FACTORS AFFECTING THE INCREASED RATES OF CAESAREAN SECTION IN BANGLADESH

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Bangladesh

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A thesis submitted in partial fulfilment of the requirement for the degree of Master of Public Health

by

Kaniz Fateema Rukhsana

Bangladesh

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LIST OF ABBREVIATIONS

BBS Bangladesh Bureau of Statistics

BDHS Bangladesh Demographic and Health Survey

EmOC Emergency Obstetric Care

FIGO International Federation of Gynaecology and Obstetrics

FY Fiscal Year

GDP Gross Domestic Product

GHWA Global Health Workforce Alliance

GNI Gross National Income

MNBU Midwife Led Normal Birth Unit

MoHFW Ministry of Health and Family Welfare

NGO Non-Governmental Organisation

SBA Skilled Birth Attendant

UN United Nations

US United States

USD United States Dollar

UNAIDS United Nations Assistance for International Developments

UNDP United Nations Population Division

UNFPA United Nations Fund for Population Activities

UNICEF United Nations Children's Fund

VBAC Vaginal Birth After Caesarean

VU Vrije Universiteit

WHO World Health Organisation

GLOSSARY

Caesarean Section: A caesarean section is a surgical procedure in which incisions are made through a woman's abdomen and uterus to deliver her baby. It is also called C-section, are performed whenever abnormal conditions complicate labour and vaginal delivery, threatening the life or health of the mother or the baby (Gibbons et al., 2010).

Elective caesarean section: It is a procedure which is scheduled in advance rather than performed because of an unscheduled emergency. Elective caesarean sections may be performed on the basis of an obstetrical or medical indication, or because of a non-indicated maternal request (Le Thi Nhu, 2015).

Emergency caesarean section: It is a procedure which is performed in an obstetric emergency, where complications of pregnancy onset suddenly during the process of labour, and immediate action is required to prevent the deaths of mother, infant or both (Le Thi Nhu, 2015)

Caesarean delivery on maternal request: It is defined as a primary pre-labour caesarean delivery on maternal request in the absence of any medical or obstetric indication (Ghosh and James, 2013).

Maternal morbidity: It refers to the physical and mental ill health or disability of a woman, directly related to pregnancy or childbirth (Koblinsky et al., 2012).

Fear of childbirth: It refers to feelings and thoughts of pregnant women about facing childbirth including labour pain, giving birth and traumas (Le Thi Nhu, 2015).

ABSTRACT

Background: Cesarean delivery rate in Bangladesh has been increased rapidly, from 4% in 2004 to 23% in 2014. Caesarean sections (CS) cause severe complications and bring about bad consequences in maternal and child health. However, the factors responsible for the increased CS rates in Bangladesh and how the decision of CSs are made is not well understood.

Objective of study: To identify the factors associated with the increased CS rates in Bangladesh and to explore how the decisions of CSs are made.

Methodology: The study is based on literature review using peer reviewed articles and other published/unpublished literatures. The study used the framework (adopted from Sancheeta Ghosh) to explore the factors associated with the high CS rate.

Findings: A combination of private profit making tendency and demand from women with higher socio-economic status, particularly in urban areas contributed to the recent increased caesarean rate in Bangladesh. However, supplier induced demand and profit motive are playing the leading role in the decision of CS.

Conclusions: Health system of Bangladesh is poorly regulated and there is lack of evidence-based guidelines for decision making about caesarean delivery that are contributing to the high CS rate. The decision to perform a CS must be chosen and monitor carefully and should not be profit oriented.

Recommendations: Awareness raising about the negative consequences of CSs, doctor's commitment to reduce the CS rate, government's initiative to policy intervention and strict monitoring of the private health facilities might help to control the high CS rates.

Key words: Caesarean section, medical indication, maternal complication, women's preference, health facilities in Bangladesh

Word count: 12,487

INTRODUCTION AND ORGANISATION OF THESIS

In clinical practice, caesarean surgery was introduced as a lifesaving intervention both for the mother and the new born (Gibbons et al., 2010). The percentage of caesarean births can be considered an indicator of women's access to skilled care in complicated cases (BDHS, 2014). Less than 5 percent of caesarean section (CS) in any region indicates the low availability of antenatal and maternal care facilities and that results in delivery complications and maternal mortality (Nazir, 2015). At the same time more than 10-15 percent deliveries by CS are not justifiable in any country (WHO, 1985). CS rates above a certain limit have no additional benefit for the mother or the baby, and extensive use of caesarean surgery brings about negative consequences on mother and child health (Gibbons et al., 2010, WHO, 2015). Moreover, CS in first pregnancy might impart an additional threat of adverse outcome in second pregnancy, because mother with previous CS is at risk of hysterectomy and placenta accreta, placenta praevia and very preterm birth (Perveen, 2011). Therefore, caesarean surgery should only be undertaken when it becomes medically indispensable (WHO, 2015).

Apart from the clinical indications for caesarean section, many women prefer delivery by caesarean section for personal reasons (e.g. avoiding pain in vaginal delivery). Profit making tendency of private clinics and influence of physicians for economic gain and time management also encourage caesarean delivery (Lei et al., 2003, Leone et al., 2008). In addition, nonclinical factors such as socio-economic and community factors are also becoming increasingly important in raising up the CS rates (Leone et al., 2008). Physicians role in the context of high CS rates are always questionable as they have the ultimate authority to take decision on mode of delivery, especially in the context of Bangladesh where shared decision making is not used in most cases. For whatever reason CS is done, the unnecessary intervention always bring more harm than good to a woman (Nazir, 2015). The unnecessary caesarean surgery also raises a variety of concerns including the progressive shift of scarce healthcare resources to nonessential medical interventions in resource-poor settings and further health risks to mothers and newborns associated with the CS (Leone et al., 2008, Aminu et al., 2014). Therefore, to explore the reasons behind the rising trends in CS rates in a resource poor setting like Bangladesh is very important.

As a health official, I got to learn that unnecessary CS has been raising in Bangladesh and contributing to severe complications and maternal deaths. Personally I had to undergo CS during giving birth of my daughter; I was never convinced that I needed to do so. Similarly, as part of my work in public health, I have encountered many instances of women, families, doctors, midwives facing this question and discussing this subject. Therefore, a variety of reasons have led to me being interested in carrying out this study and to explore the issue.

This thesis is a literature review which identifies and explores factors that affect the increased rates of CS and how the decisions of institutional delivery and undergoing caesarean surgery are made in Bangladesh. Factors are studied based on an adapted conceptual framework from Ghosh (Ghosh, 2010). The socio-economic, cultural, medical and institutional factors as guided by the adapted framework were studied. The thesis consists of five chapters. Chapter one presents brief description of relevant demography, socio-economic status and health system of Bangladesh. Chapter two details the problem, presents a justification for the study, articulates the objectives, and elaborates the methods used for the study. Chapter three identifies and explores the factors that affect the increased rates of CS in Bangladesh, how the decisions of institutional delivery and undergoing caesarean surgery are made, and the evidence-based strategies for promoting rational use of caesarean surgery. In chapter four findings from chapter three are discussed. Finally in chapter five conclusions and recommendations are proposed based on the literature review.

The outcome of this review will contribute to the available knowledge on CS practice in Bangladesh. The study will benefit relevant policy makers and stakeholders in dealing with the increased CS in Bangladesh. It will also create awareness among the would be mothers not to choose caesarean delivery unless it is medically indispensable and not to accept physicians' decisions to do a CS without asking critical questions about the indication.

CHAPTER 1: BACKGROUND INFORMATION OF BANGLADESH

1.1 Geography and economy

Bangladesh is located in South Asia covering an area of 147,570 km^2. It is mostly surrounded by India, except for a short southeastern part with Myanmar and a southern coastline on the Bay of Bengal (Fig. 1). Most of Bangladesh is low, flat land that formed by alluvial soil. The country has an extensive network of rivers providing socioeconomic base of the nation (BDHS, 2014). Bangladesh has a sub-tropical climate with a hot summer season from March to June; a monsoon season from July to early October; and a dry winter from November to February. The fertile delta is subject to frequent natural disasters, such as floods, cyclones, and droughts (BDHS, 2014).

The administrative divisions of the country consist of 7 divisions (Fig. 1) and 64 districts. Muslims make up almost 90% of the population, Hindus account for about 9%, and the remaining 1 % are other religions (BBS, 2015).

Bangladesh has a nominal GDP of $223.9 billion, with a GDP growth rate of 6.5% per annum. Its gross national income (GNI) per capita is US$1,314 in FY 2014-2015 (BBS, 2015).

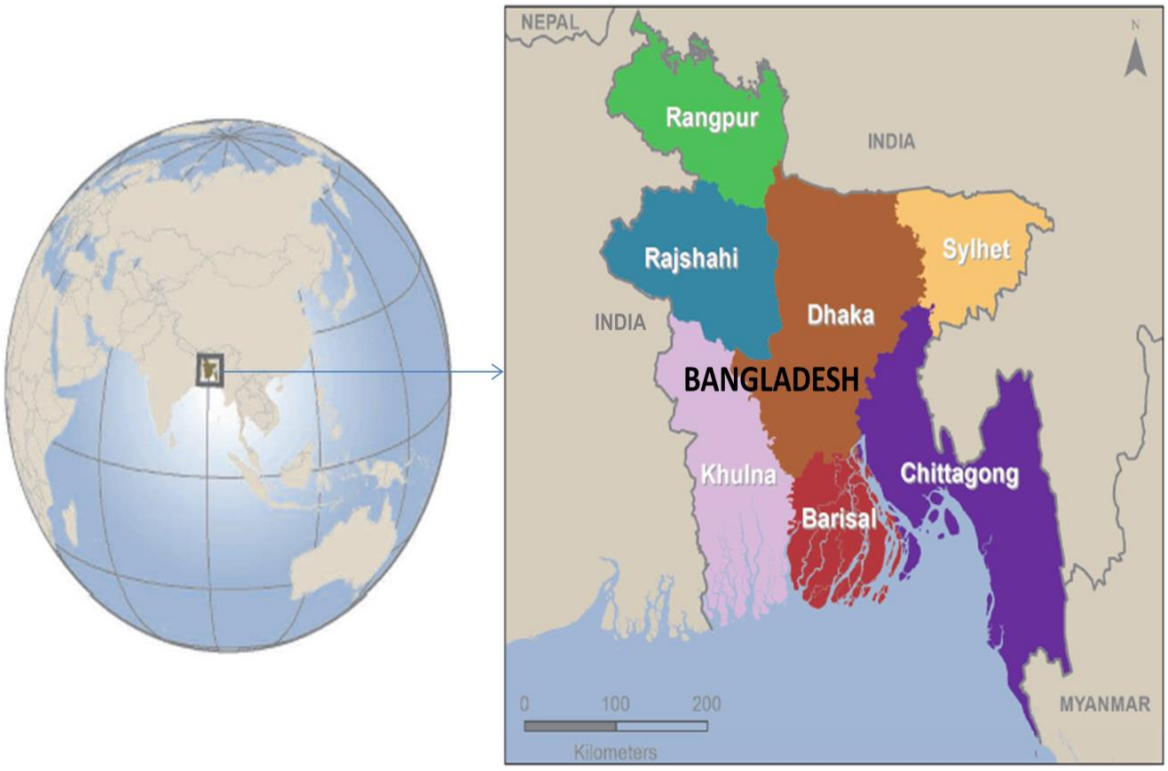

Fig. 1. Map shows location of Bangladesh in world map and divisional headquarters of Bangladesh (source: BDHS, 2014)

1.2 Population

Bangladesh is one of the most densely populated country in the world. The total population of the country is about 158 million, with a population density of 1,070 persons per km^2 (BBS, 2015). The growth rate between 2001 and 2011 censuses was 1.37 percent. The life expectancy at birth in Bangladesh is 71 years (women 72 years, men 69 years) (BDHS, 2014).

1.3 Health System and financing

The Ministry of Health and Family Welfare (MOHFW), Bangladesh has an extensive health service network. The service delivery structure follows the country's administrative pattern, starting from the national to the district, upazila (sub-district) and union (ward) levels. It provides services such as outdoor, indoor, and emergency care (Ahmed et al., 2015). The chart below (Fig. 2) summarizes the organization of the MOHFW service delivery structure.

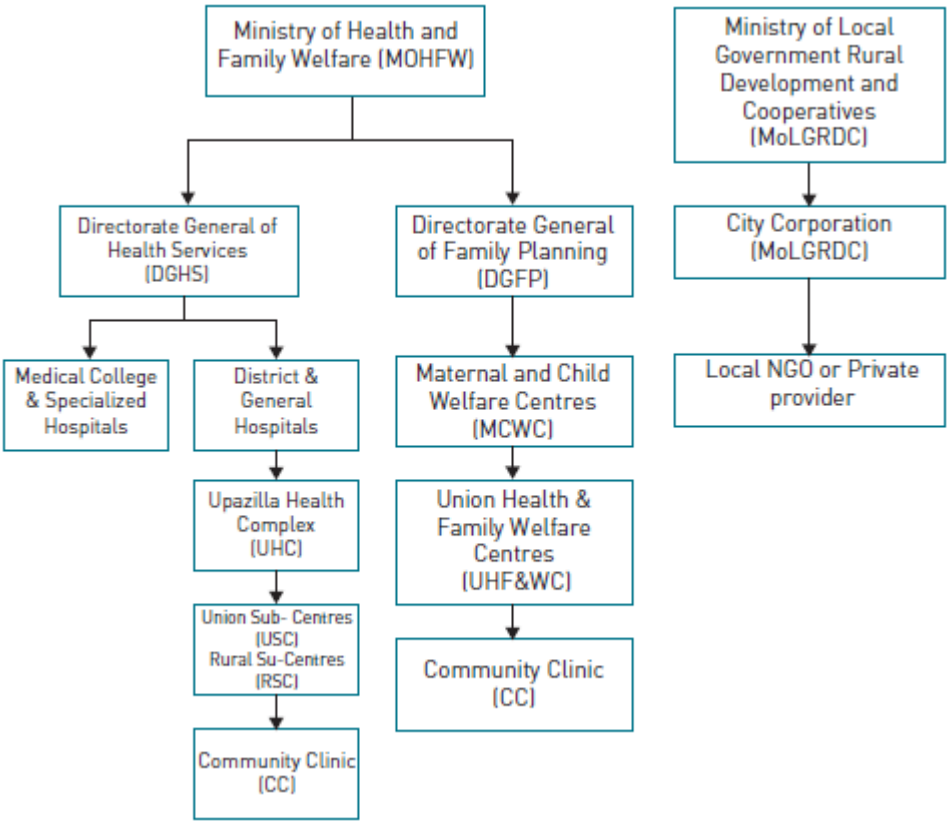

Fig. 2. Organizational structure of health service delivery in Bangladesh, Source: Ahmed et al. (2015).

The health system in Bangladesh is characterized by critical shortage of skilled health workers, doctors and nurses. The health work force are concentrated disproportionately in urban areas, while rural facilities are overburdened, understaffed and insufficiently equipped (Ahmed et al., 2015). All major private and public health institutions are located in the capital and big cities which shows highly centralized distribution. Most of caesarean deliveries in Bangladesh are conducted in these urban health facilities, particularly in private clinics. Health workers are also concentrated in urban areas (Fig. 3), although 70% of the population lives in rural areas (GHWA, 2008). While, unqualified and semi-qualified doctors and community health workers are concentrated in rural areas. The recent report of WHO suggests that there should be 3 doctors and 3 nurses per 10000 population. However, in reality, health facilities and personnel are planned on geographical and administrative considerations rather than actual size of population of a given area (Ahmed et al., 2015).

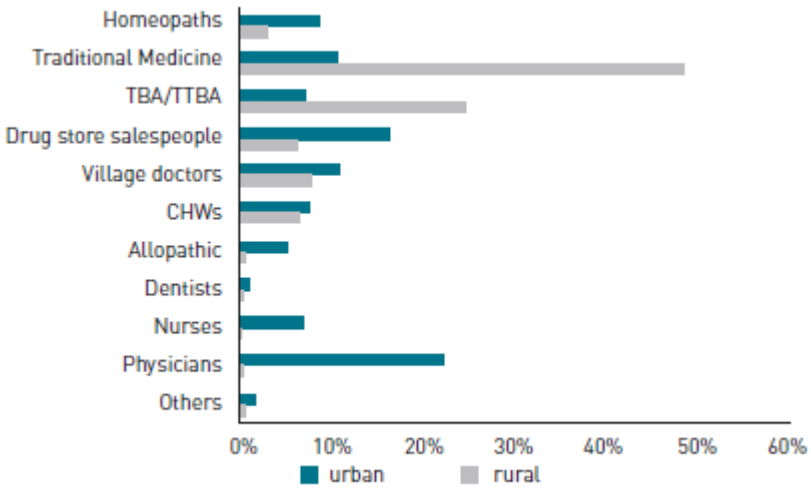

Fig. 3. Rural-urban distribution of healthcare providers (per 10,000 populations in 2012, Source: Ahmed et al. (2015).

The size of the professional health workforce is consistently increasing over time, but not according to requirements (Fig. 4). At present there are 64,434 registered doctors, 6,034 registered dentists, 30,516 registered nurses, and 27,000 nurse-midwives (MOHFW, 2013). Attrition occurs from professional mobility and brain drain, failure of rural retention, death and retirement. Leakage occurs from change of profession, and migration (Ahmed et al., 2015). Fig. 5 presents the density (per 10,000 population) of different types of health-care providers in Bangladesh. There are about eight qualified doctors, nurses, dentists per 10,000 population, which is only 5% of the country's currently active health service providers. The current doctor-nurse ratio is 0.4.

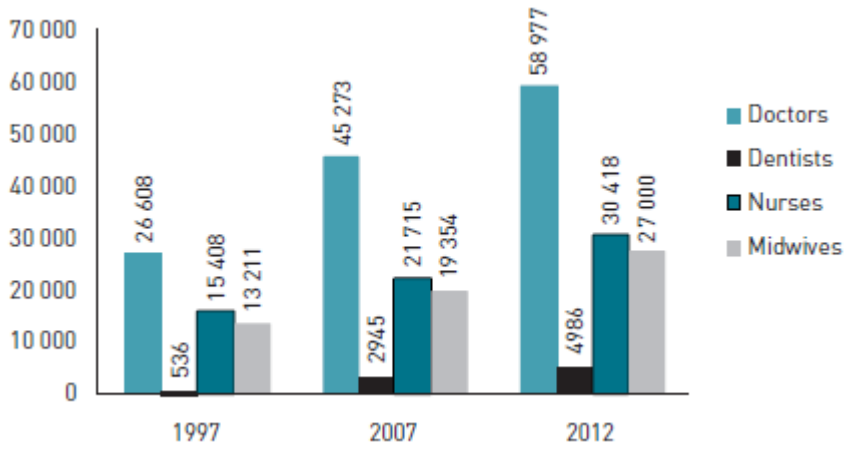

Fig. 4. Bangladesh Medical and Dental Council registered health workforce in 1997, 2007 and 2012. Source: Ahmed et al. (2015).

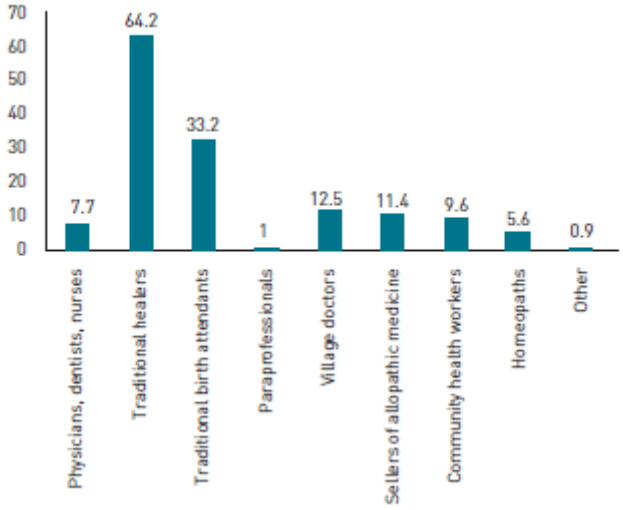

Fig. 5. Density of health-care providers per 10,000 populations in Bangladesh in 2012, Source: Ahmed et al. (2015).

The health system financing in Bangladesh primarily comes from three sources: the public exchequer, out-of-pocket payments by the users, and from the development partners (Annex 6.1 for details). Private insurance and user fees comprise a small proportion of the total funding (Islam et al., 2015). Bangladesh spends only about 3.7% in 2011 (US$ 2.3 billion) of its GDP on health (Table 1), or US$ 16.20 per person per year, of which 64% comes from out-of-pocket payments (MOHFW, 2013). WHO estimates that currently Bangladesh spends US$ 26.60 per capita in total. Public funds are the main prepayment appliance for health risk-pooling that constitute about 26% of total health expenditure (Ahmed et al., 2015).

Budget analysis shows that the national budget has increased from 14.5% of total GDP in FY 2008-09 to 18.4% of GDP in FY 2012-13. However, the health sector budget has declined from 5.71% of the national budget in FY 2008-09 to 4.87% in FY 2012-13 (Islam et al., 2015). On the other hand, health sector financial allocation remain the same, 0.9% of the GDP over the last three (2010-11 to 2012-13) fiscal years (Islam et al., 2015).

Table 1. Trends in health expenditure in Bangladesh, 1997–2011, Source: Ahmed et al. (2015).

	National reports					WHO estimates			
	1997	2000	2003	2005	2007	2008	2009	2010	2011
Total Health Expenditure in PPP$ per capita	20	24	30	37	46	52	58	61	67
Total Health Expenditure in US$ per capita	9.2	10.1	115	13.7	16.2	19.4	22.4	24.8	26.5
Total Health Expenditure as % of GDP	2.7%	2.8%	3.0%	3.2%	3.4%	3.5%	3.7%	3.7%	3.7%
Mean annual growth rate in THE		10%	8%	15%	16%	-	-	-	-
Mean annual growth rate in GDP		8%	10%	11%	14%	-	-	-	-
Public expenditure on health as % of THE	36%	31%	28%	26%	26%	36%	37%	37%	37%
Public expenditure on health as % of GDP	1%	1%	1%	1%	1%	1%	1%	1%	1%
OOP as % of total health expenditure	57%	59%	61%	64%	64%	62%	61%	61%	61%
NGO expenditure as % of THE	1%	2%	2%	2%	1%	-	-	-	-
External assistance to NGOs as % of THE	5%	7%	9%	8%	8%	-	-	-	-
Other private expenditure as % of THE	1%	1%	1%	1%	1%	-	-	-	-

1.4 Health Situation

Total fertility rate in Bangladesh is 2.3 births per woman with an average of 2.0 in urban areas and 2.4 in rural areas (BDHS, 2014). Childbearing begins early in Bangladesh, with almost half of the women give birth by age 18 and nearly 70% give birth by age 20. Maternal mortality ratio was 176 per 100,000 live births and infant mortality rate of 38 per 1000 live births in 2013. Sixty-two percent of married women use some method of contraception (BDHS, 2014).

Sixty-four percent of new mothers received antenatal care from a medically trained provider in 2014. In case of pregnant women, thirty-one percent have had four or more antenatal care visits during the course of

pregnancy in 2014. Forty-two percent of births in the past three years were assisted by a medically trained provider. Due to the increase in deliveries at medical facilities, since 2004 the percentage of births attended by a skilled birth attendant (SBA) has increased by 2.6 times. The country's aim is to attain 50% of all deliveries made by a SBA. Thirty-seven percent of births in the past three years were delivered in a health facility (BDHS, 2014).

Twenty-three percent of all deliveries were carried out by CS in 2014. Among all births delivered in a health facility, 61 percent were caesarean births (BDHS, 2014). In 2014, 15% of deliveries among women in the lowest wealth quintile carried out in a health facility, in case of highest wealth quintile the coverage is about 70% (BDHS, 2014).

CHAPTER 2: PROBLEM STATEMENT, JUSTIFICATION, OBJECTIVES AND METHODOLOGY

2.1 Problem statement

Surgical interventions during deliveries are usually made for the safety of mother and the child when complications and obstetric risk are anticipated (Kamal, 2013). Caesarean sections (CS) are effective in saving maternal and infant lives, only when they are medically justified. There is no benefit of caesarean delivery for mothers or infants who do not require that (WHO, 2015). Extensive caesarean surgeries bring about bad consequences in maternal and child health (Gibbons et al., 2010). Moreover, CS can cause short and long term risk which can be extended for many years past the surgery and can be harmful for both the mother and child (WHO, 2015). It can even cause maternal death (Leone et al., 2008).

However, in recent years, caesarean deliveries have become increasingly common in almost all countries (WHO, 2015). Some recent studies have revealed that there has been considerable increase in the rates of birth by caesarean section, especially in urban areas of low income countries (Stanton and Holtz, 2006, Neuman et al., 2014, Leone et al., 2008). In a resource poor setting like Bangladesh, unnecessary CS have two main implications. Firstly it puts pressure on the limited facilities and scarce financial and human resources. Secondly as surgery is not safe, it causes increased risk of hysterectomy and other severe complications. It also has a high physical and mental cost on women undergo the procedure (Nazir, 2015). All women undergoing CSs, either indicated or elective, poses the risk of variety of complications. Especially, in settings with high risks for adverse events and substantial negative consequences for future pregnancies, it must be the utmost priority to prevent unnecessary CSs (Heemelaar et al., 2016).

However, in recent years, the percentage of births delivered by caesarean section has increased rapidly in Bangladesh (Fig. 6), from 4 % in 2004, to 23 % in 2014 (BDHS, 2014). The factors associated with the preferences of unnecessary caesarean surgery are not the same among countries, it varies from country to country (Lei et al., 2003). Very few studies have systematically examined the factors associated with the increased CS rates in developing countries (Leone et al., 2008); this is so for Bangladesh too. Insufficient knowledge is available about the factors associated with the increased CS rates in Bangladesh. One study was conducted by Kamal (2013) based on 2007 BDHS data and at that time CS rate was relatively low (7%) in Bangladesh in compare with low income countries. Another study conducted by Anwar et al. (2008) in a sub-district of Chandpur, Bangladesh in 2008. They found the CS rate was within the WHO range of 5-15%. But the recent increased CS rate (23% in 2014) is a serious concern for Bangladesh.

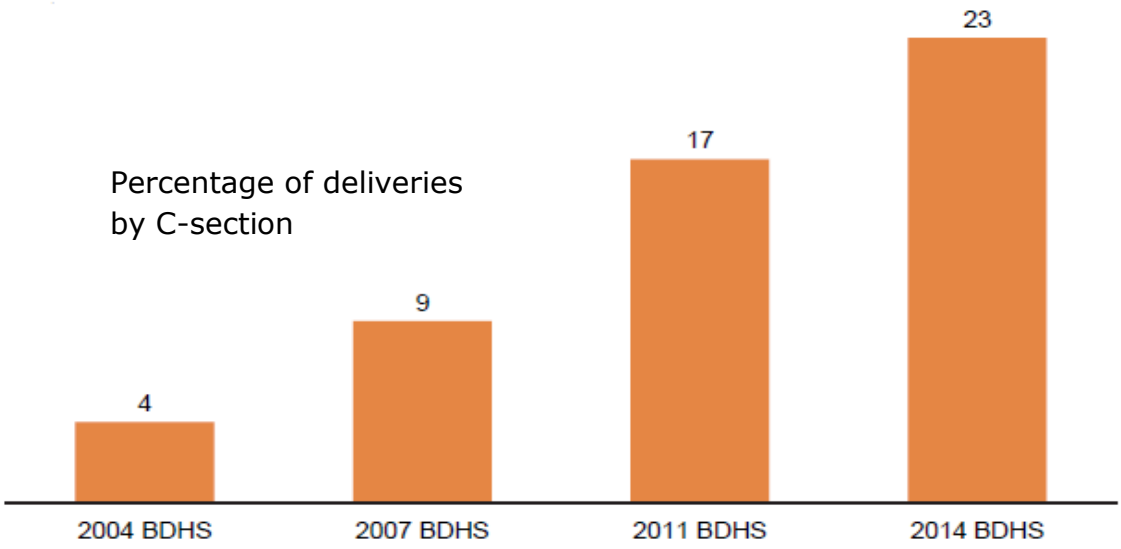

Fig. 6. Trend in births delivered by CS in Bangladesh during 2004-2014 (source: BDHS, 2014)

2.2 Justification

In Bangladesh, many women are undergoing unnecessary CSs which poses their health at risk and burdens the health system. It also reduces the finances to invest in increasing accessibility of the health services and necessary CS for women who are poor and those who are hard to reach. However, the factors responsible for the recent increased CS rate in Bangladesh are not well understood. It is also not clear whether the high CS rates are influenced by institutional, individual or family decisions. It is necessary to investigate the indications for CS to understand whether these costly surgeries are done to save lives or for economic gain of health institutions (Anwar et al., 2008).

Therefore, this review aims to identify the factors (socio-economic, cultural, medical and institutional) associated with the increased rates of birth by caesarean section in Bangladesh and to explore the factors influencing the decision of performing the surgery.

2.3 Objectives

2.3.1 General objective: To identify the factors that influence the increased rates of caesarean deliveries in Bangladesh and to recommend measures could be taken to prevent unnecessary caesarean sections.

2.3.2 Specific objectives:

1. To identify the factors associated with the increased rates of caesarean section in Bangladesh
2. To explore how the decisions of institutional delivery and undergoing caesarean surgery are made in Bangladesh.
3. To review evidence on strategies for promoting rational use of caesarean surgery in order to make a recommendation for the policy makers to prevent unnecessary caesarean sections in Bangladesh.

2.4 Materials and methods

2.4.1 Search strategy and data

The study is based on literature review. Data from related published and unpublished literature was used for this study. Google search engine was used to find various websites including websites of WHO, UNAIDS, UNFPA, Ministry of Health, Bangladesh. Data and information in the form of reports, books, policy documents and guidelines were collected from websites of these institutes. Recent Bangladesh Demographic and Health Survey (BDHS), 2014 report has also been used.

For published articles in peer reviewed journals Google Scholar, PubMed and VU e-Library were used. The articles were further screened by reading the abstracts; those were not relevant with the study were left out. Only literature which has data or information on caesarean deliveries was used. Literature that had information on only maternal care was excluded. Articles that only present abstracts without access to full text versions were also not used. Only literature presented in English was used. Years covered in the data search were between 2004 and 2016 with the exception are two articles, Lei et al. (2003) and WHO (1985). They were included since the articles contains very important background information for the topic.

The data search and selection of articles was done in multiple stages and based on each objective and research questions being answered. Databases and websites were searched based on the search terms for each specific objective including cross cutting issues. The selected articles

were reviewed thoroughly. Reference lists of relevant papers were also checked for further search for related papers.

For background information and problem statement, information and articles were searched through Google, PubMed and various institutions website as mentioned above. The search words were used including "C-section in Bangladesh", "C-section prevalence in Bangladesh", " C-section and health facilities in Bangladesh", "Economic access to C-section in Bangladesh", "health financing and C-section in Bangladesh".

For specific objective one, peer reviewed journals were systematically searched through Google scholar, PubMed, Science Direct and VU data bases. The criteria for selection were topic-specific studies conducted in Bangladesh. Articles used were searched using different combinations of the following keywords: "Determinants of C-section in Bangladesh" Socio-economic factors and C-section in Bangladesh", culture and belief and C-section", "medical indication of C-section", "C-section complication and risk".

The initial findings were very few and did not include medical and institutional factors of C-section in Bangladesh. Then the search was broadened to include "C-section and health facilities of Bangladesh "economic gain and C-section in Bangladesh", "Doctors behaviour in C-section in Bangladesh". This time required number of articles were available was reviewed subsequently.

For specific objective two, systematic overview of peer-reviewed articles and literature from related websites were used. Peer-reviewed data search were done in PubMed and Google scholar. Keywords used include different combination of "decision making and C-section", "role of women and mode of delivery", "role of family members on C-section in Bangladesh", C-section and regulation in Bangladesh" "recommendation and C-section", "measure against C-section".

Literature and articles published on neighbouring and different countries with similar socio-economic and cultural settings were also used for developing background and discussion section of this study. At the end recommendations are made based on a review of evidence on strategies for promoting rational use of caesarean surgeries, and for checking/preventing unnecessary caesarean surgeries.

2.4.2 Conceptual framework:

According to Nazir (2015), there are three main possible factors that could influence the increased CS rates in the low income countries: (i) medical condition or clinical reasons behind doctor's decision of conducting CS (ii) non-medical reasons such as economic and socio-cultural status of the patient, and (iii) the institutional concerns in carrying out the caesarean surgeries. The medical reasons include previous CS, presumed foetal distress, mal-presentation, failure to progress in labour, hypertensive disorders, near birth complications are main indication of performing CS (Nazir, 2015). The non-medical reasons are the supply and demand side possibilities. Supply side factors include profit making tendencies, particularly among the for-profit private institutions and doctors behaviour. Doctors recommend CS for their own interest, these may include economic gains, time management, risk minimizing, or for surgical practice. Demand side factors include socio-economic status of the patients, culture and belief. Many women demand for caesarean delivery because of fear of long labour and pain in vaginal delivery (Lei et al., 2003, Nazir, 2015).

Considering the background information the following analytical framework (Fig. 7) has been adapted from Ghosh (2010) to explore the factors associated with the recent increase in CS rate in Bangladesh. Ghosh's framework has taken into consideration socio-economic, institutional, risk and clinical factors leading to the conduct of caesarean deliveries in India with similar socio-cultural setting. All aspects of Ghosh's framework have been adopted except the gender issues and some risk factors including age of mothers, size of child at birth and parity. These factors might be related with caesarean delivery, but the objective of this study is to explore only those factors that are responsible for the recent rise in CS rates in Bangladesh, and not to identify all the factors that has association with CS. The original framework of Ghosh (2010) is illustrated in Annex 7.2.

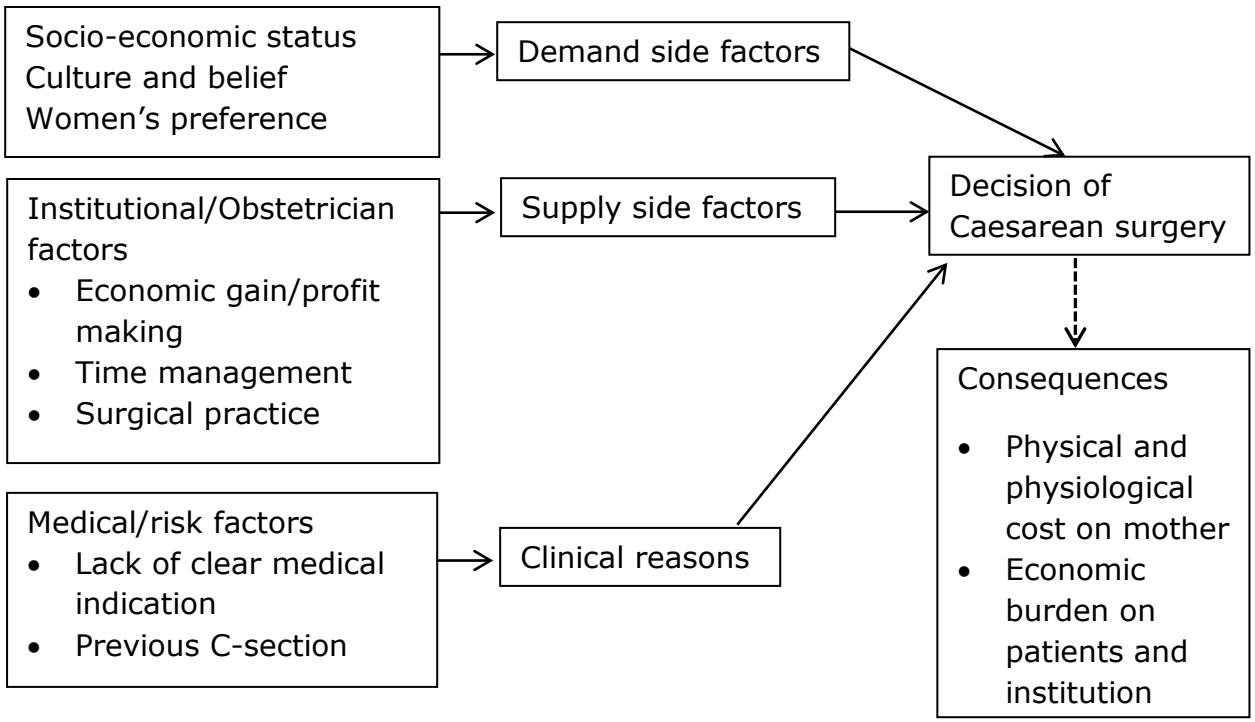

Fig. 7. Conceptual framework of factors associated with caesarean deliveries in Bangladesh (Source: Ghosh, 2010).

2.4.3 Limitations of the study

Criteria based hospital auditing is useful to investigate the indications of CS in detail (Heemelaar et al., 2016). However, conducting an audit is very difficult with the limited time and resource available. Moreover, this study's focus is to explore the institutional and socio-economic factors that influence caesarean deliveries. Literature review was performed to identify the factors associated with the increased CS rates and to explore how the decision of undergoing CS is made. Only peer-reviewed article published in English and available through VU library were used in this study. Therefore, related articles information presented in other languages and that were not accessed through VU are missing in this review. Not many studies on this topic have been conducted in Bangladesh. Some of the studies have been conducted in specific regions of Bangladesh. The limited number of studies and differing methodologies might have some influence of the results. It is necessary to mention that some studies from Bangladesh were excluded due to language barrier.

The above limitations were addressed by using different data sources with similar contexts during data analysis and triangulation. Since there was limited nationwide data, multiple studies conducted across the country were used in presenting evidence from similar studies conducted within Bangladesh or the neighbouring countries with similar socio-economic settings.

CHAPTER 3: STUDY FINDINGS

This chapter is divided into three broad sections. The first section explains for different factors influence on caesarean deliveries in Bangladesh. The second section is about the decision-making process of CS and the third and final section explores the evidence-based strategies that have been proved effective in promoting rational use of CS.

3.1 Factors that influence caesarean surgery

This section is divided into three broad sub-sections in accordance with the framework. The first sub-section explains how demand side factors are influencing on the high rate of CS. This is followed by a sub-section which examines the association of supply side factors with the increased CS rates. The third sub-section is about the influence of medical factors on CSs. Each sub-section begins with a presentation of evidence on the global situation and trends on the particular factor; this is followed by an articulation of the situation on that factor in the context of Bangladesh. Where appropriate the findings are compared and contrasted to highlight the peculiarities of the Bangladeshi context. Throughout this process, drawing on different bodies of evidence an attempt is made to explain how and why the particular factor affects the CS rates.

3.1.1 Demand side factors

3.1.1.1 Socio-economic status

Caesarean section rates are increasing worldwide (Betrán et al., 2007, Leone et al., 2008). In most of the countries, demand side factors, particularly higher socio-economic status have a strong association with the increased CS rates (Hou et al., 2014). In Bangladesh, 23% of live births were delivered by CS in 2014 (BDHS, 2014). Table 2 presents the status of CS in Bangladesh. Socio-economic variables, such as living place, economic condition and educational level have significant influence on the increased rates of caesarean delivery in Bangladesh (Karim, 2012).

a)Place of residence

Evidence shows that there has been considerable increase in the rates of birth by CS, especially in urban areas of the low and middle income countries (Leone et al., 2008). Betrán et al. (2007) conducted a study in 26 South Asian and sub-Saharan African countries and found that CS rates were highest among the urban rich, and lowest among the rural population. Hou et al. (2014) also found place of residence as an

important factor in China and Brazil. They found urban women to have a higher CS rate compared to rural women of same educational status, possibly due to the availability of technologically advance obstetrical services in urban areas.

Similarly, in Bangladesh the CS rate in urban women were more than double compare to rural women (Table 2), 38% in urban areas and 18% in rural areas (BDHS, 2014). This is also in agreement with the findings of Kamal (2013), who indicated that urban women in Bangladesh, compared to their rural counterpart are more likely to deliver through CS due to easy access of health facilities and higher socio-economic status of the urban population. Anwar et al. (2008) also found that use of CS was significantly higher among mothers from rich urban areas of Bangladesh. The availability of modern health technology and increased access to, and use of antenatal care services in rich urban areas partly explain the higher rate of CSs in urban areas. Hospitals in urban areas are better equipped and have more qualified staff than those in more remote rural regions that make CS more accessible (Feng et al., 2012).

Preference for caesarean delivery among urban residents may also be attributed to the prevailing imbalance of health workforce between urban and rural areas. Rural areas have higher rates of vacancies of health service providers (Ahmed et al., 2015) than urban areas. The use of antenatal care services is related with institutional delivery and caesarean surgeries. Due to low availability of health care services in the rural areas of Bangladesh, the rate of institutional delivery and CS in the rural areas is low. While, big cities and urban areas have less vacant posts for healthcare providers, i.e. health workers are concentrated in urban areas, resulting in the higher use of maternal care services, which ultimately leads to higher rate of institutional and caesarean deliveries (Kamal, 2013). The process of rapid urbanization and socio-economic development, is improving access to institutional care and therefore institutional deliveries and rate of CSs have been increasing in Bangladesh.

b)Economic status

It is evident from many studies across countries that women who are from better socio-economic status would have higher rates for CS births (Nazir, 2015, Ghosh, 2010, Betrán et al., 2007, Feng et al., 2012). Anwar et al. (2008) conducted a study on inequity in maternal health-care services in Bangladesh and found that only 3.3% of the women from poor households had CS, whereas 28.4% of women from the rich households had CS. This is also supported by the study of Kamal (2013), who found that the likelihood of CS increased with the increase of women's wealth status. According to BDHS (2014), among women with higher wealth status, half of births were delivered by CS (Table 2). Leone et al. (2008)

also found that women with higher socio-economic background and having better access to antenatal services were most likely to undergo CS. Kamal (2013) argued that since antenatal care seeking is a vital predictor of institutional delivery and CS, women with higher economic status can afford more antenatal visits that likely results in more institutional deliveries and undergoing CSs. The proportion of institutional delivery and CSs thus increase with the increase in women's wealth status.

Bangladesh is in the era of economic transition and process of development. It has a consistent GDP growth rate of over 6% per annum over the last decade. Its per capita national income has increased to US$1,314 in 2014-2015 and Bangladesh thus becomes a lower middle-income country (BBS, 2015). Therefore, now Bangladeshi women and their families have higher access to wealth and are more capable of affording the costly caesarean procedure. In addition, modern medical technology and advanced obstetrical services are now available in Bangladesh. Thus the recent trend in the increase of CS rates for childbirth are possibly partly attributed to the country's economic transition, women's increased wealth status and modernization process (Kamal, 2013).

c)Level of education

It is evident from previous studies conducted in different parts of the world that rate of CS is associated with women's education (Shabnam, 2016, Nazir, 2015, Hou et al., 2014). A study conducted in India by Shabnam (2016) revealed that women who had 10 years plus schooling were significantly more likely to experience CS than those who never attended school.

Similarly in Bangladesh, among women with secondary or higher education half of births were delivered by CS (BDHS, 2014). This is also supported by the study of Kamal (2013) and Anwar et al. (2008). They also found that use of CS was significantly higher among mothers with higher education. The likelihood of CS increased with the increase of women's level of education. Jisun and Kabir (2014) found that about 85% women having no education prefer vaginal delivery and about 55% women having secondary level education prefer caesarean delivery. Huda et al. (2012) found that CS without any pregnancy related complication was more common among women having 10 years plus schooling.

The reason behind the recent trend of increasing CS rates in Bangladesh may be partly attributed to the significant changes in women's education in the recent years (Anwar et al., 2008). Educated women are aware of the costs and benefit of the use of antenatal and maternity services. Education is likely to enhance women's confidence and make them capable in making decisions about their own health (Kamal, 2013).

Table 2. Status of caesarean deliveries in Bangladesh (BDHS, 2014)

Characteristics	Health Facility			Delivery at home (%)	Delivery in a health facility (%)	Delivery by C-Section (%)	Number of births
	Public (%)	Private (%)	NGO (%)				
Mother's age at birth							
<20	12.2	21.8	2.2	63.7	36.1	21.3	1,562
20-34	13.3	22.9	2.2	60.9	38.5	24.0	3,144
35-49	9.5	17.9	3.4	69.3	30.7	17.4	198
Birth Order							
1	14.5	29.7	2.3	53.2	46.4	29.7	1,990
2-3	13.8	20.4	2.1	63.9	35.6	21.3	2,247
4-5	8.1	8.5	2.6	80.4	19.3	9.1	502
6+	3.3	3.2	2.5	91.0	9.0	3.7	166
Antenatal care visits							
None	5.4	5.2	0.3	89.1	10.8	4.5	992
1-3	13.8	21.7	2.1	62.0	37.7	22.1	2,187
4+	17.1	37.2	4.1	41.1	58.4	41.1	1,442
Residence							
Urban	15.8	35.6	5.4	42.3	56.8	38.1	1,267
Rural	11.8	17.7	1.1	69.1	30.6	17.6	3,637
Education							
No education	8.0	6.3	1.3	83.8	15.7	7.0	704
Primary incomplete	11.1	9.4	2.5	76.5	23.0	10.1	801
Primary complete	12.5	15.5	1.7	69.6	29.6	13.8	579
Below secondary	14.2	23.7	2.4	59.3	40.3	24.6	1,999
Secondary and above	15.5	50.3	2.7	31.3	68.6	51.2	821
Wealth quintile							
Lowest	8.4	6.1	0.4	84.8	14.9	6.7	1,084
Second	11.9	11.3	0.9	75.6	24.1	10.4	932
Middle	14.6	17.4	2.0	65.5	34.0	18.4	942
Fourth	15.1	27.6	3.5	53.6	46.3	29.2	995
Highest	14.6	51.1	4.5	28.8	70.2	51.4	950
Total	**12.8**	**22.4**	**2.2**	**62.2**	**37.4**	**22.9**	**4904**

3.1.1.2 Culture and belief

The cultural norms, values and beliefs and their influence on societal attitude towards CS are important to reveal the underlying factors of caesarean delivery rates. The prevalent culture, social network and beliefs shape women's preferences for mode of delivery (Hou et al., 2014). Almost 90% of the population of Bangladesh are Muslim, 9% are Hindus, and the remaining 1% are other religions (BBS, 2015). In Bangladesh, these religions are deeply rooted in customs and beliefs that influence societal attitudes (Khan et al., 2012). Anwar et al. (2008) indicated that

CS rates were comparatively lower in Muslims in Bangladesh. Kamal (2013) also found that Muslim women were less likely to undergo CS compared to non-Muslims, which is attributed to the religious beliefs, cultural norms, and traditional practices. Muslim husbands don't like to permit their wives to go for antenatal check-ups or to go outside their home in shake of privacy. This statement is more relevant in the Bangladeshi socio-cultural context, where women are not willing to be examined by a male physician in healthcare facilities (Kamal, 2013). Moreover, the health facilities in Bangladesh still lack of sufficient female health care workers, and there is a rising demand that medical care for women should be provided by women (Ahmed et al., 2015). However, as Muslims are majority in Bangladesh the religious factor might not have big influence on the increased CS rates.

Traditional and cultural beliefs may also influence Bangladeshi women's choice of mode of delivery. These believes can influence them to give birth by CS on auspicious days (Khan et al., 2012). A large number of women in Bangladesh have the perception that CS is safest for the infant, but this belief is partly influenced by the information provided by doctors (Neuman et al., 2014). Print media, such as women's magazines and in some cases private hospitals also seem to influence women's preferences by highlighting the beneficial aspects of CS rather than mentioning the long term negative consequences of caesarean delivery (Emma, 2014). These findings suggest that culture and belief might have some contribution on the high CS rates. However, these demand side factors would not be sufficient to explain the recent sharp rise in CS rates in Bangladesh.

3.1.1.3 Women's preference for CS

Caesarean delivery can be performed on maternal request, which is defined as a primary caesarean delivery done on request from the would be mother in the absence of any medical or obstetric indication (Ghosh and James, 2013). One reason of the rising CS rate globally is increasing requests by women for CS in the absence of clear medical indications. The actual number of women requesting caesarean birth without a clear indications globally is unknown (Lavender et al., 2012). Mazzoni et al. (2011) in their review found only a minority of women in a wide variety of countries and situations have had a preference for CS.

However, recent studies from Bangladesh suggests that the incidence of CS on maternal request is gradually rising in Bangladesh. Nazneen et al. (2011) found that maternal request was one of the main indications for CS and 23% of all CS was based on maternal request. Studies shows that mothers have preference for caesarean delivery because of fear of labour pain or due to having belief that CS is safe for infants (Jisun and Kabir,

2014, Neuman et al., 2014). According to Huda et al. (2012), CS may reflect women's desire to avoid the arduous process of labour and delivery, or consider it modern, particularly for educated women from affluent family. Jisun and Kabir (2014) conducted a study in different public and private hospitals in Bangladesh; they found that of all the women preferred CS, about 64.7 % of them preferred CS as they thought it to be a modern and technology based process. In the same study, about 40.5% of women reported that they preferred CS in order to avoid perineal pain during delivery. A different scenarios was observed by Sarker et al. (2012) in the poor urban slum areas of Bangladesh, where only 4 % of the women had their preference for CS and 95% of the cases doctor or the doctor and her family members was the main decision makers to perform CS. Performing a CS on maternal request is prevalent only among rich, educated urban women (Jisun and Kabir, 2014). But most of the Bangladeshi women lives in rural areas with lower economic status. Moreover, physicians play the major part in taking decision for mode of delivery (Sarker et al., 2012). Therefore, the recent increased CS rates in Bangladesh is unlikely due to women's preference for CS. Similarly, Mazzoni et al. (2011) found that women's preference was unlikely to explain the high CS rates in many countries and regions.

In Bangladesh, normal vaginal delivery is seen as lower quality of care. The perceived need for CS is influenced by the belief that CS is a higher quality of care and a birth method for women of higher social status (Khan et al., 2012). During choosing between two alternatives for birth, surgical versus vaginal, women make the choice considering mainly the risk factor. Some women believe that CS is safer because they perceive the quality and safety of normal delivery is poor. In these circumstances, choice was not necessarily a preference for CS, rather a choice for safety or higher quality care versus risk and danger, as indicated by Gamble et al. (2007).

Whether or not CS should be carried out on maternal request has been a controversial issue (Devendra and Arulkumaran, 2003, Nazneen et al., 2011). In some cases physicians perform CS to avoid negligence claims and to respect their patients preference (Nazneen et al., 2011). Making CS a choice has not declared as women's right in Bangladesh. Therefore, caesarean delivery should not be recommended by maternal request or by the unavailability of proper services, e.g. effective labour pain management. There should have evidence based protocols for decision making about caesarean delivery (Islam and Yoshimura, 2015).

3.1.2 Supply side factors

3.1.2.1 Economic gain/profit making

Evidence shows that many parts of the world, supply side factors, such as economic gain and profit making tendencies, particularly among the for-profit service providers is an important driver of the increased rate of CSs (Ghosh and James, 2013, Feng et al., 2012, Hou et al., 2014, Leone et al., 2008). As for example, in China CS is more profitable than vaginal delivery (Hong, 2007), and rise in demand for CS is largely stimulated by the service providers of China (Feng et al., 2012). In Brazil, women are more likely to undergo unnecessary CS mainly due to the provider's influences (Hou et al., 2014).

Similarly in Bangladesh, there is evidence that for-profit private providers are motivated by financial incentives to conduct caesarean sections more frequently than the actual requirement. There is also emerging evidence that to maximize their income, for-profit private providers influence women who can afford to pay, to opt for delivery by CS (Neuman et al., 2014). Evidence also shows that the recent rise in CS rate in Bangladesh is more likely due to the recent rise of private clinics; of the total 37% of health facility births in Bangladesh, 60% of are carried out at private clinics (BDHS, 2014). In Bangladesh 73% of all caesarean deliveries took place at private facilities, 24% in government facilities and the remaining 3% in NGO facilities (Anwar et al., 2008). According to Aminu et al. (2014), around 80% of total deliveries conducted in the for-profit private facilities are performed by CS. Rahman et al. (2014) also found that the CS rate for private hospitals was much higher, where 453 out of 485 births were carried out by CS. Similarly, a positive association between private facility delivery and caesarean delivery in Bangladesh is reported by Neuman et al. (2014).

Huda et al. (2012) conducted a study in Chandpur, Bangladesh and found Private hospitals performed nine times more CS than the public hospitals in Chandpur (Table 3). About 25% of the cases CS was carried out when no maternal complication was found. No clear medical indication was noted for 12.5% of the cases in the hospital records (Table 3). The reported higher rate of CS in urban areas of Bangladesh is possibly due to the private sector dominated maternal care services in urban areas (Neuman et al., 2014).

According to Karim (2012), most of the unnecessary caesarean deliveries have been undertaken at private health facilities in Bangladesh. Karim et al (2012) argue that supplier/provider induced demand might be one of the main reasons behind the unnecessary CSs. And that this is likely due to profit making tendency and financial gains imperatives of the providers (Karim, 2012). Rahman et al. (2014) also indicated that the financial motive of the private hospitals might play an important role in raising the

CS rates up. Caesarean delivery requires longer stay in the health facilities compared to normal delivery and this results in extra costs for the stay and other related services. Since for-profit private health institution's primary concern is to earn money, it is often possible that CS is performed unnecessarily (Rahman et al., 2014). Thus, supplier induced demand seems to be a leading factor of the high rate of CS in Bangladesh.

While supplier induced demand, with an underlying profit motive as a driver of rising CS rates in Bangladesh is clear from the above evidence, it is important that one locates this provider side moral hazard within the broader discussion on stewardship and regulation of the health sector, particularly of the for-profit private sector. Evidence from Bangladesh shows that the health system is poorly regulated and there are few effective checks on provider side moral hazard generally, and particularly when it comes to for-profit private providers (Osman, 2008). These regulatory weaknesses in Bangladesh for the backdrop for the profit driven rise in CS rates.

Table 3. Indications of CS in public and private hospitals in Chandpur, Bangladesh, 2007-2008, Source: Huda et al. (2012)

Indications of CS	Health facilities		
	Public (%)	Private (%)	All (%)
Absolute maternal indication*	27.5	24.7	24.7
Other severe maternal complications†	5.0	3.0	3.2
Other less-severe maternal complication$	10.0	18.8	18.0
CS without any maternal complications§	12.5	26.3	24.9
Failure to progress	25.0	15.5	16.5
No clear medical indication**	20.0	11.6	12.5
All	40 (100)	361 (100)	401 (100)

*Ruptured uterus (haemorrhage and shock, brow presentation, transverse lie, foetopelvic disproportion, pre-rupture of uterus); †Include eclampsia and severe pre-eclampsia; $Include prolonged labour, history of previous CS, breech presentation etc.; §Include foetal distress, premature rupture of the membrane, disorders of amniotic fluid, and membrane;
**Include post-dated, premature labour, and full-term pregnancy with labour pain

3.1.2.2 Time management

Many studies in low and middle income countries highlight doctor related factors as influencing the rising CS rates (Perkins, 2004, Ghosh and James, 2013, Hou et al., 2014). Studies relate the increased CS rates to obstetrician's efforts to maximize their income, to their preference for convenient working hours and professional satisfaction. Perkins (2004) pointed out that prolonged labour during deliveries incurred opportunity cost for physicians, and resorting to CS served as a means for them to shorten it, and to thus save themselves from the inconvenience of managing prolonged labour. Similarly, Hou et al. (2014) indicated that physicians' preference for convenient working hours, and payment incentives for performing higher yielding CS are driving the high CS rate in China and Brazil.

In Bangladesh, obstetricians of private facilities prefer CS mainly for two reasons. First of all, in the private sector, doctors are paid more for CS compared to vaginal delivery (Sikder et al., 2015). Therefore, CS is more profitable and a financial incentive for obstetricians (Karim, 2012). Secondly, obstetricians perform CSs on times and days that are most convenient for them. The majority of CSs are carried out during the weekday and working hours (Aminu et al., 2014). Fig. 8 shows that overall 76% of emergency CS and 66% of elective CS (Annex 3) were performed during official working hours between 08:00 and 14:00 hours. Moreover, a physician can perform a CS in an hour, where as a vaginal delivery can take several hours, requiring physicians to work extra hours. In the public hospitals, although physicians are paid more or less the same for CS and vaginal delivery, the working hours preferences may act as an incentive to choose CS by most of the doctors. That means the working hours preferences are applied to both private and public sector doctors and this is the reason for giving CS preference over vaginal delivery by most of the doctors of Bangladesh. This is evident from Emma (2014), who underwent CS in a renowned private hospital (Apolo hospital) of Dhaka city, Bangladesh has expressed her bitter experience in a web blog about the doctor's malpractice regarding CS. Similar observation was also made by Shabnam (2016) in her study in India. Here it is worth mentioning that the socio-cultural settings of India and Bangladesh are more or less same.

Provider's tendency to prioritize their convenience and efficiency in the absence of evidence based practice is a driver of rising CS rates in Bangladesh, is clear from the above evidence. It is important that one locates this kind of provider behaviour within the broader discussion on human resource in Bangladesh. In Bangladesh there is extreme shortage of obstetricians and doctor's (Ahmed et al., 2015, Sikder et al., 2015). Therefore, doctor's convenience and time management could be a managerial imperative in the public and private sectors alike. Furthermore, evidence from Bangladesh shows that the health system is

poorly regulated and there are few effective checks on provider behaviour and practices, generally, and particularly when it comes to for-profit private providers. These regulatory weaknesses in Bangladesh for the backdrop which allows providers to prioritize their convenience, and perhaps managers to prioritize efficiency, at the expense of evidence based practice – together eventually driving the rise in CS rates.

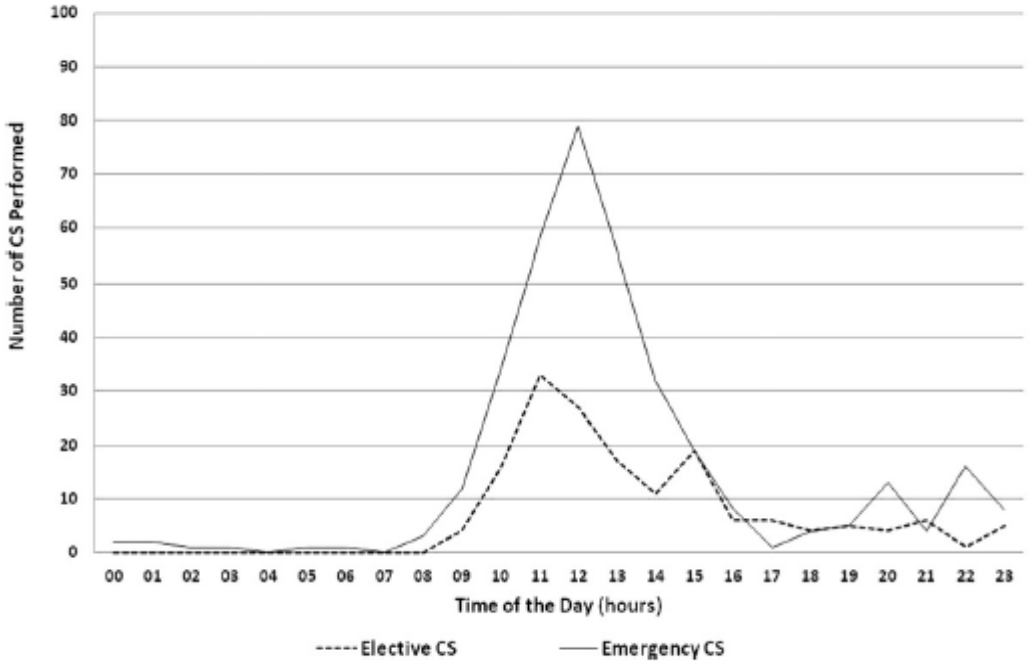

Fig. 8. Number of CS performed by time of the day (Aminu et al., 2014)

3.1.2.3 Surgical practice

As indicated in Section 1.3, Bangladesh has a shortage of doctors, particularly of surgeons, anaesthesiologists, and obstetricians. To address this shortage, the government of Bangladesh has taken a two pronged approach (Ahmed, 2010); on one hand new medical schools are being established and on the other hand, non-obstetricians are being trained to provide emergency obstetric care and to do obstetric surgeries like caesarean sections (Sikder et al., 2015, Islam and Yoshimura, 2015). Sikder et al. (2015) reported that CS rates are higher in medical schools. While one can expect CS rates to be higher in referral hospitals, Sikder et al. (2015) pointed out that a substantial proportion of these surgeries are not medically necessary, and that these are being conducted so that students particularly those doing post-graduation in gynaecology and obstetrics may learn to perform caesarean sections. Similar observations have also been made by Neuman et al (2014), who further argue that such practices somehow create a culture amongst trainees that doing surgeries even when it is not indicated, is acceptable. Inevitably, many of

these trainees continue these practices after they have graduated – both in public and in private services; that they can make much money in the process, and that there are no measures to check such behaviour in Bangladesh, amplifies and perpetuates the problem.

3.1.3 Clinical reasons

3.1.3.1 Lack of clarity on medical indications for CS

Anwar et al. (2008) indicated that the uptake of CS was significantly higher among the women those reported various complications during pregnancy and delivery. The BDHS (2014) collected information on the reasons for which a doctor recommended to have the birth delivered by CS. The most common reasons explored by the survey was mal-presentation of the baby (42%) and failure to progress in labour (21%). Islam and Yoshimura (2015) in their study in Bangladeshi hospitals found most caesarean deliveries were done because of a previous caesarean (24%), foetal distress (22%) and prolonged or obstructed labour (21%) (Table 4). Based on facility medical documentation, the most common indications for CS were foetal distress (38%), previous CS (20%), postdate (18%), oligohydramnios (14%), and prolonged and obstructed labour (15%) (Sarker et al., 2012).

However, not all are appropriate indications for CS, such as post term dates, unfavourable cervix and rupture of membranes could have been avoided if adequate guidelines and resources could be made available for safe induction of labour or augmentation (Aminu et al., 2014). Similarly, CS conducted for foetal distress could also be termed inappropriate, when at birth there was no confirmation of foetal distress (Aminu et al., 2014). Foetal distress, are not possible to be diagnosed properly without an electronic monitoring system. Most of the district level health facilities in Bangladesh are not equipped with a modern electronic foetal monitoring system and that foetal distress are generally diagnosed by clinical assessment (Islam and Yoshimura, 2015). Moreover, in a health facility, generally physicians keep record of the indications for caesarean. The providers might have a tendency to record only those indications that would justify CSs, and it is not always possible to cross-check the validity of the indications (Islam and Yoshimura, 2015). Therefore, this also increase the likelihood of elective and unnecessary CS without a clear medical indication.

Huda et al. (2012) found CS without any maternal complication in 24.9% of the cases. Karim (2012) also found that the CS was more frequent for the mothers who had minor or no indication for CS. The author indicated that in many cases caesarean deliveries had been undergone where there

was no valid reason in favour of the CS births. Aminu et al. (2014) argued that at least 16% of all CS (could be higher if a more critical analysis of the indicators for CS were possible) that were carried out for indications where alternative forms of care could have been more appropriate. As for example, implementation of evidence based practices, such as ensuring companionship during labour and delivery, using drugs and methods to alleviate pain and assisted delivery using ventouse or forceps (Aminu et al., 2014).

Sarker et al. (2012) found mal-presentation as the reason for CS in 11% of recorded cases. However, abnormal lie were responsible for CS only in 2.4% of cases (Nazneen et al., 2011). It is thus clear that the risk factors are contributing very small proportion of all CSs. Therefore, factors other than risk factors and clear medical indication influence providers' decision greatly to perform unnecessary CSs and are playing major role behind the increased CS rates in Bangladesh (Aminu et al., 2014).

Table 4. Indications for births delivered by CS in Bangladesh, n=1043 (Islam and Yoshimura, 2015).

Indications for CS	**Percentage of births by CS**
Previous caesarean delivery	24.1
Foetal distress	21.9
Obstructed/prolonged labour	20.5
Postmaturity	11.1
Oligohydramnios	6.1
Breech presentation	3.7
Pre-eclampsia and eclampsia	3.7
Leaking/early rupture of membrane	2.4
Prepartum haemorrhage or placenta previa	1.4
Others	4.3
No indication recorded	1.2

3.1.3.2 Previous C-section

Giving birth previously by CS increase the likelihood of another CS (Nazir, 2015). Currently, the national guidelines for Bangladesh on delivery after previous CS follow WHO and FIGO guidelines. These guidelines do not support a repeat CS unless there is a clear medical indication for the procedure (Aminu et al., 2014). Healthcare providers are taught that "only 25-30% of women with a previous CS need a CS in the subsequent pregnancy" (Aminu et al., 2014). However, in some studies, for instance Nazneen et al. (2011) found that patients with a previous CS are more likely to undergo a repeat CS in the subsequent pregnancies due to mainly safety consideration. They found repeat CS for 34.3% cases in Bangladeshi hospitals. Similarly Aminu et al. (2014) found repeat CS accounted for 35.1% of cases, which is higher than the 25-30% range, could be a matter of concern. Nazneen et al. (2011) also found that the same patient attends the hospital for her successive deliveries, because they found CS less painful and convenient previously. Previous CS is thus relevant and an important factor especially in the context of Bangladesh. This is evident from the fact described by Aminu et al. (2014), ''For cases with previous CS, providers know a repeat CS is not mandatory but actual practice is different. "Everywhere in Bangladesh, we (healthcare providers) recommend CS for every woman with previous CS''. Because of pressure from patients and competing private interests doctors suggests the procedure (Aminu et al., 2014). Therefore, repeated CS is an important contributor of the already high CS rates in Bangladesh and is likely to increase more in future. Awareness regarding the potential dangers associated with caesarean delivery must be raised among providers as well as among pregnant women and their families (Aminu et al., 2014).

3.2 Decision making process of caesarean delivery

The demand for a caesarean delivery can be purely woman's own preference or in many cases family decisions made by husband or in laws (Ghosh and James, 2013). It is difficult to differentiate between demands exclusively from woman or demand from her family members or the doctor. In most cases, it is a complex interplay within a family set-up (Ghosh and James, 2013). Although requesting for CS is not a legitimate right for women, pressure from patients and their families and competing private interests also increasingly play an important role in the decision-making process. In case of caesarean deliveries, advice from physicians have been found to play an important role in the maternal decision on mode of delivery (Aminu et al., 2014).

Sarker et al. (2012) conducted a study on caesarean deliveries in urban slum areas of Bangladesh. They asked the mothers those underwent CS,

"due to whose intention, mainly, was your CS delivery performed?". About 58% identified the doctor, 37% identified the doctor and family members, and 4% identified themselves and 1% cases husbands made the decision (Fig. 9). However, Jisun and Kabir (2014) conducted a similar study based on primary data from different public and private hospitals in Bangladesh. They found that about 60% women reported that she and her family jointly took decision about her caesarean delivery.

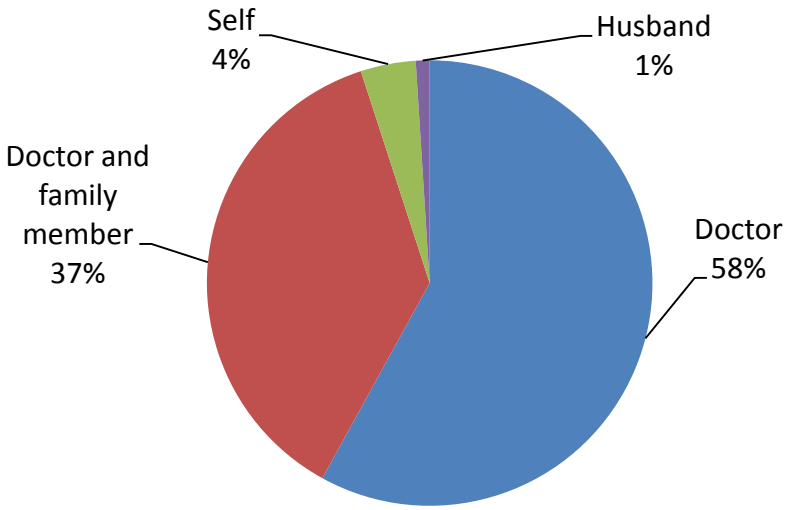

Fig. 9. Primary decision maker for CS (n=390) (Sarker et al., 2012)

The decision making by women and their families is atttributable to the reason that sometimes an educated rich urban woman or her family wants a specific obstetrician to conduct the delivery because of the doctor's reputation. In this situation the likelihood of elective CS increses, especially for a doctor with enormously work load (Shabnam, 2016). However, in case of poor women living in rural areas or in urban slums, the scenario is completely different. The poor women don't enjoy the autonomy of taking their own decision. Even if a doctor recommend for CS based on clear medical indication, the family members of the women with lower wealth status don't believe the doctor and often raise question with the doctor's decision. According to Khan et al. (2012), there are misconceptions about CS and distrust regarding the reason for recommending CS by the healthcare providers. When a woman have CS involving high family expenditure and economic burden to family members, the blame goes to the woman. So in the lower income households, women are less likely to choose CS as their preferred mode of delivery.

However, In Bangladesh rich urban families are more likely to prefer CS, because CS is a modern procedure and the operation has become much

safer now-a-days with relatively less risk (Jisun and Kabir, 2014). Aminu et al. (2014) also pointed out that patients' belongs to affluent families try to influence providers' decision and request for a CS even when there is no medical indication for several reasons, such as fear of loss of the baby or the mother. According to Aminu et al. (2014), some providers' claim that families put pressure on them to perform a CS and also threats that they would otherwise take the patient to another facility; one provider said, "Many patients desire CS, sometimes political leaders. But, we counsel them and advise them for a normal delivery. If they insist on CS (and we refuse), they leave the hospital."

According to Aminu et al. (2014), majority of providers from public hospitals reported that there are agents who often try and persuade patients to request a discharge from the public hospital so they can be taken to a private facility for a CS. One provider interviewed by Aminu et al. (2014) expressed, "In our hospital, there are many brokers. If CS is not done, they'll contact the patient's family to request for discharge to (a private) clinic. So, it is one of the important factors in decision in every place in Bangladesh."

In contrast, there are opposite scenarios. Aminu et al. (2014) reported that although protocols on emergency obstetric care (including some on CS) were available, very few providers adhere to these. One of the provider in the interview with Aminu et al. (2014) expressed, "We have protocols and guidelines… our nurses follow it, we follow it. But I think there are many professors and gynecologists (who) do not follow protocol. Their interest is CS. It happens in Bangladesh everywhere… If every sister follows protocol, if every doctor follows protocol, if every gynecologist follows protocol, then CS must reduce."

Another factor that influence the providers decision in favour of performing a CS is critical shortage of staff in health facilities. In most hospitals, particularly the rural hospitals in Bangladesh, don't have the required minimum staff of one doctor to perform the CS and another to provide anaesthesia for 24 hours a day. Such hospitals rely on visiting staff who had to finish his/her work somewhere else first. One obstetrician in the study of Aminu et al. (2014) expressed, "Our own CS is more or less elective CS because after office hours we do not have all manpower and facilities available. So, we try to do CS in the afternoon. Electricity is also a factor, so we try to do (CS in) daylight. We don't do it in the evening or night."

The shortage of health personnel in health facilities is perhaps paradoxically a reason why physicians prefer elective CSs, and why those are performed during daytime working hours. This is evident from the findings of Sikder et al. (2015) who reported that the unavailability of Obstetrician and Anaesthetist when needed is the cause of CS are not performed at emergency (24 hours a day) particularly in rural areas of

Bangladesh. This is one of the main reasons for the increase in the number of elective CS in the areas where the lack of health personnel is a problem. The inability to conduct emergency CSs when needed is considered a barrier in providing evidence based maternity care and CS with clear medical indication (Aminu et al., 2014).

From the above findings it is clear that a combination of private profit making tendency, physicians working hour references and demand from women and their family might play leading role in the decision of CS and that could be contributed to the recent increased trend in caesarean delivery in Bangladesh. Similar observation was also made by Jisun and Kabir (2014) in their study in Bangladesh.

3.3 Evidence-based strategies for promoting rational use of caesarean surgery

This chapter presents evidence-based interventions from Bangladesh and other countries. Proven interventions as examples from different countries are presented to address the issue and to promote rational use of CS. Based on the literature review, broadly two categories of interventions have been found effective:

1) Demand-side interventions and
2) Supply-side interventions

3.3.1 Demand-side interventions

To educate pregnant women's only about the risk of CS will not change their behaviour, unless the socio-cultural factors of caesarean deliveries are not properly understood (Hou et al., 2014). In Bangladesh, CS is considered as high quality of care and regarded as a procedure of higher social status. If this prevalent societal belief and perception regarding CSs cannot be changed, any interventions aimed at reducing CSs would not be fruitful. To increase the quality of care during pregnancy and delivery for women of all social classes is equally important. The Brazilian national campaign for "Humanization of Normal Childbirth and Reduction of Unnecessary Caesareans" introduced in Brazil in 2006 is one example that has abled to reduce CSs successfully (Hou et al., 2014).

Women who share reproductive health matters with friends and family are less likely to have a CS than others who do not (Leone et al., 2008). Awareness raising by trained community health providers can reduce unnecessary CSs. Brazil is the example of a successful community intervention in overcoming unnecessary caesarean births and women's willingness to undergo an elective CS (Leone et al., 2008).

Trial for vaginal birth under proper vigilance for those who had a previous CS can reduce the rate of repeated CS, particularly in tertiary care settings. The mother's fear of labour pain can be mitigated by creation of "fear clinics", similar to that exist in the Netherlands (Hou et al., 2014). Another example is the introduction of the "birthing companion" that is applied in several developed countries. Although, these interventions are recent, they have been successful in reducing the demand for CS (Hou et al., 2014). Education and behavioural change intervention could also be effective in influencing the choice of women including those who had a previous CS. An example of successful education interventions program is in Taiwan that was targeted to would be mothers and was able to reduce the CS rate (Wang and Chung, 2004).

3.3.2 Supply-side interventions

3.3.2.1 Changing doctor's behaviour and practice

To change doctor's behaviour in reducing CS rate can be achieved by feedback and audit. Feedback and audit can be achieved through mandatory second opinions, internal and external peer review of medical records for trial of labour outcome, vaginal birth after caesarean and births outcomes (Hou et al., 2014). A mandatory second opinion to reduce unnecessary CSs intervention trial was conducted successfully in Brazil and five Latin American countries (Althabe et al., 2004). A similar intervention titled "peer reviewed caesarean surveillance system", was introduced in Taiwan. This intervention was also very successful and was able to reduce CS rates from 37% to 30.7% within four years (Liang et al., 2004). Substantial changes in physician's practices cannot be achieved through a single behaviour intervention. Large reductions in CS rates need a combination of different interventions (Hou et al., 2014). The interventions that have been proved to be most effective in reducing CS rates are listed in Table 5.

Although protocols on emergency obstetric care including some on CS are available in Bangladesh, very few providers adhere to these. A partograph could also be an effective tool to decide on surgical interventions during pregnancy complications. Uses of a partograph at all hospitals could be very effective to monitor intensively in protecting overmedication of delivery (Aminu et al., 2014).

Table 5. Best medical practices to reduce caesarean deliveries, source Hou et al. (2014).

Number	Medical interventions to reduce caesarean deliveries
1	Definition of precise indication of caesarean
2	Use of protocols and evidence-based flow charts
3	Second opinion prior to caesarean
4	Encouragement of Vaginal Birth after caesarean (VBAC)
5	Effective induction of Labour and VBAC
6	Monitoring labour to identify risk and promote natural birth
7	WHO guidelines for labour management
8	Mechanisms to combat pain and support women for fear of labour pains
9	Foetal monitoring
10	Training of medical professionals for non-surgical intervention to assist labour

3.3.2.2 Policy interventions

Literatures show that physicians' advice has large influence on women in choosing mode of delivery. However, often the role of physicians in inducing demand for CSs is ignored in Bangladesh. Incorporation of special guidelines in the national health policy and regulations is important to make CS more restrictive and bring CS under law, in restricting unnecessary CSs (Karim, 2012). To form a panel of qualified specialized doctors by Health Ministry to verify the appropriateness and necessity of a particular CS procedure is essential. Such activities have been proved effective in countries such as UK, Canada, Australia, Germany, Italy and Sweden (Karim, 2012).

Establishment of a trained midwifery programs could be effective. China has introduced a midwife led normal birth unit (MNBU) as an innovative policy approach to restrict their high CS rate. The project was launched at Hangzhou University in 2008. Evaluation results for the first 266 women accessing the service have been reported and are very encouraging. Among the women accessing the MNBU, 87.6% had vaginal delivery compared to 58.8% for the women attending the standard care unit (Hou et al., 2014).

Payment mechanisms to health professionals and hospitals can be done in Bangladesh that have been proved effective in reducing CS rates in some countries (Hou et al., 2014). For instance, Taiwan has changed its reimbursement mechanisms from fee-for-service to a case-based payment system in order to control costs. They reduced the reimbursement differences between CSs and normal deliveries to remove physicians' financial incentive to perform CSs. This payment method was proved effective in reducing unnecessary CSs of Taiwan (Hou et al., 2014).

CHAPTER 4: DISCUSSION

The findings indicate demand side (socio-economic, cultural, women's choice and preferences), supply side (institutional and doctors behaviour) and clinical factors that influence the increased CS rates in Bangladesh. The evidence also indicated the influence of social-cultural, economic, and for-profit service providers on the women's decision of conducting the CS. The above influencing factors and their relative contribution to the increased CS rates in Bangladesh are discussed below in light of evidence from the findings of literature review.

The adapted and modified framework used for this study has been very useful in fulfilment of the purpose of the study. It has been able to attain the research objectives by systematic presentation of the factors that the study aimed to explore. The framework is also flexible and that helped to explore women's decisions and their preferred mode of delivery.

4.1 Factors associated with the high CS rates in Bangladesh

Findings from several studies in Bangladesh (Anwar et al., 2008, Karim, 2012, Jisun and Kabir, 2014, Neuman et al., 2014) showed that the indications for the increased CS rates seem to be more institutional and socio-economic than medical. Because most of the CSs took place in private-sector facilities and were used mainly by well-off families. And because rate of CS in private hospitals is much higher than public hospitals. This is also supported by past studies in many low and middle income countries (Feng et al., 2012, Ghosh and James, 2013, Hong, 2007, Hou et al., 2014).

Although the expertise of health care providers and quality of care in the facilities are questionable, maternal health care facilities (dominated by private) are widely available in Bangladesh, especially in urban areas. Maternal care is also being provided in public hospitals, but due to the long waiting lines and low quality services, most women who can afford expensive private care avoid public hospitals. The charges for CS are usually at least double compared to normal delivery (Khan et al., 2012). Therefore, the high rates of CS in these private clinics might be associated with supply side (institutional) and in partly demand side (e.g. socio-economic, women's preferences) factors of caesarean deliveries.

In Bangladesh, private health clinics have been mushrooming during the last three decades. There is a competition for profit making. Under the backdrop of no effective regulatory mechanisms from the Government, it is not surprising that most of the unnecessary CS deliveries have been carried out in these private clinics as indicated in the previous studies (Karim, 2012, Rahman et al., 2014, Neuman et al., 2014, Huda et al., 2012). The findings indicate that the rise in demand for CS is largely

stimulated by these private clinics and healthcare providers motivated from perverse financial incentives that encourage women to undergo the costly CSs. It is also evident that obstetricians and the private hospitals earn more money by doing CSs compared to vaginal deliveries. For this reason, CS has become an important source of income for the private health care providers. Caesarean delivery requires longer stay in the health facilities compared to normal delivery and this results in extra costs for the stay and other related services. Therefore, as indicated in the findings that there is increasing competition for pregnant women in Bangladesh due to higher profitability of caesarean deliveries, and that agents from private providers often try to persuade patient's family to request a discharge from the public hospital in order to perform a CS in the private facility. Moreover, since private health institution's primary concern is to earn profit, it is often possible that CS is performed unnecessarily. This is very natural in the Bangladeshi context where corruption is pervasive and there is no effective health care regulation or protocols. Similar views were expressed by Shabnam (2016) from the neighbouring country India with similar socio-cultural context.

Many doctors are also launching their own private clinics in Bangladesh. Almost all these clinics have gynaecology department and they are more interested in CS, because of its high profitability. However, there are not as many obstetricians and anaesthesiologists to meet the demand of growing number of private clinics (Ahmed et al., 2015). These clinics rely on visiting staff from public hospitals who have financial motive and working hour preferences. They mostly prefer elective CSs and perform CSs during daytime working hours. The unavailability of health personnel when needed is one of the main reasons for the high CS rates without a clear medical indication, and for not performing CS at emergency particularly in rural areas of Bangladesh. This is also supported by the observation of Aminu et al. (2014) and Sikder et al. (2015).

In the advanced countries painless vaginal delivery is more common, compared to caesarean procedure. However, in Bangladesh the facility of painless labour is not available. There is lack of expertise and health care personnel for conducting this type of delivery. Doctors are also reluctant to perform this procedure due to its longer time requirement.

Another important cause of the unnecessary CSs is that the health sector government expenditure of Bangladesh is very low. As for example, in 2013 total health expenditure of Bangladesh was only 3.5% of GDP (annex 7.1b). In the same year the government health expenditure of Maldives, South Africa and India were 10.8%, 8.9% and 4.8% of GDPs respectively (Islam et al., 2015). To control the unnecessary CSs, government should spend more money to develop maternal health care infrastructure. However it is very difficult to attain that overnight due to poor economy of Bangladesh. The seats of public medical colleges cannot be increased much for the same reason. As a result the admission and

tuition fees in the private medical colleges have increased tremendously. Government has no control over it. The new doctors from private medical colleges mostly join private clinics. These doctors who completed their study paying huge amount of money, may try to get back the amount by any means. It is not unusual for them to perform unnecessary CSs.

Therefore, from the above discussion it is clear that directly or indirectly the increased CS rates in Bangladesh is more likely due to the influence of for-profit private health institutions and the doctors (working hour preferences and financial incentives) working for those private clinics.

Demand side factors, i.e. socio-economic reasons and women's request are also playing an important role behind the increased CS rates in Bangladesh. The findings indicate that education and wealth status of the women is considered as an important predictor for use of CSs. It is also evident that urban women in Bangladesh, compared to those live in underdeveloped rural areas are more likely to deliver through CS. The reason could be a combination of factors, such as availability of modern technology and advanced obstetrical services to take care of risk factors, women's preference, and wide prevalence of the for-profit private healthcare facilities in the urban areas. Similar observation was also made by Ghosh (2010) and Hou et al. (2014) in their studies conducted in India and China respectively.

However, the above demand side factors alone are unlikely to be sufficient to explain the recent increased CS rates in Bangladesh. Because although the urban women with higher education and wealth status prefer CS and they request doctors to conduct CS, majority of Bangladeshi women live in rural areas with lower financial ability and low or no education. It is also evident that many physicians are found to motivate and persuade the urban rich women in choosing CS. Moreover, a high proportion of CS are performed for no clear medical indication (Huda et al., 2012, Aminu et al., 2014, Karim, 2012). Many studies from low and middle income countries, for instance Chu et al. (2010) in China and Maaløe et al. (2012) in Tanzania also found a large proportion of CSs were performed without a clear reported medical indication.

The lack of association between CS and clear medical indication combined with the providers financial incentives to perform CSs and the surgical practise of junior doctors to enhance their skills, further suggest that caesarean surgery is being performed in Bangladesh more than the actual requirement. Therefore, demand side factors and maternal request for CS are likely to have little contribution to the increased CS rate, while supply side or institutional factors might have been playing the leading role of increased CS rate in Bangladesh.

Whether women's request for CS or their doctors influence to accept the procedure, which is more responsible for the increased CS rates are not

well proved. Although from the above discussion it is clear that supply side or institutional factors may have larger influence on the increased CS rate in Bangladesh, a combination of private profit making tendency and demand from women with higher socio-economic status, particularly in urban areas might be contributed to the recent increased trend in caesarean delivery in Bangladesh. This is supported by Jisun and Kabir (2014), they found that preference for CS was statistically significantly higher among women who were living in the urban areas, admitted into private clinics, and those were wealthy and educated.

4.2 Decision making process of CS in Bangladesh

The most likely causes for the high CS rates are increasing access to private health care facilities with advanced technologies, higher education and wealth status of women, and decision-making power and the preference for CS not only by physicians but also in some cases by the women. Review findings also show that factors, such as previous CS, mal-presentation or abnormal lie influence the decision of performing CS.

Female education level in Bangladesh has increased in recent years (BBS, 2015). Education make women aware, empowered, develop confidence and increase of capability that help them to make decisions about their own health. On the other hand, education also increases chances of women being informed and misinformed about risks. Being informed about risks, and having the financial and social resources to decide for themselves may explain why educated women prefer elective caesarean delivery.

Educated women are also more likely to deliver in expensive or highly rated institutions, which may turn out to be perform CSs for financial reasons. Kamal (2013) indicated that sometimes an educated rich urban woman or her family want a specific reputed obstetrician to conduct the delivery. In this situation, the likelihood of elective CS increses because of the doctor’s work load and working hour preferences. But this finding may not be justified. Because most of the Bangladeshi women don’t have education and financial ability and they don’t have the autonomy of taking their own decision and are less likely to choose CS as their preferred mode of delivery. Therefore, in few cases womens are likely to take decision for CS and has contributed less in the increased CS rates in Bnagladesh.

In case of caesarean deliveries, advice from physicians have been found to play an important role in the maternal decision on mode of delivery. Doctors of for-profit private clinics were found to persuade women and influence them to opt for caesarean delivery. However, from service providers point of view, pressure from patients and their families have main influence on the decision-making process of caesarean delivery. On

the contrary, it is evident from the study of Sarker et al. (2012) that about 58% of the cases the doctors, 37% cases the doctors and family members, and only 4% cases the women themselves made the decision of CS. Moreover, others may also argue that doctor's influence might be the strongest, since doctor's are the ultimate decision maker and the power imbalance during labour favours decision making by the doctors. Despite women's own preferences, obstetricians can indeed persuade women's to change their choices. Similar indication was also made by Hou et al. (2014) in their study on Chinese and Brazilian women. The study found that at the start of the women's pregnancy, they had a preference for normal delivery but they changed their decision to CS after repeated interaction with their doctors. Therefore supplier induced demand seems to be a leading cause of the increased CS rates in Bangladesh.

Another findings that suggests that service providers take the decision of performing an elective CS because of critical shortage of staff in health facilities. In most hospitals in Bangladesh, the rural hospitals in particular, don't have the adequate number of staffs to conduct the CS for 24 hours a day. Such hospitals rely on visiting staff who have busy schedule. In such a situation, they have to conduct elective CSs in most cases and during working hours, because after office hours they don't have the required manpower. This is evident from the findings of Sikder et al. (2015). In addition, in the context of Bangladesh, the difficulty in arranging for an emergency CS within short period possibly be an important cause of choosing an elective CS. In Bangladesh, proper vaginal delivery related requirements, such as electronic foetal monitoring system, painless vaginal delivery expert are lacking in many private and public health facilities. For this reason doctors sometime have to give CS preference over vaginal delivery.

So it is clear from the above discussion that supplier induced demand and profit motive are playing a leading role in the decision of CS and driving the CS rates up in Bangladesh.

4.3 Evidence-based protocols and policy interventions

It is important to take care of the health service provider side moral hazard issue seriously and brings this under national health policy and regulation. However, the health system of Bangladesh is poorly regulated and there is no such effective mechanism to address the provider side moral hazard, particularly to the for-profit private providers. These regulatory weaknesses in Bangladesh are offering a conducive environment for the for-profit private health service providers and consequently have been contributing to the rising in CS rates. There is also a lack of use of evidence-based guidelines or protocols, which may lead to misinterpretation of clinical signs, fear of simple interventions, and

an excessive rate of emergency CSs. This is in agreement by Maaløe et al. (2012) in their study in Tanzania. The absence of evidence-based protocols for decision making about caesarean delivery are contributing to the high rate of caesarean delivery at the health facilities in Bangladesh.

In the context of absence of regulatory mechanism, evidence-based guidelines and capacity to provide safe surgical births in Bangladesh, poor women who need a CS may not get it, and many rich women who do not experience life-threatening complications get a caesarean surgery unnecessarily. Which in turns leading to sever maternal complications, morbidity and even death. Similar statement was also made by Khan et al. (2012).

CHAPTER 5. CONCLUSIONS AND RECOMMENDATIONS

5.1 Conclusions

The increase in CS rate and the impact of caesarean delivery on maternal and child health, is a serious concern worldwide. A significant rise in the rate of cesarean delivery has also been obsered in Bangladesh over the last decade. This review reveals that providers induced demand, particularly driven by the private sector is the leading cause of the increased CS rates in Bangladesh. It also suggests that demand from urban rich and educated women may play a part. Preference for CS is significantly higher among women who are living in the urban areas, take obstetric care in private facilities, and those who are wealthy and educated. Above all, a combination of profit making tendency of private health facilities and doctors, and demand from women with higher socio-economic status, particularly in urban areas have contributed to the recent increased trend in caesarean delivery in Bangladesh.

Physician's influence have been found to play an important role in the maternal decision on mode of delivery. Although, maternal request for CS and pressure from patients or their families have some influence on the decision-making process, doctor's influence to persuade the women might play the major role.

All women undergoing CSs, either indicated or unnecessary, poses the risk of variety of complications and may results in maternal morbidity and mortality. Performing a CS when it is not really needed poses economic pressure on family and on the limited resources of a resource poor setting like Bangladesh. Avoiding unnecessary CS could contribute to making CS accessible to those who really need this intervention to manage potential life threatening complications in both women and the newborns. Therefore, it is important to prevent unnecessary CSs and to keep the CS rates as low as possible. The decision to perform a CS delivery must be taken and monitored carefully and should not be profit oriented. Awareness raising about the negative consequences of caesarean deliveries, doctor's commitment to reduce the rate of CS, government's initiative to policy intervention and strict monitoring of the private health facilities may help to control the high CS rates. The review study call for further evidence based study in understanding of the role of private providers in maternity care and careful examination of the consequences of increased CSs in the private sector of Bangladesh.

5.2 Recommendations

Based on the evidence gathered from this literature review, recommendations are made towards reducing the high CS rates in Bangladesh. The recommendations are categorized into two groups:

1) Demand-side recommendations and
2) Supply-side recommendations

5.2.1 Demand-side recommendations

- The prevalent societal belief and perception of "CS is a high quality care and a procedure of higher social status" needs to be changed. To initiate a national campaign in changing societal belief, and to ensure quality of care during pregnancy and delivery for all classes of women (irrespective of rich-poor, urban-rural) is recommended.

- It is recommended to incorporate community based approaches for restricting the rising CS rates in Bangladesh. Community health workers should be trained up to raise awareness about the negative consequences of CSs, and to discourage women from choosing unnecessary CSs.

- The women have to be empowered and awarded to ask critical questions to their physicians about the reasonability of proposing a CS and about the indications of the proposed CS.

- Indications for performing CS should be evaluated carefully. Women's who opt for CS solely for their convenience, need to be counselled properly.

- Motivation programs should also be initiated for the mothers to reduce their anxiety on the fear of labour pain during delivery.

- Trial for vaginal birth under proper vigilance for those who had a previous CS can reduce the rate of repeat CS. Education and behavioural change intervention could also be effective in influencing the choice of women including those who had a previous CS.

- Interventions should focus less on women's individually but more on the community and institutional factors that influence women's decisions for CS. It is because any intervention aimed at only pregnant mothers may not be effective, if the healthcare providers are not adequately sensitized and if they are not agreed to decrease unnecessary CS.

5.2.2 Supply-side recommendations

5.2.2.1 Changing doctors behaviour and practice

- Doctors behaviour in reducing CS rate can be changed by feedback and audit, which can be achieved through mandatory second opinions; peer review of medical records, vaginal birth after caesarean and births outcomes. All physicians deciding an elective CS, must have a second opinion from a peer about CS before performing it.

- There should be evidence based protocols or guidelines for preventing CS and for decision making about caesarean delivery. A clear guideline should be disseminated to the health service providers. It can be done through professional associations by reorientation of healthcare providers with current evidence based protocols.

- A partograph could also be an effective tool to decide on surgical interventions during pregnancy complications. Using evidence-based interventions to reduce CS (partograph, artificial rupture of membranes, augmentation of labour with oxytocine and vacuum extraction) at all health care settings is strongly recommended to monitor intensively in protecting overmedication of delivery.

- To introduce effective monitoring of the indications of CS in both public and private health facilities to reduce unnecessary CSs. The reasons behind the failure of providing services during emergency complications and the prevailing high rate of caesarean procedure in the private health facilities should be addressed.

5.2.2.2 Policy interventions

- Special guidelines should be incorporated in the national health policy and regulations to make CS more restrictive and bring CS under law in restricting unnecessary CSs.

- Policy interventions could focus on setting guidelines and protocols such as, auditing and discourage physicians from performing medically unnecessary CSs.

- Private practices of the government doctors should be restricted by bringing that under regulations to reduce CSs at the private clinics. At the same time adequate salary and remuneration of doctors and related staffs need to be ensured.

- To form a panel of qualified specialized doctors by the Health Ministry to verify the appropriateness and necessity of a particular CS procedure is also essential.

- Establishment of a trained midwifery programs as like China could be a potentially good intervention in Bangladesh considering similar socio-cultural context with China. In Bangladesh, although there are informal and non-trained midwives, physicians are the only professional that can perform delivery. Restructuring obstetric care policies and establishment of trained midwife birth attendant would provide women more options, which would be a positive step towards a more humanized birthing procedure.

- Payment mechanisms, e.g. reducing payment differences between CSs and normal deliveries to health professionals and hospitals can be done in Bangladesh that have been proved effective in reducing CS rates in countries like Taiwan and Brazil.

Finally, certain population of Bangladesh, particularly those people live in remote areas and urban slums are still struggling to reach the minimum level of CS as recommended by the WHO. Therefore it is important to tackle the issue of high CS rates carefully, so that it would not be detrimental for cases where caesareans are essential but hard to reach them with this service. In this context the FIGO (2007) stated correctly that ‘‘women should not be denied access to caesarean delivery when needed, for want of funds or infrastructure; neither should they be placed under pressure to have a caesarean birth because of a lack of professional care to support a normal labour and delivery.’’

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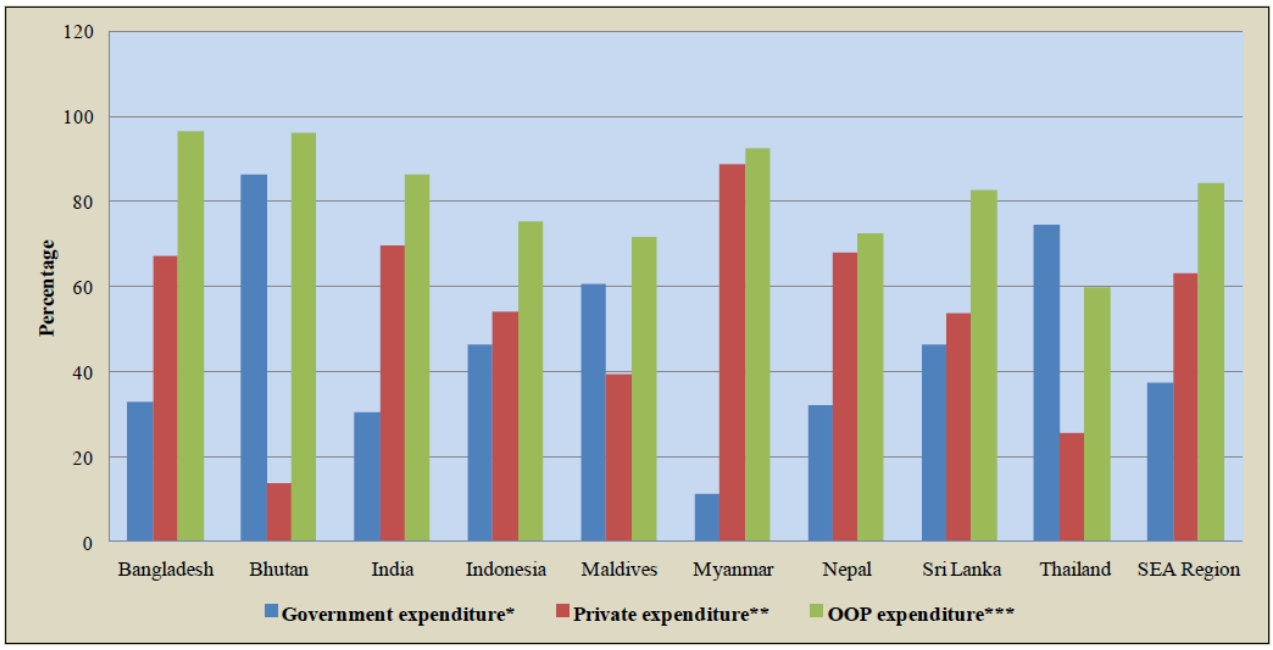
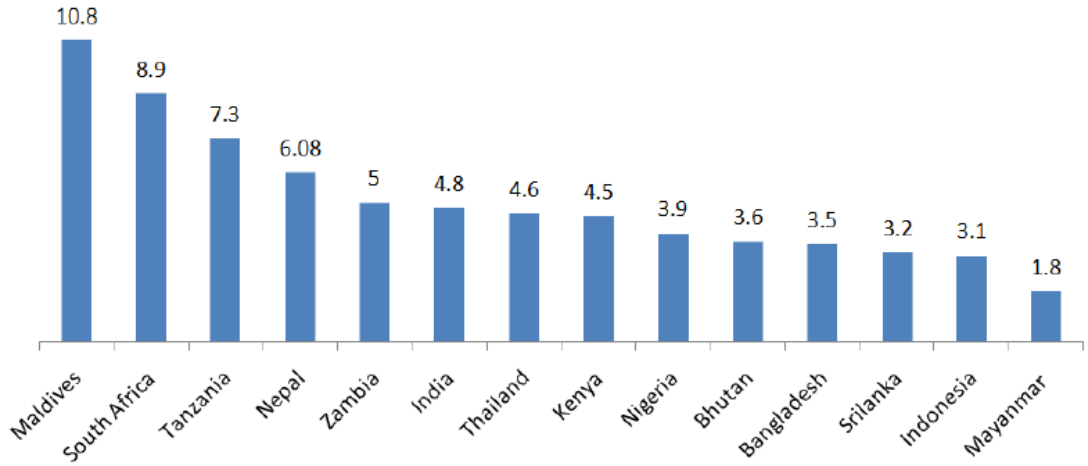
7. Annexes

7.1 Annex 1 (a). Healthcare financing in selected SEA Regional countries, source: Majumder (2013)

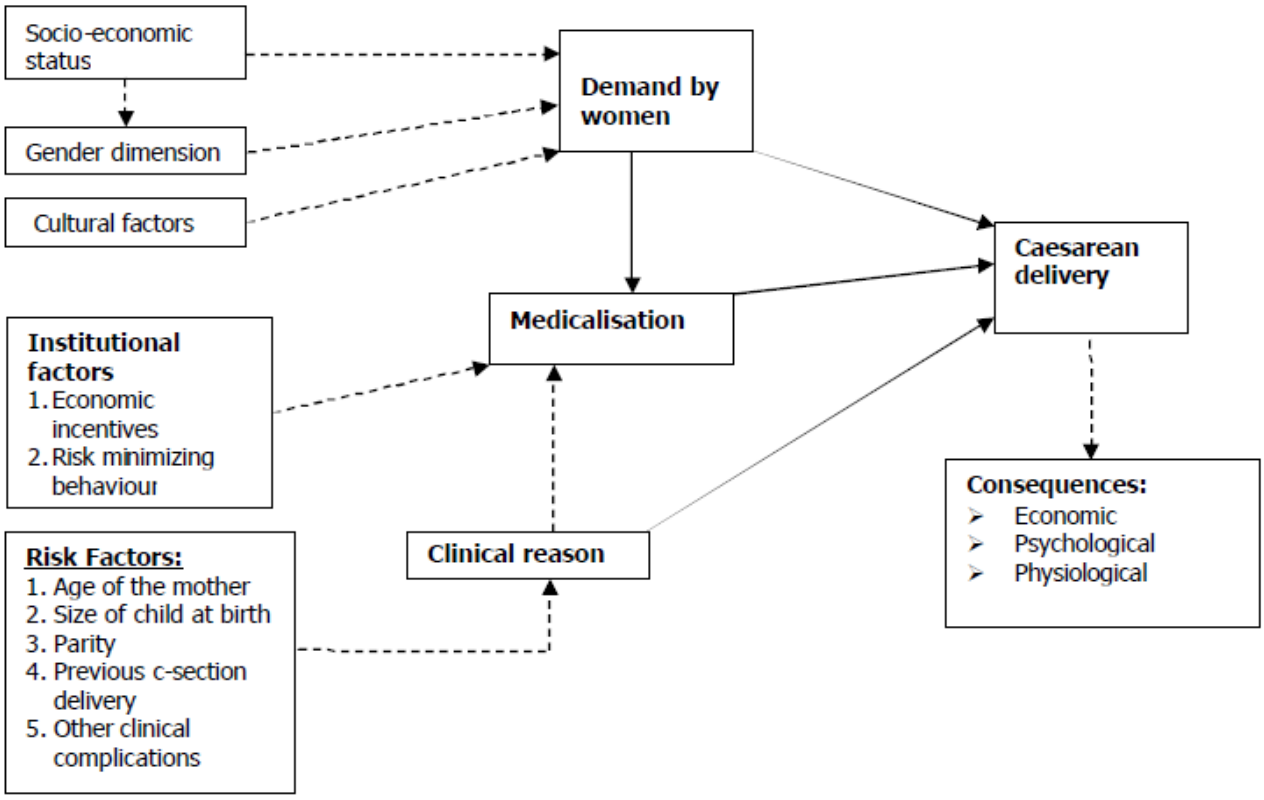


General government expenditure on health as % of total expenditure on health; ** Private expenditure on health as % of total expenditure on health; * Out-of-pocket expenditure as % of private expenditure on health.

7.1 Annex 1 (b). Total health expenditure as a % of GDP in Selected Countries, 2013; Source Islam et al. (2015).



7.2 Annex 2. Original conceptual framework used by Ghosh (2010), which is modified and adopted in the present study



7.3 Annex 3. The proportion of CS that are done as emergency or elective by five different district hospitals in Bangladesh, Hospital A performed higher emergency CS, because it is a referral hospital that receive patients from the territories. Source: Aminu et al. (2014).