Saharan Africa (44). These factors can be inter-related since more educated women are more likely to belong to the higher wealth quintiles, and reside in urban areas, and also more likely to make independent personal choices regarding their preferred mode of delivery. They belong to the higher socioeconomic stratum for which personal agency and autonomy in health related matters is likely to be stronger. Additionally, women in these categories have better access to information through mass and social media and are likely to explore more choices for their reproductive health.

### Gender Dimension

The empowerment of women in regards to decision-making and choice has been highlighted as one of the contributors to an increase in the number of planned C/S that may not be medically indicated (33). One reason for parous women to request an elective C/S is a previous negative experience, and for nulliparous women, it is the fear of the unknown and a potential loss of control (45). Other reasons given for women choosing C/S in the absence of a medical indication include the fear of injury to their pelvic floor tissues, undesirable effects on their sexual lives, as well as urinary incontinence (43). The proponents of allowing women to choose C/S delivery even without medical indication argue that vaginal deliveries have many risks than are not communicated by doctors (46). In Uganda, this is reflected in part by the proportion of C/S that are categorised as 'elective' (those that occur before the onset of labour pains). These are operations that are planned beforehand for various reasons. It is worthwhile to note that not all elective C/S are without medical indications. Women who have had at least two previous C/S, those with previous uterine rupture, previous obstetric fistula and other maternal-foetal conditions may not be allowed a vaginal delivery and elective C/S is planned (2). In countries such as the UK, guidelines for the conduct of C/S were updated in 2011 to provide for those women who wish to have C/S without medical indication and, with such an enabling regulatory environment, it is easier for this category of C/S to increase in the short and medium term (47). No such guidelines that explicitly consider women's birthing choice in Uganda were found in the literature.

One Swedish study assessing the mode of delivery that fathers wished for their children found that majority (89%) preferred a vaginal birth, 6.4% opted for C/S (especially those with previous negative experience with a vaginal birth), and 4.7% had no specific preferences (48). This finding is also collaborated by Ugandan study which showed that "*women whose choice of mode of delivery was based on the husbands preference, were less likely to deliver by caesarean section*" (42).

Another concept that can be related to gender dimension is that of respectful maternity care<sup>7</sup> (RMC). It was developed and endorsed by WHO and emphasizes the provision of dignified and respectful maternal healthcare services from a human rights approach (49). For such a service to be provided, the decisions of the woman and her autonomy must be recognised and respected, including the desired mode of delivery. Therefore the gender perspective may be playing a vital role in determining mode of delivery as is reflected in proportion of pre-labour C/S that are occurring in Uganda as presented above.

**Domestic and spousal violence during pregnancy:** Pregnancy and childbirth carry with them considerable social, psychological and physical stresses for women. These changes can also spark tension between the pregnant woman and their partner. This tension can boil over and degenerate into physical violence against the woman. This is an established fact as is reflected in the Ugandan Demographic and Health Surveys (UDHS). Both in 2006 and 2011, 16% of women reported physical violence during pregnancy (31,50) and a lower percentage (11%) reported the same in 2016 (17). Relatedly, 46% and 56% of women reported fear

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<sup>7</sup> See the 'Glossary of terms' for definition.

of their spouse and spousal violence respectively (17). A more recent study estimates intimate partner violence in Uganda to hover around 27.8%, and is linked to pre-existing marital conflicts (51). A higher prevalence of intimate partner violence among Ugandan pregnant women (70.3%) has been reported but few women (9.1%) are confident enough to report it to healthcare workers (52). Many women are able to cope with these stresses with little or no social and therapeutic interventions, others experience severe anxieties that can result into avoiding sexual activities entirely, opting for abortion, adoption or even delivery by C/S (53). These stressful experiences of pregnant women can contribute, among other factors, to the phenomenon known as tokophobia (the pathological fear of pregnancy and childbirth) and this has been linked with physiological changes which can lengthen the duration of labour by increasing the levels of catecholamines with resultant uterine atony (54). Uterine atony and longer duration of labour is a more direct cause of C/S delivery. Whereas the studies in Uganda have not directly linked domestic and intimate partner violence to labour outcomes and mode of delivery, it can be logically inferred that the prevalence of intimate partner violence may have an effect on the mode of delivery and contribute to C/S in the country.

### **Cultural factors**

**Use of herbal remedies:** The use of herbal remedies during pregnancy is well documented both in developing and developed countries (55). These are used for several reasons ranging from getting energy, preventing C/S, making vaginal delivery easier, preventing nausea and vomiting, to giving the baby good luck (56). Although the actual extent of use of herbal remedies among pregnant women in Uganda is hard to estimate, some regional studies have shown a prevalence of use of 20% in Gulu district (57), 70% among women in an urban tertiary hospital (56), and of 35.1% in a referral hospital in Western Uganda (58). Another study reported that ‘nearly all’ study participants reported having used herbal remedies during pregnancy and to aid in childbirth (59). Use of herbal remedies during late pregnancy have been associated with higher risks of uterine rupture (60), a strong indication for C/S delivery. Many of these herbs have oxytocic effects and may induce false labour which may compromise foetal and maternal health and consequently result into C/S (61).

**Local Beliefs:** Uganda has several cultures with varying beliefs and practices concerning childbirths. However, many Ugandan cultures discourage women from undergoing caesarean birth. In central Uganda, the communities and even traditional birth attendants (TBAs) consider women who fail to deliver vaginally as weak and childish (62) and are despised. In western Uganda, women who delivery by C/S are perceived as ‘unlucky’ and ‘lazy’ (63) while for those in Eastern Uganda among the Sabinu societies even the husband of a woman who delivered by C/S may be denied some societal rights and privileges for not encouraging his wife to exercise her body ‘sufficiently enough for a homebirth’ (64). Therefore in as far as is possible, C/S delivery is avoided as much as possible among this ethnic group. These findings are correlated by another study in Bangladesh which showed that C/S may be culturally unacceptable at community level partly due to distrust in the rationality of doctors’ decisions to perform C/S, but also the strongly held socio-cultural beliefs (65).

**Use of traditional birth attendants (TBAs):** A TBA is a person, especially in a developing country, who assists a woman during labour and delivery with skills learned by apprenticeship or personal experience rather than by formal training (66). They are vital in offering obstetric care services in areas underserved by the formal healthcare systems, including in conflict areas (67). Although they were outlawed in Uganda, they are still practicing and command a lot of influence (68). About 74% of deliveries in Uganda are attended by skilled attendants and up to 10.7% of deliveries are attended by TBAs, a figure which is higher than those attended by medical doctors (9.7%) (17). Even where SBAs and formal facilities exist, TBAs are reserved as contingency providers in case the woman is unable to reach the health centre / skilled attendant in time (69). TBAs are much respected by both men and women and are used as advocates for women in reproductive health matters in resource mobilization (from the men), and in matters of critical decision making, including the place and mode of delivery for the woman (70).

Some of the reasons women choose to delivery with TBAs despite the presence of skilled attendants are: insensitivity of the skilled attendants to the cultural norms of the society concerning birth, and the rudeness, and insensitivity with which the skilled attendants sometime handle the women (69). The literature does not explicitly link TBAs with C/S in Uganda but their position and influence in reproductive health matters and their role as protectors of socio-cultural birthing practices is likely to discourage women from opting for C/S births, which is interpreted as a weakness on the part of the woman as discussed above. In places, TBAs are consulted to validate advice given by skilled birth attendants (64) and may discourage women from choosing or even accepting C/S.

### **Influence of the media**

This has been shown to have a mixed contributory role on how women perceive child birth; whereby negative pregnancy and birth experiences shared on these through media can instil fear in some women, but can also be a source of support to “reduce feelings of isolation and provide validation” to others as a means of peer and social support (71). Some studies have shown that the media gives incomplete information concerning the risks and benefits of C/S use and this influences decisions of women concerning their preferred mode of delivery. The reasons for conducting C/S, as well as short-term maternal risks are more commonly covered by online media outlets in Brazil, and much less information is given about the long-term complications (72). In Iran, a deliberate mass media campaign was conducted aiming to persuade pregnant women not to choose unnecessary C/S and resulted in an increase in the proportion of women who intended to have a vaginal delivery (73). An Indian study found that exposure of women to mass media was associated with higher C/S rates (74).

Studies in Uganda showed that women who were more exposed to mass media (radio and television) were better prepared for delivery in terms of saving money, buying necessary materials, identifying transport and the birth place/skilled provider (75) and more likely to go for antenatal care early in the first trimester (76). In the Ugandan context, the literature does not reveal a direct effect the media has on caesarean delivery.

## **Medicalization**

Medicalization as a concept has attracted various definitions, interpretations and applications but what seems central to the various perspectives is the compromising of an individual’s right to self-determination, in addition to interpreting biological processes as medical problems which would deserve medical intervention (77). In this regard, medicalization of childbirth would mean that unnecessary medical interventions are applied to a natural process without due justification.

### **Institutional Factors<sup>8</sup>**

Health facility deliveries have been rising up for both public and private health facilities. Deliveries in public facilities increased from 29.1% through 44% to 57.3% between the years 2006, 2011 and 2016 respectively. Likewise deliveries in the private facilities increased from 12% through 13.4% to 16.1% in the same period (17,31,50). Only deliveries conducted within (higher level) healthcare facilities have the potential to end up as C/S; and it is not surprising that C/S rates have been going up. However this scenario also presents an opportunity for unnecessary C/S to be performed resulting in and contributing to the observed maternal mortality and morbidity in Uganda. The various institutional factors are discussed below.

### **Place of delivery (Private Versus Public), financial incentives and provider-induced demand:**

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<sup>8</sup> [Institutional factors](#) are “conditions and formal and informal rules in the society that constrain behaviour. These may stem from legislative, executive, or judicial actions, depend on administrative capabilities, informal norms, and social cohesion”

C/S are major surgical procedures and are performed in health centres which have the requisite human and infrastructure resources. They are part of a category of maternal and new born care services known as comprehensive emergency obstetric and new born care (CEmONC<sup>9</sup>). In Uganda, C/S are performed in health facilities from the level of HC IV and upwards which have operating theatres and these may be owned by the government (public), the private-not-for-profit (PNFP), as well as the private-for-profit (PFP).

By the year 2011, only 5% of all health facilities countrywide were performing C/S (compared to 53% offering normal deliveries and 70% providing antenatal care services); Kampala region is where the highest percentage (26%) of C/S are performed (78). Ninety eight percent of the over 1,500 health facilities in Kampala are privately owned (79). This reflects a significant contribution the private sector makes to maternal health services in Uganda, in spite of the fact the national referral hospital, Mulago, where the highest number of C/S are performed is located within Kampala.

At the national level, health facility deliveries have been increasing as depicted in figure XXXX. The same upward trend of deliveries has occurred in private health facilities over the years from 12% in 2006, through 13.4% in 2011 to 16.1% in 2016 (17,31,50).

At the national level, recent observations show that C/S rates in private facilities are considerably high, with one private clinic registering C/S rates of 92.6% in the last year, according to the MoH annual health sector performance report (18). The reasons for this high C/S rates in private health facilities are not highlighted.

The table below shows that by 2016, 10.6% of the overall births that were occurring in private health facilities were through C/S, compared to 7.8% of the births in public facilities. It also shows that the proportion of elective C/S in private health facilities were twice as many as those in public facilities, yet the proportions of emergency C/S are comparable (17).

Place of delivery	Percentage of births through C/S	percentage of C/S before labour pains (elective)	Percentage of C/S after onset of labour (emergency)
Public health facility	7.8	2.4	5.4
Private Health Facility	10.6	4.9	5.7
Health Facility	8.4	3.0	5.5

**Table 1: Table showing proportions of elective and emergency C/S in both public and private health facilities in Uganda by the year 2016**

Another report (79) shows that 26% of deliveries in urban areas occur in a private hospital or clinic, compared to only 11% of deliveries in rural areas. Also, among the poorest and poorer, 5% and 10% of the deliveries occur in private (mostly PNFP) facilities.

The table below shows the top ten private and top ten public HC IVs in Uganda with the highest C/S rates in the financial year 2021/2022 (18). It's worth noting that the average C/S rate in the private facilities (58%) is nearly twice as high as that in the public facilities (32%).

No	Name of HC IV	Owner -ship	C/S rate (%)	Name of HC IV	Owner -ship	C/S rate (%)
1	Doctor's Plaza, Mbarara	PFP	92.6	Rwekubo, Isingiro	Gov't	51
2	Michoos Medical Centre, Kumi	PFP	69.1	Serere, Serere	Gov't	35

<sup>9</sup> CEmONC: These are services which comprise caesarean section and blood transfusion, in addition to the basic emergency obstetric and new born care services (BEmONC). BEmONC has functions which include: 1. Administration of parenteral antibiotics, uterotonics and anticonvulsants; 2. Manual removal of the placenta; 3. Assisted vaginal delivery (vacuum extractions); 4. Removal of retained products of conception, and 5. Neonatal resuscitation).



3	St. Paul (Kasese)	PNFP	59.4	Rugazi, Rubirizi	Gov't	34
4	Henrob Family Clinic, Wakiso	PFP	59.3	Sembabule, Sembabule	Gov't	34
5	Busaru, Bundibugyo	PNFP	55.8	Midigo, Yumbe	Gov't	33
6	Abii Clinic, Kampala	PFP	52.9	Budadiri, Sironko	Gov't	29
7	Mother Francisca Lechner, Ntungamo	PNFP	51.7	Kyangwali, Kikuube	Gov't	29
8	Kolonyi, Mbale	PNFP	48.1	Mpigi, Mpigi	Gov't	27
9	St. Ambrose Charity, Kagadi	PFP	47.1	Kiganda, Kassanda	Gov't	24
10	Midas Touch, Kyenjojo	PFP	44.2	Aboke, Kole	Gov't	24
	Average rate		58	Average Rate		32

**Table 2: Check Table Numbering Table showing the top ten private and public HC IVs with the highest number of C/S rates in Uganda in the financial year 2021/22 (18).**

The higher proportions of elective C/S in the private sector may be linked to profit motives of these private businesses (80), and to a lesser degree to risk mitigation. One private for profit hospital in Kampala charges for a C/S Uganda shillings (UGX) between 5,490,000 and 6,840,000 (€1,385<sup>10</sup> and €1,726), and a normal delivery at UGX 2,430,000 (€ 613.2) (81)

The C/S rate at the government-owned Rwekubo HC IV has been attributed to a large proportion of obstetric referrals of refugees sent to the facility (18). The wide variation in the C/S rates between private and public facilities may point to a higher proportion of unnecessary C/S in the private (and also public) health facilities.

John Bosco Oryema studied physician-induced demand for C/S in Uganda from a health economics perspective and found a combination of factors that enable this demand to thrive. These include: a growing private sector; the doctors owning many of the private health facilities with clear profit motives; the remuneration of doctors in private practice which depends on their output may prompt them to induce the demand of C/S as a means of boosting their income; the lack of standardized guidelines for tracking healthcare costs, and weak monitoring and regulatory systems of the private sector (80). Some of the vivid examples of physician-induced demand for monetary gains appear in newspaper articles where patients or their attendants narrate experiences where the motive of the doctor's decision for a C/S was clearly monetary (82).

The role of corruption and bribery in both the public and private health facilities may have an effect in some of these cases. According to (83), in the public facilities, the official government policy allows for richer patients to pay user fees for certain services, but also to consume some free services. At the same time, poorer patients who would ideally access all services freely, are willing to pay some amounts (83). This therefore allows health facilities to induce especially the richer patients to pay un-official fees. These findings in Uganda were also collaborated by Wojczewski and colleagues (84).

**Risk minimizing behaviour / fear of litigation**: Malpractice litigation can have far-reaching effects on doctors and healthcare providers. It can shape the practice of providers and the policies of healthcare institutions. A study in Spain found that physicians who had undergone litigation practice some form of defensive medicine<sup>11</sup> including ordering more tests and avoiding specific kinds of patients and procedures (85). In relation to C/S, a defensive C/S has been defined as “a caesarean delivery recommended by the doctor in the absence of any clear medical indication that such a delivery method is needed to avoid possible litigation or a possible accusation of malpractice” (86).

<sup>10</sup> At a rate of €1 = UGX 3,962.7

<sup>11</sup> Defensive Medicine: This is the practice of recommending a diagnostic or medical treatment that is not necessarily the best option for the patient, but mainly serves to protect the physician against the patient as a potential plaintiff.

One study in Uganda found that although the rates of medical litigation are on the rise, their proportion among the overall court cases is still very low (estimated at 1 medical case out of about 500 court cases) (87). These low rates of medical litigation in Uganda have been attributed to factors such as poverty, low education levels, weak civil society, weaknesses of the legal and judiciary systems which delay justice among others (87). In Mulago national referral hospital, it was found that over 81.5% of the patients didn't know anything about the patient's charter, and that 55% of them did not know their patient rights, yet 72% had at least a secondary education (88). The limited knowledge among patients about their rights renders the fear of litigation among Ugandan service providers a less likely factor in contributing to increasing C/S rates in the country.

## Clinical Reasons

### Risk factors

Factors in this category normally contribute to the 'medically indicated' C/S and in this sense, they would normally not be considered as contributing to the unnecessary C/S. However, if a given biological factor such as obesity or young maternal age which in itself is not an indication for a C/S, is used solely to conduct a C/S without any other medical indication, or without following the due medical protocols, then unnecessary C/S can result. Some of the commonest indications for C/S include in Uganda are dystocia, 'presumed' foetal distress, high risk of uterine rupture, mal-presentation and foetal-maternal compromise (89). The word 'presumed' here indicates that the person who made the diagnosis was not very sure. So if women are given C/S with presumed diagnoses, then the likelihood of unnecessary surgeries cannot be ruled out. Some clinical factors are discussed below.

**Age of the mother and teenage pregnancy:** The age of a mother has a significant impact on the mode of deliver. A recent Ugandan study found that C/S are more likely among older women when compared to the younger ones (and women over 40 years were twice as likely to delivery by C/S in comparison to younger women 15 to 19 years (41). A similar finding associating C/S with higher maternal age was found in India (90). However the Uganda Demographic and Health Survey (UDHS) 2016 shows that C/S are more among the younger women aged less than 20 years (17). This finding is in line with the fact that Uganda has one of the highest rates of teenage pregnancies in the east African region where about 135 for every 1,000 women between 15 and 19 years gave birth to a child every year (12). Yet still, Dusabe et al found no association between maternal age and C/S rate (63). This paints a rather unclear picture in the findings.

**Size of the child at birth:** The size of the baby has important ramifications on the mode of delivery as well as post-delivery complications to the mother. Macrosomic (big) babies ( $\geq 4,000^{12}$  g) have a higher chance of causing labour dystocia (and a resultant need for C/S), postpartum haemorrhage, severe perineal tears, low Apgar scores and increased neonatal morbidity and mortality (91). A Ugandan study however showed that birth weight did not have a significant effect on the mode of delivery (41).

**Obesity:** Maternal obesity is a growing public and reproductive health problem in Africa, with first trimester prevalence rates of up to 17.9% , a figure which is comparable to some developed countries (92). In sub-Saharan Africa, women who are overweight and obese are four times as likely to deliver by C/S compared to the normal weight counterparts (93). Being overweight and obese is a recognizable problem among Ugandan women of reproductive age (15-49 years) and the prevalence rates of overweight and obesity doubled and tripled respectively between 1995 and 2016 (94). Whereas obesity is associated with the more affluent members of the higher socio-economic strata in Uganda, it is also a rapidly growing problem among the non-urban (and especially female) Ugandan populations (95) with similar predisposing factors as the urban populations. The association between obesity and higher likelihoods of C/S births has been

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<sup>12</sup> Some sources put this figure at 4,500g.

demonstrated (92), and this has important implications in Uganda in the area of reproductive health and C/S rates. Therefore, given the current trends of obesity and being overweight among Ugandan women in reproductive age, coupled to the positive societal attitudes and adoration of a big-sized body (96), the contributory effect of obesity on the observed C/S rates can be established.

Previous C/S delivery and parity: Having the index C/S is a major determinant of having subsequent deliveries by C/S, as one study in Western Uganda demonstrated (63). With the first C/S done, the chances of delivering through surgical means in the next pregnancies increase dramatically. Conducting a vaginal birth after a previous C/S (VBAC) carries a three-fold risk of uterine rupture and therefore calls for a C/S delivery of subsequent pregnancies; it is thus prudent that the very first C/S is avoided (97).

It is observed from the UDHS (17) that in Uganda, 10.5% of the C/S are on nulliparous women compared to 6.8%, 4.3% and 2.8% of the women with birth orders 2-3, 4-5 and 6+ respectively. It is further noted that 25% of the C/S conducted on nulliparous women are elective. This finding also is collaborated by another study (41) which showed that women having their first birth were more than twice as likely as those having their third or higher birth to deliver by C/S. Those having their second child were 30% less likely to have a C/S compared to the first birth. In Vietnam where primary C/S account for more than two thirds of the overall C/S, the main indications for these category of C/S are non-reassuring foetal heart, arrest of labour and maternal request (98).

### Other Clinical Factors

The decision making process to conduct a C/S: One study in a tertiary referral hospital in Uganda found that 96% of the decisions for C/S were made by the junior intern doctor and midwives, despite the hospital employing four senior specialists; consequently over 50% of these decisions were determined to have been inappropriate during a later clinical audit (89). There was a lack of a second opinion. In another context, the decision making process is eased by the availability of better medical technologies which help to inform quicker actions. This is especially true during the intra-partum foetal heart monitoring. Where better monitoring tools exist, foetal distress is identified much earlier and interventions including C/S increase may be offered. Such was the case in Tanzania where the introduction of a continuous foetal heart rate (FHR) monitoring tool led to an a doubling of C/S rates, (99). Such interventions have not been associated with improved perinatal outcomes (100).

In an attempt to provide quality healthcare services, communication is paramount and women need to be involved in decision making and be seen as partners in the process. However in Uganda's healthcare facilities, few women participate in discussions or even ask questions concerning key decisions in their care cascade; Kigenyi et al. found that only 10% of women in labour were afforded an opportunity to ask questions and this contributed to a low median score index of 17% in regards to involving these women in decision making (101).

Health system weaknesses: The role of doctor absenteeism: Louise Ackers et al. observed that in the Ugandan healthcare system, absenteeism plays a critical role in contributing towards poor healthcare outcomes and they made special mention of doctors' absenteeism as a core factor in this matter. Their unique study showed that critical decisions by senior healthcare workers (HCWs) (in this case doctors) during labour are delayed and result into poor clinical outcomes. Labour situations which would have been safely managed with non-surgical interventions like augmentation, assisted delivery or evacuations, given a good clinical judgement by a more senior and experienced staff may worsen to the level of requiring surgery as a result of absenteeism of doctors. The absenteeism of doctors occurs with impunity and enforcement of compliance to contractual terms is not enforced (102). A small provider: client ratio increases the workload in the labour wards leading to compromise in the quality of service delivery (101); in practical terms, this may mean insufficient monitoring of labouring women, delayed interventions and subsequent caesarean sections which could have been avoided. Some of the reasons cited for this absenteeism include: the need to supplement low salaries by working in private practice, dual roles of

doctors in clinical and administrative work and low levels of monitoring and accountability by the supervisory structures (102).

**Ultrasound scan in pregnancy:** A study in Eastern rural China looking at an association between Ultrasound scans done during antenatal care and the uptake of C/S by pregnant women revealed a strong association between the two (103). Some of the reasons given for women seeking ultrasound scans during antenatal care include their belief that it is a measure of quality care; they feel connected to the baby; they think that it will detect all abnormalities. (103). One large US study demonstrated a 44% higher chance of a C/S for women with an ultrasound- estimated foetal weight, done within one month of delivery, and especially if the estimated weight was at least 3,500g (104). These two studies assessed the impact of ultrasound scan both in early and late pregnancy and that both are likely to lead to a decision to deliver by C/S. In Uganda, literature has not revealed the effect ultrasound use during pregnancy has on the mode of delivery. However some Ugandan studies (105,106) show that pregnant women fear ultrasound scans (reasons of safety of their babies, and cost among others) and healthcare workers are sceptic about the routine use of ultrasound due to limited availability, cost, inadequate operational skills and workload issues. With such findings, it improbable that ultrasound scan can have an effect on C/S rates in Uganda currently.

**Use of assisted vaginal delivery – vacuum delivery:** Assisted vaginal delivery (also known as Assisted vaginal birth or instrumental vaginal birth or operative vaginal birth) is the “vaginal birth of a baby performed with the help of forceps or a vacuum device” (107). This procedure is used for the management of prolonged second stage labour (108), foetal distress for a deeply engaged head, and maternal exhaustion and its use can reduce the inappropriate use of C/S (109). However, the use of assisted vaginal delivery has been reducing in many LMICs (low and middle income countries) for reasons including lack of the necessary equipment, inadequate staff trained in the procedure as well as insufficient policies relating to authorisation of key staff to perform the procedure (110). In Uganda, use of vacuum delivery has been reducing in clinical practice and some efforts aimed at re-introducing it in a tertiary teaching hospital showed promising positive effects in preventing initially scheduled C/S (36% of the planned caesarean deliveries) (111). However, this intervention was done only in one hospital. Its lack of widespread use in many hospital in the country probably contributes to may C/S rates in the country. The reasons cited for the low use of vacuum extraction include lack of training and equipment (112).

### (Non)Use of Updated Clinical Care Guidelines

Some of the commonest indications for C/S in Uganda include poor progress of labour and these diagnoses are based on various labour management guidelines which include the partograph. However, newer research had made adjustments to the labour monitoring guidelines which adjustments have important ramifications on the clinical decisions to conduct a C/S. Examples of these according to WHO (49) include: the active stage of labour is now considered to begin at 5cm of cervical dilatation as opposed to the previously recommended 4 cm, and a cervical dilatation rate slower than 1cm/hour in the active phase of the first stage for women with spontaneous labour onset in itself oughtn't be used to justify interventions such as augmentation or C/S. Another publication from the American College of Obstetricians and Gynaecologists (ACOG) in fact recommends that active phase of labour should be considered to start at 6cm of cervical dilatation (113).

During a review of the maternal deaths that occurred in Uganda in the FY 2021/22, the rate of partograph use was only 32%, and the completeness hovered at around 60% (22). Among the fresh still births and early neonatal deaths reviewed that year, only 16.2% and 18.3% respectively, had the partograph used during their labour, and the accuracy levels of partograph use were, respectively, 57.5% and 59.5% (22). This indicates that in Ugandan obstetric practice, standard monitoring tools are not consistently used and therefore decision making, including the one to perform a C/S may be rushed and irrational.

# Evidence-Based Interventions Aimed At Reducing Unnecessary C/S

## WHO Recommendations: Non-clinical interventions to reduce unnecessary caesarean sections (3)

Non-clinical interventions are defined as “interventions applied independently of a critical encounter between a healthcare provider and a patient in the context of patient care”. (3).

These are categorized into three segments namely; those that target women, those that focus on healthcare professionals, as well as those that target health organizations and systems

1. Interventions targeted at women
  - a. Health education for the couple as part of antenatal care. These include psychosocial education, childbirth and relaxation training.
2. Interventions that target HCWs
  - a. Use of evidence-based clinical guidelines in a supportive way that includes a mandatory second opinion from more senior colleagues in relation to C/S decisions
  - b. Implementing of C/S audits and giving timely feedback to HCWs
3. Interventions targeting healthcare facilities and systems
  - a. Set up collaboratively midwifery-obstetrician model of care: This arrangement’s main focus is on ensuring that midwives are the primary caregivers and physicians offer a 24-hour backup
  - b. Financial strategies which ensure that payments for caesarean and vaginal births are equalized.

## Financial and Regulatory Interventions:

Some studies assessed the effects of implementing different financial and regulatory interventions aimed at reducing C/S rates in high-income countries (HICs) and it was observed that implementing some financial interventions had a positive but small effect on reducing C/S rates (114):

1. Equalising the re-imburement fees for vaginal and C/S delivery
2. Introducing case-based payment systems increased vaginal births after C/S (VBAC) (with resultant reductions in repeat C/S)
3. Implementing a diagnosis-related group (DRG) payment system where patients with similar clinical and cost characteristics are grouped together and payments or budget allocations are made depending on a particular DRG category.
- 4.

## The Robson (“10 groups”) classification system of C/S

This is not an intervention per se but is a records standardizing criterion which would make it possible to study specific factors influencing C/S use among different categories of pregnant women (Robson’s Groups) among different health facilities, countries and geographical regions. This would enable optimization of C/S use. It’s against this background that WHO recommended the Robson classification system as a tool to effectively and systematically monitor and compare C/S rates within healthcare systems over time (8). Robson developed a relatively simple easy-to-implement prospective system of classifying C/S which is “mutually exclusive, totally inclusive and clinically relevant” (115). It has been adopted by over 50 countries globally and carries with it an advantage of being able to ‘self-validate the quality of data’ and using a simple-to-use method which can also incorporate labour events in addition to morbidity and mortality (116). WHO anticipates that this system will help health care facilities to; assess the quality of care and clinical management practices, assess effectiveness of interventions and strategies of optimizing C/S, and identify women groups that contribute the most and least to the observed C/S rates (117). The literature has not revealed evidence of its use in Uganda

## CHAPTER 5: DISCUSSION

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The first section discusses factors associated with C/S use in Uganda, while the second focusses on Evidence based intervention could be used in to reduce unnecessary C/S.

### **Factors associated with C/S use in Uganda**

In this study, higher C/S rates were found among women belonging to the higher socio-economic status, defined by higher income levels, higher education levels as well as residing in urban areas. Women in this category are the kind who are better able to decide where to consume health services from, which type of service to use and also be able to pay for the same. Therefore a wider choice range is available to them and they are better able to search for, get and act on health-related messages from various sources, in addition to being targets of health advertising and soliciting information from the various sources. Attainment of higher education levels for women implies that they spent longer periods of time in school and thus were likely to have delayed childbirth. It is women with such characteristics who are more likely to be working with careers and societal roles that may induce them to postpone childbirth to a later date. These factors aggregate to make them have children at a more advanced age and are then likely to deliver by C/S. Women dwelling in urban areas were also more likely to deliver by C/S and this can be related to the ease of access they have to health facilities that offer CEmONC. The region with the greatest percentage of health facilities offering C/S is Kampala, an urban area. Urban areas are the places where public and private health facilities that offer C/S services are often situated and, therefore, available to women. The same findings associating higher C/S rates with income level, urban residence and higher education level have been made across several studies.

This study also found that delivery in the private health sector is associated with higher C/S rates. This is partly attributed to the number of health facility deliveries that have been steadily increasing over the recent past in both the public private sectors. The private health sector is growing in Uganda and many of the private facilities offering C/S are pay doctors depending on their performance. Such an arrangement motivates the practitioners to induce demand for C/S moreover from clients who less equipped with adequate knowledge to make an informed decision. This kind of knowledge asymmetry between the doctors and the patients is likely to result in unilateral decisions for C/S that feeds the profit motive of the private health facility. Additionally, many of the private for profit centres are owned by doctors who also often work in the same facilities. The business goal of meeting operational costs and making profits may have a strong influence on the observed rates of C/S which are charged far higher than normal deliveries. The charges for C/S are far higher than those for normal deliveries and accrue more profits. Annual C/S rates as high as 92.6% in a private clinic is highly suggestive that the profit motive overrides many other factors. The MoH report did not give reasons for such high C/S rates. Another factor enabling higher C/S rates in private health facilities is the inadequate supervision of these facilities by the health regulatory authorities.

High C/S rates are also observed within the public health facilities and here several factors may explain the findings. First, this may be due to the referral status of the health facility which concentrates women with genuine medical indications for C/S in one place, as was seen with Rwekubo HC IV. In other instances, bribery enabled by the mixing of paying and non-paying patients accessing the same services and without proper regulation in public health facilities may entice some providers to induce C/S for which they get either a formal or informal remuneration. The decision-making process to conduct C/S in Uganda is also responsible for some unnecessary C/S, although the literature did not quantify these. Intern doctors, who are the most junior cadre among doctors in Uganda and are permitted to conduct C/S, make these decisions with little or no input from their supervisors (89). They are the first on call and spend the most on the wards; they make many decisions including those to conduct C/S and no second opinion from their supervisors is given. Absenteeism too has its role here since doctors can afford to be absent without any

repercussions. This is a result of weak administrative systems that does not hold doctors accountable both in terms of duty attendance.

Poor compliance to or non-use of updated clinical care guidelines was also seen to contribute to higher C/S rates in this study. A notable finding was that the routine use of assisted vaginal delivery, specifically vacuum extraction, has been disappearing from clinical practice owing to lack of the equipment and its use. It however has a great potential for managing second stage labour dystocia and prevent several would be emergency C/S. This is a low cost intervention for Uganda which can quickly be implemented by on-ward training of HCWs managing labour. In the clinical care setting, this study has also shown that the use of routine labour monitoring tools such as the partograph is very low (about 35%) and inaccurate. The factors for this were not stated, but may be attributed to the workload the labour ward staff have to contend with, or a work culture which is not keen on using them. New evidence from recent research shows that labour progresses at a rate slower than previously thought (113) and should inform changes in labour management protocols. An example of this is the recent revision of the definition of active labour using cervical dilatation (from 4cm to 5cm). This change was incorporated into the recently released 'Essential maternal and new-born clinical care guidelines for Uganda'. If new evidence is not used to inform obstetric and labour management practice, then women whose labour would be progressing well could be misdiagnosed as having prolonged labour and be subjected to unnecessary C/S.

Previous C/S is another contributor to higher C/S rates. If for any reason a woman delivers her first child by C/S, then she's almost certainly committed to delivering her subsequent pregnancies surgically. This is especially important in Uganda where the fertility rate is high (5.4 children per woman). A decision to conduct the index C/S would therefore need to be re-evaluated especially if it is being taken by a junior officer as discussed above. In low-income settings such as in Uganda, access to a C/S by a woman in one pregnancy may not automatically mean that she will easily access the same the next time she requires it. It is interesting to note that 25% of the C/S on 1<sup>st</sup> birth order women are elective, which means that they are not given a chance to try out a normal delivery. Whereas indications for elective C/S are well stated (2), a 25% proportion appears rather high for this group of women. A possible contributor to this in the Ugandan context would be the high rates of teenage pregnancies. Additionally, a growing problem of obesity is observed among Ugandan women and has been linked with increasing C/S rates, in part due to the increased risk of foetal macrosomia. This also is a problem that may be linked to changing nutritional patterns as well as urbanization. The prevalent use of herbal remedies in Uganda especially among women who visit TBAs may also be a contributory factor, although the literature in the Ugandan context did not show studies that directly link use of herbal remedies with C/S both among nulliparous and multiparous women.

The gender dimension in itself was not found to have a clear effect on the C/S rates. The literature did not show studies specifically looking at the gender effect on C/S rates in Uganda. In high income countries such as the UK, this is a well-studied subject where women can choose their desired mode of delivery including choosing C/S even in the absence of medical indications. In such countries, even the legal and regulatory environment enable women to make the choice to have a C/S, and for their healthcare providers to respect that choice. In Uganda, such an enabling environment is not yet present. The gender-specific effect on C/S only be inferred in relation to women of the higher socio-economic status, among whom C/S rates are seen to be higher. However perhaps in the broader perspective the gender effect in relation to C/S delivery can be linked to sociocultural beliefs and practices. This study found that cultural beliefs despise women who deliver through C/S together with their partners. In fact the study found evidence that Ugandan men preferred vaginal birth over C/S. In the clinical care setting, women are not given much chance to be a part of the decision making process concerning their mode of delivery. Moreover, if given the chance, it is likely that many would opt to not deliver by C/S as is reflected in the socio-cultural beliefs that despise women who fail to deliver vaginally. Further still TBAs, who are still influential to both women and men in obstetric care especially among lower income women and those in the rural areas, are a factor likely to dissuade C/S

use among their constituents (64). The role of TBAs also extends to the sourcing and preparation of herbal remedies whose overarching role is to help women have easier vaginal deliveries and not eventually require C/S but may inadvertently be predisposing some women to C/S. The use of herbal medicines during pregnancy is so widespread in Uganda among women of various social strata, and these herbs have been linked to enhanced risks of uterine rupture, which is a strong indication for C/S.

The other important aspect of gender in this study relates to pregnancy-related domestic and spousal violence, which is well established and highly prevalent in Uganda. This has known psychological and physical effects on women which can contribute to tokophobia and be linked to suboptimal progress of labour and this may result in C/S delivery. This specific effect cascade in Uganda has not been studied.

Maternal age and size of the baby in themselves had an indeterminate direct effect on C/S rates in this study. Some studies associated lower maternal age to higher C/S rates; other found advanced maternal age to be an important contributor to higher C/S rate, and still others found no clear linkage between the two. Studies in other settings such as India have linked advanced maternal age to more C/S, as is the case in high income countries where more women choose to have children at a later age. In Uganda, given its young population and high level of teenage and young mothers, the lower age is more likely to be linked to the higher C/S rates. Size of the baby had no effect on C/S rates.

The media was not found to have a clear effect on the C/S rates in Uganda, although it is established that women act on reproductive health-related information they receive through the media, specifically mass media. The effect of social media on C/S births was not established.

Other factors such as the use of technologies like ultrasound scan in pregnancy and the fear of litigation were not found to have an effect on C/S rates currently in Uganda. Ultrasound scans, are not as widely accessible to many women, need a specific skills set which is still inadequate in Uganda, and also come with cost. They are also perceived as time-consuming by HCWs and as unsafe by many women in rural areas. Currently, litigation is not a major factor in Uganda in influencing C/S rates.

### **Evidence-based interventions to reduce C/S rates.**

These were well summarized by WHO to cater to the women and their families, the healthcare systems as well as the healthcare professionals. Financial motives and clinical care factor should especially be addressed.

### **Analysis of the literature and evidence used in this work**

The literature concerning C/S rates including trends is vast. Most of it is for high income countries. The indications, and complications of C/S on women and children in the short and long term is well covered. For sub-Saharan Africa and low-and middle-income countries, specific determinant for C/S rates in the local context is limited. Many studies are retrospective and cross-sectional in nature and design. Only one study in Iran concerning the effect of the media on C/S was found. Systematic review studies comparing rates in various geographical regions are fairly available. The concept of medicalization in of childbirth including the role of gender is less well studied. Some factors such as maternal age and parity had no corresponding studies to explain the observed trends. Ugandan nationally-representative literature is heavily anchored on the UDHS, especially 2016 and this is seven years old and reports of five years prior. A new demographic and health survey is much needed. Future research could work to address these issues.



## **The theoretical framework used in this study:**

The theoretical framework I adapted from Ghosh was comprehensive and I am confident that it covered the relevant topics in their breadth. However some components such as gender and the media and socio-cultural ones I believe could be enriched. I adapted it progressively as more relevant literature was found

## **Limitations of the study**

- The periodical ministry of health reports have until recently not focused on a detailed analysis of C/S. The latest Annual Health Sector report 2021/2022 is the first to analyse C/S especially in the private sector to deeper degree of detail. Most of the nationally representative data on the subject is anchored in the UDHS.
- Lack of more updated baseline health and demographic data; latest UDHS is 2016, which is 7 years old; by this time, we ought to have had UDHS 2021 for more updated information
- Limited access to data from private health facilities, such as fertility clinics. These do not regularly report their outputs/performance to MoH, and thus contribute to the incompleteness of data
- Uneven regional distribution of local research in Uganda among the health regions. A lot of research in the field has been conducted in western and central Uganda; much less in northern and eastern parts of the country.
- Inaccessibility online to some important grey sources of current from MoH, yet this has been an online-based study. Reports such as the Annual Health Sector Performance Report 2021/2022 is not uploaded on the official MoH website, or other websites. The author has to specifically request for it through his personal networks.
- Limited access to publications for studies conducted by researchers through Ugandan universities. Most of these are not easily accessible online and yet they may have locally relevant and specific evidence.
- For the different specific factors, local evidence from Uganda was not available.
- For articles that were not freely available, they were accessed through the VU library. However, a few still couldn't be accessed.
- To overcome these, challenges, some articles were sourced from other settings similar to Uganda's and triangulation was done.
- Articles not published in English were not used in this study.

## **CHAPTER 6: CONCLUSIONS AND RECOMMENDATIONS**

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### **Conclusion**

Following the research objectives of this study, the following conclusion is made:

#### **Factors that contribute to C/S rate increase in Uganda**

**Economic incentives:** This is a factor which is strongly associated with high C/S use, especially in the fast growing private health care sector that is not routinely monitored. The same is true for public health facilities where the role of official and unofficial financial gain is at play.

**Non-streamlined clinical decision-making process** where junior officers without little supervision make C/S decisions that are not validated by more experienced colleagues and without routine audit of the same. This is closely linked to health system weaknesses that allow for the absenteeism of doctors

**Clinical care practise** that have over the time abandoned known low-cost and effective interventions like use of vacuum delivery, which can prevent a sizeable number emergency C/S

Slow uptake and use of latest clinical care guidelines to inform current practice.

Higher socio-economic status for women allows them easier access to C/S and may be target of doctor-induced demand for C/S. previous C/S, maternal obesity and the widespread use of oxytocic herbal remedies also contribute to high C/S rates.

### **Factors with an indeterminate effect on C/S rates in Uganda**

The evidence for the effect on gender on the C/S use in Uganda was inconclusive; the same goes for use of ultrasound in pregnancy, maternal age, fear of litigation, the media and size of the baby.

Cultural beliefs and the use of TBAs probably contribute to lower C/S use since these two dissuade women in their constituencies not to use C/S.

## **Recommendations**

### **To the Policy Makers, MoH**

- Should develop a policy that requires all C/S including primary C/S to be reviewed by more than one physician, especially if it is suggested by junior staff
- Use latest research evidence to develop and update guidelines relating to the management of labour and ensure that they are used to inform practice

### **To the Health system regulators and the Health Professionals' Councils**

- Enforce regular and complete reporting of performance from the private healthcare providers
- Planned monitoring of the technical performance of private health facilities

### **To Health Facility Managers and administrators**

- Implement mechanisms that will ensure that HCWs and especially doctors honour their contracted work hours and address their specific concerns
- Efforts to fight bribery and ensure transparency should be enhanced to reduce C/S that are motivated by financial gain (official and unofficial) in the public health facilities
- Ensure that C/S audit and feedback to the obstetric care team is given

### **To the Clinical care managers (Department of Obstetrics and Gynaecology)**

- Enforce compliance to the clinical care guidelines as provide by the ministry of health from time to time including use of partograph and the use of available alternatives to C/S such as vacuum extraction
- Train and re-train clinical staff on indications and use of vacuum extraction
- Ensure completeness and accuracy of the labour monitoring records including the partograph
- Involve women in decision making concerning there mode of delivery and address emerging fears. Use the concept of respectful maternity care (RMC)
- Let decision for C/S, especially those made by junior staff be validated. This should especially be the case for primary C/S

### **To the Community Health Department**

- Plan for and conduct community education and sensitization engagements with various sections of the population in regards to entire journey of pregnancy and childbirth with the view of equipping the population with sufficient information to make informed decisions about childbirth
- Set up known and consistent communication channels through which people can acquire the needed information.

### **To the researchers**

- To conduct more research relating to C/S (over)use are made and build a new evidence base evidence that will inform future practice.

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## ANNEXES

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### Annex 1

#### Indications for Caesarean Section (6)

Category	Indications
<i>Maternal indications for caesarean</i>	<ul style="list-style-type: none"> <li>• Prior caesarean delivery</li> <li>• Maternal Request</li> <li>• Pelvic deformity or cephalopelvic disproportion</li> <li>• Previous perineal trauma</li> <li>• Prior pelvic or anal/rectal reconstructive surgery</li> <li>• Herpes simplex for HIV infection</li> <li>• Cardiac or pulmonary disease</li> <li>• Cerebral aneurysm or arteriovenous malformation</li> <li>• Pathology requiring concurrent intra-abdominal surgery</li> <li>• Perimortem caesarean</li> </ul>
<i>Uterine/anatomical indications for caesarean</i>	<ul style="list-style-type: none"> <li>• Abnormal placentation (such as placenta previa, placenta accreta)</li> <li>• Placental abruption</li> <li>• Prior classical hysterotomy</li> <li>• prior full thickness myomectomy</li> <li>• history of uterine incision dehiscence</li> <li>• Invasive cervical cancer</li> <li>• prior trachelectomy</li> <li>• Genital tract obstructive mass</li> <li>• Permanent cerclage</li> </ul>
<i>Foetal indications for caesarean</i>	<ul style="list-style-type: none"> <li>• Non-reassuring foetal status (such as abnormal umbilical cord Doppler study) or abnormal foetal heart tracing</li> <li>• Umbilical cord prolapse</li> <li>• Failed operative vaginal delivery</li> <li>• Malpresentation</li> <li>• Macrosomia</li> <li>• Congenital anomaly</li> <li>• Thrombocytopenia</li> <li>• Prior neonatal birth trauma</li> </ul>

## Annex 2

Long and short term complications of Caesarean Sections on women and children (35,118)

Short and Long term complications of Caesarean Sections	
Short term maternal complications: <ul style="list-style-type: none"> <li>• <b>Pain associated with major surgery including hip pain</b></li> <li>• <b>Longer recovery time and hospital stay</b></li> <li>• <b>Haemorrhage</b></li> <li>• <b>Injury to abdominal and pelvic organs like gut and bladder</b></li> <li>• <b>Infections and wound dehiscence</b></li> <li>• <b>Acute renal failure</b></li> <li>• <b>Cardiac arrest</b></li> <li>• <b>Haematoma</b></li> <li>• <b>Puerperal venous thromboembolism</b></li> <li>• <b>Spinal injuries</b></li> </ul>	Short term children complications: <ul style="list-style-type: none"> <li>• Altered immune development</li> <li>• Increases risks of allergy, asthma and atopy</li> <li>• Reduced intestinal gut microbiome diversity</li> <li>• Breathing problems</li> </ul>

<ul style="list-style-type: none"> <li>• Higher risks of maternal deaths</li> <li>• Breastfeeding problems</li> </ul>	
<p>Longer term maternal complications:</p> <ul style="list-style-type: none"> <li>• Pelvic and intra-abdominal adhesions</li> <li>• Obstetric fistula (commoner with vaginal delivery)</li> <li>• Chronic pain</li> <li>• Dysmenorrhoea</li> <li>• Sexual dysfunction</li> <li>• Sub-fertility</li> <li>• Incontinence (commoner with vaginal delivery)</li> </ul> <p>Problems with subsequent pregnancies:</p> <p><b>Higher risks of:</b></p> <ul style="list-style-type: none"> <li>• Abnormal placentation</li> <li>• Ectopic pregnancy</li> <li>• Still births</li> <li>• Uterine rupture</li> <li>• Preterm births</li> </ul> <ul style="list-style-type: none"> <li>• Behavioural and psychological problems</li> </ul>	<p><b>Long term children complications:</b></p> <ul style="list-style-type: none"> <li>• Varying hormonal, physical, bacterial and medical exposures,</li> <li>• Frequent illnesses</li> <li>• Lower food demands</li> <li>• Fewer sleeping hours</li> </ul>

## Annex 3

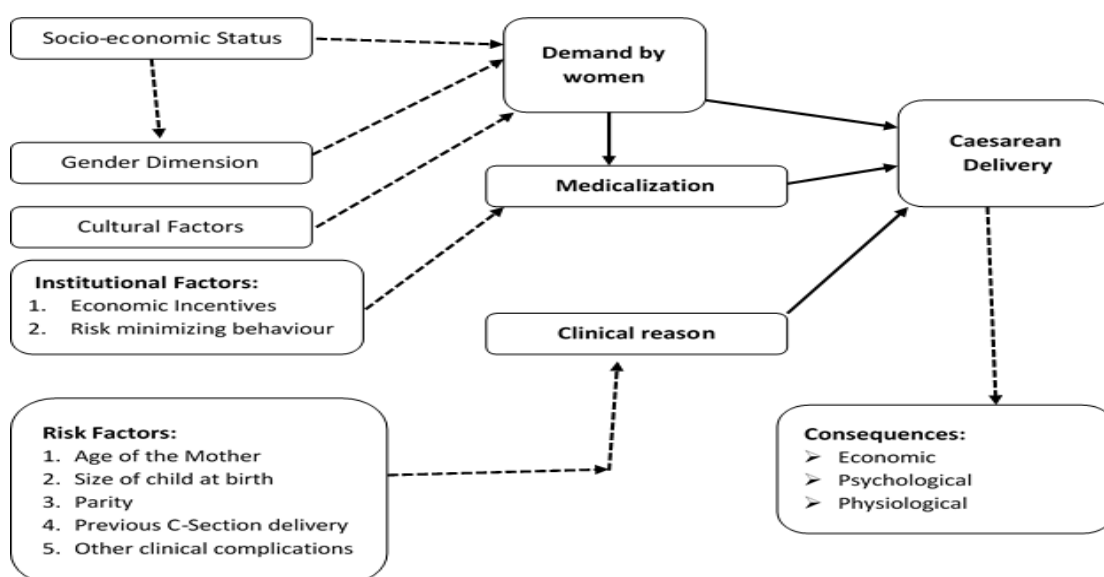
### The Search Table

	SEARCH TERM/PHRASE		SEARCH DATABASE AND SEARCH ENGINE	Websites
Grey Literature	<ul style="list-style-type: none"> <li>• Uganda</li> <li>• Ministry of Health, Uganda</li> <li>• Uganda Bureau of Statistics</li> <li>• Uganda National Household Survey</li> <li>• health sector development plan Uganda</li> <li>• "Demographic Transition" and Uganda</li> </ul>	AND Uganda, Africa, Developing country, Low income-country Low and middle income country	Google Search Engine	Government of Uganda World Bank World Health Organization world bank
Objective 1 &2  Articles, Reports, websites, books, newspaper articles,	Caesarean Section, Caesarean Section, Global rates for caesarean section, Does tokophobia contribute to higher rates of caesarean sections?, Robson classification for caesareans section, Increasing trend of caesarean delivery in India, Ghosh, Ghosh's theory, "increasing caesarean sections in sub-Saharan Africa", Ana Pilar Betran, Caesarean section rates Africa, Elective caesarean section, Absenteeism, Tokophobia, Women and traditional beliefs, private health facilities, economic incentives, money,		<ul style="list-style-type: none"> <li>• Google Scholar</li> <li>• PubMed</li> <li>• VU Library</li> <li>• Google Search Engine</li> </ul>	

	<p>monetary gain, private healthcare, public health facilities, previous caesarean, index caesarean section labour monitoring, socio-economic status, parity, index caesarean section, primary caesarean section, herbal remedies, cultural beliefs, TBAs, traditional birth attendants, antenatal care, gender, ultrasound in pregnancy, medicalization of childbirth, macrosomia, obesity, weight gain in pregnancy, litigation the media, domestic violence, body image, caesarean section on demand, herbal remedies, cultural beliefs, labour monitoring, minimum recommended caesarean section rates, defensive medicine and caesarean delivery, corruption in healthcare, number of health workers sued, 'effects of herbs on labour outcomes', increasing demand for caesarean section' cost of caesarean delivery, social indications for caesarean delivery, 'obesity and labour outcomes', obesity among pregnant women', midwives training, assisted vaginal delivery, cost of vaginal delivery, effect of social media on caesarean section rates, influence of the media on birth outcomes, bribery in Uganda's healthcare system, reasons for primary caesareans section</p>			
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## Annex 4

Ghosh's framework for analysing increasing trends of Caesarean Sections in a developing country (India)(33)



## Annex 5

Percentages of live births delivered by C/S in Uganda, according to background characteristics, according to the Uganda Demographic and Health Survey 2016. Source (17).

Background Characteristic	Percentage delivered by C/S	Timing of decision to conduct C/S		Number of births
		Before onset of labour pains	After onset of labour pains	
<b>Mother's age at birth</b>				
<20	7.0	1.2	5.8	2,737
20-34	6.1	2.4	3.8	10,591
34-49	5.2	2.4	2.8	1,943
<b>Birth Order</b>				

1	10.5	2.6	7.9	3,396
2-3	6.8	2.8	4.0	5,134
4-5	4.3	2.1	2.2	3,263
6+	2.8	0.9	1.9	3,478
<b>Antenatal care visits</b>				
None	3.7	1.3	2.3	195
1-3	5.5	1.9	3.5	3,821
4+	8.5	3.0	5.5	6,080
Don't know/missing	7.9	6.2	1.8	56
<b>Place of delivery</b>				
Health facility	8.4	3.0	5.5	11,203
-Public facility	7.8	2.4	5.4	8,748
-Private facility	10.6	4.9	5.7	2,455
<b>Residence</b>				
Urban	11.0	4.7	6.3	3,233
Rural	4.9	1.5	3.4	12,038
<b>Region</b>				
South Central	11.1	5.6	5.5	1,881
North Central	6.8	1.6	5.2	1,645
Kampala	12.5	5.9	6.6	580
Busoga	2.6	0.8	1.8	1,527
Bukedi	2.5	0.4	2.1	1,060
Bugisu	2.8	1.3	1.5	763
Teso	4.9	1.7	3.1	948
Karamoja	2.9	0.7	2.2	432
Lango	4.6	0.9	3.8	799
Acholi	4.7	1.3	3.4	741
West Nile	6.3	1.5	4.9	1,067
Bunyoro	3.5	0.4	3.1	905
Tooro	9.8	3.8	6.0	1,210
Kigezi	7.9	2.6	5.4	506
Ankole	5.9	1.9	4.0	1,209
<b>Special area</b>				
Island districts	4.3	1.5	2.8	202
Mountain districts	8.2	3.4	4.8	1,260
Greater Kampala	13.2	6.6	6.6	1,247
<b>Mother's education</b>				
No education	3.2	0.6	2.6	1,680
Primary	4.5	1.2	3.3	9,391
Secondary	7.9	3.0	4.9	3,243
More than secondary	21.7	11.3	10.4	958
<b>Wealth quintile</b>				
Lowest	2.7	0.6	2.1	3,442
Second	3.4	0.9	2.5	3,203
Middle	5.3	1.3	4.0	2,950
Fourth	6.1	1.5	4.6	2,735
Highest	14.2	6.9	7.3	2,940
<b>Total</b>	6.2	2.2	4.0	15,270

**END**