SOCIAL DETERMINANTS OF CAESAREAN SECTION AMONG CHILD BEARING WOMEN IN ZAMBIA

By

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DECLARATION

I Faith L. Nzumba hereby declare that this dissertation entitled 'Social Determinants of Caesarean Section among Child bearing Women in Zambia' is for the award of The Master of Public Health. It has not already been accepted in substance for any other degree, and it is not being submitted concurrently for any other degree.

Signature: _____ Date: _____

APPROVAL

This dissertation of **Faith L. Nzumba** has been approved as partial fulfillment of the requirements for the award of the degree of Master of Public Health by The University of Zambia.

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ABSTRACT

This study determined social determinants of Caesarean Section among child bearing women in Zambia. The study used a quantitative research paradigm and followed a stratified two-stage sample design. A cross-sectional study design was used. The study was guided by the following research questions. a) What socio-demographic factors are associated with Caesarean Section among child bearing women In Zambia? b) Which socio-economic factors are associated with Caesarean Section among child bearing women in Zambia?

Study findings revealed that level of education, wealth index, place of delivery, type of place of residence and birth order were major determinants of Caesarean Section. The socio-demographic factor associated with Caesarean Section among child bearing women in Zambia was birth order. The findings revealed that the percentage of women undergoing Caesarean Section decreases from the 1st to the 5th birth order.

In addition, level of education, wealth index, place of delivery and type of place of residence were identified as socio-economic factors associated with Caesarean Section among child bearing women in Zambia. The study recommends that:

i) In line with government policy on maternal interventions, the practice of Trial of Labour (TOLAC) for women with a history of Caesarean Section should be considered.

ii) Increasing women's access to non-medical interventions during labour such as continuous support during labour and External Cephalic Version (ECV) is vital.

iii) Further, there is need for the Ministry of Health to strengthen adherence of healthcare professionals to clinical practice guidelines combined with audit and feedback.

DEDICATION

To God Almighty without Who absolutely nothing would have been accomplished.

To my parents- Abraham Moonga Nzumba and Patra Inutu Akasiwa Nzumba, siblings - Zipora, Isaac [L], Elizabeth and Jacob and my husband Mr. Kanyanga Kalyata for their encouragement and support throughout my education endeavors.

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LIST OF ABBREVIATIONS AND ACRONYMS

AIDS	Acquired Immuno Deficiency Syndromes
CDC	Centre for Disease Control
CDMR	Cesarean delivery on maternal request
CS	Caesarean Section
EAs	Enumeration Areas
ECV	Eternal Cephalic Version
HIV	Human Immunodeficiency Virus
NVD	Natural vaginal delivery
SDH	Social Determinants of Health
TOL	Trial of Labour
TOLAC	Trial of Labour after Caesarean Section
WHO	World Health organisation
ZDHS	Zambia Demographic and Health Survey

CHAPTER ONE

INTRODUCTION

1.1 Overview

This study aimed at determining social determinants of Caesarean Section among child bearing women in Zambia. The study used a quantitative research approach. The source of data was the 2018 Zambia Demographic and Health Survey, with women of childbearing age (15 -49) as the target population. The sample size was 13,683 women. The study was guided by the following research questions: a) What socio-demographic factors are associated with Caesarean Section among child bearing women In Zambia? b) Which socio-economic factors are associated with Caesarean Section among child bearing women in Zambia? Data was analysed using STATA software version 15.0.

This chapter presents the background of the study, statement of the problem, purpose of the study, specific objectives, research question, significance of the study, delimitation of the study, limitation of the study, theoretical framework, definitions of key terms and ethical considerations.

1.2 Background of the study

Caesarean Section (CS) is an important lifesaving intervention that can reduce maternal and newborn morbidity and mortality. It is the most commonly performed surgical procedure in obstetrics. Caesarean Section is delivery by a surgical incision into the mother's abdomen and uterus(Amini et al., 2018). The global increase in the prevalence of Caesarean Section has

become a considerable public health issue and requires special attention according to its probable maternal and perinatal risks, cost issuesand inequity in access. In the past, Caesarean Section was performed for pure obstetric indications where vaginal delivery carries risks on the mother and the baby (Khasawneh et al., 2020). Approximately 18.5 million Caesarean Section are performed each year worldwide, accounting for 21% of births globally in 2015, up from 12% in 2000 (Dankwah et al., 2019).

The World Health Organization (WHO) has repeatedly reported that any population-based rate of Caesarean Section delivery should not exceed 15% and should ideally be performed when medically indicated. The increase in Caesarean Section rates globally has prompted concerns that the procedure may be overused or used for inappropriate indications. However, with the advance in anesthesia and postoperative care over the past one to two decades, the rate of Caesarean Section rose all across the world with a variable reported rate of 15–40% amongst different nations and institutions (Khasawneh et al., 2020).

Josi (2019) postulates thatthe rate of CS varies considerably between world regions, from 4.1% in Africa to 44.3% in the Latin America and the Caribbean. But what is even more striking are the differences in CS rates within countries. According to ZDHS (2018), CS rates in Zambia increased from 3% in 2007 to 5% in 2018. Multiple factors have contributed to this uptrend. Maternal indications for CS include previous CS, antepartum hemorrhage, uncontrolled hypertension, and failure to progress of labor. Fetal indications include fetal distress, malpresentation, cephalopelvic disproportion and certain major congenital anomalies(Khasawneh et al., 2020).

Reasons behind the global increase in Cs are multifaceted and include both clinical and non-clinical factors. Changes in risk profiles of women and a purported rise in medical indications

underlie the increase in CS rates in many settings (Elnakib et al., 2019). In the absence of clinical justification for CS, studies have attributed the increase in CS to multiple factors ranging from socio-demographic characteristics of pregnant women such as their education, types of facility where childbirth takes place and place of residence. Recent lancet series also showed that there were large differences in C-Section use between women in the poorest and the richest wealth index. Cultural and environmental differences in different areas of a country play a major role in shaping these factors and may also influence the CS practice in those areas (Karim et al., 2020).

According to ZDHS (2018), delivery by CS was at 8.8% for urban areas compared to 2.9 % in rural areas. This is evident in women in the highest wealth quintile compared to those in the lowest wealth quintile. The CS rate in the highest wealth quintile is seven times higher (14%) than the rate in the lowest quintile (2%). This also is reflected in rates of caesarean sections by type of facility at delivery; as CS are more common in private facilities (14%) than public facilities (5%). In addition, the probability of undergoing a CS increases with increasing education. The caesarean rate for births to women with a higher education is 22%, as compared with 4% for births to women with no education.

Identifying factors influencing CS is critical to reduce the unnecessary practice of this intervention and only increase its access to people greatly in need of it. Given this background, this study therefore seeks to determine social determinants of Caesarean Section among child bearing women in Zambia.

1.3 Statement of the Problem

Since 2002, Caesarean Section rates have consistently been on the rise in Zambia. According to ZDHS (2018), CS rates increased from 2% in 2002, 3% in 2007, 4% in 2014 through to 5% in 2018. Despite the rates being below the 10 -15% threshold by World Health Organization, the trend is worrisome as CS rates keep on increasing. The ideal situation is that CS rates should be reducing or better still be stagnant at utmost as was the case from 1996 to 2002; due to a lot of resources invested and tremendous efforts by the government to improve maternal and neonatal outcomes.

According to Khasawneh et al. (2020), the rise in CS delivery results into the rise of short-term and long-term maternal and neo-natal complications. Although the goal of CS is to avoid the complication that might develop after vaginal delivery, this surgery is not without significant impact on maternal and neonatal outcomes. Previous studies have reported an increase in maternal mortality up to three times with CS delivery. Similarly, the rate of maternal complications increases two and five folds after elective and emergency CS respectively. According to Opiyo et al. (2019), caesarean section is associated with risks that can extend many years beyond the current delivery and affect future pregnancies, further increasing Neonatal Intensive Care Unit (NICU) admissions that pose social and financial burdens.

Evidence-based studies have shown numerous factors connected to consistent rise in the rate of CS in Sub Saharan Africa. This has been attributed to social economic factors such as education of the mother, place of residence, wealth index and type of facility at delivery. Study results show that women with higher education and economic class underwent more

CS than women without formal education and those in low wealth index class. Furthermore, women residing in urban areas and those who delivered in private health facilities are known to have more CS than their counterparts in rural areas and the women who utilized government owned health facilities (Yaya et al., 2018).

Although studies on CS have been conducted in Zambia, no studies on social determinants of Caesarean Section among child bearing women has been undertaken. The gap has created loss of prospects to learn from past trends in order to provide remedial action. If this trend is ignored and left unattended without proper interventions in place; the country is likely to score alarming rates in the nearest future that may be difficult to reverse, creating inappropriate allocation of scarce resource in the struggling economy due to an increase in total health expenditure.

1.4 Purpose of the Study

The purpose of the study was to determine social determinants of Caesarean Section among child bearing women in Zambia.

1.5 Specific Objectives

i) To establish the socio-demographic factors associated with Caesarean Section among child bearing women in Zambia.

ii) To identify socio-economic factors associated with Caesarean Section among child bearing women in Zambia.

1.6 Research Questions

- What socio-demographic factors are associated with Caesarean Section among child bearing women in Zambia?

- Which socio-economic factors are associated with Caesarean Section among childbearing women in Zambia?

1.7 Significance of the Study

The findings of this study are expected to contribute a great deal to the already existing knowledge about increasing rates of Caesarean Section. The information generated will also provide more insights about the prevailing factors contributing to high levels of CS among child bearing women in Zambia. This will be used to aid relevant authorities to come up with policies and more appropriate, evidence based and specific strategies to lower the rates of CS in the country. The information generated will also meet academic requirements. It is therefore important that these factors are identified, analysed and finally suggest solutions to address the identified and stated problem.

1.8 Delimitation of the Study

This was a national survey. All the 10 provinces of Zambia were represented. The updated list of enumeration areas (EAs) for the 2010 Population and Housing Census provided the sampling frame for the 2018 ZDHS, representative at the national and provincial levels, and for urban and rural areas.

1.9 Limitations of the Study

Limitations of this study include the use of cross-sectional data that only enables establishment of associations and not causal relationships. Often, there is a delay between the period of data collection and results publication for the ZDHS which may provide information that might not be reflective of the current situation. Despite the stated limitations, this study was relevant to understand the social determinants of Caesarean

Section among child bearing women in Zambia which will inform policy makers and planners on necessary adjustment aimed at reducing caesarean section rates in the country.

1.10 Theoretical framework

The Theory of Planned Behavior is one of the leading theories applied to study health-related behaviors, intentions and their influencing factors. The theory proposes that a conscious motivation to act predict behavior. Also, it is hypothesized that the intention is predicted by attitude towards the behavior, subjective norms and perceived behavior control. A pregnant woman's choice on mode of delivery is a health-related behavioral intention, making it feasible to apply this theory to explore the association. According to this theory, people adopt behavioral decisions from reasonable investigation and available information. Hence attitudes of women about CS compared to vaginal delivery and evaluation of the consequences of this choice is a construct of this model. Due to access to readily available information on CS and reasonable investigation in urban areas and among educated women, a good proportion of women opt for Caesarean Section (Sun et al., 2019).

With regard to the uncontrolled growth of CS and the emphasis on increasing the indicator of Natural vaginal delivery (NVD) in Iran's Health System Transformation Plan, the theory of planned behavior was suitable and useful for identifying the factors influencing the intention to perform NVD as well as designing and implementing educational interventions aimed at promoting NVD. In this study, perceived behavioral control, attitude, evaluation of behavioral outcomes and normative beliefs constructs showed the highest positive and significant predictive value for NVD. The constructs of planned theory of behavior predicted 28.7% of the variance of NVD in pregnant women (Yaghobi et al., 2019).

1.11 Definition of key Terms used in the Study

Clear terminology is very important to every study. In this study of determining social determinants of Caesarean Section among child bearing women in Zambia therefore, the following definition of terms were used.

Caesarean Section : Delivery by a surgical incision into the mother's abdomen and uterus (Amini et al., 2018).

Child Bearing Age: Range of ages during which a woman may become pregnant (CDC, 2021).

Social Determinants of Health: Conditions in which people are born, grow, work, live and age, and the wider set of forces and systems shaping the conditions of daily life (WHO, 2022).

1.12 Ethical considerations

Ethical clearance was obtained from the University of Zambia Biomedical Research Ethics Committee (**REF. 2494-2022**).Also, certification as a Health Researcher was granted by the National Health Research Authority (Registration Number **NHRAR-R-1146/19/09/2022**). Permission was also obtained from the Zambia Statistics Agency (ZSA) to use the 2018/19 ZDHS dataset for the study. The dataset was strictly used for the purpose of research and safely kept to avoid any form of misuse, accidental loss or destruction.

1.13 Summary

This chapter has given a brief explanation on Social Determinants of Caesarean Section. The chapter has also shed light on the statement of the problem, purpose, objectives and research

questions which guided the present study. Further, the chapter has provided the significance, delimitations, limitations and has discussed the theoretical framework on the Theory of Planned Behavior before providing key operational terms used in the study. Finally, it has discussed ethical considerations.

CHAPTER TWO

REVIEW OF RELATED LITERATURE

2.1 Overview

Caesarean Section is ideally performed to avoid the complication that might develop after vaginal delivery. It is classified on the basis of either elective or emergency procedure. An elective CS is defined as a planned, non-emergency delivery which occurs before initiation of labor. Emergency CS on the other hand is unplanned delivery performed before or after onset of labor, which is typically urgent and is required due to fetal, maternal or placental conditions. This includes fetal distress, enclampsia, cord accidents, uterine rapture and failed instrumental birth (Benton et al., 2019).

However, reasons behind the global increase in CS include both clinical and non-clinical factors. In the absence of clinical justifications, studies have attributed this increase to socio-economic and demographic characteristics of pregnant women (Karim et al., 2020). To gain an understanding of social determinants of Caesarean Section in Zambia, a review of the literature on determinants of Caesarean Section in Zambia and other parts of the world was done. Literature was reviewed according to the objectives of the study which were; what socio-demographic and which socio-economic factors are associated with Caesarean Section among child bearing women in Zambia.

2.2 Socio-demographic factors associated with Caesarean Section

Several study results show that Socio-demographic factors such as maternal age, gestational age, birth order and fetal gender have an influence on Caesarean Section. When CS is

appropriately used, it can improve both infant and maternal health outcomes. According to the World Health Organization, CS is a vital treatment in pregnancy (Manyeh et al., 2018).

Maternal Age and Caesarean Section

According to Manyeh et al. (2018), Women aged 30–34 years were more than twice likely to have Caesarean Section compared to those less than 20 years. However, women aged 34 years and above were more than thrice likely to undergo Caesarean Section compared to those less than 20 years.

Amjad et al. (2018) argue that several pieces of research have demonstrated that the chance of CS is higher among older women. It is believed that older mothers are prone to pregnancy complications that may lead to caesarean deliveries. In Pakistan for instance, the rising trend among women of getting married or conceiving at a later age due to orientation towards career, financial and educational goals tend to increase their chances of undergoing CS.

Gestational Age and Caesarean Section

Gestational age has an influence on Caesarean Section. According to Mia et al. (2019), CS rates increases with lower gestational age. Study results conducted in Bangladesh on Socio-demographic, health and institutional determinants of caesarean section among the poorest segment of the urban population showed that CS rates were higher for births with a gestational age less than 37 weeks at 47.1% compared to those with 37 weeks and above at 21.4%. Elective Caesarean Section is usually planned after 39 weeks of pregnancy to reduce respiratory distress in the neonate.

Birth Order and Caesarean Section

Manyeh et al. (2018) states that the odds of having CS reduced significantly with increasing parity. Among women with parities 2, 3 and above, there were reduced odds of 74, 57 and 51% respectively of having CS compared to those with parity 1. Amjad et al. (2018) argue that women with a child at first birth order have a higher chance of delivering by Caesarean Section.

Compared to third order babies, first and second order babies were 2.3 and 2.4 times more likely of being delivered through caesarean section (Saaka and Hammond, 2020). These findings are consistent with those in ZDHS (2018) with CS rates of 7.2 and 3.3 for 1st birth order and 4th to 5th orders respectively.

Fetal Gender and Caesarean Section

There is increasing evidence of a gender related phenomenon where the presence of a male fetus may have an adverse effect on the outcome of pregnancy. Women with female babies had 19–27% lower odds of CS compared to male babies between 2005 and 2019. Indications are increased birth weight and head circumference of male fetuses compared to females. Also, increased rates of CS due to fetal distress have been reported in male bearing pregnancies (Kibe et al., 2022).

According to Mia et al. (2019), a research study conducted in Bangladesh revealed that CS was higher among women who delivered a boy child compared to those who delivered a girl at 28.5% and 22.5% respectively. A study in Japan demonstrated that women carrying a male fetus had a significantly higher risk of Caesarean Section.

2.3 Socio-economic factors associated with Caesarean Section

Global Caesarean Section rates have more than doubled over the past 2 decades, with an increasing contribution on elective caesarean deliveries. Various study results have shown that elective CS are done in the absence of maternal or fetal indications. The rising rates are mainly attributed to socio-economic factors. Several study findings have shown that socio-economic factors such as education, wealth index, place of residence and type of health facility at birth have an influence on Caesarean Section (Cai et al., 2018).

Social determinants of health (SDH) have a major impact on people's health, well-being and quality of life. They are defined as conditions in which people are born, grow, work, live and age, and the wider set of forces and systems shaping the conditions of daily life. Five key domains of SDH include economic stability, education access and quality, health care access and quality, neighborhood and built environment and social and community context. Examples include safe housing, transportation and neighborhoods, racism, discrimination and violence, education, job opportunities and income, access to nutritious foods and physical activity opportunities, polluted air and water, language and literacy skills (WHO, 2022).

Education Status and Caesarean Section

According to ZDHS (2018), the probability of undergoing a CS increases with increasing education. The CS rate for births to women with a higher education is 22%, as compared with 4% for births to women with no education.

A meta-analysis of a study on CS and its association with educational attainment, wealth index and place of residence in Sub-Saharan Africa revealed that parents' education is a

crucial factor that is the reason behind the increased rate of CS. Educated respondents are more likely to use CS compared to respondents with no education. Regarding the association of CS rate with education, the current study showed similarity with many of the previous studies. Majid et al. (2019) presented a study in Iran that showed that the probability of utilizing the CS is higher among educated women than women having lower education(Islam et al., 2022).

This study also shows that Arendt et al. (2017), Feng et al. (2020), Nababan et al. (2018), and Divyamol et al. (2016) indicated that an increase in maternal education level leads to CS delivery as educated women make their own decision regarding delivery and in general prefer CS delivery. Also, previous findings of Epistein et al., Lee et al., and Mumtaz et al. reported that the educated women prefer CS as the level of pain is lower and they believe it is safer and interferes less with the workload, leisure time and is socially more prestigious than the normal vaginal delivery. Similar study results have been found among women with husbands that attained higher education. A study by Long et al. (2015) showed that the overall odds ratio for paternal education also showed that husbands with education are more likely to use CS than husbands with no education.

Carlotto, Marmitt and Cesar (2020) argue that the excess of this intervention involves not only clinical needs, but also non-obstetric factors such as convenience for the physician and especially the mother's desire. The mother's deliberate and assumed decision to perform this procedure putting aside clinical indications to her or the baby is called on-demand Caesarean Section. Factors significantly associated to this practice was high schooling. Other reasons for this surgical event are fear of childbirth, interference with future sexual performance and lack of pain during labor.

According to Karim et al. (2020), findings from a cross-sectional survey on the prevalence and factors associated with Caesarean Section in four hard-to-reach areas of Bangladesh revealed that 20% of women interviewed within 12 months of the last birth outcome and completed higher than primary level education had Caesarean Section. Similarly, CS rate for women who had husbands with higher than primary level of education was higher at 23% compared to those women's husbands having only primary complete or no formal education at all.

Results of a similar study conducted in Ghana revealed that the odds of women having CS went up with increasing level of education in both the crude and adjusted models. In the crude model, odds of women with primary level of formal education having CS were 75% higher compared to those with no education. In addition, the odds of women with Junior High School level of education having CS as compared to those with no education is almost three times more likely. Furthermore, the odds of participants with Senior High level of schooling having CS were eight times more likely compared to those with no formal education. Holding other variables constant, the odds of having CS was 65 and 79% higher for participants with Primary and Junior High School level of schooling respectively compared to those with no education (Manyeh et al., 2018).

Type of Health Facility and Caesarean Section

According to ZDHS (2018), Caesarean Sections are more common in private facilities at 14% than public facilities at 5%. Elnakib et al. (2019) argue that another factor implicated in the increase in CS rates other than clinical reasons is the physician factor, attributing to the rise in CS not to obstetric risk factors, but due to physician-related and institutional reasons

commonly practiced in private health facilities compared to public health facilities. In addition to medical and obstetric risk factors identified from the analysis of medical records, interviews with obstetricians shed light on multiple health provider-related drivers of CS. A convenience incentive, lack of supervision and training and lack of familiarity with clinical guidelines were three important factors revealed as contributing to the increase in CS rates. Almost half of obstetricians in private health facilities confirmed a personal preference for Caesarean Section.

McCall et al. (2021) argue that Caesarean Section use is higher in private sector facilities compared to public sector facilities. Within the private sector in Egypt, Palestine and Yemen, the highest use of CS was in the wealthiest quintiles. Similar to previous studies completed in the region; Jordan, Iraq and Egypt had higher CS births in private hospitals compared to public hospitals. This is likely influenced by financial gain, medicalisation of childbirth, fear of litigation and time convenience for healthcare providers and women's fear of vaginal birth and labor pain. In addition, previous studies that were done in the region indicated that growth in the private sector is a key driver for the increase in the use of caesarean section.

According to Sarkar (2020), Caesarean delivery became a primary mode of delivery without any medical consideration especially in private hospitals in West Bengal. The Caesarean delivery rate is alarmingly high in private hospitals (71%) compared to public hospitals (19%). Nearly 55% of total Caesarean delivery was contributed by private hospitals only. Also, findings indicated that along with the concern of rising CS rate in the state, the prevalence of CS rates in the private hospitals are shocking. In many districts such as N 24 Parganas, Nadia, Murshidabad, and Birbhum, the CS rates in private hospitals are as high as more than 80 per 100 deliveries.

Sk, (2020) argues that several studies especially in developing countrieshave revealed that delivery in private hospitals is one of the most contributing factors in CS deliveries. The present study conceptualises a causal pathway in which the possible risk factors, socio-economic, maternal and pregnancy-relatedas well as institutional, influence the chances of CS delivery. It is hypothesised that certain factors would contribute to CS deliveries largely indirectly through the place of delivery that is either a public or private institution.Studies in India as well as in the South Asian context revealed that wealth status is one of the strongest factors influencing the decision to go to private hospitals over public ones for childbirth. Studies also have shown that women with a higher level of education choose private hospitals over public ones for delivering their babies. Additionally, the place of residence, whether urban or rural, is associated with the use of private hospitals for delivery.

The World Health Organization (WHO) has recommended that the population-based CS rate should lie between 5% and 15%, as no additional health benefit is associated with CS if its rate goes above 10%–15%. The increase in CS rate causes burden to the general health system and also strain on the family members. Unnecessary CS may have an adverse impact upon maternal, neonatal and infant morbidity and mortality. The high cost of Caesarean Section may result in catastrophic health expenditure for families and additional pressure upon health systems, especially in low- and middle-income countries (Singh, Pradeep and Jauhari, 2020).

Wealth Index and Caesarean Section

Over time, Caesarean Sections have stopped being a measure to improve perinatal outcomes and have become a consumer product to an extent that rates are the lowest among the poorest

women and increases as the rate at which the purchasing power of the population increases· These findings are consistent with those in the ZDHS (2018) which shows that CS rate in the highest wealth quintile is seven times higher (14%) than the rate in the lowest quintile (2%). Also linked to this, CS has become a symbol of social status among Brazilian women and a convenience factor for mothers and doctors who like to schedule the delivery for a certain time or day of the week. McCall et al. (2021) also indicates that across most countries, CS use was highest in the richest quintile compared to the poorest quintile with an example for Iraq at 42.8 % and 22.6% respectively.

Karim et al. (2020) states that recent lancet series showed that there were large differences in CS use between women in the poorest and the richest wealth quintile. This Prevalence was increased as family's economic condition improved. 30% of women belonging to the highest wealth quintile had CS in their most recent delivery. This is because CS are costly for poor families.

A study conducted in Ghana on socio-economic and demographic factors associated with Caesarean Section showed that participants who belong to the richest wealth quintile were more than two times more likely to have CS compared to those who were in the poorest category. The odds of having CS went up with increasing socioeconomic status. In the crude analysis, participants with middle wealth quintile were 44% more likely to have CS compared to those in the poorest group. Participants who belong to the richer and richest quintiles were more than two times and three times more likely to have Caesarean delivery compared to those in poorest groups (Manyeh et al., 2018).

According to Amini et al. (2018), a study in Iran showed that a better socioeconomic status increased the odds ratio of Caesarean Section. Reasons were attributed to the availability of utilities and financing the costs of CS. It has been demonstrated that women with lower socioeconomic status are not provided with the accessibility to CS. Studies conducted in different South Asian countries, including Bangladesh, India and Nepal, suggest that women with a higher socio-economic background are more likely to undergo CS. Also, literature from other countries indicates that the rate of CS was higher among mothers with higher socio- economic status. Further findings also show that mothers with better socio-economic status are more likely to choose CS than their poorer counterparts. This is because mothers belonging to a higher socio-economic class have enough resources to afford the expense of a Caesarean Section.

Place of Residence and Caesarean Section

Variations in culture, environment and geography of a country play a major role in shaping and influencing the CS practice in those areas. This also reflects in the ZDHS (2018) results which shows CS rates as high as 8.8% in urban areas compared to 2.9% in rural areas, a gap of 5.1 %.

An important finding in a study on rural–urban disparities in Caesarean deliveries in sub-Saharan Africa is the unequal distribution of CS across rural and urban areas. According to Ahinkorah et al. (2022), access to Caesarean delivery is limited among rural dwellers and women with lower socio-economic status. Generally, higher rates of Caesarean deliveries are recorded in urban areas and lower rates in rural areas. Recent studies have shown that the higher rate of Caesarean delivery among urban dwellers is largely due to the higher socio-

economic status of women living in urban areas compared to those in rural areas. This is because women in rural communities are mostly poor and thus the least likely to receive adequate healthcare, including access to Caesarean deliveries. These results are consistent with previous studies conducted in South Asia. Under these circumstances, higher rates in urban areas might merely reflect on-demand or provider initiated CS without a medical indication.

Despite the narrowing rural urban gap observed in childbirth medicalization in Vietnam, de Loenzien et al. (2019) argue that study findings confirm the primary assumption that the place of residence had a significant effect on CS practices in Vietnam. Findings show that women who live in urban areas are twice likely to deliver by CS than women who live in rural areas. In a study conducted in Vietnam, the overall CS rate among the women who delivered in healthcare facilities was particularly high at 29.2%. It was almost twice as high in urban areas at 42.4% compared to rural areas at 22.9%. The results confirm that the urban context was particularly favorable to CS. Main reasons linked to higher levels of CS were more prevalent in the urban areas than in the rural areas.

De Loenzien et al. (2019) further argue that key indicators associated with a higher level of CS in urban areas only showed more favorable socioeconomic situations for women who live in urban areas. A larger proportion of women reached a tertiary level of education in urban areas accounting for 39.0% than in rural areas at 19.0%. Additionally in urban areas, the CS rates were much higher among women who had reached a tertiary level of education at 53.7% compared to women who had a primary level of education or less at 31.7%. Also, the proportion of women who live in the richest household quintile reached a much higher level of CS use in urban areas at 48.0% than in rural areas at 7.6%. Consequently, the proportion of

women recurring to CS in urban areas is much higher among women who live in the richest households at 55.3% than among women who live in the poorest households at 21.4%.

2.4 Summary

This chapter reviewed literature on Social determinants of Caesarean Section. It started by reviewing literature on socio-demographic factors associated with Caesarean Section and ended with a review on socio-economic factors associated with Caesarean Section.

CHAPTER THREE

METHODOLOGY

3.1 Overview

Methodology and research design is a guide for successful planning and implementation of any study. This chapter covered the research design that was used for this study. This includes target population, sample size and sampling procedure. It also covered the type of instruments to be used in data collection procedures that was used in data collection and how data was analysed.

3.2 Research Design

This was a cross sectional study because it aimed at determining social determinants of Caesarean Section among child bearing women in Zambia. The study design was cross sectional because the project was conducted based on secondary data from the Zambia Demographic Health Survey (ZDHS, 2018). In this study, there was no manipulation of data because there was no need to introduce a stimulus or an intervention. In this research, the population of interest constituted females in the reproductive age (15-49).

3.3 Study population

The population of interest in this research constituted females in the reproductive age, a nationally representative population based on a cross sectional survey of 13,683 women aged 15-49 in the 2018 Zambia Demographic Health Survey (ZDHS, 2018).

3.4 Sample size

The sample size was a nationally representative sample of 13,683 females aged 15-49 in 13,595 selected households for the 2018 Zambia Demographic Health survey data set. The updated list of enumeration areas (EAs) for the 2010 Population and Housing Census provided the sampling frame for the survey.

3.4.1 Dataset Description

The 2018-19 Zambia Demographic Health survey data set provided demographic estimates of the country based on a sample of 13,683 women aged 15-49 and 12,132 men aged 15-59 (ZDHS, 2018). Three questionnaires were used namely; the Household questionnaire, women's questionnaire and the men's questionnaire. For this study, the women's questionnaire was used, as it concentrated on women of child bearing age (15-49). This questionnaire contains information related to maternal health care, reproductive health history, fertility preferences and knowledge, use, and source of family planning methods.

3.4.2 Operationalization of Variables

Variable Description	**Operational Definition**	**Indicator**	**Scale of Measurement**
Dependent Variable			
Caesarean section	Delivery by a surgical incision into the mother's abdomen and uterus.	1. No 2. Yes	Nominal
Independent Variables			
Educational level	School attendance in	1. No education 2. Primary	Ordinal

	complete years	3. Secondary 4. Higher	
Wealth quintile	Household's cumulative living standards	1. Poorest 2. Poorer 3. Middle 4. Richer 5. Richest	Ordinal
Place of residence	Urban rural residence	1. Urban 2. Rural	Nominal
Mother's age	Age of infant's mother	Ages 15-49 (reproductive interval age group)	Ordinal
Birth order	Order in which an infant is born in their family	Orders 1 -14	Ordinal
Sex of the child	Infant's state of being male or female	1. Male 2. Female	Nominal
Duration of pregnancy	Pregnancy length	5, 7,8, 9 and 10 months	Ordinal
Place of delivery	Place where infant was delivered	1.Respondent's home 2.Other home 3. Government hospital 4.Government health centre 5.Government health post 6.Other public sector 7.Private hospital/clinic 8.Mission hospital or	Nominal

		clinic 9.Other private sector 10.Other	

3.5 Sampling Procedure

The updated list of enumeration areas (EAs) for the 2010 Population and Housing Census provided the sampling frame for the 2018 ZDHS. The survey sample was representative at the national and provincial levels, and for urban and rural areas. The sample was designed to represent the national population age 15-49. The Survey followed a stratified two-stage sample design with the first stage involving selecting sample points consisting of EAs and the second involving systematic sampling of households. To generate statistics that are representative of the country as a whole and the 10 provinces, the number of women surveyed in each province contributed to the size of the total (national) sample in proportion to size of the province. This was achieved by weighting the distribution of the women in the sample such that it resembled the true distribution in the country. Sampling errors for the 2018 ZDHS were calculated for selected variables considered to be of primary interest.

3.6 Instruments for Data Analysis

All data was weighted and STATA version 15.0 was used to analyse the data to account for women who delivered by Caesarean Section compared to those who did not.

3.7 Data Collection Procedure

The study extracted data for women aged 15 - 49 from the 2018 Zambia Demographic and Health Survey data. A checklist was used that took into consideration the target population, age group of target population (women) interviewed, when and where the data was collected, availability of variables relevant to the study, what questions participants were asked, how consistent the data is with other sources and whether the data has been published in any credible research journals.

3.8 Data Analysis

The data gathered using the stated instrument was collected for analysis. All data was weighted and STATA version 15.0 was used to analyse the data to account for women who delivered by Caesarean Section compared to those who did not. Descriptive statistics for both groups and socio-demographic variables were presented as frequency distributions and percentages. Weighting was performed to account for the complex sampling design and allowed us to generalize our findings to all women in Zambia. Weighted percentages of the national population from the original sample were calculated. The association between Caesarean Section deliveries and its determinants were assessed by calculating un-adjusted odds ratios (OR) and adjusted odds ratios (AOR) with 95% confidence intervals (CI). A simple binary logistic regression analysis was carried out to assess the relationship between deliveries by Caesarean Section and the independent variables. In the multivariate logistic regression analysis, the inclusion of independent variables was based on a significance level of p-value < 0.05. The AOR were obtained by simultaneously entering all the independent variables that were found to be significant in the bivariate analyses.

3.9 Trustworthiness

The 2018 Zambia Demographic Health Survey provides good quality data as it adhered to the standard quality control protocols as stipulated by measureDHS. Validity and reliability measures were deployed. To ensure validity, appropriate methods of measurement were chosen, coupled with the use of appropriate sampling methods in selecting the target population. To ensure reliability, research methods were consistently applied and the conditions of the survey standardized.

3.10 Summary

This chapter discussed the research design used which is cross sectional. It also looked at the study population, sample size and the sampling procedure. The instruments for data collection, data collection procedure and how data was analysed were also discussed.

CHAPTER FOUR

PRESENTATION OF FINDINGS

4.1 Overview

This chapter presents findings on analyses of social determinants of Caesarean Section among child bearing women in Zambia. The analysis is based on the objectives as presented in chapter one.

4.2 Socio-demographic characteristics of childbearing women aged 15-49 years

According to table 2, women with 9-month pregnancy duration were the highest at 87.2%, followed by those delivering from government facilities at 78.3%. The least were mothers in the age group 45 - 49 at 2.2%. With place of residence, women in the childbearing age were more in rural areas compared to urban areas at 67.3% and 32.7% respectively. For the wealth index, the percentage of women decreases with each successive index from the poorest to the richest at 26.1% to 14.5% respectively. Furthermore, women of childbearing age who attained primary education were the highest at 50.5% with the lowest at 4.5% for those with higher education.

Table 1: Socio-demographic characteristics of childbearing women

Variables	**No**	**Percentage**
Education Level		
No education	732	9.9
Primary	3715	50.4
Secondary	2594	35.2
Higher	331	4.5
Wealth Index Combined		
Poorest	1921	26.1
Poorer	1697	23
Middle	1488	20.2

Richer	1195	16.2
Richest	1071	14.5
Place of Residence		
Rural	4961	67.3
Urban	2411	32.7
Mothers' Age		
15-19	741	10
20-24	1904	25.8
25-29	1640	22.3
30-34	1373	18.6
35-39	1008	13.7
40-44	547	7.4
45-49	159	2.2
Birth Order		
1st	1813	24.6
2nd	1366	18.5
3rd	1096	14.9
4th	900	12.2
>=5th	2197	29.8
Sex of Child		
Female	3710	50.3
Male	3662	49.7
Duration of Pregnancy		
<9months	534	7.2
9months	6430	87.2
>9months	408	5.5
Place of Delivery		
Home	1044	14.2
Government	5776	78.3
Private	552	7.5

4.3 Chi-square Tests

Results in table 3 show that women with higher education had the highest percentage of CS at 19.03% followed by those in the highest wealth index at 12.7% and those who delivered from private facilities at 10.5%. In addition, women who delivered from home had the lowest percentage of CS at 0%, followed by 2.6% for those in the poorest wealth index.

Furthermore, place of residence, educational level, wealth index, place of delivery, birth order and duration of pregnancy all indicate a P-value of 0.000 (P<0.05), statistically showing a significant relationship of these variables with Caesarean Section.

Table 2:Chi-square Tests

	C-section		
Independent Variable	**No**	**Yes**	**P – Value**
Age	**%**	%	
15-19	93.25	6.75	
20-24	95.17	4.83	
25-29	95.37	4.63	
30-34	94.25	5.75	
35-39	95.24	4.76	
40-44	94.88	5.12	
45-49	96.86	3.14	0.251
Place of Residence			
Urban	91.41	8.59	
Rural	96.55	3.45	<0.001
Educational Level			
No education	95.9	4.1	
Primary	96.61	3.39	
Secondary	93.87	6.13	
Higher	80.97	19.03	<0.001
Wealth Index			
Poorest	97.45	2.55	
Poorer	96.88	3.12	
Middle	95.5	4.5	
Richer	93.89	6.11	
Richest	87.3	12.7	<0.001
Sex of Child			
Male	94.46	5.54	
Female	95.28	4.72	0.108
Place of delivery			
Home	100	0	
Government	94.46	5.54	
Private	89.49	10.51	<0.001

Birth Order			
1st	92.11	7.89	
2nd	93.85	6.15	
3rd	95.62	4.38	
4th	96.67	3.33	
5th	96.68	3.32	<0.001
Duration of pregnancy			
<9months	93.07	6.93	
9months	95.24	4.76	
>9months	91.42	8.58	<0.001

4.4 Unadjusted and adjusted Odds Ratios

Table 4 shows unadjusted and adjusted estimates. Results for unadjusted estimates indicate that women in the richest wealth index are 5.56 times more likely to have CS compared to those in the poorest index. Findings show that women in rural areas are 0.38 times less likely to have delivery by CS as compared to those in urban areas. Regression results also show that women with higher education have 1.09 odds of undergoing CS. This shows that women with higher education are more likely to have CS than those without education. In terms of wealth index, the richest women are 2.74 times more likely to undergo CS compared to the poorest women. The results further show that the odds of women undergoing CS increase from the poorest to the richest index.

Table 3: Unadjusted and adjusted Odds Ratios

Predictor	**odds ratio (95% CI)**	**P-Value**	***adj. odds ratio (95%CI)**	**P-Value**
Mother's Age				
15-19	1(ref)	N/A	1(ref)	N/A
20-24	0.70(0.492, 1.001)	0.051	0.72(0.497, 1.053)	0.091
25-29	0.67(0.495, 0.970)	0.034	0.82(0.525, 1.285)	0.389
30-34	0.84(0.585, 1.217)	0.363	1.31(0.786, 2.178)	0.301

35-39	0.69(0.460, 1.039)	0.076	1.43(0.794, 2.573)	0.233
40-44	0.75(0.463, 1.201)	0.227	1.86(0.959,3.621)	0.066
45-49	0.45(0.176, 1.144)	0.093	1.36(0.468, 3.931)	0.576
Residence				
Urban	1(ref)	N/A	1(ref)	N/A
Rural	0.38(0.308,0.468)	<0.001	0.81(0.595,1.071)	0.132
Education				
no education	1(ref)		1(ref)	N/A
Primary	0.82(0.547,1.233)	0.343	0.59(0.393,0.914)	0.017
Secondary	1.53(1.025,2.277)	0.037	0.61(0.390,0.967)	0.035
Higher	5.50(3.483,8.687	<0.001	1.09(0.621,1.926)	0.756
Wealth Index				
Poorest	1(ref)	N/A	1(ref)	N/A
Poorer	1.23(0.831,1.826)	0.300	1.10(0.737,1.647)	0.637
Middle	1.80(1.238,2.620)	0.002	1.52(1.016,2.281)	0.042
Richer	2.49(1.718,3.597)	<0.001	1.69(1.069,2.686)	0.025
Richest	5.56(3.972,7.775)	<0.001	2.74(1.675,4.476)	<0.001
Sex of a Child				
Male	1(ref)	N/A	1(ref)	N/A
Female	0.84(0.685,1.038)	0.108	0.86(0.698, 1.071)	0.183
Place of Delivery				
Home	1(ref)	N/A	1(ref)	N/A
Government	0.50(0.372,0.671)	<0.001	0.47(0.341,0.637)	<0.001
Private	1	N/A	N/A	N/A
Birth Order				
1st	1(ref)	N/A	1(ref)	N/A
2nd	0.77(0.579,1.012)	0.06	0.76(0.556,1.047)	0.093
3rd	0.53(0.382,0.748)	<0.001	0.47(0.314,0.710)	<0.001
4th	0.40(0.269,0.602)	<0.001	0.32(0.193,0.526)	<0.001
5th+	0.40(0.301,0.536)	<0.001	0.32(0.196,0.539)	<0.001
Duration of Pregnancy				
Less than 9 months	1(ref)	N/A	1(ref)	N/A
9 months	0.67(0.471,0.955)	0.027	0.63(0.434,0.907)	0.013
Greater than 9 months	1.26(0.779,2.039)	0.346	1.39(0.838,2.298)	0.202

4.5 The Best Predictors Model

Table 5 shows the best predictors model. To have the best predictors, only those predictors significant in the unadjusted model are chosen, hence removing mother's age, sex of the child

and duration of pregnancy. The results show that women in the richest wealth index were 3.00 times more likely to undergo CS compared to those in the poorest index. Women with higher education had higher odds of CS than those with no education (AOR = 1.19; 95% CI: 0.688 - 2.071). Also, women delivering from private healthcare facilities were 1 time more likely to undergo CS than those delivering from home. On the other hand, women with 4th birth order were 0.44 times less likely to undergo CS compared to those with the 1st order.

Table 4: The best predictors of Caesarean Section

Predictor	***adj. odds ratio (95%CI)**	**P-Value**
Residence		
Urban	1(ref)	N/A
Rural	0.78(0.584, 1.048)	0.099
Education		
No education	1(ref)	N/A
Primary	0.59(0.385, 0.890)	0.012
Secondary	0.58(0.373, 0.918)	0.020
Higher	1.19(0.688, 2.071)	0.530
Wealth Quintile		
Poorest	1(ref)	N/A
Poorer	1.13(0.755, 1.684)	0.557
Middle	1.58(1.060, 2.369)	0.025
Richer	1.78(1.123, 2.805)	0.014
Richest	3.00(1.850, 4.857)	<0.001
Birth Order		
1st	1(ref)	N/A
2nd	0.78(0.588, 1.044)	0.096
3rd	0.55(0.392, 0.780)	0.001
4th	0.44(0.290, 0.664)	<0.001
5th+	0.56(0.409, 0.767)	<0.001
Place of Delivery		
Home	1(ref)	N/A
Government	0.47(0.346, 0.644)	<0.001
Private	1(omitted)	

4.6 Summary Presentation of Findings according to Objectives

OBJECTIVE	FINDINGS
General Objective	
To determine social determinants of Caesarean Section among child bearing women in Zambia.	level of education, wealth index, place of delivery, type of place of residence and birth order were major determinants of CS.
Specific Objectives	
To establish the socio-demographic factors associated with Caesarean Section among child bearing women in Zambia.	Birth order was the socio-demographic factor associated with Caesarean Section among child bearing women in Zambia.
To identify socio-economic factors associated with Caesarean Section among child bearing women in Zambia.	Level of education, wealth index, place of delivery and type of place of residence were identified as socio-economic factors associated with Caesarean Section among child bearing women in Zambia.

4.7 Summary of the chapter

This chapter presented findings of a study whose main objective was to determine social determinants of Caesarean Section among child bearing women in Zambia. Results showed that level of education, wealth index, place of delivery, type of place of residence and birth order were major determinants of CS.

CHAPTER FIVE

DISCUSSION OF FINDINGS

5.1 Overview

This study determined social determinants of Caesarean Section among child bearing women in Zambia. Therefore, this chapter presents a discussion of findings of the research in relation to the objectives of the study; to establish the socio-demographic factors associated with Caesarean Section among child bearing women in Zambia and to identify socio-economic factors associated with Caesarean Section among child bearing women in Zambia.

5.2 To establish the socio-demographic factors associated with Caesarean Section among child bearing women in Zambia

Study results showed birth order was a significant predictor of CS with a p-value of 0.000 ($P< 0.05$) from the statistical test. According to study results, the percentage of women undergoing CS in the 1^{st}, 2^{nd}, 3^{rd}, 4^{th} and 5^{th} orders were at 7.89%, 6.15%, 4.38%, 3.33% and 3.32% respectively. This means that the percentage of women undergoing CSdecreases from the 1^{st} to the 5^{th} birth order. From regression results, women with birth order 4 were 0.44 times less likely to undergo CS than those with birth order 1.

Equally, a study done by Amjad et al. (2018) argue that women with a child at birth order one had a higher chance of CS. Manyehet al. (2018)show that the odds of having CS delivery reduced significantly with increasing parity. Among women with parities 2, 3 and above, there were reduced odds of 74, 57 and 51% respectively of having CS delivery compared to those with parity 1.

5.3 To identify socio-economic factors associated with Caesarean Section among child bearing women in Zambia

According to study results, there was a significant relationship between level of education and CS among child bearing women in Zambia. The results showed that women with higher education were more likely to undergo delivery by C-section compared to those with no education with the odds ratio of 1.2 and this was statistically significant with a p-value less than 0.001. This is in line with the results obtained from a study that was done by Islam et al. (2022) which revealed that parents' education is a crucial factor that is the reason behind the increased rate of CS. A study in Iran showed that the probability of utilizing CS is higher among educated women than women having lower education. The study further indicated that an increase in maternal education level leads to CS as educated women make their own decision regarding delivery and in general prefer Caesarean Section.

Wealth index was another significant predictor of Caesarean Section. The study revealed that there was a significant relationship between wealth index and CS with a P-value of <0.001 (P< 0.05). Findings show that the odds of undergoing CS for women in the richest wealth index were 3 times more than those in the poorest index.

Similar results were found in a study conducted in Ghana by Manyeh et al. (2018) which found an association between wealth index and CS. Results showed that participants in the richest wealth index were more than two times more likely to undergo CS compared to those in the poorest category. The odds of having CS went up with increasing socioeconomic status.

Study results also revealed a significant relationship between place of delivery and Caesarean Section, a p-value of <0.001 (P<0.05). Results show that the odds of women undergoing CS

in private health facilities were higher by 1compared to those in government health facilities. This means that women in private health facilities were more likely to undergo CS compared to those in public health facilities. Caesarean Section in private facilities were at 11% compared to 6% and 0% in government facilities and at home.

A study done by Sarkar (2020) on prevalence and determinants of the use of caesarean section in the dichotomy of public and private health facilities in West Bengal had similar results. Study results revealed that CS rate is alarmingly high in private hospitals (71%) compared to public hospitals (19%). Nearly 55% of total CS was contributed by private hospitals only.

In addition, results obtained on the type of place of residence showed that women undergoing CS in urban areas were at 9% compared to 3% in rural areas. Also, regression results showed that women in urban areas had higher odds (1.00) of undergoing CS compared to those in rural areas. Further, the Pearson chi-square test p= 0.000 ($P<0.05$) validates the significant relationship between type of place of residence and C-section.

These results are consistent with findings of a study conducted in Vietnam by Loenzien et al. (2019) on magnitude and correlates of Caesarean Section in urban and rural areas. Study findings confirm the primary assumption that the place of residence had a significant effect on CS practices in Vietnam. Findings show that women who live in urban areas were twice likely to deliver by CS than women who live in rural areas. The overall Cs rate among the women who delivered in healthcare facilities was particularly high at 29.2%. It was almost twice as high in urban areas at 42.4% compared to rural areas at 22.9%. The results confirm that the urban context was particularly favorable to CS. Main reasons linked to higher levels of CS were more prevalent in the urban areas than in the rural areas.

However, it is worth noting that there was no association between Caesarean Section and mother's age. This is contrary to several pieces of research that have demonstrated that the chance of CS is higher among older women. It is believed that older mothers are prone to pregnancy complications that may lead to CS. In Pakistan for instance, the rising trend among women of getting married or conceiving at a later age due to orientation towards career, financial and educational goals tend to increase their chances of undergoing caesarean delivery (Amjad et al., 2018).

There is increasing evidence of a gender related phenomenon where the presence of a male fetus may have an adverse effect on the outcome of pregnancy. In women who delivered male babies, CS was higher than for those with female babies (Kibe et al., 2022). A study conducted in Bangladesh revealed that CS was higher among women who delivered a boy child compared to those who delivered a girl at 28.5% and 22.5% respectively (Mia et al., 2019). Although most studies have shown an influence of fetal gender on CS, findings on this study showed opposing results as there was no significant relationship between sex of a child and CS. This was evident from the statistical test which showed a p-value of 0.108 ($P>0.05$).

Contrary to findings of this study, data from England showed that increasing gestational age was associated with a decreased risk of CS. Gestational age at delivery was found to be associated with decreased odds of CS in two of the analyses conducted where all CS were compared with all vaginal deliveries and elective CS compared with attempted vaginal delivery. Similar studies also found that CS rate was highest for very preterm birth and declined to a nadir at 40 weeks of gestation (Singh, Pradeep and Jauhari, 2020). Despite a number of studies showing an association of gestational age on CS, this study did not show

this association. This was evident from the statistical test which showed a p-value of 0.509 (P>0.05).

5.4 Summary

This chapter discussed findings of the study according to objectives. The significant predictors of Caesarean Section which are level of education, wealth index, place of delivery, type of place of residence and birth order were discussed at length.

CHAPTER SIX

CONCLUSION AND RECOMMENDATIONS

6.1 Conclusion

This study explored social determinants of Caesarean Section among child-bearing women in Zambia. After data analysis by use of all appropriate statistical tests; level of education, wealth index, place of delivery, type of place of residence and birth order were found to be significant predictors of Caesarean Section.

Of the major predictors, birth order was established as the socio-demographic factors associated with Caesarean Section among child bearing women in Zambia.

In addition, the study identified level of education, wealth index, place of delivery and type of place of residence as socio-economic factors associated with Caesarean Section among childbearing women in Zambia.

6.2 Recommendations

Though CS rates are below the 10-15% threshold by WHO, these rates keep on increasing, hence the need to put up interventions to lower them. Based on study findings, interventions on private healthcare facilities, healthcare professionals and promotion of non-medical interventions during labor are critical.

Study findings show that CS rates in private healthcare facilities were high, influenced by area of residence, level of education and wealth index. This is because private healthcare

facilities are mostly accessed by women in urban areas that have attained higher education and are in the highest wealth index. In line with government policy on Maternal, Newborn and Child healthcare interventions therefore, there is need to come up with measures on regulating CS especially in private healthcare facilities. Trial of labor (TOL) for women with twin gestations when the first twin is in cephalic presentation, as well as Trial of Labour after Caesarean delivery (TOLAC) should be considered. Study results support the contemporary practice of TOL for twins at term when the first is in cephalic presentation with no other contraindications. In a single-center cohort study of 581 TOL twin deliveries, 81.5% of mothers achieved vaginal birth and the overall incidence of serious perinatal morbidity was low (Ylilehto et al., 2020).A review reported that TOLAC is safe and feasible for most women with a history of CS. In general, TOLAC is potential strategy for decreasing the Caesarean Section rate and successful trials would reduce some important adverse outcomes (Mi et al., 2021).

In addition, increasing women's access to non-medical interventions during labor such as continuous labor and delivery support and External Cephalic Version (ECV) is vital. Continuous support during labour reduces the need for medical interventions, including medicated births and improves both maternal and neonatal outcomes. A review of continuous support for women during childbirth by Bohren et al. found that this practice reduced CS births and neonatal admissions (Lunda, Minnie and Benadé, 2018). Also, ECV is a useful method to reduce the Caesarean Section rate in women with breech presentation. According to Kim (2019), studies have shown that routine use of ECV reduces the CS rate by approximately two-thirds in term pregnancies with breech presentation.

Further, there is need for the Ministry of Health to strengthen adherence of healthcare professionals to clinical practice guidelines combined with audit and feedback as well as mandatory second opinion for Caesarean Section indication. Implementation of clinical practice guidelines combined with mandatory second opinion for CS indication contributes to the reduction of the overall risk for CS. Implementation of clinical practice guidelines combined with audit and feedback also reduces the risk of Caesarean Section (Chen et al., 2018).

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APPENDICES

Appendix 1: Time Line

ACTIVITIES	Apr 2021	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan 2022	Feb 2022	Mar	Apr	May	Jun
Proposal development															
Submission of the proposal at the school of public health															
Submission of proposal to Ethics															
Data analysis and research write up															

Appendix 2: Budget

S/N	**Activities**	**Amount in kwacha**
1	Proposal Development (printing)	K300.00
2	Communication	K200.00
3	Internet	K700.00
4	Ethics	K500.00
5	Data Analysis/ Interpretation	K2000.00
6	Report writing	K400.00
7	Photocopying	K300.00

8	Other	K300.00
	Total	**K 4, 700.00**

Appendix 3: University of Zambia Biomedical Research Committee Approval Letter

UNIVERSITY OF ZAMBIA
BIOMEDICAL RESEARCH ETHICS COMMITTEE
Telephone: +260 977925304 Ridgeway Campus
Telegrams: UNZA, LUSAKA
Telex: UNZALU ZA 44370 Lusaka, Zambia
Fax: + 260-1-250753 E-
mail: unzarec@unza.zm**Federal Assurance No. FWA00000338**
IRB00001131 of IORG0000774

9th March, 2022

Your REF. No. 2494-2022

Ms. Faith L. Nzumba,
University of Zambia,
Graduate School of
Business, P.O Box
32379, **Lusaka.**

Dear Ms. Nzumba,

RE: SOCIAL DETERMINANTS OF CAESAREAN SECTION AMONG CHILD BEARING WOMEN IN ZAMBIA (REF. NO. 2494-2022)

The above-mentioned research proposal was presented to the Biomedical Research Ethics Committee on 7th March, 2022. The proposal is **approved**. The approval is based on the following documents that were submitted for review:

a) Study proposal
b) Questionnaires
c) Participant Consent Form

APPROVAL NUMBER : REF. 2494-2022

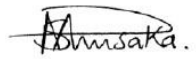
This number should be used on all correspondence, consent forms and documents as appropriate.

- **APPROVAL DATE : 9th March 2022**
- **TYPE OF APPROVAL : Standard**
- **EXPIRATION DATE OF APPROVAL : 8th March 2023**

After this date, this project may only continue upon renewal. For purposes of renewal, a progress report on a standard form obtainable from the UNZABREC Offices should be submitted one month before the expiration date for continuing review.

- **SERIOUS ADVERSE EVENT REPORTING**: All SAEs and any other serious challenges/problems having to do with participant welfare, participant safety and study integrity must be reported to UNZABREC within 3 working days using standard forms obtainable from UNZABREC.
- **MODIFICATIONS**: Prior UNZABREC approval using standard forms obtainable from the UNZABREC Offices is required before implementing any changes in the Protocol (including changes in the consent documents).
- **TERMINATION OF STUDY**: On termination of a study, a report has to be submitted to the UNZABREC using standard forms obtainable from the UNZABREC Offices.
- **QUESTIONS**: Please contact the UNZABREC on Telephone No. +260977925304 or by e-mail on unzarec@unza.zm.
- **OTHER**: Please be reminded to send in copies of your research findings/results for our records. You are also required to submit electronic copies of your publications in peer-reviewed journals that may emanate from this study. Use the online portal: unza.rhinno.net for further submissions.

Yours sincerely,



SodyMweetwaMunsaka, BSc., MSc., PhD
CHAIRPERSON
Tel: +260977925304

E-mail: s.munsaka@unza.zm

Appendix 4: National Health Research Authority -Certificate of Registration as Health Researcher

MINISTRY OF HEALTH

NATIONAL HEALTH RESEARCH AUTHORITY

The Health Research Act

(Act No. 2 of 2013)

CERTIFICATE OF REGISTRATION

THIS IS TO CERTIFY THAT

Nzumba Faith L

has been registered as a Health Researcher

Dated this 19th Day of September 2022

Registration Number NHRAR-R-1146/19/09/2022

DIRECTOR

PROF. GODFREY BIEMBA