Caesarean section in nulliparous women: a mixed methods study of factors influencing decision-making and outcomes for women - the MAMMI Study Caesarean Section Strand

Thesis submitted in fulfillment of the requirement for the Degree of Doctor of Philosophy at the University of Dublin Trinity College

2020

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Declaration

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Summary

Background: Caesarean section (CS) rates are on a rise over the last number of decades with limited or poor understanding of factors that influence decision-making for CS. It is a concern because there are increased morbidities associated with birth by CS compared to vaginal births. There is a need to understand the factors that influence the decision to perform CS in nulliparous women from the care providers' and women's perspectives.

Design: A longitudinal prospective mixed methods study.

Aim and objectives: This research aimed to identify and explore the non-clinical and clinical factors that influence the decision to perform CS in nulliparous women, and to identify postpartum morbidities experienced by women following birth by CS.

Setting: Two large (8500 births per annum) and one medium (3000 births per annum) sized maternity hospitals in the Republic of Ireland.

Sample: A total of 3047 women were recruited to the study. Data from 2755 women who consented to having their hospital records accessed were included in the analysis. One-to-one interviews were conducted with 20 obstetricians, 15 midwives and 20 women.

Methods: A sequential explanatory mixed methods design was conducted in two phases. Nulliparous women (n=3047) aged ≥18 years, who could read or understand English, were recruited in early pregnancy from three maternity hospitals in the Republic of Ireland (from 2012 to 2017), and completed surveys antenatally and at 3, 6, 9 and 12 months postpartum. In the qualitative phase in-depth interviews were conducted with clinicians (obstetricians and midwives) (in 2017) who were involved in decision-making for CS to explore factors influencing CS and women's involvement in the decision-making process and, in 2018, with a sub-sample of women who had birthed by CS.

Findings: The rate of CS in the study sample was 32.2% (n=888/2755). Factors significantly associated with the risk of having a planned CS were: aged ≥40 years, having had treatment for infertility, being in private care, multiple pregnancy, fetus in breech and other malpresentations. The risk of having an unplanned CS was significantly associated with being aged 35-39, and ≥40, years, overweight/obese/very obese, pre-existing high blood pressure, asthma, having had treatment for infertility, being in private care, multiple pregnancy, preterm gestation, fetus in breech and other malpresentations, induction of labour (IOL) and epidural for pain

management in labour. The risk of an unplanned CS increased significantly for women who had induction of labour (IOL) and epidural, with (ARR 1.70, 95% CI 1.44-2.01, p<0.001) or without intravenous (IV) oxytocin (ARR 2.06, 95%CI 1.57-2.69, p<0.001). Findings suggested that only a small proportion of women (4.76%) had requested a CS. After controlling for the pre-pregnancy (maternal age and pre-pregnancy BMI), pregnancy (type of care and number of fetus(es)) and intrapartum (IOL, IV oxytocin in labour and epidural for pain management in labour) factors, CS significantly increased the risk of increased blood loss (≥500mls) at birth, increased duration of hospital stay postpartum (≥4 days), increased use of antibiotics, and wound infection in the immediate (ARR 7.05, 95% CI 3.09-16.08, p<0.001) and up to 3-months postpartum (ARR 3.25, 95% CI 2.20-4.79, p<0.001).

Five themes, each with several subthemes, emerged from analysis of interview data with clinicians; 'A fear factor'; 'Personal preferences versus a threshold - clinician driven factors'; 'Standardised versus individualised care - a system perspective'; 'Private versus public - a possible difference in practice'; and 'Lack of experience or loss of skills and confidence'. Women's interview data emerged into three themes; 'I wanted a natural birth, but…'; 'Involvement in decision-making'; and 'A timely decision'. Four key findings were derived from integration of quantitative and qualitative findings; 'A system within the system', 'Women's involvement', 'Clinician driven factors', and 'Consequences for women'. Although women's age, obesity, treatment for infertility and breech presentations were associated with an increased risk of birthing by CS, there were a multitude of other factors that drove decision-making. Findings explored a 'parallel system' within the existing system of maternity care, where, on one side, clinicians believed their decisions to be appropriate and safe, and made in consultation with women, and on the other side, women described themselves as 'agreeing' or 'going along with' the professional's decisions while feeling not being listened to.

Conclusion: Findings indicate that the factors associated with and influencing decision-making for CS are complex and multifactorial, and there is increased risk of morbidities following birth by CS compared to women who have vaginal birth. Understanding the complexities of factors that contribute to the decision to perform CS in nulliparous women, and awareness of the impact of CS on women's postpartum health, has the potential to help reduce the rate of CS. This can be achieved by revisiting policies, further research and implementation of strategies to reduce CSs in nulliparous women, ultimately leading to a reduction in the number of repeat CSs in multiparous women.

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List of Abbreviations

ARM – Artificial Rupture of Membranes
AVB – Assisted Vaginal Birth
BMI – Body Mass Index
BP – Blood Pressure
CS – Caesarean Section
CTG – Cardiotocograph
CWIUH – Coombe Women and Infants University Hospital
ECV – External Cephalic Version
ER – Emergency Room
FBS – Fetal Blood sampling
GP – General Practitioner
GUH – Galway University Hospital
HSE – Health Service Executive
IMIS – Irish Maternity Indicator System
IOL – Induction of Labour
IV – Intravenous
MAMMI – Maternal health And Maternal Morbidity in Ireland
NICU – Neonatal Intensive Care Unit
PPH – Postpartum Haemorrhage
RH – Rotunda Hospital
SVB – Spontaneous Vaginal Birth
TGCS – Ten-Group Classification System
VBAC – Vaginal Birth after CS
WHO – World Health Organization

Meaning of terms

Maternal age: The participants' age was calculated from the date of completion of the antenatal survey.

Pre-pregnancy Body Mass Index (BMI): BMI is described in three categories; ideal BMI (including data on women who were underweight) ($\leq$24.9kg/m^2), overweight (25-29.99kg/m^2) and obese including very obese ($\geq$30 kg/m^2).

Type of care: There are three maternity care packages available at two study sites (RH and CWIUH) public, semi-private and private maternity care, and two packages at one of the study sites (GUH); public and private maternity care. Public care is free to all women who are residents in the

Republic of Ireland, and involves care being provided by midwives, obstetricians and GPs during pregnancy, labour and postnatal period.

Gestational age: Gestational age at birth is presented in two categories; term gestation (≥37weeks), and preterm (30 to 36 weeks) including very preterm (<30 weeks) gestation.

Presentation of fetus at birth: Presentation of the fetus in utero indicates the anatomical part of the fetus that is leading and is closest to the pelvic inlet of the birth canal. Fetal presentation/position at birth is categorised as follows; cephalic (baby presenting head first), and breech (baby presenting with buttocks and/or feet first) including other (any other malposition or malpresentation of the fetus in-utero including unstable lie) presentations.

Induction of labour (IOL): Induction of labour is a process of stimulating labour and birth and is often accomplished through pharmacological methods and artificial rupture of membranes (ARM) or a combination of both.

Intravenous (IV) oxytocin in labour: Oxytocin is a drug used to stimulate uterine contraction to induce or augment labour.

Mode of birth: The mode of birth data are presented in four categories; spontaneous vaginal births (SVB), assisted vaginal births (AVBs) (with use of vacuum or forceps, or both), planned and unplanned CSs.

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1. Chapter 1 Introduction

1.1. Introduction to the topic

Being a mother is a unique part of a woman's life. A woman's experience of her first birth, and her health and well being after birth influences her future reproductive health. Most women desire a natural birth with a safe outcome for the baby and a sense of control and personal achievement through active involvement in their care and decision-making (World Health Organization (WHO) 2018, Downe *et al*. 2018). However, over the last few decades, more and more women are giving birth to their first baby by caesarean section (CS). Analysis of data from 121 countries between 1990-2014 showed an average rise in CS rates of 12.4%, with an annual rise of 4.4% (Betran *et al*. 2016). In 2015, CS rates in 33 European countries ranged from 16.1% in Iceland, the lowest, to 56.9% in Cyprus, the highest of all countries (Euro-Peristat Project 2018), and the median CS rate was 27%. The national CS rate in Ireland was 33.8% in 2018, with rates in the 19 maternity units ranging from 26% to 42% (McMahon *et al*. 2019). The rising rates of CSs, and the wide variation that exists between and within countries, are poorly explained, and there is a growing need to understand underlying influencing factors (Macfarlane *et al*. 2015). As long ago as 1985, a landmark statement from WHO stated that there was no justification for any country to have a CS rate above 10-15% (WHO 1985). Three decades later, reports from WHO, following a systematic review (Betran *et al*. 2015) and an ecological study (Ye *et al*. 2016) to identify association between CS and maternal and neonatal outcomes, stated that CS rates between 10-15% were associated with reduced maternal and neonatal mortality; however rates above 15% were not associated with reduced mortality and had no additional benefits for women and newborns.

Despite plentiful evidence to suggest that morbidity is increased following birth by CS compared to vaginal birth (Villar *et* al. 2007, Liu *et* al. 2007, Betran *et al*. 2016), CS rates are on the rise in most parts of the world (Betran *et al*. 2016) with no concomitant improvements in maternal and neonatal morbidity (Liu *et al*. 2007, Silver 2012, Chauhan *et al.* 2014). In

fact, birthing by CS is associated with a five-fold increase in cardiac arrest, a four-fold increase in wound haematoma, a three-fold increase in infection and haemorrhage resulting in hysterectomy and a two-fold increase in anaesthetic complications (Liu *et al*. 2007). When healthcare cost is considered, the total cost of 'excess' CS in 2008, worldwide, was estimated to be 5.4 times the cost of the 'needed' procedures (Gibbons *et al*. 2010). Rehospitalisation following birth is one of the indicators of maternal ill-health, and results in increased healthcare costs (Lydon-Rochelle 2000). Postnatal costs in an Irish maternity unit have been estimated at €1,196 per bed-day (Kenny *et al*. 2015), which means the costs of readmission are, on average, €4,306 per woman. Women birthing by CS are more than twice as likely to require rehospitalisation due to wound complications, compared with women birthing vaginally (Panda *et al*. 2016). Moreover, primary CS makes decision-making for future births difficult and complex for women (Shorten *et al*. 2014).

Regardless of the type of birth and associated outcomes, most women feel a sense of control and satisfaction when they actively engage in their own care. An insight into women's views of their involvement in the decision-making process for their care is a necessary step. Understanding the care providers' and decision-makers' perspectives on factors influencing decision-making for CS is vital to identify the factors that can be addressed to reduce unnecessary CSs safely. Findings from research on maternal outcomes reveal that women experience an increase in both the type and severity of morbidity post CS, compared to those who birth vaginally (Liu *et al*. 2007). However, it is not known if women's perceived involvement in the decision-making process influences the type and extent of morbidities experienced postpartum. An insight into the factors that influence the decision to perform CS and involvement of women in the decision-making process will potentially help address the concerns over rising CS rates.

A large amount of literature indicates that decision-making for CS is influenced by a number of poorly understood complex factors, both clinical and non-clinical. This emphasises the need to explore these factors from multiple perspectives of key stakeholders, obstetricians, midwives and

women (Macfarlane *et al.* 2015, Marshall *et al.* 2015, Miller *et al*. 2016, Betran *et al*. 2018). This will subsequently help to target clinical and non-clinical interventions at clinician and organisational level to reduce unnecessary CSs in the future (WHO 2018, Betran *et al*. 2018).

1.2. Background of the study

This study was embedded in the larger Maternal health And Maternal Morbidity in Ireland (MAMMI) study (available at https://www.tcd.ie/mammi/about.html) which comprises of several strands (Figure 1-1), a multicentre, multistrand prospective cohort study aiming to explore the health and health problems experienced by first-time mothers birthing in Ireland.

Figure 1-1 Overview of MAMMI study

Despite the plethora of worldwide research on rising CS rates, the factors and processes that contribute to the decision to perform a CS in nulliparous women are not studied in detail. Factors responsible for the decision to perform CS, from clinicians' perspectives, are complex and poorly understood (Bryant *et al*. 2007, Kenny *et al*. 2015, Foureur *et al*. 2016).

Asking clinicians and women directly is one way of exploring these unknown factors.

1.3. Rationale for the study

The rising rates of CS are a growing concern worldwide. Existing literature demonstrates that

(i) many of the factors influencing the decision to perform CS in nulliparous women remain poorly understood

(ii) many of the reasons associated with an increase in the CS rate are non-clinical

(iii) women birthing by CS experience severe morbidity compared with women birthing vaginally

iv) morbidities experienced by women post CS compared to women birthing vaginally are unknown in Ireland

(v) clinicians' perspectives of factors influencing the decision to perform CS in nulliparous women are unknown in Ireland

(vi) women's perspectives of factors influencing and their involvement in the decision to birth by CS are unknown

Like most other parts of the world, Ireland has a rising trend in CS (Healthcare Pricing Office (HPO) 2018) with unexplained variations in rising rates of CS between hospitals (Brick *et al*. 2016, Sinnott *et al*. 2016). The lack of clarity and understanding of the factors that influence the decision-making for CS is a gap in existing knowledge.

1.4. Aim and objectives of the study

This study aims to identify and explore the non-clinical and clinical factors that influence the decision to perform CS in nulliparous women, and to identify postpartum morbidities experienced by women following birth by CS. The objectives are to:

Objective i: Identify the combination of pre-pregnancy, antenatal and intrapartum factors, non-clinical and clinical, and possible patterns, associated with birth by CS in 3047 nulliparous women in Ireland;

Objective ii: Identify the postpartum morbidities experienced by nulliparous women who birthed by CS and compare these to morbidities experienced by women who birthed vaginally;
Objective iii. Explore, from the perspectives of obstetricians (n=20), midwives (n=15) and women (n=20), the factors influencing the decision to perform a CS, and women's views of their involvement in the decision-making process.

1.5. My journey to the study

As a midwife working in the labour and birthing suite of one of the largest maternity hospitals in Ireland, the Coombe Women and Infants University Hospital (CWIUH), I was passionate about promoting normal birth, involving women in their care and taking an active role in decision-making around mode of birth. This was my starting point for this study, and exploring the factors influencing decision-making for mode of birth, and women's involvement in the process. My passion and plans were well-timed and favoured by the ongoing MAMMI study initiated by Dr Deirdre Daly in 2011. The MAMMI study, at that stage, was an established study, with ongoing recruitment and follow up of first-time mothers recruited from two maternity hospitals in Ireland. This made it possible for me to establish the study in a third site, the CWIUH.

I became actively involved in the study from September 2013, after my registration to the PhD programme (as a part-time student), with generous funding from the Friends of the Coombe, supporters of the CWIUH, my employing institution. As a practising midwife and being passionate about research, this was a timely opportunity for me to get immersed in research and the study. The initial phase involved a lot of reading around the trends in CS and work being carried out in different parts of the world to address the issues around the rising CS rates. Shortly into my PhD journey, I explored this issue from different dimensions, by conducting an audit to examine outcomes of readmission to hospital following birth by CS (Panda *et al*. 2016). I also explored views of clinicians from Sweden, a country with low rates of CS, particularly in relation to their views of factors that influenced their decision-making and helped them to maintain low rates of

CS (funded by COST Action IS1405) (Panda *et al.* 2018a). In 2016, I was awarded a three-year Healthcare Professional Fellowship from the Health Research Board (HRB), which enabled me to conduct and complete the study as a full-time PhD student.

1.6. Outline of thesis

This thesis consists of seven chapters. Chapter one has described the background in the international and Irish context, the rationale for this study, and the aim and objectives. Chapter two presents a review of the existing literature around rates of CS worldwide, in Europe and Ireland, risk factors associated with birth by CS, outcomes for women following CS, and recommended strategies to reduce CSs. This includes the aim, methods and findings of my systematic review and metasynthesis of studies on obstetricians' and midwives' views of factors influencing decision-making for CS, the main focus of this research. Chapter three consists of a detailed description of this study's paradigm and design, including the rationale for choosing a mixed methods approach. The details of phase 1, quantitative, and phase 2, qualitative, are described along with the methods used for data collection and ethical considerations. Chapter four presents the findings of the quantitative phase (phase 1) describing the factors associated with CS and outcomes/postpartum morbidities experienced by women following birth by CS compared to women who had a vaginal birth. Part one of chapter 5 presents the findings on clinicians' views of factors influencing decision-making for CS, and part two details the findings on women's views of factors influencing decision-making for CS, and their involvement in the decision-making process for their mode of birth. Chapter six presents an integration of the quantitative and qualitative findings, in a joint display, followed by a discussion of the study's key findings with reference to existing literature. This chapter also acknowledges the strengths and limitations of this research. Chapter seven, the conclusion and recommendation chapter, summarises the research findings, and presents a dissemination plan, my journey through this research along with recommendations for practitioners, education, future researchers and policymakers.

1.7. Conclusion and summary

This introductory chapter summarises the rationale for this research from an Irish and international context, its aim and objectives, and an overview of all the chapters of this thesis. With the growing concerns around rising CS rates at local, national and international level and, with no additional maternal or neonatal benefits with rates above 10-15%, it is vital to understand the factors that influence decision-making for CS. Many strategies have been recommended to reduce any unnecessary CSs. However, very little is known about obstetricians' and midwives' views of factors that influence their decision-making, and women's views of their involvement in the decision to birth by CS.

2. Chapter 2 Review of literature

2.1. Introduction

This chapter reviews the literature on factors influencing decision-making for CS and pregnancy and birth outcomes for women. The major rise in CS rates is a global concern and debated across all the countries. Most of the concerns are due to existing and strong evidence that there is no additional benefit to mothers and babies when rates are above 10-15%; in fact, medically unnecessary CS is associated with worse outcomes for mothers and babies compared to vaginal births (Souza *et al*. 2010, Sandall *et al*. 2018). The concepts 'Too little, too late (TLTL)' and 'Too much, too soon (TMTS)', introduced by Miller *et al.* (2016) appropriately describes the underuse of CS (TLTL) in some parts of the world with associated harm to mothers and babies, and overuse of CS (TMTS) in other parts with increased morbidities for women and newborns. Addressing the issues around these two concepts (TLTL and TMTS) is essential to optimise the appropriate use of CS.

Maternity care in Ireland

There are 19 maternity units in Ireland, and most of these units provide two options of maternity care, public and private care (www.hse.ie). The three maternity units in Dublin (CWIUH, Rotunda Hospital and National Maternity Hospital) have a third option for semi-private care. Approximately, 81% women book for public care and 19% chose private care (HPO 2016). (http://www.hpo.ie/latest_hipe_nprs_reports/HIPE_2016/HIPE_Report_2016.pdf). Maternity care in the public system is freely available to all women who are resident in the Republic of Ireland. Women who choose semi-private care pay a fee, part of which is covered by their private health insurance; however, the obstetric consultant's fees in private care is not covered by the health care insurance. In the public and semi-private system, women book for their maternity care in their chosen maternity unit and their care during pregnancy, intrapartum and postpartum period are provided by midwives and the team of obstetricians. Women in private care can book directly with a consultant obstetrician in their chosen materity

unit, and the consultant obstetrician is directly responsible for decision-making and their care. In the public care system, consultant obstetricians lead a team and also have their own private practice within the same maternity unit. All 19 maternity units offer both public and private maternity service, co-located within the same unit. In all parts of Ireland, women choose to have a home birth. These women, generally, book directly with the self-employed community midwives (SEMS) on behalf of HSE. (https://www.hse.ie/eng/services/list/3/maternity/homebirth-services.html) During labour and birth in hospital, all women are cared for by midwives employed within the public health service system. All decisions in relation to women's mode of birth are mostly a shared process, with obstetricinas as the final decision-makers, regardless of the type of care, public, semi-private or private. Most of the care for women during labour and birth is provided by the midwives. Midwives refer to the obstetricians on-call when needed. There are no data on the interdisciplinary education of midwives and doctors but, anecdotally, their education and training occurs separately.

This review presents the current trends, outcomes of birth by CS, risk factors, recommended strategies to reduce CSs safely, and findings from my systematic review on clinicians' views of factors influencing decision-making for CS.

2.2. Caesarean section rates

2.2.1.Rates worldwide

Maternity care and systems vary widely across the world with a wide variation in outcomes (Kennedy *et al.* 2015). According to one of the WHO reports, a CS rate of less than 10% reflects underuse and more than 15% indicates an over and unnecessary use of the procedure (Gibbons *et al.* 2010), since rates higher than this are not associated with any additional benefit to mothers and babies (Betran *et al.* 2015, Betran *et al.* 2016, Ye *et al.* 2016); however, analysis of data from 121 countries between 1990 and 2014, indicated a global average increase of CS rates from 6.7% to 19.1%, with an annual average increase of 4.4% (Betran *et al.* 2016). Figure 2-1 presents CS rates from selected high-income countries.

Although the rising trend in CS is a concern worldwide, overuse of the procedure is evident mostly in countries with high-income economies. Reports from several high-income countries indicate high rates of CS, e.g., Canada (30%) (Canadian Childbirth snapshot 2015-2016), Australia (33%) (Australian Perinatal statistics series 2017), New Zealand (26%) (Report on Maternity, New Zealand 2015), and the United States (31%) (Hehir *et al.* 2018), raising concerns over inappropriate use of CSs. Figure 2-1 presents CS rates per 100 live births for selected high-income countries in 2016.

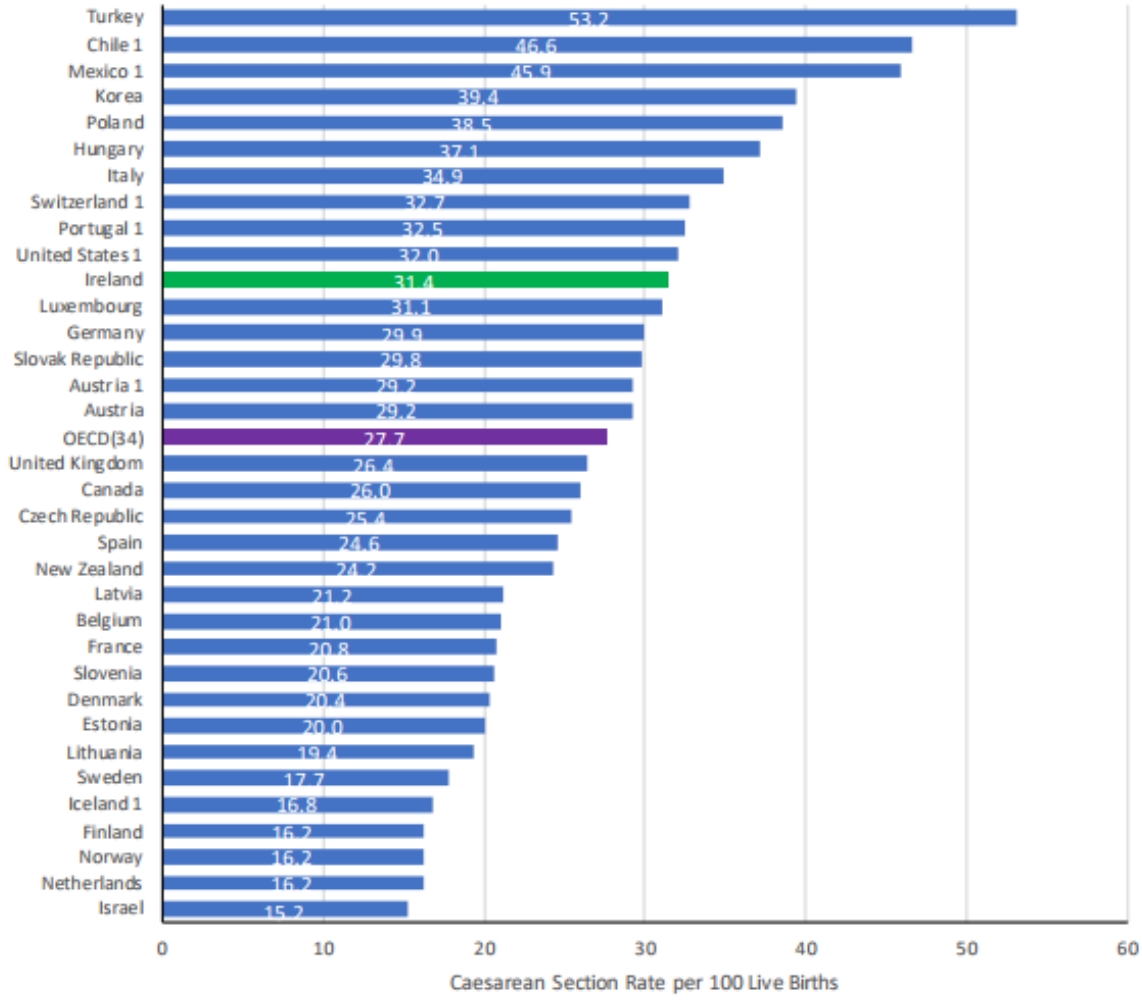

Figure 2-1 CS rates per 100 live births for selected High-income countries, 2016
(Source: National Healthcare Quality Reporting System, Annual Report 2019 (Primary source: OECD Health Statistics))
1 Data refer to in-patient cases only

2.2.2.Rates in Europe

CS rates across many European countries have increased steadily in recent years and also show wide variation in rates between countries (Table 2-1). Available CS rates from 33 European countries indicate that rates ranged from as low as 16.1% (Iceland) to as high as 56.9% (Cyprus) of all countries, with 27 countries with a high rate of CS (more than 20%). The latest EuroPeristat Report (Euro-Peristat Project 2018) shows that 22 countries have an increased and 11 have a decreased rate of CS over the last five years, indicating a possible difference in practice, healthcare systems and professional attitudes towards CSs (Macfarlane *et al.* 2015).

Table 2-1 Variation of CS rates in European countries – Changes between 2010 – 2015

Country	CS rates in 2010 (%)	CS rates in 2015 (%)	Change (%)
Belgium	20.3	21.3	↑ 1.0
Bulgaria	Not available	43	
Czech Republic	23.1	26.1	↑ 3.0
Denmark	22.1	21.6	↓ 0.5
Germany	31.3	32.2	↑ 0.9
Estonia	21.2	19.5	↓ 1.7
Ireland	27	31.3	↑ 4.3
Spain	25.3	24.6	↓ 0.7
France	21.0	20.2	↓ 0.7
Croatia	Not available	21.6	
Italy	38	35.4	↓ 2.6
Cyprus	52.2	56.9	↑ 4.7
Latvia	24.4	22.0	↓ 2.4
Lithuania	25.2	21.9	↓ 3.3
Luxembourg	30.0	32.7	↑ 2.7
Hungary	32.3	39.0	↑ 6.7
Malta	33.1	32.0	↓ 1.1
Netherlands	17.0	17.4	↑ 0.4
Austria	28.8	29.7	↑ 0.8
Poland	34.0	42.2	↑ 8.2
Portugal	36.3	32.9	↓ 3.4
Romania	36.9	46.9	↑ 10.0
Slovenia	19.1	21.2	↑ 2.1
Slovakia	29.4	31.1	↑ 1.7
Finland	16.8	16.4	↓ 0.4
Sweden	17.1	18.3	↑ 1.2
England	24.6	27	↑ 2.4
Wales	26.1	26.1	0
Scotland	27.8	32.5	↑ 4.7

Northern Ireland	29.9	29.9	0
Iceland	14.8	16.1	↑ 1.3
Norway	17.1	16.5	↓ 0.6
Switzerland	33.1	34.2	↑ 1.1

(Source: Euro-Peristat Project, November 2018)

2.2.3.Rates in Ireland

Ireland has the highest birth rate in Europe (14 per 1000 population) (Euro-Peristat Project 2018). CS rates in Ireland, although in the European average, rose from 25% in 2006 to 27% in 2010, and to 31.3% in 2015, a 4.3% increase from 2010 to 2015 (Euro-Peristat Project 2018). However, average CS rates can mask within-country variations, and rates in some units are as high as 38% (Cavan General Hospital and St Luke's General Hospital, Kilkenny) (National Healthcare Quality Reporting System 2019), with unexplained reasons for these variations (Sinnott *et al.* 2016).

The CS rates vary widely across the 19 maternity units in Ireland (26% to 42%), with rates as high as 45% among first-time mothers in one hospital (McMahon *et al*. 2019). Table 2-2 presents CS rates in the 19 maternity units in the Republic of Ireland for all mothers (National Healthcare Quality Reporting System 2019 (NPRS data 2017)) and first-time mothers (Bum2Babe 2017). Mostly the nulliparous CS rates are higher than all CSs (Table 2-2), and some of these upward trends in CS rates are attributed to the rising number of nulliparous women (up by 0.9% from 2017 (38.1%) to 2018 (38.4%)) with above average numbers of nulliparous women in the large maternity hospitals in Ireland (McMahon *et al*. 2019). However, many of the factors behind this rise remain unexplained and are discussed in later sections of this chapter.

Table 2-2 Rates of CS in the 19 maternity units in Ireland

Maternity Unit	**Total live births**	**All mothers (%)** (NPRS 2017)	**First-time mothers (%)** (Bump2Babe 2017)
Cavan General Hospital	1644	38.4	40.9
St Luke's General Hospital Kilkenny	1603	38.3	44.5
South Tipperary General Hospital	1016	36.4	37.8
Mayo University Hospital	1599	35.4	41

Portiuncula University Hospital	1759	35.3	35.9
Our Lady of Lourdes Hospital, Drogheda	3122	35.4	36.9
University Maternity Hospital, Limerick	4375	35.1	36.5
Rotunda Hospital	8367	34.2	35.4
Midland Regional Hospital Mullingar	2076	34.2	32.7
University Hospital Galway	2935	33.6	32.3
University Hospital Kerry	1383	33.4	36.7
Coombe Women and Infants University Hospital	8213	31.9	33.95
Cork University Maternity Hospital	7410	31.6	32.8
Sligo University Hospital	1325	31.3	38.1
Letterkenny University Hospital	1709	31.0	36.8
University Hospital Waterford	1886	26.8	31.0
National Maternity Hospital	8823	27.2	29.47
Midland Regional Hospital Portlaoise	1473	27	28.6
Wexford General Hospital	1768	25.9	29.1

(Source: National Healthcare Quality Reporting System 2019 (Primary source: National Perinatal Reporting system (NPRS) 2017) for 100 live births, and Bump2Babe, the Consumer Guide to Maternity Service in Ireland 2017)

2.2.4.Rates in the three study settings

Robson's ten-group classification system (TGCS) has gained wide popularity over the years as a way of analysing CS rates, due to its simplicity, robustness and flexible criteria for classification of the groups of CSs (Betran *et al.* 2014). The TGCS is used in all the three study sites, the Rotunda Hospital (RH), Galway University Hospital (GUH) and the Coombe Women and Infants University Hospital (CWIUH) to analyse and report annual CS rates. Rates in 2017 were 34% in the RH and GUH, and 32% in the CWIUH for all women, and 35% in the RH, 32% in the GUH and 34% in the CWIUH for first-time mothers (Malone 2017, Ryan 2017, Sheehan 2017). A comparison of the CS rates among nulliparous women according to Robson's ten-groups in the three hospitals (2017 data) is presented in Table 2-3.

Table 2-3 Summary of CSs rates among nulliparous women in the three site hospitals in 2017 using Robson's Ten-group classification system (TGCS)

Robson's groups for nulliparous women	Rates of CS in the study hospitals		
	Rotunda Hospital (RH)	Galway University Hospital (GUH)	Coombe Women and Infants University Hospital (CWIUH)
Group 1 – Nulliparous/ singleton/ cephalic/ term/ spontaneous labour	15.2% (226/1504)	15.6% (72/1463)	12.2% (162/1332)
Group 2a – Nulliparous/ singleton/ cephalic/ term/ induced	33.7% (451/1337)	50.4% (174/345)	35.5% (473/1331)
Group 6 - Nulliparous breech presentation	94.0% (157/167)	98.1% (53/54)	94.6% (157/166)

(Source: Hospital Annual Clinical reports (Malone 2017, Ryan 2017, Sheehan 2017))

2.3. Outcome of birth by CS

CS can be life saving when performed for a clinical indication. However, women birthing by CS are at an increased risk of developing short-term and/or long-term complications compared to women who birth vaginally (Liu *et al.* 2007, Souza *et al*. 2010, Keag *et al.* 2018). Compared to planned vaginal births, birth by planned CS is associated with an increased risk of maternal cardiac arrest (adjusted odds ratio [AOR] 5.1), wound haematoma (AOR 5.1), hysterectomy (AOR 3.2), major puerperal infection (AOR 3.0), risk of anaesthesia-related complications (AOR 2.3), venous thromboembolism (AOR 2.2), haemorrhage requiring hysterectomy (AOR 2.1), and increased length of hospital stay (adjusted mean difference 1.47 d) (Liu *et al.* 2007). Similar findings reported by Villar *et al.* (2007) indicated a doubled risk of severe maternal morbidities and mortality (including death, hysterectomy, blood transfusion, and admission to intensive care) and five-fold increased risk of postpartum infection with birth by CS compared to vaginal births. A systematic review and meta-analysis of one Randomised Controlled Trial (RCT) and 79 prospective cohort studies found that CS was associated with increased risk of miscarriage in subsequent pregnancy, placenta praevia, placenta accreta, placental abruption, postpartum haemorrhage, hysterectomy, still-birth,

preterm labour, fetal growth restriction and neonatal death (Keag *et al.* 2018).

Apart from the short-term and long-term complications, women birthing by CS are at increased risk of readmission to the hospital, mostly due to wound complications (Lydon-Rochelle 2001, Declercq *et al.* 2007, Panda *et al.* 2016), which is associated with increased length of hospital stay (Panda *et al.* 2016), and increased healthcare costs (Kenny *et al*. 2015). WHO estimated the cost associated with performing unnecessary CSs at $2.32 billion (Gibbons *et al.* 2010).

Birth by CS was associated with an increased risk for admission to a Neonatal Intensive Care Unit (NICU) for seven or more days (OR 2.2) and neonatal mortality (OR 1.8) (Villar *et al.* 2007). Risk of respiratory morbidities is doubled with planned CS compared to vaginal birth (Hansen *et al.* 2007). In high-income countries, a high rate of CS is associated with high infant mortality ($p < 0.05$), mostly attributed to iatrogenic prematurity indicating the need to develop practical strategies to reduce CS rates in the interest of perinatal health (Xie *et al.* 2015). Long-term complications such as wheezes and breathing difficulties (up to 5 years of age), asthma (up to 12 years), obesity (up to 5 years), hypersensitive and allergic skin conditions and inflammatory bowel disease (up to 35 years) were reported among children born by CS (Keag *et al.* 2018).

2.4. Risk factors associated with birth by CS

There are several risk factors associated with birth by CS. There is an ongoing debate in the literature as to the reasons for performing CSs in most maternity sectors. There is consensus around clinical reasons such as labour dystocia, fetal distress, acute clinical emergency (e.g., severe antepartum haemorrhage or umbilical cord prolapse, etc.), which have become more prevalent over time (Villar *et al.* 2007, Chauhan *et al.* 2014), and other reasons include breech presentation, preeclampsia, etc. (Villar *et al.* 2007).

An analysis of trends in CS rates in Ireland between 1999 to 2007 identified three influencing factors, clinical indicators (e.g., lack of progress in labour, fetal distress, etc.), changes in maternal characteristics (e.g., age and maternal weight) and, intrapartum factors (mostly attributed to changes in medical technology and clinicians' practice and management of a given situation, such as breech presentation). Most of which are similar to those cited in the international literature (Brick and Layte 2011, Brick *et al*. 2016), however, the authors concluded that these three factors together explained 55% of the rising trend in CS, with no explanation and justification of the remaining 45% (Brick and Layte 2011), indicating the importance to explore the factors that influenced clinical decision-making for CSs, and reasons for the rising trend.

2.5. Strategies to reduce CSs

A number of strategies are recommended in literature to reduce CSs safely for all women and, in particular, first-time mothers. These strategies mainly focus on improving intrapartum practices, organisational guidelines, audit of clinical practice, managing breech presentations through External Cephalic Version (ECV), education and training of health professionals and counselling women with fear of childbirth, etc. as outlined in Table 2-4.

Table 2-4 Recommended strategies to reduce CSs

Source	Target	Strategy
Edmonds & Jones 2013	Reducing overuse of CSs	Promoting vaginal birth, preparing women for labour and birth, and supporting women during labour
Panda & Begley 2014	Improving intrapartum practices to improve birth outcomes	At practice level, delaying admission to labour ward until onset of active labour
King 2012	Reducing intrapartum related CSs	Continuous and one-to-one support during labour, avoiding or limiting the use of amniotomy, synthetic oxytocin infusions and epidural anaesthesia, encouraging and maintaining hydration, mobilisation and upright position in labour
Degani & Sikich 2015	Reducing CSs at individual clinician level	Case selection for induction (i.e., selecting women with justified criteria for inducing their labour), involving consultant obstetricians in the decision-making process
Vogel *et al.* 2015	Reducing CSs at practice level	Avoiding medically unnecessary first-time CSs
Colomar *et al.* 2014	Reducing CS at hospital level	Implementation of guidelines and protocols, conducting regular audits of clinical practice
Turner 2011	Reducing CSs	Using quality control performance charts
Marshall *et al.* 2015	Reducing CSs at organisation level	Leadership and executive support
Panda *et al.* 2018a	Maintaining a low rate of CS	Shared care approach (involving midwives and obstetricians in decision-making), a common goal of achieving normal birth, a consistent and transparent pathway of care for women in pregnancy and childbirth, and provision of counseling service to women with fear of childbirth
Bell *et al*.	Reducing CSs for first-time mothers with singleton cephalic presentations at	A systematic approach to education and training of healthcare providers on

2017	term gestation	labour management and labour support guidelines
Boatin *et al*. 2018	Safely reducing first-time CS	Audit and feedback using Robson's classification system, revisiting the practical definition of labour dystocia, improving interpretation and management of fetal heart rate abnormality, and offering women ECV when the fetus is presenting by breech at early term, and trial of labour for women with twin pregnancies
Chaillet *et al*. 2015	Reducing CSs among women with low risk pregnancies, without any adverse effects on maternal and newborn outcomes	Providing feedback on audits to clinicians and implementing best practice guidelines at hospital level
Chen *et al*. 2018	Safely reducing CSs	Childbirth and relaxation training for women, use of clinical guideline and mandatory second opinion policy, audit and feedback on routine CS practices and presence of an obstetrician in the labour ward for 24 hours a day
Kingdon *et al*. 2018	Reducing unnecessary CSs	Women viewed effective communication, and the format and content of the information provided by health professionals as an important intervention

2.6. Systematic review of literature: Clinicians' views of factors influencing decision-making for CS – a systematic review and metasynthesis

2.6.1. Background

With growing concerns around the rising trend of CS rates, there is a strong emphasis on identifying the reasons behind this rising trend (Macfarlene *et al.* 2015) and understanding the decision-makers' perspectives is also essential. This systematic review was conducted to determine clinicians' views of factors influencing the decision to perform a CS.

The review was conducted in September 2016 and published in July 2018 (Panda *et al*. 2018b). To provide contemporaneous literature for discussion in the thesis, the search was updated in November 2018 for studies that assessed clinicians' views on factors influencing the decision to perform CS. The integrated findings of the published and updated systematic review are presented in this chapter.

2.6.2. Aim and objectives

Aim

To offer insight and understanding, through aggregation, summary, synthesis and interpretation of findings from studies that report clinicians' views on the factors that influence the decision-making to perform CS.

Objectives

1. To determine the views of obstetricians on factors that influence the decision-making to perform a CS.
2. To determine the views of midwives on factors that influence the decision-making to perform a CS.

2.6.3. Methods

2.6.3.1. Identifying studies for inclusion

Inclusion criteria:

All studies published in the English language that reported the views of obstetricians and midwives on the factors that influence the decision to perform a CS including quantitative, qualitative and mixed methods studies.
Exclusion criteria:
Studies published in languages other than English, randomised controlled trials (RCTs), and studies reporting only women's views or women's experiences (despite their importance) were excluded.

2.6.3.2. Searching and selection strategy

The electronic databases of PubMed (1958-2016), CINAHL (1988-2016), Maternity and Infant care (1971-2016), PsycINFO (1980-2016) and Web of Science (1991-2016) were searched in September 2016, and an updated search was conducted in November 2018 (October 2016-November 2018).

The search strategy was underpinned by the PICo approach.
'Population' (P) included obstetricians and midwives ('obstetrician' OR 'obstetricians' AND/ OR 'midwife' OR 'midwives').
'Interest' (I) was related to identifying views of the participants (e.g., 'view or views' OR 'Perspective or perspectives').
'Context' (Co) included factors influencing decision-making for CS (e.g. 'decision-making' AND 'caesarean section' or 'caesarean section' or 'factors').
Search terms were combined using the Boolean operand 'AND' (for example 'caesarean section' AND 'clinicians' AND 'views'), using the key words *'caesarean section', 'midwives', 'obstetricians', 'views', 'factors'* etc. (Appendix 1 presents the complete search strategy).

2.6.3.3. Selection:

Retrieved papers were reviewed by two independent authors (SP & DD) for title and abstract, and by three authors (SP & DD and SP & CB) for full text. For inclusion, two authors had to agree, and any disagreements were discussed with the third author until consensus was reached.

2.6.3.4. Assessment of methodological quality of included studies

A range of tools have been developed to assess the methodological quality of research studies such as Consolidated Criteria for Reporting Qualitative

Research (COREQ) (Tong *et al.* 2007) and the Critical Appraisal Skills Programme (CASP) checklist (Public Health Resource Unit 2006). These tools mainly assessed the quality of qualitative research studies, and hence were not deemed as appropriate tools for the purpose of quality assessment for this review, which includes quantitative, qualitative and mixed methods studies.

The 12-point quality assessment criteria checklist developed by Thomas *et al.* (2003) (Appendix 2) was deemed to be the most appropriate tool for the study because it facilitated assessment of methodological quality of qualitative, quantitative and mixed methods studies. The items included in the tool were relevant to the barriers to, and facilitators of, healthy eating amongst children. Hence, modifications were made to the last three criteria of the original tool (which were specific to 'quality of methods for research with children'), to make it appropriate for my review (Appendix 3).

Studies that met the criteria were scored as '1' and those that did not meet the criteria were scored as '0'. The scores were categorised as 'weak' (0-6), 'moderate' (7-9) and 'strong' (10-12), and a decision was made to exclude studies that were in the weak score category. Three authors (SP, DD & CB) independently assessed each study and agreed the final mark and each paper's inclusion for data extraction and synthesis.

2.6.3.5. Data extraction

A data extraction tool was developed to extract data from included studies on author(s), year of publication, location, aim, study design, participants and sample size, data collection method(s), data analysis and key findings reported by author(s).

2.6.3.6. Data analysis

There are various methods and options for analysing data in systematic reviews, such as meta-analysis, meta-synthesis, etc., and each method has its own implications for and applicability to the type of data involved (Dixon-Woods *et al.* 2005). Thematic analysis is flexible by allowing integration of both qualitative and quantitative evidence (Dixon-Woods *et al.* 2005), and

hence was deemed to be the most appropriate method of analysis for this review. Thematic analysis was conducted using the four steps derived and adopted from Lucas *et al's* (2007) framework; such as, data collection, identification and isolation of emergent themes, identification of broad themes, and synthesis of findings.

2.6.4. Results

2.6.4.1. Study selection

A total of 1478 individual titles were retrieved (from the initial search in September 2016 (n=1463) and updated search in November 2018 (n=15)), resulting in 1113 studies after removing the duplicates (n=365) (Table 2-5).

Table 2-5 Results of search strategy for each database

Data base	Dates	Results
PubMed	01/01/1958 – 30/09/2016	812
CINAHL	01/01/1988 – 30/09/2016	158
Maternity and Infant Care	01/01/1971 – 30/09/2016	393
PsycINFO	01/01/1980 – 30/09/2016	89
Web of Science	01/01/1991 – 30/09/2016	11
Updated search	01/10/2016 – 30/11/2018	15

(Adapted from Panda *et al.* 2018b)

Following review by title and abstract by two independent authors (SP & DD), a total of 918 studies were excluded. The remaining 195 studies (September 2016 (n=180) and November 2018 (n=15)) were independently reviewed by two authors (SP & DD; and SP & CB) for selection by full text and a total of 135 studies were excluded because they did not report on clinicians' views of factors influencing decision-making for CS (Figure 2-2) leaving 60 studies (September 2016 (n=53) and November 2018 (n=7)) for assessment of methodological quality.

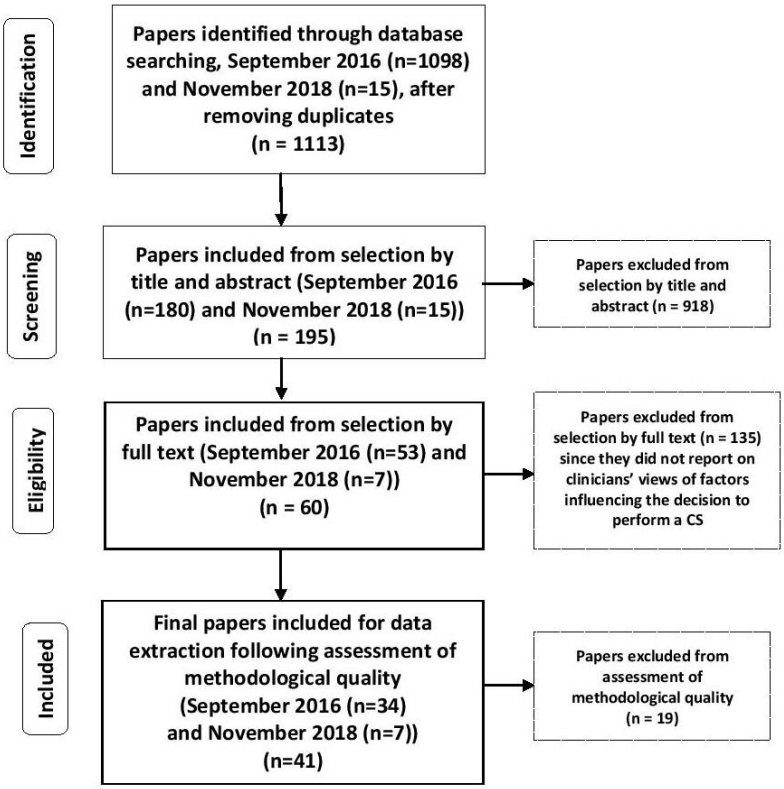

Figure 2-2 PRISMA flow chart presenting search results

(Moher D, Liberati A, Tetzlaff J, Altman DG, The PRISMA Group (2009). Preferred Reporting Items for Systematic Reviews and Meta-Analyses: The PRISMA Statement. PLoS Med 6(7): e1000097. doi:10.1371/journal.pmed1000097)

2.6.4.2. Results of assessment of methodological quality

Three authors (SP, DD and CB) reviewed each of the included papers for assessment of methodological quality. Nineteen papers scored '6' or less, and were excluded, leaving 41 papers (September 2016 (n=34) and November 2018 (n=7)) for data extraction and analysis. The reasons for exclusion of studies (n=19) were mostly in relation to reliability and validity of data collection tools, methods of data collection and data analysis. The remaining 41 papers scored as moderate (score 7 to 9) (n=24) or high quality (score 10-12) (n=17) (Appendix 4).

2.6.4.3. Study characteristics

The 41 studies, involving 8004 obstetricians (in 40 studies) and 1310 midwives (in 15 studies) (only one study included a combination of obstetricians and midwives (n=26) (Yazdizadeh *et al.* 2011)), were published during the 26-year period from 1992 to 2018. These studies were

conducted in 21 countries; 29 were conducted in 12 OECD countries (http://www.oecd.org/countries/) and 12 in nine non-OECD countries (Appendix 5). A quantitative design was used in 23 studies (surveys, postal questionnaires), 17 used a qualitative design (individual or focus group interviews) and one used mixed methods design (interviews and surveys) (Table 2-5). This review aimed to explore clinicians' views, hence views of other personnel, family planning workers (n=18) (Huang *et al.* 2013); hospital administrator (n=1) (Cox 2011); insurance bodies, syndicates and scientific societies, ministries, international agencies, medical schools, media representatives and women's groups (n=20) (Kabakian-Khasholian *et al.* 2007) and professional decision-makers (n=9) (Colomar *et al.* 2014), were excluded from data extraction and analysis. Obstetricians in Huang *et al*'s (2013) study were described as 'township doctors' who were involved in the decision to perform CS and have therefore been included in the analysis.

Table 2-6 Summary characteristics of the studies

Author(s)/ Year/ Country	Aim	Study design	Participants and sample size	Data collection Methods(s)	Data analysis	Key findings reported by author(s)
Appleton *et al.* (2000) Australia	To establish the level of knowledge and the background attitudes of staff towards VBAC	Survey	159 consultant obstetricians and 116 registrars/ residents 681 midwives (Response Rate (RR) =67%)	Question-naire	Chi-square analysis	**Obstetricians:** Previous classical caesarean, **breech** and twins. **Parental anxiety** was a major factor influencing a decision for or against a trial of labour. **Midwives:** Previous classical caesarean, **Midwives perceived** higher risk associated with trial of labour
Arikan *et al.* (2011) Turkey	(1) To investigate the caesarean rate among actively practising obstetricians in Turkey and reasons why they choose this mode of delivery for themselves /partners. (2) To investigate the attitudes, practices, and beliefs with respect to caesarean delivery on maternal request (CDMR) among actively practising obstetricians in Turkey	Descri-ptive	387 obstetricians (RR = 77%)	Self-administered Question-naire	Chi-square, Mann–Whitney U, and Kruskal–Wallis tests	**Obstetricians:** Most common reason for choosing CS was reduced **ano- rectal trauma**. CS on maternal request. **Private hospitals** with significantly higher rate of CS due to maternal request compared to public hospitals
Bagheri *et al.* (2013) Iran	To explore obstetricians' views of what might influence pregnant women's choice of	Quali-tative	18 obstetricians	Semi-structured Interview	Inductive qualitati-ve content analysis	**Obstetricians:** Women's **right and previous experience**. Personal preferences for CS, **shortage of midwives**, **lack of cooperation**

	delivery					among clinicians. **Fear of litigation**. CS believed to be **safer than vaginal birth**
Bailit *et al.* (2007) United States	To determine which primary caesarean delivery risk factors are important to practising obstetricians	Survey	259 obstetricians (RR = 29%)	Question-naire	Wilcoxon signed rank test	**Obstetricians: Medical problems, maternal obesity,** macrosomic infant, malpresentation, Bishop score, **patient's fear**
Bergholt *et al.* (2004) Denmark	To assess Danish obstetricians' and gynaecologists' personal preference and general attitude towards elective caesarean section on maternal request in uncomplicated single cephalic pregnancies at term	Survey	364 obstetrician and gynaecologists (RR = 80%)	Question-naire	Multiple logistic regression analysis	**Obstetricians: Risk to the fetus, risks of perineal injury. Woman's right to have an elective CS** on maternal request without any medical indication
Bettes *et al.* (2007) United States	To examine obstetrician–gynecologists' knowledge, opinions, and practice patterns related to caesarean delivery on maternal request	Survey	699 obstetricians and gynaecologists (591 of these were involved in conducting births) (RR =68%)	Question-naire	Descripti-ve statistics, independ-ent sample t tests, 2-test	**Obstetricians:** No **policy regarding CS on maternal request**. **Media portrayal** on CS. **Difference in views** between male and female obstetricians. **Women's right** to request for CS. The **risk of urinary and fecal incontinence and pelvic floor** prolapse. **Convenience. Liability concerns**
Bryant *et al.* (2007) Australia	To explore the beliefs through which decisions for caesarean birth are made and to consider how this might contribute to the increasing rate of	Quali-tative	6 obstetricians and 12 hospital-based midwives	Interviews	Thematic analysis	**Obstetricians: Women's right** to choose CS. **Risks associated with** CS is viewed as minimal. **Powerful belief systems among obstetricians**. Midwives: **Midwives contested** the notion of free choice. **Maternal**

	caesarean birth					**request in absence of medical indication**
Chaillet *et al.* (2007) Canada	To investigate obstetricians' perceptions of clinical practice guidelines targeting management of labour and vaginal birth after previous caesarean birth, and to identify the barriers to, facilitators of and obstetricians' solutions for implementing these guidelines in practice.	Quali-tative	27 obstetricians	Focus group and individual interviews	Thematic analysis	**Obstetricians:** Management and hospital policy; **medicolegal concerns**, **skill levels**, acceptance of guidelines, **nature of medical explanations** provided, and the management of maternal request for medical interventions
Chalmers *et al.* (1992) South Africa	To investigate doctors' perceptions of CS practices and explore the availability of facilities which could help to reduce the high CS rate	Survey	203 obstetricians (RR =45.2%)	Question-naire	Chi-square analysis	**Obstetricians:** Reasons for first CS are **Dystocia, fetal distress,** etc. Marked **difference between private and hospital-based doctors** with private doctors more readily performing CS compared to hospital-based doctors. **Fear of litigation**, **financial incentives** for high CS rates
Chigbu *et al.* (2010) Nigeria	To determine obstetricians' attitude to and factors predicting obstetricians' acceptance of caesarean delivery on maternal request in Nigeria	Survey	211 obstetricians (RR =70.3%)	Question-naire	Multiple logistic regression analysis	**Obstetricians:** Positive attitude of obstetricians to maternal autonomy and maternal request for CS. No influence of obstetricians' bio-professional characteristics on CS
Coleman *et al.* (2005) United States	To assess obstetrician-gynaecologists' current practice patterns and	Survey	502 obstetricians and	Question-naire	Descripti-ve statistics,	**Obstetricians: Multifetal gestation, diabetes and obesity**. P**atient preference and risk of**

	opinions regarding vaginal birth after caesarean delivery (VBAC)		gynaecologists (RR = 41.8%)		t- test, Chi square test and Spearman analysis	**liability**. High repeat CS reported by **private physicians compared to physicians working in not-for-profit hospitals**
Coleman-Cowger *et al.* (2010) United States	To determine obstetricians'-gynaecologists' practice patterns of caesarean delivery on maternal request (CDMR) following the 2006 National Institutes of Health (NIH) State-of-the-Science Conference on this topic, and compare them with those in their practice prior to the conference	Survey	352 obstetricians and gynaecologists (RR = 59%)	Question-naire	Descripti-ve statistics, t- tests, Chi square test and Wilcoxon Signed Ranks test, power analysis	**Obstetricians:** Significant agreement to the statement that **woman has a right to request and obtain an elective CS**. **Maternal age, plans for future childbearing**, week of pregnancy, BMI, fetal size, maternal anxiety
Colomar *et al.* (2014) United States	To explore attitudes of physicians attending births in the public and private sectors and at the managerial level toward caesarean birth in Nicaragua	Quali-tative descri-ptive	17 obstetricians and gynaecologists	Individual and focus group interviews	Descripti-ve analysis	**Obstetricians: Fetal weight, presentation, history of previous birth by CS**, **breech.** Obstetricians were not aware of **existing standards**. **Defensive medicine and lack of guidelines**. Lack of human and material **resources, Convenience**
Cotzias *et al*. (2001) United Kingdom	To determine what proportion of obstetricians would agree to elective pre-labour CS for 'maternal request'	Survey	151 consultant obstetricians (RR = 61.4%)	Question-naire	Descripti-ve analysis	Obstetricians agree to **maternal request** for CS in absence of medical indication if a woman is well informed of the risks. **Litigation**
Cox (2011)	To explore the barriers	Quali-	11	Semi-	Thematic	**Obstetricians: Fear of liability**.

United States	associated with the ACOG VBAC guidelines, as well as the strategies that obstetricians and midwives use to minimize their legal risks when offering a trial of labor after caesarean	tative	obstetricians and 12 midwives	structured Interviews	analysis	**Convenience**. Lack of availability of anaesthetist. **Financial benefits Midwives: Fear of liability. Convenience**. Exclusion of midwives from **policymaking**
Danishevski *et al.* (2008) Russia	To identify the factors that Russian obstetricians take into account when recommending a Caesarean section	Quali-tative: Inter-views	92 practising obstetricians (Response rate is not reported in the paper)	Responses to vignettes	Conjoint analysis	**Obstetricians: Birth weight** of 3.5 kgs or more, **gestation of over 42 weeks, maternal age** of 32 years or above**,** time of the day, **male obstetricians** were three times **more likely** to recommend CS compared to female obstetricians
Doret *et al.* (2010) France	To evaluate obstetricians' practice patterns, opinions and factors influencing decision-making about mode of delivery in women with two previous c-sections	Survey	105 obstetricians (RR = 65.6%)	Question-naire	Non-parametric Mann-Whitney test or *t* test, Chi square test	**Obstetricians:** Factors that negatively influence VBAC following two previous CSs were **increased maternal and neonatal risks** and VBAC not being a **standard of care** for these women
Faas-Fehervary *et al.* (2005) Germany	To evaluate the influence of biographic data, working environment and personal birth experience on the attitude towards Caesarean Section on demand.	Survey	719 gynaecologists (RR = 34%)	Question-naire	Chi square and *t*-test	**Obstetricians:** Approval for CS on demand is related to **patient autonomy** and physicians' **age, personal birth experiences**

Foureur *et al.* (2016) Australia	To explore the views and experiences of providers in caring for women considering VBAC, in particular the decision-making processes and the communication of risk and safety to women.	Quali-tative: Descri-ptive inter-pretive	3 obstetricians and 15 midwives	Focus group interviews	Thematic analysis	**Obstetricians:** Clinicians' p**ositive orientation** towards VBAC**. Midwifery care** was viewed as integral to achieve VBAC. **Different perspectives** among midwives and obstetricians Midwives: **Positive orientation** towards VBAC. **Midwives did not express fears concerning the risks** of VBAC
Fuglenes and Kristiansen (2009) Norway	The aim of this study was to test the hypothesis that obstetricians' choice of delivery method is influenced by their risk attitude and perceived risk of complaints and malpractice litigation	Survey	507 obstetricians (RR = 71%)	Question-naire - 5 clinical scenarios presented	Chi square test for bivariate analysis of categorical variables and t-test for continuous ones. Logistic regression	**Obstetricians:** Perceived risk of complaints and malpractice **litigation** were two clear determinants for the choice of CS by obstetricians. **Maternal request** is a driving force leading to higher CS rates
Huang *et al.* (2013) China	To assess population-based caesarean section (CS) rates in rural China and explore determinants and reasons for choosing a CS	Quali-tative	24 township doctors	Focus group interviews	Frame-work approach was used for analysis	**Obstetricians:** CS was less time consuming, confidence of obstetrician. Financial benefit to the hospital. **Maternal request**
Josefsson *et al.* (2011) Sweden	To compare Swedish obstetricians'/gynecologists' and midwives' attitudes and opinions on different aspects of	Survey	846 obstetricians 278 midwives (RR=66%)	Question-naire	Chi square test and student's *t*-test	**Obstetricians: Difference in attitudes of midwives and obstetricians about rates of CS. Midwives: Difference in attitudes of midwives and obstetricians**

	caesarean section (CS)					
Kabakian-Khasholian *et al.* (2007) Lebanon	This study aims to provide an analysis of the policy environment encouraging C-section in Beruit and its suburbs and to reveal approaches that could be adopted for the reduction of this practice, by considering the attitudes, opinions and actions of different stakeholders	Quali-tative	10 obstetricians	Interview and group discussions	Applied political analysis	**Obstetricians: Lack of skilled obstetricians, convenience**, lack of unified **standards and guidelines**, **maternal demands** for CS, diversity in medical education. **Women's request**. Lack of facilities. **Private insurance**
Kamal *et al.* (2005) United Kingdom	To explore the views of health professionals on the factors influencing repeat caesarean section	Quali-tative	12 doctors and 13 midwives (6 hospital-based and 7 community midwives)	Semi-structured interviews	Constant compar-ative method	**Obstetricians: Repeat CS** was a major contribution. F**etal distress, breech presentation, poor fetal growth, preeclampsia.** Avoiding subsequent **litigation.** **Midwives:** Repeat CS for women who had previous birth by CS **and breech presentation**. **Lack of 'quality of evidence', Professional boundaries.** Avoiding subsequent **litigation**
Karlstrom *et al.* (2009) Sweden	To describe obstetricians' and midwives' attitudes towards CS on maternal request	Quali-tative	9 obstetricians and 16 midwives	Focus group discussions	Content analysis. Themes were derived	**Obstetricians: Previous negative birth experience,** fear related to childbirth, hospital working condition, **fear of litigation**. **Midwives: Heavy workload**, **stress in intrapartum care. Fear of litigation**

Kenton *et al.* (2005) United States	To determine the practice patterns and opinions of recently trained US obstetrician-gynaecologists regarding repeat CS, primary elective CS, and elective CS for the prevention of pelvic floor disorders	Survey	304 obstetrician-gynaecologists (RR = 61%)	Question-naire	Mann-Whitney and McNemar tests, Chi square test	**Obstetricians:** Lack of availability of anaesthesia facility. Risks of **uterine rupture, neonatal morbidity/mortality issues, haemorrhage, preventing pelvic floor**
Koigi-Kamau *et al.* (2005) Kenya	To determine perceptions, preferences and practices of vaginal birth after Caesarean	Survey	64 obstetricians in private practice (RR = 60%)	Question-naire	Descriptive statistics	**Obstetricians:** Increased **demand for repeat** by women, obstetricians' **convenience, fear of litigation** in case of complications
Kwee *et al*. (2004) Netherlands	To determine the opinion of Dutch gynaecologists and registrars on caesarean section (CS) on request	Survey	583 gynaecologists and registrars (RR = 65%)	Question-naire	Analysis of variance and logistic regression analysis	**Obstetricians: Autonomy for the woman**, **litigation**. Influence of obstetricians' gender and experience on decision to perform CS
Litorp *et al.* (2015a) Tanzania	To explore women's and caregivers' experiences, perceptions, attitudes, and beliefs in relation to caesarean section.	Quali-tative	18 obstetricians and 8 midwives	Individual and focus group interviews, and participant observations	Thematic analysis	**Obstetricians: Women's low level of education**. Care providers believed that **vaginal birth is unpredictable**. Socio-economic consequences for women. Midwives: Vaginal birth is unpredictable
Litorp *et al.* (2015b) Tanzania	To explore obstetric care givers' rationales for their hospital's CS rate to identify factors that might cause CS overuse	Quali-tative	18 obstetricians and 14 midwives	Individual and focus group interviews	Thematic analysis	**Obstetricians: Conflict and difference** in attitude. Lack of resources. **Maternal age and weight. Private patients'** request for CS. **Litigation** Midwives: **Conflict and difference** in attitude among professionals.

						Lack of resources (equipments, staff shortages). **Litigation**
Monari *et al*. (2008) Italy	To explore the attitudes toward caesarean section of midwives and obstetricians who worked in the same geographical area	Survey	100 obstetricians and 148 midwives (public sector only) (RR =94.6%)	Structured Question-naire	Fisher's extract and Chi square tests	**Obstetricians: Reduce the chances of stress and fecal incontinence**. **Difference in attitudes**. **Male obstetricians were more likely to agree to or perform CS than females.** **Midwives:** Risks associated with CS. **Medico legal problems**
Samadi *et al.* (2013) Iran	To assess the behaviour and preferred delivery method among Iranian obstetricians in challenging cases	Survey	75 obstetricians (RR is not reported in the paper)	Revised Jackson personality inventory Question-naire	Prevalence of response and risk scores	**Obstetricians: Medicolegal issues**, avoiding risks
Weaver and Richards (2007) United Kingdom and Ireland	To examine whether, and in what context, maternal requests for caesarean section are made	Mixed method	29 obstetricians (interviews) and 785 consultants (questionnair-es) (RR =58%)	Survey and Interviews	Using SPSS (for surveys) and thematic analysis	**Obstetricians: Maternal request**, **fear of litigation** and defensive medicine
Yazdizadeh *et al*. (2011) Iran	To identify barriers to reduce the caesarean section rate in Iran, as perceived by obstetricians and midwives as the main behavioural change target groups	Quali-tative	26 obstetricians and midwives (number of midwives and obstetricians are not presented separately in	In-depth interviews	Thematic analysis	**Obstetricians: Financial** and **judicial** problems. **Absence of on call physician**. Shortage of resources. **Distrust and insufficient collaborations** **Medicalisation** of labour. **Absence of hospital protocol** **Midwives:** The **type and ownership of hospitals.** Shortage

			the paper)			of **human resources** and facilities. Distrust and insufficient collaborations between obstetricians and midwives. **Absence of hospital protocol**

Summary characteristics of the studies included from updated search in November 2018

Author/ Year/ Country	Aim	Study design	Participants and sample size	Data collection	Data analysis	Key findings reported by author(s)
Carrera *et al.* (2017) United States	To understand perceptions of actively practicing obstetricians in Puerto Rico: factors that influence decision making in cesarean delivery	Survey	62 obstetricians (RR=59%)	Self-administe-red surveys	Formative content analysis	Obstetrical indications (52%) Hypertensive disorders, fetal distress. Obstetricians' **convenience (52%) and medical liability** (50%) associated with vaginal births. Maternal request (35%). Financial issues
Kisa *et al.* (2017) Turkey	To determine the opinions and attitudes of Turkish obstetricians and midwives to caesarean section (C-section) and vaginal birth following a C-section	Quan-titative	88 midwives (RR=73%) and 22 obstetricians (RR=45%)	Question-naire	Paired t-test and chi square test	More midwives (31%) than obstetricians (18%) believed their CS rates to be high. Factors influencing high CS rates: difficulties in vaginal birth, **hospital management, maternal preferences**, and increased number of births in their organisations
Kucuk (2017) Turkey	To assess obstetricians' perceptions surrounding cesarean delivery rates in Turkey	Quan-titative	100 obstetricians (RR=62.5%)	Self-administe-red Question-naire	SPSS version 11 (SPSS, Chicago, IL, USA); frequenc-ies and Percent-ages	Obstetricians (96%) perceived CS rates to be high. **Fear of litigation** (100%). Maternal request (32%). Other reasons were obesity. Financial factors. Convenience
Melman *et al.*	To explore barriers and	Quali-	Ten midwives	Individual	Domains	**Hospital guidelines** and their

(2017) Netherlands	facilitators for delivering optimal care as described in clinical practice guidelines	tative	and Ten Obstetric consultants and ten obstetric residents	and focus group interviews	assigned using ATLAS.ti GmbH Version 7, Berlin, Germany	availability. **Perceived risk** with vaginal birth. Lack of **skills** in conducting vaginal breech births or fetal blood sampling. Lack of adequate **staffing**
Munro *et al.* (2017) Canada	To explore maternity care providers' and decision makers' attitudes toward and experiences with providing and planning services for women with a previous cesarean	Quali-tative	Four midwives, four obstetricians	In-depth, semi-structured interviews	Construct-ivist grounded theory	Interactions between the **clinical, organisational, and policy levels** of the healthcare system. Concerns related to **liability** and patient **safety**. Maternal autonomy. Limited access to resources
Begum *et al.* (2018) Bangladesh	To explore the attitudes of obstetricians towards caesarean section birth in a rural area of Bangladesh	Quali-tative	Six obstetricians	Individual interviews	Thematic analysis using deductive approach	**Perception of risks** with vaginal birth compared to CS. **Financial incentives** associated with CS. **Poor management of labour**. **Inadequate skilled staff**
Panda *et al.* (2018a) Sweden	To explore Swedish obstetricians' and midwives' perceptions of the factors influencing decision-making for CS in nulliparous women in Sweden	Quali-tative	Eleven midwives and five obstetricians	Focus group interviews	Thematic analysis	A **culture and belief of promoting normal birth**, counselling women with fear of childbirth, team approach and consistency in pathway of care, lack of influence of privatisation of care, **no fear of litigation**, and availability of consultant obstetricians in the labour ward had a positive influence, and lack of experienced clinicians had a negative influence

(Adapted from Panda *et al.* 2018b)

2.6.5.Thematic analysis and meta-synthesis

Thematic analysis identified clinicians' perspectives of a range of factors in relation to the decision to perform all types of CS including primary (first-time) and repeat CSs. Three interrelated key themes emerged; 'clinicians' personal beliefs', 'healthcare systems' and 'clinicians' characteristics' (Table 2-6). Figure 2-3 is a diagrammatic presentation of the themes and subthemes (41 studies). While each theme is of equal importance, 'clinicians' personal beliefs' emerged as the driver of the decision to perform CS. No new themes emerged from thematic analysis of the updated search. All seven studies from the updated search contributed to the existing themes and are described in this section integrated with the existing themes and subthemes.

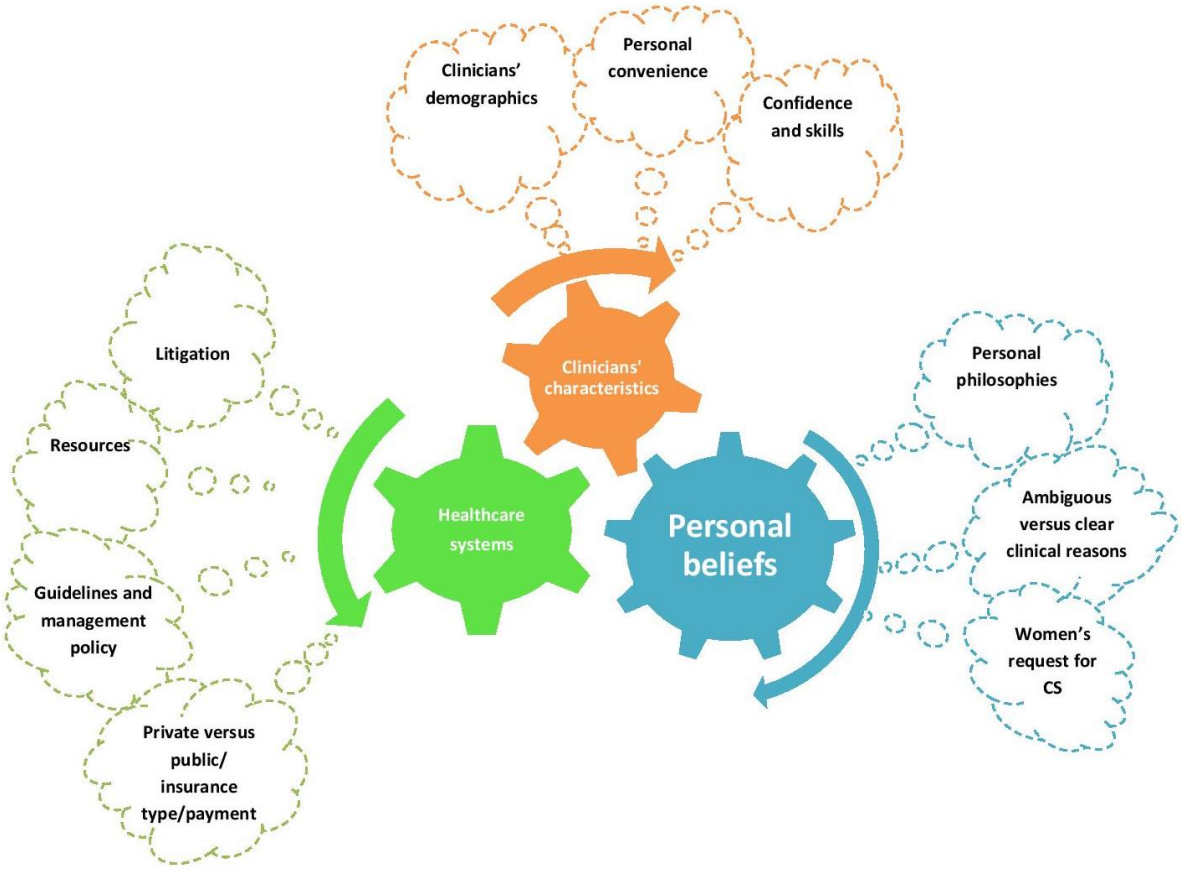

Figure 2-3 Diagrammatic presentation of the themes and subthemes (Adapted from Panda *et al.* 2018b)

Table 2-7 Themes and subthemes reported in each study

Author/Year	Theme 1: Clinicians' personal beliefs	Theme 2: Healthcare systems	Theme 3: Clinicians' characteristics
	Subtheme 1.i Professional philosophies- **a.** Perception of risk; **b.** CS being a 'safe option'; **c.** Lack of cooperation and trust **Subtheme 1.ii** Beliefs in relation to women's request for CS **Subtheme 1.iii** Ambiguous versus clear clinical reasons	**Subtheme 2.i.** Litigation; **Subtheme 2.ii.** Resources; **Subtheme 2.iii.** Private versus public/insurance type/ payment; **Subtheme 2.iv.** Guidelines and management policy	**Subtheme 3.i.** Personal convenience; **Subtheme 3.ii.** Clinicians' demographics; **Subtheme 3.iii.** Confidence and skills
Appleton *et al.* (2000)	1.i.a; 1.ii; 1.iii	2.iv	3.ii
Arikan *et al.* (2011)	1.i.a; 1.i.b; 1.ii; 1.iii	2. iii	
Bagheri *et al.* (2013)	1.i.a; 1.i.b; 1.i.c; 1.ii	2.i; 2.ii; 2.iii	
Bailit *et al.* (2007)	1.iii		
Bergholt *et al.* (2004)	1.ii; 1.iii		
Bettes *et al*. (2007)	1.ii; 1.iii	2.i; 2.iv	3.i
Bryant *et al.* (2007)	1.i.a; 1.i.b; 1.i.c; 1.ii		3.i
Chaillet *et al.* (2007)	1.ii	2.i; 2.ii; 2.iv	3.iii
Chalmers *et al.* (1992)	1.i.a; 1.i.b; 1.ii; 1.iii	2.i; 2.ii; 2.iii	3.i
Chigbu *et al.* (2010)	1.ii	2.i	3.ii
Coleman *et al.* (2005)	1.ii; 1.iii	2.i; 2.ii; 2.iii	
Coleman-Cowger *et al.* (2010)	1.ii; 1.iii		
Colomar *et al.* (2014)	1.i.a; 1.i.b; 1.ii; 1.iii	2.i; 2.ii; 2.iv	3.i
Cotzias *et al.* (2001)	1.ii	2.i	
Cox (2011)	1.i.a; 1.i.c	2.i; 2.ii; 2.iv	3.i
Danishevski *et al.* (2008)	1.iii	2.ii	3.ii
Doret *et al.* (2010)	1.ii; 1.iii	2.iv	
Faas-Fehervary *et al.* (2005)	1.i.b	2.i; 2.iii	3.ii

Foureur *et al*. (2016)	1.i.a; 1.i.b	2.i	
Fuglenes and Kristiansen (2009)	1.ii	2.i	3.ii
Huang *et al.* (2013)	1.ii	2.iii	3.i; 3.iii
Josefsson *et al*. (2011)	1.i.c; 1.ii		
Kabakian-Khasholian *et al.* (2007)	1.ii	2.iii; 2.iv	3.i; 3.iii
Kamal *et al.* (2005)	1.i.a; 1.ii; 1.iii	2.i; 2.ii; 2.iv	
Karlstrom *et al.* (2009)	1.i.a; 1.i.b; 1.ii	2.i; 2.ii	3.i
Kenton *et al.* (2005)	1.iii	2.ii	3.ii
Koigi-Kamau and Kiarie (2005)	1.ii	2.i	3.i
Kwee *et al.* (2004)	1.i.b; 1.ii	2.i	3.ii
Litorp *et al.* (2015a)	1.i.a; 1.i.b; 1.ii		
Litorp *et al.* (2015b)	1.i.a; 1.i.c; 1.ii; 1.iii	2.i; 2.ii.	
Monari *et al.* (2008)	1.i.a; 1.iii	2.i	3.ii
Samadi *et al.* (2013)	1.i.a; 1.i.b	2.i	
Weaver and Richards (2007)	1.ii; 1.iii	2.i	
Yazdizadeh *et al*. (2011)	1.i.a; 1.i.b; 1.i.c; 1.ii	2.i; 2.ii; 2.iii.; 2.iv	3.i
Updated search (November 2018)			
Carrera *et al.* 2017	1.ii; 1.iii	2.i	3.i
Kisa *et al.* (2017)	1.ii	2.iv	
Kucuk (2017)	1.ii; 1.iii	2.i; 2.iii	3.i
Melman *et al.* 2017	1.i.a, 1.ii	2.ii; 2.iv	3.iii
Munro *et al.* (2017)	1.ii	2.ii	
Begum *et al.* 2018	1.i.a	2.ii; 2.iii; 2.iv	
Panda *et al.* (2018a)	1.i; 1.ii	2.ii; 2.iii; 2.iv	3.iii

(Adapted from Panda *et al.* 2018b)

2.6.5.1. Theme 1 Clinicians' personal beliefs:

Clinicians' personal beliefs emerged as a key driver influencing the decision to perform CS and were discussed in all 41 included studies. Three interlinked subthemes were identified; 'professional philosophies', 'beliefs in relation to women's request for CS' and 'ambiguous versus clear clinical reasons'.

Subtheme 1.i Professional philosophies: Decision-making was mostly influenced by obstetricians' own philosophies. Eighteen studies reported on clinicians' philosophies, with references to their attitudes (Table 2-7). These mostly included their agreements or disagreements, and perception of risk associated with CS/vaginal birth/Vaginal Birth after CS (VBAC) (16 studies), their personal preferences and a perception of CS being a 'safe option' (12 studies) and lack of co-operation and trust among professionals (6 studies) (Table 2-7).

1.i.a. Perception of risk: Sixteen studies reported on obstetricians' and midwives' perceptions of risk associated with CS, mostly attributed to risks for the mother and fetus, and a general perception that some degree of risk was associated with CS compared to vaginal birth (first birth or VBAC). Most obstetricians (53% (n=40)) chose CS to avoid risks in unclear situations (Samadi *et al.* 2013), and due to their perceived risks of outcomes following vaginal births, such as urinary and fecal incontinence and pelvic floor prolapse (almost half (48%, n=335) of the obstetricians in the United States (US)) (Bettes *et al.* 2007).

> *"But some of the times when you go into caesars* [CS]*, and you see how paper thin that lower segment is, it's terrifying…if you have contractions on that...it just goes" (Obstetrician) (Foureur et al. 2016, p.3)*

> *"When I was resident, we used to say...first we should save the mother...but now the life of the newborn is as important as the life of mother. We can't give a dead child to the mother...So if there can be a least possible risk for the fetus, we choose CS" (obstetrician) (Bagheri et al. 2013, p.48)*

In absence of any medical indication, midwives in Litorp *et al*'s study (2015a) regarded vaginal birth as preferable to CS; however, in general, they had a positive attitude towards CS.

> *"In general, I think it* [CS] *is good...It's good because it helps mothers to enjoy the fruits of pregnancy" (Midwife) (Litorp et al. 2015a, p.716)*

1.i.b. CS being a 'safe option': Clinicians' perception of what was 'safe' determined their personal preferences and beliefs about CS (reported in 12 studies). Despite acknowledgement of the complications of CS, such as wound infection, adhesions and complications of anaesthesia, etc., about two-third of the obstetricians in Arikan *et al*'s study (2011) preferred CS for themselves or their partners. Compared to vaginal birth, CS was believed to be a safe option due to its reduced risk of complications (Bagheri *et al.* 2013), particularly for women living in isolated areas with lack of access to facilities (Litorp *et al.* 2015a).

> *"Earlier on, CS was very dangerous in our setting. Nowadays we feel that CS is safe, we tend to do more CSs." (Senior obstetrician) (Litorp et al. 2015a, p.717)*

> *"Elective caesarean sections I view as being quite safe. Emergency caesarean sections...may be…a bit more dangerous...still...a relatively safe operation." (Obstetrician) (Bryant et al. 2007, p.1197)*

Midwives often perceived obstetricians' belief of CS being a 'safe option', as one of the factors that influenced the decision to perform CS (Bryant *et al.* 2007).

> *"You know all that kind of talk around, "it's the most dangerous journey the baby will ever make, down the women's vagina."...the belief system amongst obstetricians is now that it's* [CS] *so safe that why would you risk that whole painful, messy, vaginal, risky business?" (Midwife) (Bryant et al. 2007, p.1197)*

1.i.c. Lack of cooperation and trust: Six studies identified **'**lack of cooperation and trust' between obstetricians and midwives, as well as between obstetricians with different levels of expertise, as a factor that influenced decision-making for CS. Disagreements between obstetricians and midwives around decision-making were identified as other factors. Midwives' lack of involvement (Yazdizadeh *et al.* 2011) and sometimes,

their influence on registrars to perform a CS for genuine indications (Litorp *et al.* 2015b) were factors that influenced the mode of birth.

> *"The discrepancy between the midwives' and the specialists' information is our main problem." (Midwife) (Yazdizadeh et al. 2011, p.10)*

Some of the issues in relation to lack of cooperation were related to obstetricians' perception of the midwife's role (Yazdizadeh *et al.* 2011, Bagheri *et al.* 2013).

> *"The midwives...are better in vaginal deliveries, but they should take responsibility. If they...call us in a very serious condition and put the responsibilities to us, I prefer to have a delivery (CS) from the very beginning." (Obstetrician) (Bagheri et al. 2013, p.47)*

Subtheme 1.ii Beliefs in relation to women's request for CS: Clinicians' views of "women's request for CS" was reported in 31 studies (Table 2-7), and mostly attributed to obstetricians' beliefs in women's right and autonomy to choose a CS, and their perception of women's anxiety and fear, socio-cultural perspectives, women's preferences and demands.

Obstetricians (77% (n=604)) in the UK and Ireland reported maternal request as a main reason to perform CS (Weaver *et al.* 2007). Most obstetricians agreed to perform CS for maternal request (n=154, 69%) due to patient pressure (n=55, 89%), fear of litigation (n=22, 35%) (Cotzias *et al.* 2001), and increased demand from women (n=15, 45.7%) (Koigi-Kamau & Kiarie 2005). In a Swedish study, more obstetricians than midwives had a positive attitude towards maternal request for elective CS (Josefsson *et al.* 2011). Mostly, obstetricians believed in women's right to choose CS and agreed to perform one following discussion of the risks and consequences (Bergholt *et al.* 2004, Arikan *et al.* 2011). In the US, 92.2% (n=545) of the obstetricians said no policy existed on managing women's request for CS. The remaining 7.8% (n=46) of the obstetricians said a policy existed, and 72.2% (n=33) of these said that the existing policy supported women's request for CS (Bettes *et al.* 2007).

> *"At the end of the day...it's their body and...their right to choose...as long as it's an informed consent, I would be very agreeable to obliging either way." (Obstetrician) (Bryant et al. 2007, p.1194)*

> *"I think it's very fraught...and I don't think it's as simple as saying, this is the pros and cons of the situation, now you choose." (Midwife) (Bryant et al. 2007, p.1195)*

Women's anxiety and fear of labour were reported as the most common reasons to request CS, and obstetricians, in general, favoured these requests (Karlstrom *et al.* 2009, Arikan *et al.* 2011). Over half of the US obstetricians (n=699, 54.6%), attributed women's requests for CS, mainly, to complications from previous birth (83.9%), and maternal anxiety (71.4%) (Bettes *et al.* 2007).

> *"There are a lot of women who...have no trust in their bodily functions or that we are made to give birth." (Focus group discussion with midwives and obstetricians) (Karlstrom et al. 2009, p.60)*

Lack of preparedness for labour and birth, women's higher social class, their country's culture and changes in women's lifestyle were other possible reasons for women's requests for CS (Yazdizadeh *et al.* 2011, Bagheri *et al.* 2013).

> *"People believe...if someone has a normal delivery that is because she doesn't have enough money...They say clearly that we have money, and we pay for caesarean section." (Obstetrician) (Bagheri et al. 2013, p.47)*

The media was viewed as influencing women's attitude towards birth and contributed to the decision to perform CS (Karlstrom *et al.* 2009, Yazdizadeh *et al.* 2011, Samadi *et al.* 2013).

> *"There have been a lot of writings...a lot in the media. In a way...it's a lot influenced from there." (Focus group discussion with midwives and obstetricians) (Karlstrom et al. 2009, p.60)*

Subtheme 1.iii Ambiguous versus clear clinical reasons: Eighteen studies reported on clinicians' decision-making in ambiguous situations or clinical uncertainties (Table 2-7). These mostly included reasons such as previous CS, risk of anorectal or perineal trauma, urinary and anal incontinence, maternal age, obesity, previous classical CS or birth complications or abortions, risk of pelvic prolapse, uterine rupture, and medical conditions such as myopia. Breech presentation, although not justifiable, was also reported as one of the clinical reasons in most studies.

Fetal distress, malpresentation, dystocia, placenta praevia and umbilical cord prolapse were other commonly reported clinical reasons (Appleton *et al.* 2000, Bettes *et al.* 2007, Arikan *et al.* 2011).

> *"We are running high* [rate of CS] *because we are giving caesarean section for a lot more indications now than we used to. For instance, we used to deliver breeches* [vaginally] *and we no longer deliver breeches* [vaginally]*." (Obstetrician) (Kamal et al. 2005, p.1056)*

Obstetricians' personal beliefs in some uncertain and ambiguous situations often influenced their decision.

> *"Often there's a slight medical reason in it, such as some people have had a difficult* [birth]*…and may ask for...*[CS] *this time...It's often difficult to separate them completely" (Obstetric Registrar) (Weaver et al. 2007, p.37)*

Contribution of updated search to theme 1

All seven studies (from the updated search) reported on clinicians' philosophies and their influence on the decision to perform CS. More midwives (31%) than obstetricians (18%) believed their CS rates to be high (Kisa *et al.* 2017). Risk associated with vaginal birth influenced clinicians' decision to perform a CS in uncertain situations (Melman *et al.* 2017, Munro *et al.* 2017, Begum *et al.* 2018).

> *"We usually do not take risks when there is 50/50 chance of vaginal delivery...My whole career will be ruined for a single fetal death." (Obstetrician) (Begum et al. 2018, p.8)*

> *"If the shoulder dystocia was severe, I would not risk to experience that again." (Midwife) (Melman et al. 2017, p.3)*

In contrast, a culture and belief of promoting normal birth was viewed by Swedish clinicians as a factor that positively influenced their decision-making and helped them maintain a low rate of CS in Sweden (Panda *et al.* 2018a).

> *"The main factor is public opinion about what is normal and what is abnormal delivery...Most people in Sweden...promote normal delivery and...think that CS is not something normal." (Focus Group Interviews with Obstetricians) (Panda et al. 2018a, P.3)*

Women's preferences for CS (Kisa *et al.* 2018), and the advice they received from friends and family influenced the communication between the woman and her care givers, and ultimately influenced decision-making for CS (Melman *et al.* 2017). In this context, counselling women with fear of childbirth was perceived to be an effective way to reduce CSs resulting from maternal requests (Panda *et al.* 2018a).

2.6.5.2. Theme 2 Healthcare systems:

Twenty-eight studies reported on factors related to healthcare systems and their influence on decision-making for CS, described under four subthemes; 'litigation', 'resources', 'private versus public/insurance type/payment' and 'guidelines and management policy'.

Subthemes 2.i Litigation: Clinicians' fear of litigation was the most common factor reported in 23 studies (Table 2-7). Midwives perceived that obstetricians transferred the responsibility to women in ambiguous situations to avoid subsequent litigation (Kamal *et al.* 2005); however, midwives confirmed that their practice did not change on the basis of any fear of legal consequences (Cox 2011). Fear of litigation, in Weaver *et al*'s study (2007), was reported as one of the main reasons to perform CS by 67% (n=525) of obstetricians in UK and Ireland.

> *"It's a bunch of crap that you have to change your practice…because somebody might sue you. Anytime you get a less than optimal outcome, people want to blame...It's just kind of a personal philosophy." (Midwife) (Cox 2011, p.5)*

Many obstetricians, on the other hand, described the medicolegal problems as leaving them with a negative experience (Cox 2011), a fear and a social stigma (Yazdizadeh *et al.* 2011) and a fear of blame (Litorp *et al.* 2015b) which ultimately, influenced their practice (Colomar *et al.* 2014).

> "[The] *number one priority...is the fear of medico-legal problems because we didn't do a caesarean." (Obstetrician) (Colomar et al. 2014, p.2385)*

> *"If you have a problem* [during a trial of labour]*, you are going to get no sympathy from the medico-legal community." (Obstetrician) (Cox 2011, P.5)*

In contrast, one study in Nigeria reported a greater threat of litigation after performing CS because women believed that complications arising from natural vaginal birth were unavoidable (Chigbu *et al.* 2010).

Subtheme 2.ii Resources: The influence of lack of resources in the decision to perform CS was reported in 16 studies (Table 2-7). This was mostly attributed to having insufficient experienced clinicians to facilitate natural birth (Chailet *et al.* 2007, Karlstrom *et al.* 2009, Bagheri *et al.* 2013).

> *"You should have a midwife for every woman, now we have a midwife for two or sometimes more than that. So, we can't monitor patients properly…We choose caesarean section very fast." (Obstetrician) (Bagheri et al. 2013, P.47)*

For women with previous CS, access to personnel for emergency CS (n=477, 95%) and/or immediate availability of anaesthesia (n=462, 92%) were viewed as important factors that influenced US obstetricians' decision-making (Coleman *et al.* 2005).

> *"The absence of specialists* [consultant obstetricians] *in teaching hospitals is another problem. Residents* [obstetric registrars]*…decide in favour of C-section as soon as…a small problem is encountered." (Obstetrician) (Yazdizadeh et al. 2011, P.7)*

Lack of access to physical resources, such as labour rooms or a theatre in remote areas were viewed as a hindrance to provision of safe and effective care in labour, leading to a reduced rate of normal birth, and ultimately influencing the rate of CSs (Kamal *et al.* 2005, Karlstrom *et al.* 2009, Yazdizadeh *et al.* 2011). Fifteen percent (n=35 of 233) of the South African obstetricians reported this as an influencing factor in their decision-making (Chalmers *et al.* 1992).

> *"Contrary to international standards, the size of our labor rooms have reduced and they have been converted into operating rooms over time." (Midwife) (Yazdizadeh et al. 2011, p.9)*

Subtheme 2.iii Private versus public/ insurance type/ payment:

Eleven studies reported on the influence of the type of hospital and healthcare coverage (private or public), and/or financial benefits to the

institution (Table 2-7). Obstetricians working in private hospitals regarded CS to be a safe option (Chalmers *et al.* 1992), with a more positive attitude towards maternal requests, compared to their colleagues in public hospitals (Arikan *et al.* 2011). Higher financial incentives for performing CS compared to vaginal births was viewed as being another influencing factor (Yazdizadeh *et al.* 2011, Bagheri *et al.* 2013, Colomar *et al.* 2014).

> *"In the private sector, providers are reimbursed approximately $700 for normal childbirth and $1500 for caesarean section, so the doctor prefers to perform caesarean." (Obstetricians) (Colomar et al. 2014, P.2388)*

Subtheme 2.iv Guidelines and management policy: Hospital policies and their influence on the decision-making process for CS were reported in 13 studies (Table 2-7). This was mostly attributed to a lack of hospital guidelines for the management of labour, VBAC, or CS on maternal request (reported by 92% (n=643) obstetricians in an Australian study) (Appletone *et al.* 2000), existing policies supporting CS on maternal request (Bettes *et al.* 2007, Cox 2011), and/or obstetricians being unaware of the existing guidelines (Colomar *et al.* 2014).

> *"Some obstetrics groups…weren't offering VBAC* [Vaginal Birth After CS] *and didn't have any desire to consider offering that service." (Obstetrician) (Cox, 2011, p.6)*

In addition, over-medicalisation of labour and lack of consideration to women's individual needs were some other influencing factors (Chailet *et al.* 2007, Yazdizadeh *et al.* 2011). Lack of involvement in the policy-making process was viewed as a factor by midwives (Cox 2011).

Contribution of updated search to theme 2

All seven studies reported on influence of healthcare system factors, and fear of litigation was the most common factor (Carrera *et al.* 2017, Kucuk 2017, Munro *et al.* 2017). Influence of private practice, and financial benefits associated with CS were other factors (Begum *et al.* 2018).

Lack of up-to-date protocols, and management guidelines, and access to them when needed were considered to be factors influencing the decision-

making. Staff shortages and financial constraints were other factors that influenced rising CS rates.

> *"Improved support during labour could reduce CS rates. However,...increase in staffing is not an option." (Obstetrician) (Melman et al. 2017, p.6)*

A team approach with consistency in pathway of care, lack of influence of privatisation of care, and lack of fear of litigation were perceived as other factors that helped clinicians maintain a low rate of CS in Sweden (Panda *et al.* 2018a).

> *"Every time it goes little bit wrong, we take it on...we analyse...about how can we do better...next time." (Focus Group Interviews with Midwives) (Panda et al. 2018a, P.4)*

2.6.5.3. Theme 3 Clinicians' characteristics:

Clinicians' characteristics as influencing the decision to perform CS was identified in 19 studies (Table 2-7), and three subthemes emerged; 'personal convenience', 'clinicians' demographics', and 'confidence and skills'.

Subtheme 3.i Personal convenience: 'Personal convenience' was reported as a factor in 12 studies (Table 2-7), and mostly attributed to obstetricians' perception of CS being an 'organised and controlled' option compared to attempts at vaginal birth. Scheduling a CS was perceived to be a convenient option by 23% (n=136) of the US obstetricians (Bettes *et al.* 2007).

> *"It is certainly easier to do a repeat C-section…and 'I get to have a little bit of easier life.' I think when you get to the heart of it, that's what's going on." (Obstetrician) (Cox, 2011, p.6)*

> *"The caesarean section gives us the opportunity to manage our schedules, finding someone to work instead of us, tell the hospital when we are leaving…Of course, physicians welcome this". (Obstetrician) (Bagheri et al. 2013, p.e47)*

> *"With CS I minimize my time and I earn more!" (Obstetrician) (Litorp et al. 2015b, p.235)*

Midwives believed that obstetricians used 'convenience' as a way of promoting CS (Cox 2011).

> *"Repeat caesareans are not only OK here, they are promoted! They can pick the date, which is very convenient...and they're selling caesareans." (Midwife) (Cox, 2011, p.6)*

Subtheme 3.ii Clinicians' demographics: Obstetricians' views of the influence of their personal demographics, such as age, gender and professional status on the decision-making for CS was reported in eight studies, three of which reported no influence (Kenton *et al.* 2005, Fuglenes & Kristiansen, 2009, Chigbu *et al.* 2010), and the remaining five reported some influence (Table 2-7).

Age: Two studies reported conflicting findings on age as an influential factor. Younger obstetricians had high rates (70%) of CS on demand, compared to rates (56%) among their older colleagues (Faas-Fehervary *et al.* 2005); in contrast, Russian obstetricians reported a 4% increased risk of approving and performing CS with increasing age of the obstetricians (Danishevski *et al.* 2008).

Gender: Three studies that explored the influence of gender found that male obstetricians were more willing to perform CS than their female colleagues (Kwee *et al.* 2004, Danishevski *et al.* 2008, Monari *et al.* 2008). Male obstetricians were three times more likely to recommend a CS compared to their female colleagues in a Russian study (Danishevski *et al.* 2008).

Professional status: The risk of performing or approving a CS increased with seniority and experience of obstetricians, reported in two studies. In Netherlands, experienced doctors (more than less experienced doctors) performed CS more frequently (Kwee *et al.* 2004), similar to findings from an Australian study where obstetric residents/registrars (83%, n=116) encouraged 'trial of labour' more than consultants or senior colleagues (60%, n=159) (Appleton *et al.* 2000).

Subtheme 3.iii Confidence and skills: Clinicians' lack of confidence and skills to perform vaginal birth, mostly related to fear of complications, was reported in five studies (Table 2-7).

> *"Obstetricians are familiar with the operation. Combined with a shortage of skilled midwives and the doctors' poor skills to attend to a vaginal delivery and manage dystocia, CS may not cause more morbidity or mortality for women and babies than a normal delivery." (Township doctor (Obstetricians)) (Huang et al. 2013, p.917)*

Contribution of updated search to theme 3

Four studies reported on influence of clinicians' characteristics. More than half of the obstetricians (52%) from the US reported 'personal convenience' as a factor that influenced their decision to perform CS (Carrera *et al.* 2017). Lack of clinical skills, confidence and experience were perceived as other factors that influenced their decision-making and outcome of birth (Melman *et al.* 2017; Panda *et al.* 2018a).

> *'The mode of delivery in case of a breech presentation depends on the expertise of the obstetrician in attendance'. (Midwife) (Melman et al. 2017, p.5)*

> *"Experienced midwives are the most important part of having a woman normally delivered and...a woman in labour...will of course trust her" (Focus Group Interviews with Obstetricians) (Panda et al. 2018a, P. 4)*

2.6.6.Discussion

This systematic review was the first review that brought together clinicians' views of factors that influenced decision-making for CS. Inclusion of all types of studies, quantitative, qualitative and mixed methods, and all types of CSs including VBACs, facilitated a collective presentation of views of 9314 clinicians from 21 countries over a period of 26 years. A systematic approach was used in searching, selecting and conducting assessment of methodological quality of the included studies for final data extraction and analysis. Thematic analysis combined with quantitative findings facilitated a comprehensive presentation of clinicians' views from all the studies to provide clarity in the factors that influenced clinicians' decision-making.

Rising rates of CS with no evidence of associated benefits to mothers and babies, is a growing global concern. The key issue is a lack of clarity of the

factors that influence decision-making for CS. In general, there are multiple factors that influence decision to perform a CS, and it is complex. Getting an insight into the complexities is the first step to develop local and global strategies to reduce the rising rates of CS safely. Clinicians play a vital role in the decision-making process and, often, their decision is influenced by their own beliefs and the healthcare system and its culture. The findings from this systematic review highlight all the key issues, from clinicians' own perspectives, that influence their decision-making.

Clinicians' views of factors influencing the decision to perform CS, through a synthesis of findings from 41 studies (34 from initial and seven from updated search) are presented in this systematic review. This section compares and contrasts the integrated findings with other existing literature. Three themes; 'clinicians' personal beliefs', 'healthcare systems' and 'clinicians' characteristics' emerged, with 'clinicians' personal beliefs' as the key driver.

Among all the factors, litigation emerged as a key factor, and has been reported previously as an influencing factor for CS (Aldakhil 2016), mostly attributed to perceived pressure from the healthcare system, court of law, and women and their families, which influenced the decision to perform a CS or aim for VBAC (Kamal *et al.* 2005, Cox 2011, Colomar *et al.* 2014, Kucuk 2017).

Maternal request was reported as a major factor in this review; however, other studies have reported a minimal contribution of this to the overall rates of CS (Gamble and Creedy 2000, Mazzoni *et al.* 2016). There were differences among obstetricians and midwives, mostly related to approval or disapproval of CS on maternal request (Bryant *et al.* 2007). However, obstetricians more so than midwives were inclined to agree with women's request for CS (Cotzias *et al.* 2001, Arikan *et al.* 2011). Although CS was viewed as a 'safe option' in most of the studies, clinicians in two studies (Kamal *et al.* 2005, Foureur *et al.* 2016) perceived vaginal birth to be safer.

Similarities and differences in views among clinicians from OECD and non-OECD countries were identified within a cultural context (Appendix 6). While

'fear of litigation' was a major factor in both, clinicians in non-OECD countries were more fearful of the pressure from women, health system and litigation, and the resulting stigma (Yazdizadeh *et al.* 2011, Bagheri *et al.* 2013), whereas fear of complications and adverse outcomes, and being sued and subsequent legal consequences were some major concerns among clinicians from the OECD countries (Fuglenes & Kristiansen 2009, Foureur *et al.* 2016). Despite these differences, clinicians from OECD and Non-OECD countries had similar views about women's right to choose their mode of birth, and CS being a safe and convenient option for childbirth (Bryant *et al.* 2007, Bagheri *et al.* 2013).

In general, the influence of private healthcare and financial incentives, lack of hospital guidelines or clinicians' unawareness of the existing guidelines and protocols were other factors that influenced the decision-making process (Kabakian-Khasholian *et al.* 2007, Yazdizadeh *et al.* 2011, Kisa *et al.* 2017, Begum *et al.* 2018).

Although not a major factor, clinicians' characteristics influenced the decision to perform CS. Male obstetricians more than their female colleagues (Kwee *et al.* 2004, Monari *et al.* 2008, Danishevski *et al.* 2008), and experienced obstetricians (consultants) more frequently than less experienced ones, were perceived to perform CS (Appleton *et al.* 2000). Perception of CS as a 'convenient' option was a major factor that influenced obstetricians' decision-making (Bryant *et al.* 2007, Bettes *et al.* 2007, Carrera *et al.* 2017), and midwives perceived this as a way of promoting CS (Cox 2011). Clinicians' level of experience, confidence and skills were other factors that determined the decision to perform CS (Chailet *et al.* 2007, Huang *et al.* 2013, Melman *et al.* 2017, Panda *et al.* 2018a).

2.6.7. Conclusion, implications and recommendations

The complex nature of factors that influence decision to perform a CS are crucial and key to gaining an understanding of decision-making for CS. Obstetricians as final decision-makers, and midwives as key professionals are vital determinants of the overall rate of CS in any country. Although a range of factors were identified in this systematic review including personal,

cultural, institutional, legal and financial factors, 'clinicians' beliefs' was the key driver that influenced their decision to perform CS. This systematic review has reduced the gap in information and offered insight into the factors influencing rising rate of CS. Careful consideration of the factors that can possibly be avoided within the maternity care system will help care providers reduce many unnecessary CSs. This will be of significant benefit to policymakers and help revise the institutional policy with a goal to promote normal births and avoiding any unnecessary CSs. Further research is recommended to establish how some of the factors identified can be addressed to avoid unnecessary CSs.

Although limited to the views of clinicians, whose decision may be further influenced by the healthcare system and/or policymakers, the strengths of this metasynthesis lies in its in-depth exploration of the issues influencing the decision to perform CS from the decision-makers' perspectives. The comprehensive presentation of clinicians' views provides an in-depth understanding, and will help development of intervention studies to focus on modifiable factors to reduce unnecessary CSs in the future.

2.6.8.Peer-reviewed publication and media portrayal

This systematic review was published on 27th July 2018 (https://doi.org/10.1371/journal.pone.0200941). Trinity College Dublin issued a press release on the publication of the findings from the systematic review on 31st July 2018, which was covered by the Irish and International media in early August 2018 (Appendix 7). I gave three radio interviews on RTE Drive time, Highland Radio, and South-East Radio programmes, Ireland, and PBS News Hour, New York, US (https://www.pbs.org/newshour/health/c-section-vbac-vaginal-maternal-health). A summary of the findings was published in the Midwives Magazine from Royal College of Midwives, UK (https://www.rcm.org.uk/news-views/rcm-opinion/clinicians-views-of-factors-influencing-cs-decision-making/).

2.7. Summary of chapter 2

This chapter presented a review of existing literature on rising trends in CS, risk factors associated with birth by CSs, outcomes of birth by CS compared to vaginal births, recommended strategies to reduce overuse of CSs with emphasis on findings from my systematic review on clinicians' views of factors influencing decision-making for CS. The rising CS rate is raising a plethora of concerns, mainly around the decision-making process. Despite ongoing debate around maternal requests, literature suggests their minimal contribution to the overall rise of CSs. Clinicians' attitude towards safety issues associated with vaginal birth and preference for CS as safe option plays a vital role in the rising trend. Clinicians' perceived fear of adverse outcomes and subsequent legal implications contributes to their preference for a CS over vaginal birth. CS being considered as a convenient option for childbirth further added to clinicians' preference for CS. Financial issues and privatisation of maternity care are other factors that contribute to the steady rise. Institutional factors such as hospital guidelines on management of labour, criteria for inducing labour, managing maternal requests, staffing issues, and lack of skilled and experienced clinicians, and lack of physical facilities such as access to theatre in emergency situations, infrastructure of labour wards, etc., are viewed by clinicians as contributing to the rise of CSs. The complexities behind the factors that influence CS rates to rise are often under explained. Ultimately, clinicians' attitude and the culture of practice that drive clinicians to perform unnecessary CSs and the system that supports or hinders the decision-making process are the key drivers that influence the rising rates of CS.

3. Chapter 3 Methodology

3.1. Introduction

The goal of my research was twofold; first, to identify and explore factors associated with and influencing the decision-making for CS in nulliparous women and, second, to identify outcomes for women following birth by CS. To achieve these goals, I chose to embed and establish my study within the ongoing MAMMI study, a longitudinal cohort study on first-time mothers' health and morbidities during pregnancy and up to one year postpartum. The study commenced in the first site, the Rotunda Hospital (RH) in Dublin, in 2011 with a focus on urinary incontinence experienced by first-time mothers (MAMMI 1) (Unpublished thesis by Dr Deirdre Daly). It was extended to a second site, the Galway University Hospital (GUH) (MAMMI 2), in 2013 to provide diversity by increasing the number of women from rural areas, and to increase the sample size in order to study less prevalent morbidities such as peripartum anxiety, depression and faecal incontinence. My research study was focused on establishing the CS strand, and extending the study to a third site, the Coombe Women and Infants University Hospital (CWIUH) in Dublin, in 2015 (MAMMI 3) to increase the sample size further. The research methods and my unique role in establishing MAMMI 3 are detailed in this chapter.

This chapter presents the methodology, and rationale for using a sequential explanatory design with mixed methods research. Integration of the findings was underpinned by pragmatism. A detailed description of the data quality issues and ethical considerations are included.

3.1.1. Aim and Objective

The aim of the study was to identify and explore the non-clinical and clinical factors that influence the decision to perform CS in nulliparous women, and to identify postpartum morbidities experienced by women following birth by CS.

The study objectives were

Objective i

To identify the combination of pre-pregnancy, antenatal and intrapartum factors, non-clinical and clinical, and possible patterns, associated with birth by CS in 3047 nulliparous women in Ireland.

Objective ii

To identify the postpartum morbidities experienced by nulliparous women who birthed by CS and compare these to morbidities experienced by women who birthed vaginally.

Objective iii

To explore, from the perspectives of obstetricians (n=20), midwives (n=15) and women (n=20), the factors that influenced the decision to perform a CS, and women's views of their involvement in the decision-making process.

3.2. Philosophical underpinning - pragmatism

The question of interest in a study determines the type of research methods (Cresswell & Plano Clarke 2011). Developing a mixed methods research requires an understanding of the underpinning philosophical assumptions, at a broad and abstract level, and are often discussed with the use of the term 'world view' or 'paradigm' (Morgan 2007, Cresswell & Plano Clarke 2011). A researcher's philosophical orientation and the decisions made in the research process are guided by a research paradigm, and it is essential that researchers demonstrate an understanding to guide their assumptions, beliefs, norms and values in locating their research in a particular paradigm (Kivunja & Kuyini 2017).

A philosophical justification is a key to creating a foundation for every research study and gaining knowledge pragmatically, through the use of different approaches and research methods, can provide a deeper understanding and more realistic view of the research topic (Tashakori & Teddlie 2010). Pragmatism as a paradigm arose in the 20th century and has gained popularity in mixed methods research. As a philosophical approach, pragmatism focuses mainly on the importance of the research problem, use of multiple methods of research to collect data to address the problem and the consequences of the research, and values both objective and subjective knowledge (Cresswell & Plano Clarke 2011). Cresswell (2009) described four characteristics of research paradigms or world views (Table 3-1) that

inform mixed methods research. This is a helpful starting point to understand the similarities and differences between and within the paradigms and demonstrates how pragmatism is situated as a paradigm within these four characteristics.

Table 3-1 Four basic characteristics of research paradigms

Postpositivist	Constructivist	Participatory	Pragmatist
Determination	Understanding	Political	Consequences of actions
Reductionism	Multiple participant meanings	Empowerment and issue oriented	Problem centered
Empirical observation and measurement	Social and historical construction	Collaborative	Pluralistic
Theory verification	Theory generation	Change oriented	Real-world practice oriented

(Adapted from Cresswell 2009)

In this study a pragmatic two-phased mixed methods approach was designed to achieve the study's aims. An adapted framework from Crotty's conceptualisation model (Figure 3-1) is used to discuss how pragmatism underpins this study (Crotty 1998).

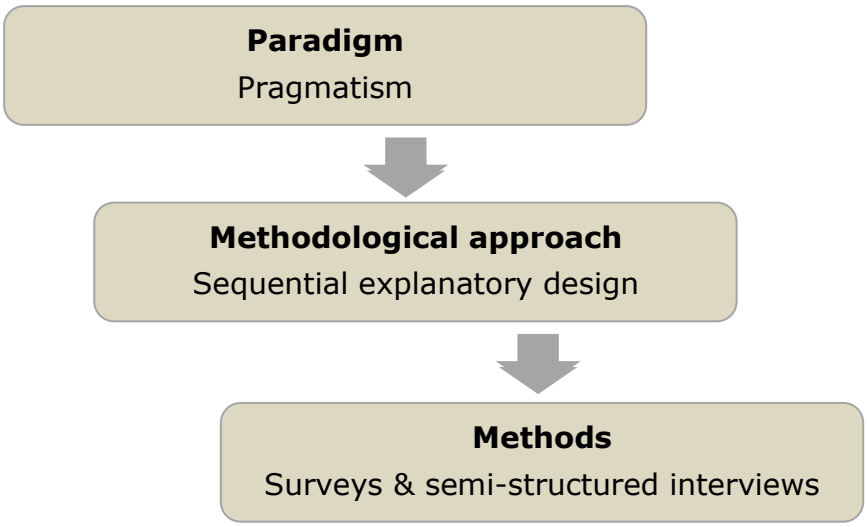

Figure 3-1 Study paradigm, methodology and methods overview (Adapted from Crotty 1998)

Although the four characteristics of these paradigms have some similarities, they differ in their approaches to research. While a postpositivist paradigm is associated, mostly, with quantitative approaches, constructivism and

participatory paradigms are associated with qualitative approaches, and pragmatism is associated with mixed methods research (Cresswell & Plano Clarke 2011). These paradigms differ from an epistemological, ontological, axiological and methodological standpoint (Cresswell 2009), and these four key elements of a research paradigm, described by Lincoln & Guba (1985) guide the research processes. Each element is discussed in this chapter in relation to my research.

3.2.1.Elements of research paradigm

3.2.1.1. Epistemology

Epistemology is concerned with how knowledge can be created (Lincoln & Guba 1985) and choosing the right methods to achieve the research objectives can be challenging. Identifying the factors associated with birth by CS and exploring the factors that influence decision-making for CS from multiple perspectives cannot be sufficiently addressed through the use of any single research method. Neither quantitative nor qualitative methods are sufficient on their own to address these details comprehensively. Therefore, a pragmatic world view with an epistemological approach of choosing the multiple components allowed a comprehensive method of addressing research objectives i and iii.

3.2.1.2. Ontology

Ontology is more about how things really work (Scotland 2012). This element in my research is concerned with exploring the reality from the multiple participants' perspectives, and is vital to address objective iii of this research, which is focused on exploring clinicians' and women's views of factors influencing decision-making for CS.

3.2.1.3. Axiology

Axiology is concerned with understanding the personal values that guide the research process (Kivunja & Kuyini 2017). Being a midwife and playing an active role in decision-making for CS was a starting point to being passionate about the factors that influenced decision-making for CSs. As a midwife and a researcher, I was eager to understand and tease out issues

that influenced the decision to perform a CS in nulliparous women. This was the strong motivation that guided my research.

3.2.1.4. Methodology

Methodological standpoint is related to the decisions underpinning the methods used to collect data (Crotty 1998). The logic of using a combination of different methods of research helps researchers address their research aims comprehensively through use of a mixed methods approach (Johnson *et al*. 2007). This was crucial to achieve the goals which required use of a quantitative method to identify the factors associated with birth by CS, determine the morbidities experienced by women who birth by CS and compare these to those experienced by women who birth vaginally, and integrate these with findings from the qualitative methods exploring factors influencing the decision to perform a CS in nulliparous women from multiple perspectives of clinicians and women. Meeting the research objectives of this study required the use of quantitative and qualitative methodologies, and an integration of both.

3.3. Study design – Mixed methods

A mixed methods design was chosen in two phases, phase 1, the quantitative, and phase 2, the qualitative method. Mixed methods designs in the field of healthcare research are gaining widespread popularity through facilitating an extensive understanding of the research phenomena/problem (Doyle *et al*. 2016). Mixed methods designs are forms of realistic synthesis based on the inclusion of quantitative and qualitative components, which not only acknowledges the importance of these two approaches to research but also offers a powerful third paradigm (integration) that provides balanced and comprehensive research results (Tashakori & Teddlie 2010). A mixed methods design (Figure 3-3) was essential in order to answer each specific objective, through the use of different research methods, to address the research question comprehensively.

3.3.1. Phase 1 (Quantitative) – Longitudinal prospective cohort study

A longitudinal prospective cohort study design was used in phase 1, the quantitative phase. This consisted of self-completion surveys, administered

antenatally and at 3, 6, 9 and 12 months postpartum, and data abstraction from consenting women's hospital records.

Surveys captured information on a broad range of factors that, individually or collectively, influenced the decision to perform a CS. These data were supplemented with clinical data abstracted from consenting women's pregnancy and birth records to identify the factors associated with birth by CS, and postpartum morbidities experienced by nulliparous women who birthed by CS and vaginally.

3.3.2.Phase 2 (Qualitative) – Descriptive qualitative study

A descriptive qualitative design was used in phase 2, the qualitative phase, which consisted of one-to-one in-depth interviews with women who birthed by CS, and clinicians (obstetricians and midwives) who were directly involved in the decision-making process for CS in the selected study sites. A qualitative descriptive design is often regarded as a valuable and distinctive component of qualitative research and an appropriate method of choice to describe and explore the 'what', 'why' and 'where' of a phenomenon of interest (Sandelowski 2000). A rich description of the content to produce meaningful information for the readers from the perspectives of the participants is vital in any research that uses a qualitative component, and a descriptive qualitative approach is a unique choice that allows presentation of the depth of information (Colorafi & Evans 2016). A descriptive qualitative approach allows flexibility in presenting the research and its findings as they emerge (Kim *et al*. 2017). This approach was chosen over phenomenology, ethnography and grounded theory, with a commitment to study the concept in its natural and existing state, and to describe the factors that influenced decision-making for CS to the extent that is possible within the context of my research. This objective was achieved by collecting data from clinicians and women using one-to-one interviews. In-depth interviews with clinicians were used to tease out their views of factors influencing the decision to perform a CS, while in-depth interviews with a sub-sample of women, recruited to the study in phase 1, explored their perspectives of factors influencing the decision to perform CS and their involvement in this decision.

3.3.3. Integration of phase 1 (quantitative) and phase 2 (Qualitative) – Sequential explanatory design

Choosing the most appropriate design in conducting a mixed methods study can be challenging because of issues related to managing time, resources, coupled with the multiple skills required by the researcher (Creswell & Plano Clark, 2011). The challenges associated with 'integration' become clearly evident when results and findings from different components are reported sequentially in parallel form (Bazeley 2018). Different approaches have been suggested to design a study to best address the research problem and purpose of a study, and each approach has a different emphasis, with many commonalities. Basing the design of a mixed methods study on pragmatic foundations allows the researcher to choose a design that works best for the particular research problem (Cresswell & Plano Clarke 2011). Being explicit about the reason and points of integration in mixed methods study is the most frequently suggested way to overcome challenges faced when choosing a design. Cresswell & Plano Clarke (2011) stressed the importance of understanding the value of adapting existing frameworks and being flexible to the emerging needs to mix as the study progresses. Giving careful consideration to these challenges in choosing the most appropriate design, an adapted sequential explanatory design was chosen. A sequential explanatory design begins with a quantitative phase and then proceeds to a qualitative phase, and there are a number of reasons for choosing this design (Cresswell & Plano Clark 2011). This design allowed integration/mixing at design stage through data collection using quantitative and qualitative methods, data analysis and an integrated interpretation of the findings from textual narratives (qualitative) and numerical data (quantitative) evidence. Each individual method, quantitative and qualitative, was chosen to answer the specific objectives, and when combined, these two methods together enabled the researcher to answer the study's aims as a whole.

3.3.3.1. Point of integration/mixing

One of the challenges in conducting and reporting mixed methods studies is being explicit about the point of integration. Identification and establishment of the interactive relationship between the two methods is

vital to give clarity in a mixed methods study (Cresswell & Plano Clarke 2011). The mixing and integration strategies in this study were identified and established at every stage of the research process; at design stage, in data collection, data analysis and reporting and discussion stage (Figure 3-2).

The study settings were the first point of integration. Women for phase 1 and clinicinas for phase 2 of the study were recruited from the three settings (RH, GUH and CWIUH), and a sub-sample of women for phase 2 were recruited from one study site, the CWIUH. Identification and selection of women for the interviews was the next point of integration; the quantitative phase served as a vehicle to identify and access a sub-sample of women for the phase 2 interviews, and this was the point of integration at data collection stage. Data gathered in the quantitative phase from women's self-administered surveys and hospitals records provided information to purposively select women for one-to-one interviews in phase 2. Data analysed from clinicians' and women's perspectives were integrated with the data gathered from self-administered surveys and hospital records to provide a comprehensive analysis of the non-clinical and clinical factors that were associated with and influenced the decision to perform a CS and outcome of CS in nulliparous women. Data, in the quantitative phase, were collected from all women, not just from those who birthed by CS, and in the qualitative phase specific women who had a CS birth were identified to take part in the interviews. A selection of specific women allowed exploring of in-depth information on factors that influenced the decision for their birth by CS and their involvement in the decision-making process in the individual circumstances. Clinicians were recruited from all the three study sites to get a reflection of their views of factors influencing decisions to perform CS in different hospitals. Integrating views of women and clinicians provided complete and thorough information on factors that influenced decision for CS from multiple perspectives.

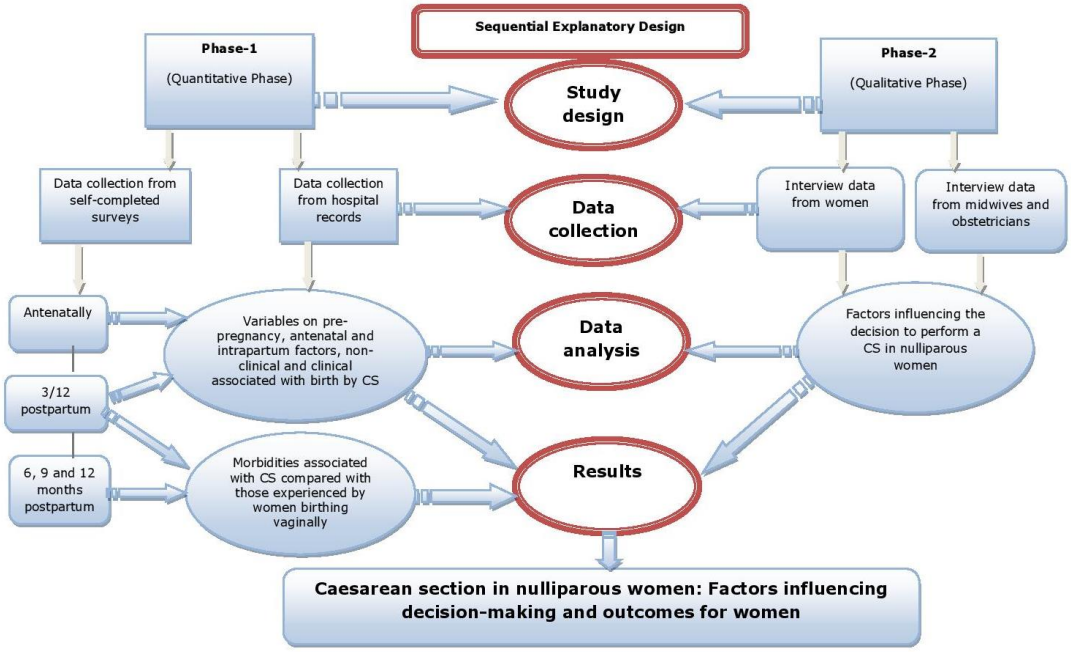

Figure 3-2 Flow diagram of research design

3.4. Methods

3.4.1.Study setting

Following establishment of MAMMI 1 in 2011 in the first site, the RH, and MAMMI 2 in 2013 in the second site, the GUH, as part of this study, the CS strand of MAMMI study, I established the MAMMI study in the third site, the CWIUH (MAMMI 3) in 2015. The population in this setting included women from urban and rural areas, with both high and low obstetric risks, with annual births of approximately 8500.

Possible influence of social media in Ireland during the period of the study

While the MAMMI study was being conducted, the maternity services in Ireland were widely discussed in the media, mainly because of investigations into specific cases or circumstances which led to serious adverse outcomes resulting in the death of women and/or their babies. These include multiple cases of fetal and neonatal deaths in Portlaoise maternity hospital (https://www.thejournal.ie/prime-time-portlaoise-hospital-fifth-baby-death-1397609-Apr2014/; https://www.independent.ie/irish-news/health/new-report-details-three-previously-unknown-baby-deaths-at-portlaoise-hospital-35746873.html), and maternal deaths (http://aimsireland.ie/irelands-maternal-death-rate-

depends-on-who-you-are-asking/; https://www.thejournal.ie/malak-thawley-investigation-3861063-Feb2018/; https://www.ucc.ie/en/media/research/maternaldeathenquiryireland/Confidential-Maternal-Death-Enquiry-Report-2013---2015--Web.pdf; https://pregnancyandinfantloss.ie/reports/). Discussions of these serious outcomes in the media possibly had an influence on clinicians' behaviour, attitude, practice and decision-making. For the first time, a one-day conference was held on 3rd May 2018 in Dublin on the interactions between the Irish Maternity Services, the Media and the Law that brought together service-users/advocates, clinicians, healthcare managers, journalists, lawyers, communication and media experts. Concerns were raised about the negative impact of media coverage on clinicians, and the media responded by highlighting that their goal and role was not to take sides, but to facilitate a logical and reason-based debate on the issues and adverse outcomes, respecting diverse and contrary opinions. (https://www.latouchetraining.ie/courses/maternity-media-and-the-law-3-may-2018-dublin/)

Site preparation

Following research ethics committee approval from the Research Ethics Committees of the University and the CWIUH, site preparation commenced in March 2015. This involved meetings with the Master and the Director of Midwifery/Nursing to seek approval to organise information sessions for recruiting women and clinicians, meetings with the Clinical Midwife Managers (CMM) of the outpatient and community clinics, and regular information sessions with staffs working in the booking clinics of the CWIUH including midwives from private, semi-private, public and community clinics. The information sessions mainly aimed at ensuring midwives' understanding of how to offer information to all eligible women and seek women's permission for the researcher to contact them 1 to 2 weeks after they received the study information. Site preparation also involved obtaining permission from individual consultants for approval to offer study information to women under their private care. Following six months of preparatory work, I ensured a sufficient stock of study information packs at each booking clinic with weekly topping up of packs in every clinic.

Recruitment started on 26th August 2015 and closed on 31st March 2017. During the recruitment period, regular meetings with all staffs continued with informal coffee mornings and one presentation on preliminary findings from MAMMI 1 and 2. Arrangements were made with the IT department of the CWIUH to collect hospital data of women who had consented for access to their hospital records.

3.4.2. Sampling, selection criteria and sample size

3.4.2.1. Sampling, selection criteria and sample size - Phase 1

Sampling and selection criteria

All nulliparous women attending the CWIUH were conveniently sampled for phase 1 of the study. Convenient sampling is a method of non-probability sampling that allows the researcher to choose the study participants conveniently according to who is available to participate (Parahoo 1997). This allowed the researcher to offer study information to all eligible women attending the CWIUH.

Inclusion criteria

All nulliparous women, aged 18 years or over, who could read and understand English and consented to take part.

Exclusion criteria

Women who were under 18 years of age and could not read or understand English, and women who had misacarriage.

Sample size

A rigorous quantitative study often requires a large sample size to allow for a good estimate of the parameter of a population by providing adequate power to the study (Creswell & Plano Clarke 2011). The original study, recruiting a sample of 1841 nulliparous women from the first study site, was based on the sample required to study urinary incontinence, a morbidity that affects 20%-30% of first-time mothers postpartum. However, it was acknowledged that this sample size was insufficient to study the less prevalent morbidities, such as peripartum anxiety and depression, experienced by 10-15% of participants, and faecal incontinence, which is

very rare. Thus, the study was extended to the second and third site to increase the sample size. The current sample size of 3047 enabled an adequate number of respondents (2007) at 12 months' follow-up, based on a response rate of 65.88% of the total number of women, with a confidence level of 95% and a margin of error of +/-5, yielding a sample of approximately 1000 women who have birthed by CS.

3.4.2.2. Sampling, selection criteria and sample size - Phase 2

Sampling and selection criteria

The participants for phase 2 were selected using purposive sampling which allowed choosing participants with specific characteristics to serve the purpose of the interviews.

Clinicians

Clinicians (midwives and obstetricians) who were directly involved in the decision-making process for CS were recruited from the three study sites.

Inclusion criteria

Clinicians eligible for the interviews selected from all the three study sites were

- labour ward midwives with all levels of experience
- obstetricians (consultant obstetricians and senior registrars) who were involved in the decision-making process for CS.

Exclusion criteria

Clinicians excluded from the phase 2 of the study were

- midwives who were not practising in the labour ward at the time of data collection
- doctors who were employed as Senior House Officers or who were not involved in clinical decision-making for CS in the site hospitals at the time of data collection.

Women

The sub-sample of women eligible to take part in phase 2 consisted of women who were initially recruited to phase 1 of the study from the CWIUH only, and who had birthed by CS.

Inclusion criteria

A sub-sample of women recruited to phase 1 of the study from the CWIUH were selected for interviews in phase 2. These women were identified from their responses to the question on mode of birth in the 3-month postpartum survey, hospital records of consenting women, and consent form. In order to be sensitive to women's needs as they adjusted to motherhood and recovered from their CS, women were approached and recruited after 3 months' postpartum. The criteria for selecting women for in-depth interviews were women who

- birthed by CS at term gestation, planned or unplanned, performed before or during labour following spontaneous onset or induction of labour
- had no pre-existing medical or pregnancy-related conditions indicating CS as the only choice of birth (e.g. placenta praevia, placental abruption, severe preeclampsia, HIV, genital herpes, etc.)
- consented to being contacted for interviews on their original consent form

Exclusion criteria

The following women were excluded from phase 2 of the study

- women who birthed vaginally, or birthed preterm (i.e., before 37 completed weeks of gestation) or had pre-existing medical or pregnancy related conditions
- women who declined to take part in one-to-one interviews.

Sample size

The importance and impact of the result of a qualitative study is not determined by the sample size and, moreover, there is no justification for a large sample size in a qualitative study (Holloway & Wheeler 1996). A small number of participants often provide in-depth information about the concept of the research (Creswell & Plano Clarke 2011); hence, a small number of participants were recruited for interviews to gain an in-depth understanding

of the 'factors that influenced decision-making for CS' from clinicians' and women's perspectives. The final sample size for the qualitative phase was determined when no new major themes emerged.

3.4.3.Recruitment and follow up

3.4.3.1. Recruitment and follow up – Phase 1

All eligible nulliparous women were recruited to the study from the antenatal booking clinics in the CWIUH. Midwives working in the antenatal booking clinics acted as gatekeepers, and offered all eligible women a MAMMI study information pack consisting of a letter of introduction (Appendix 8), MAMMI study information booklet (Appendix 9), consent form (Appendix 10) and Antenatal survey 1 (available at https://www.tcd.ie/mammi/about.html), and obtained consent from women to forward their contact details (name and telephone number) to the researcher. This information pack contained a booklet on the purpose of the study, what the study involved, the participants' rights to decline to take part in or withdraw from, at any point, permission to access hospital records and for future contact for any related research. The researcher telephoned each woman 1 to 2 weeks later, to answer their questions, and women who chose to participate were asked to complete and return the consent form and antenatal survey, using the freepost envelope provided in the pack. Women who had indicated their willingness to participate were reminded by a text message three weeks later. A total of 873 women were recruited to the study from the CWIUH. Postpartum surveys were posted at 10, 23, 36 and 49 weeks after the baby's birth. Postnatal reminders involved a reminder telephone call four weeks after posting the survey, followed by a text reminder and resending the survey two weeks after each reminder. Of the many methods of retention, reminder contacts through phone calls or reposting of questionnaires are found to be one of the few effective strategies to improve retention rates in longitudinal studies (Booker *et al.* 2011). Table 3-2 presents the recruitment and retention rates of women from the three study sites.

Table 3-2 Recruitment and retention rates from the three study sites

Survey	RH	GUH	CWIUH

	Number	%	Number	%	Number	%
Antenatal survey	1841	100	333	100	873	100
3-months postpartum survey	1486	81	287	86	707	81
6-months postpartum survey	1387	75	262	79	656	75
9-months postpartum survey	1303	71	238	71	609	70
12-months postpartum survey	1226	67	217	65	564	65

3.4.3.2. Recruitment and follow up - Phase 2

Clinicians

Clinicians for one-to-one interviews were recruited from the three study sites. In each site, the official collaborators, the Director of Midwifery/Nursing, had agreed to act as gatekeeper to the midwives, and the Master/Senior Obstetrician had agreed to act as gatekeeper to obstetricians, and offered a letter of invitation (Appendix 11), willingness to participate form (Appendix 12), and phase 2 information (Appendix 13) to all eligible clinicians. This leaflet contained a clear outline of the purpose of the study, what was involved and participants' rights to decline to take part in or withdraw from the study, at any point. Clinicians interested in taking part were asked to return a completed consent form (Appendix 14), or 'Willingness to participate form' or to send the researcher a text message. The researcher acknowledged receipt of completed consent/willingness to participate forms or text messages and arranged a convenient interview date, time and venue for 1 to 2 weeks later. Before the interview started clinicians were given the opportunity to ask questions, and the information about the purpose of the interview was clarified prior to commencing each interview. Written consent was obtained prior to the interview, and interviews continued until no new major themes emerged.

Women

Women for one-to-one interviews in phase 2 were recruited from the CWIUH in 2018. A letter of invitation (Appendix 15) and information leaflet (Appendix 16) detailing the purpose of phase 2 of the study was posted to all eligible women. This leaflet detailed the purpose of the study, what the study involved and participants' rights to decline to take part in or withdraw from, at any point. These women were phoned 1 to 2 weeks later to ask if

they had any questions and to ascertain their willingness to participate in the interviews, and a date and time was scheduled for the interview. Before the interview started women were given the opportunity to ask questions, and the information about the purpose of the interview was clarified. Written informed consent (Appendix 17) was obtained from every woman recruited to phase 2 of the study, and interviews continued until no new major themes emerged.

3.4.4.Data collection

Table 3-3 Source of data to meet the study's objectives

Study objectives	**Source of data to meet the objectives**
Objective i. To identify the combination of pre-pregnancy, antenatal and intrapartum factors, non-clinical and clinical, and possible patterns, associated with birth by CS in 3047 nulliparous women in Ireland.	Self-administered antenatal survey (survey 1) and clinical records of consenting women.
Objective ii. To identify the postpartum morbidities experienced by nulliparous women who birthed by CS and compare these to morbidities experienced by women who birthed vaginally.	Clinical records of consenting women and self-administered three-month postpartum survey.
Objective iii. To explore, from the perspectives of obstetricians (n=20), midwives (n=15) and women (n=20), the factors that influenced the decision to perform a CS, and women's views of their involvement in the decision-making process.	One-to-one indepth semi-structured interviews with midwives, obstetricians and women.

3.4.4.1. Data collection - Phase 1

Quantitative data in phase 1 were collected from two sources: survey data from nulliparous women antenatally and at 3, 6, 9 and 12 months postpartum using the MAMMI study surveys and data abstraction from consenting women's hospital records.

The MAMMI study surveys

The MAMMI surveys were adapted by Dr Deirdre Daly, as part of her PhD study, based on a survey conducted in Australia (Brown *et al.* 2006). All

surveys were similar in content and contained questions regarding women's physical and mental health and wellbeing. Dr Daly assessed the face and content validity of the MAMMI surveys. Face validity of the surveys was assessed by 15 women who were pregnant or had recently given birth. Content validity of survey 1 (antenatal) and 2 (3-months postpartum) was examined by 18 experts using a 4-point relevance rating scale, and the mean scale content validity index (S-CVI) for individual survey items was 0.97 (range 0.73-1.0) for survey 1 and 0.97 (range 0.80-1.0) for survey 2. The surveys were tested with 10 women and piloted with 33 women, 19 of whom (58%) responded.

I was actively involved in recruitment and data collection from site 1 as part of MAMMI 1 since 2013 and contributed to the inclusion of questions in the survey 1 administered to women in the CWIUH, asking them about their preferred mode of birth in their first and subsequent pregnancies.

Test-retest reliability of the MAMMI surveys

Dr Daly had assessed the test-retest reliability of the MAMMI surveys in 2011. Ten women completed survey 1 twice, with a 1 to 2 week period in between, to assess test-retest reliability. The Cohen's kappa coefficient ranged from 0.87-1.0 indicating very strong agreement between the responses.

Data on factors associated with CS were collected from survey 1 (antenatal survey) and survey 2 (3-months postpartum survey), to achieve objective i. To achieve objective ii, data were collected from women's 3-month postpartum survey and hospital records for data on morbidities/birth outcomes in the immediate postpartum period, during women's hospital stay. In the MAMMI study surveys, data on women's health were available at four time points up to 12-months postpartum. However, the 3-month postpartum period was chosen to identify morbidities/postpartum outcomes to enable recall, to study the time period when, according to previous studies, women were most likely to experience health problems directly linked to their pregnancy and mode of birth.

Data related to morbidities experienced by women following birth by CS compared to those experienced by women birthing vaginally were collected from various sections of the 3-months postpartum survey, to achieve objective ii. A copy of survey 2 is provided in Appendix 18, as an example. A list of variables relevant to the CS strand that were included in analysis to achieve the objectives of this study is presented in Table 3-3.

Table 3-4 List of variables assessed

List of variables	Key factors assessed in CS strand
Antenatal survey 1	
A1 What is your date of birth?	Maternal age
A3 What weight were you just BEFORE you became pregnant?	Pre-pregnancy weight, giving pre-pregnancy BMI
A4 Was your pregnancy conceived with treatment for infertility?	Treatment for infertility
A5 Have you ever had any of the following conditions? High blood pressure Asthma Diabetes	Pre-existing medical conditions
3-months postpartum survey	
B18 a. Was your baby admitted to a special care nursery or neonatal intensive care unit while you were in hospital? B18 b. If yes, why was your baby admitted?	Baby's admission to NICU
B20 While you were in hospital after the birth, did you experience any of the following medical complications or health problems?	
Perineal wound infection Caesarean section wound infection	Wound infection immediate postpartum
Breast problems	Breast problems immediate postpartum
D1 SINCE THE BIRTH, apart from when you were in hospital immediately after having your baby, have you experienced any of the following	
Perineal wound infection Caesarean section wound infection	Wound infection 3-months postpartum
Breast problems	Breast problems 3-months postpartum

B22 While you were in hospital after the birth, did you use antibiotics?	Administration of antibiotics immediate postpartum
G 1 SINCE THE BIRTH, how many times have you visited a local doctor or GP (General Practitioner) (about own health)	GP visits postpartum
G4 SINCE THE BIRTH, how many times have you visited a hospital emergency room/department (about own health)	Attendance(s) at ER postpartum
Data collected from hospital records	
1. Type of healthcare (also captured in S2 at 3-months postpartum)	Type of care (health insurance cover)
2. Number of fetus(es)	Number of fetus(es)
3. Expected date of birth 4. Date of baby's birth	Gestational age at birth
5. Baby's position for birth	Presentation of fetus at birth
6. Onset of labour-Induced	Induction of labour (IOL)
7. Onset of labour - IV syntocinon	Intravenous (IV) oxytocin in labour
8. Pain relief in labour - Epidural	Epidural for pain management in labour
9. Mode of birth Spontaneous 10. Mode of birth Vacuum 11. Mode of birth Forceps 12. Mode of birth Kiwi 13. Mode of birth Kiwi and Forceps 14. Mode of birth Vacuum and Forceps 15. Mode of birth Elective CS but labour started (and reason for CS) 16. Mode of birth Emergency CS (and reason for CS) 17. Mode of birth Other	Type of birth Type of CS
18. Blood loss amount (mls) at birth	Amount of blood loss at birth
19. Baby's condition (transferred to NICU?)	Baby's admission to NICU
20. Duration of postpartum hospital stay	Duration of hospital stay postpartum
21. Readmission to hospital following birth 22. Reasons for readmission 23. Treatment at readmission	Maternal readmission to hospital following discharge postpartum

3.4.4.2. Data collection - Phase 2

Qualitative data in phase 2 were collected using one-to-one in-depth interviews with clinicians (midwives and obstetricians) and women to explore factors influencing decision-making for CS and women's involvement in the decision-making process.

Interviews with clinicians

Study information was offered to all the clinicians who met the inclusion criteria. In-depth one-to-one interviews were conducted to explore clinicians' views of their perceptions of factors influencing decision-making for CS. An interview guide (Appendix 19) was developed from the literature and used to guide the interviews. A similar version of the interview guide had been used successfully to conduct focus group interviews with Swedish clinicians (Panda *et al*. 2018a). Awareness of timely and appropriate use of probing questions to the participants is an important contributor to successful data collection (Milne & Oberle 2005). The interview guide included open-ended questions such as '*Tell me about your role in decision-making for CS in nulliparous women*?' and probing questions such as *'Can you tell me more about that?'* or *'Can you explain that to me in a little more detail?*' were used to facilitate discussion. Terms such as '*fear of litigation*' or '*hospital guidelines or policy'* were also used as prompts, when appropriate, to facilitate the flow of discussion. Clinicians for the interviews were recruited from all the three study sites and one-to-one interviews were conducted at a time and place preferred by the individual clinician.

Decision trail for interviews with clinicians

A reflective diary was maintained throughout all the interviews to guide the later interviews. Rigour was assured through maintaining an audit trail of decisions made, with peer debriefing with my two supervisors, clinicians, and other qualitative research experts from Griffith University, Australia during a research school in October 2017, as part of my research experience abroad.

Interviews with women

Study information was offered to all women who met the inclusion criteria. An interview guide (Appendix 20) was used to conduct in-depth one-to-one interviews with women who birthed by CS. The interview guide included open-ended questions such as *'Can you describe your role in the decision-making for the birth of your baby?'* or *'How did you feel about the way the decision was made?'*. The interviews mainly focused on women's views of factors influencing the decision to perform a CS and their involvement in the

decision-making process for their CS. Most interviews were conducted by telephone (n=17) and three were conducted in-person/face-to-face, as suited the individual participant.

Decision trail for interviews with women

A reflective diary was used to maintain an audit trail, which is vital in establishing the rigour of a qualitative study (Koch 2006). This helped maintain a consistent approach and guided exploring in-depth issues more efficiently and effectively.

The first five interviews were conducted with women who expressed interest in being interviewed after receiving the study documents. Following each interview an entry was made in my diary, reflecting back on the interview, which helped guide decision-making for the next interview/s. The first four interviews were conducted with women who had planned CS, due to reasons related to breech presentation, poor obstetric history (previous late miscarriages), etc. At this stage there was a need to interview women who had unplanned CS either prelabour, during spontaneous labour or following IOL. This decision helped to purposively select women who had CS during labour or prelabour, following spontaneous labour or due to unsuccessful IOL. Reflecting on each of these interviews indicated the need to conduct further interviews with women who had a CS during second stage of labour, due to failure to progress, suspected fetal distress or other reasons.

The focus of the interviews with women was to explore their views of factors that influenced the decision to have a CS for their first birth and their involvement in the decision-making for their CS. An ongoing audit trail of interviews worked as a helpful guide in identifying gaps in the data collected. For example, most women expressed that they were actively involved in the decision-making process because the reason to proceed for CS was well explained to them by the clinicians. However, on teasing out further, women expressed that they accepted/agreed to the recommendations offered by the clinicians, but did not feel they had any involvement in the actual decision-making for their birth by CS. After 17 interviews it was apparant that no new information was being obtained from

the interviewees, hence a decision was made to stop the interviews after completing 20 interviews in total.

3.4.5.Data analysis

3.4.5.1. Data analysis - Phase 1

Data were available for 3047 nulliparous women recruited to the study from the three sites. Data were stored on TCD's server, password protected and access restricted, and analysed in the School of Nursing & Midwifery, TCD using the IBM statistical software SPSS version 24. The data collected from the three study sites were merged following checking and cleaning of each database for the antenatal survey, 3, 6, 9, and 12 months postpartum survey and the hospital database.

Descriptive statistics

Descriptive statistics were used to analyse socio-demographic data and are presented as percentages and compared with national data to show the representativeness of the study sample. Participants' characteristics were assessed, including age, pre-pregnancy BMI, country of birth, ethnicity, educational qualification, employment, accommodation, relationship status. Variables related to pregnancy and mode of birth are presented using frequency distribution and percentages.

Multivariable regression analysis

Identification of factors associated with birth by CS

Data from all women recruited to the study from the three site hospitals and who consented to have their hospital records accessed were included in the analysis to assess factors associated with birth by CS (Objective i) (Table 4-21). Univariate and multivariable Poisson regression analysis were conducted to assess pre-pregnancy, pregnancy and intrapartum factors associated with birth by CS.

Postpartum morbidities experienced by women following CS

Descriptive statistics were used to present prevalence data following birth at immediate postpartum and 3-months postpartum. Women's self-completed

3-month postpartum data and consenting women's hospital data were used to assess and compare outcomes and postpartum morbidities experienced by women following CS and vaginal birth (Objective ii) (Table 4-35).

3.4.5.2. Data analysis - Phase 2

Constant comparative technique was used as a process to conduct thermatic analysis. Interview recordings were transcribed using a professional transcriber. NVivo© software package was used to manage interview data. Transcripts were read and re-read against the audio recordings to ensure accuracy. Transcripts were coded, categorised and analysed thematically to explore factors that influence the decision to perform a CS in nulliparous women and involvement of women in the decision-making process for their CS (Objective iii).

A rigorous and trustworthy thematic analysis is a process of interpreting and representing textual data (Nowell *et al.* 2017). Thematic analyses of data from clinicians and women were combined. This was invaluable in understanding the combination of non-clinical and clinical factors that culminate in the decision to perform a CS in nulliparous women, and women's views of their role and involvement in the decision-making process.

Clinicians

Clinicians' characteristics and demographics are presented under location of employment (site 1, 2 and 3), current role and total number of years of experience in current role (Table 5-1) and their professional experience in current role (Table 5-2). Findings from thematic analysis of interview data with clinicians are presented as themes and subthemes with participants' verbatim quotes to illustrate their views in chapter 5 part one.

Women

Women's characteristics and demographics are presented under age, healthcare insurance status, type of CS, reason for CS and time since birth (Table 5-5). Thematic analysis of women's interview data are presented with women's verbatim quotes to illustrate their views on factors influencing

decision-making for CS and their involvement in decision-making for their CS in chapter 5 part two.

3.4.5.3. Integration of findings from phase 1 and phase 2

Analysed data from phase 1 and phase 2 were integrated to report factors associated with birth by CS from quantitative data and factors that influenced the decision to perform a CS according to clinicians' and women's perspectives from the qualitative data using joint display (Table 6-1).

3.4.6.Quality/Legitimation

A combination of the use of traditional quality criteria for the quantitative component such as validity, reliability, and generalisability, and alternative quality criteria for the qualitative component such as credibility, transferability, dependability and conformability are recommended to assess the quality of mixed methods (Bryman *et al.* 2008). All mixed methods research should involve more than a mere assessment of the individual quantitative or qualitative component and should consider the strengths of the integration of both methods adding value to the research design.

3.4.6.1. Phase 1 (Quantitative) Legitimation

Validity

The MAMMI surveys were assessed for face and content validity. (Detailed in section 3.4.4.1).

Reliability

Test-retest reliability of the MAMMI surveys was assessed. (Detailed in section 3.4.4.1).

Generalisability

Generalisability is another important aspect to consider in interpreting results from quantitative data. This study was conducted in three Irish maternity hospitals (two large and one moderate sized) with approximately 22,000 births per annum, 34% of the annual births in Ireland in 2016. This adds value to the generalisation of the study findings to the national population.

3.4.6.2. Phase 2 (Qualitative) Trustworthiness & rigour

Ensuring trustworthiness and rigour are two important steps in every piece of qualitative research (Nowell *et al.* 2017). Lincoln & Guba (1985) proposed the term 'trustworthiness' to describe questions of truth value, applicability, consistency and neutrality of qualitative research. In the current study, eight components were addressed; credibility, transferability, dependability, confirmability, authenticity and member checking to ensure trustworthiness and rigour.

Credibility

Credibility relates to the accuracy of descriptions or interpretations of the experiences that are studied (Lincoln & Guba 1985). In phase 2 of this study, transcripts were checked twice for accuracy, and peer debriefing and maintenance of a decision-trail to enhance credibility. Credibility was also ensured through the interview process itself, by rephrasing, expanding and repeating the question to the participants in different situations. This allowed for achieving greater depth in the interviews. The mock interviews carried out with my PhD supervisor and my experience of conducting focus group interviews with clinicians in Sweden (Panda *et al*. 2018a) helped enhance and ensure credibility in the qualitative phase of the current study.

Peer debriefing

Peer debriefing is a method of ensuring rigour through presenting the conclusions from data analysis to peers for evaluation (Holloway & Wheeler 1996). In the current study, peer debriefing was carried out with two PhD supervisors to discuss methodological issues, data analysis, and findings from early data analysis. My two supervisors read eight different transcripts to assess congruence of the emerging themes with the raw data. Peer debriefing was also carried out with a team of qualitative researchers at a research school during research experience abroad at Griffith University, Australia in October 2017. These peer debriefing sessions involved discussions with qualitative research experts and other PhD researchers with similar interest, which generated ideas on teasing out complex issues from clinicians and guided future interviews.

Audit Trial

An audit trail in qualitative research is a process of ensuring clarity in justification of all actions carried out. It involves a detailed collection of documentation and step-by-step recording of all aspects of the research. (Lincoln & Guba 1985). A reflective diary was maintained that helped as a guide in decision-making for later interviews, by allowing for additional questions and prompts to tease out more complex issues related to decision-making for CS. The transcripts were read and re-read to derive the initial codes, which were then categorised together to derive the themes. The step-by-step of actions and decisions were recorded. The audit trail helped to justify all the actions during the process of data collection and data analysis.

Transferability

Transferability refers to the generalisability of the findings (Tobin & Begley 2004). This can be ensured through an in-depth and rich description of the context in which the findings were arrived at to provide clarity and justification of actions carried out in arriving at the findings. This will facilitate other researchers to decide whether these findings can be transferred to another context. Chapter 5 part one and two present an in-depth description of the findings.

Dependability

Dependability refers to ensuring a logical and transparent process where others can examine the methods, decisions and outcome of the research process (Tobin & Begley 2004). In the context of the current research this was ensured by maintaining a reflective diary of actions carried out to arrive at the conclusion to give clarity and maintain transparency of the process and decisions.

Confirmability

Confirmability involves further investigation to ensure the findings are clearly derived from the data, and this can be determined by auditing the steps involved in arriving at the findings (Lincoln & Guba 1985). To ensure confirmability, an audit trail of the decisions made at each step were maintained, justifying the actions taken to arrive at the findings. This was

also ensured by independent coding of interview transcripts. A random sample of eight of the 55 transcripts were independently coded by my PhD supervisors and the findings were discussed. The codes and emerging themes were discussed and agreed; further peer-debriefing sessions were held with qualitative research experts at the research school at Griffith University, Australia.

Authenticity

Authenticity in qualitative research involves ensuring rigour through demonstrating genuineness with presentation and interpretation of associated concerns and issues (Tobin & Begley 2004).

The five components of authenticity described by Tobin & Begley (2004) are (i) fairness, (ii) ontological authenticity, (iii) educative authenticity, (iv) catalytic authenticity and (v) tactical authenticity. 'Fairness' is a way of presenting all the views, similarities, differences, agreements and disagreements to give a completeness and justness to the findings. This aspect is described in Chapter 5 (part one and two) of the thesis to give a complete presentation of 'fairness'. 'Ontological authenticity' refers to a deeper understanding of the issue being studied. This was ensured by presenting an in-depth understanding of complexities involved in decision-making and by teasing out issues during one-to-one interviews. 'Educative authenticity' involves helping people acknowledge and respect the viewpoints of others. Acknowledging that the factors involved in the decision-making for CS are complex and involve multiple factors, was vital to appreciate clinicians' and women's viewpoints. 'catalytic authenticity' involves interaction with participants, and initiating and accelerating some form of actions, and 'tactical authenticity' is established through engaging, encouraging and empowering others. Dissemination of findings will help clinicians reflect on existing practices and to open up discussions for 'next step action' to reduce any inappropriate CSs.

Member checking

Member checking is another way of ensuring trustworthiness of the study. Member checking helps ensure that the findings presented are a true and

fair representation of the participants' views (Holloway & Wheeler 1996). Member checking can be done in several ways; by sending the interview transcripts to the participants, a summary of the interviews with the researcher's interpretation of their views illustrated with verbatim quotes from the interview or a copy of the emerging findings (Holloway & Wheeler 1996). In this study clinicians and women were sent a synopsis of the key findings along with a questionnaire (Appendix 21 & 22) to assess respondents' views on the themes and subthemes derived from the interview data, and participants were asked to comment on the extent to which their views were reflected in the key findings. The results of member checking are detailed in chapter 5 part one (Table 5-4) and two (Table 5-7).

3.4.6.3. Quality of mixed methods research

A mixed methods study requires clear justification for the use of mixed methods design, and the quantitative and qualitative components, and point(s) of integration (OCathain *et al.* 2008). Many frameworks have been recommended to assess the quality of mixed methods research. A framework is important to give an insight to the research design and promote legitimacy, and mixed methods design typology have been elusive since they have been used mostly to address highly distinct issues in a creative way (Tashakori & Teddlie 2010).

Some basic design typologies deal with questions mainly relevant to the 'how' and 'what' of the stages where data are mixed in a mixed methods study and can reflect the evolving complexities for the research design used (Tashakori & Teddlie 2010). To assist with judging the quality of mixed methods studies, O'Cathain *et al*. (2008) proposed guidelines on Good Reporting of A Mixed Methods Study (GRAMMS) (Table 3-4). These guidelines have been applied to my study, to justify the quality components in the quantitative, qualitative and integration phase.

Table 3-5 Good Reporting of A Mixed Methods Study (GRAMMS, OCathain *et al*. 2008)

(1) Describe the justification for using a mixed methods approach to the research question
(2) Describe the design in terms of the purpose, priority and sequence of methods

(3) Describe each method in terms of sampling, data collection and analysis

(4) Describe where integration has occurred, how it has occurred and who has participated in it

(5) Describe any limitation of one method associated with the presence of the other method

(6) Describe any insights gained from mixing or integrating methods

3.4.7.Ethical considerations

3.4.7.1. Ethical approval

Phase 1

Research Ethics Committee (REC) approval (Appendix 23) for the overall MAMMI study was obtained from the Faculty of Health Sciences Research Ethics Committee, Trinity College Dublin (TCD) (in May 2011) and the REC of the RH (October 2011), GUH (in May 2013) and the CWIUH (in April 2014). TCD approval for my study was obtained in March 2015.

Phase 2

Conducting one-to-one interviews with women recruited to the MAMMI study was approved by the REC of TCD and three study sites as part of the overall MAMMI study. REC approval for the CS strand of the MAMMI study, which involved one-to-one interviews with clinicians, was obtained from the Faculty of Health Sciences Research Ethics Committee, TCD (in March 2015) and the REC of the CWIUH and GUH (in January 2015) and the RH (in September 2015) (Appendix 23).

3.4.7.2. Informed consent

Phase 1

Written informed consent was obtained from every woman recruited to the study from all three study sites (detailed in section 3.4.3.1).

Phase 2

Clinicians

Written informed consent was obtained from every midwife and obstetrician recruited to the study from all the three study sites (detailed in section 3.4.3.2).

Women

Women for phase 2 interviews were identified from a sub-sample of women recruited to the study from the third study site, the CWIUH. Written informed consent was obtained from every woman recruited to the phase 2 of the study (detailed in section 3.4.3.2).

3.4.7.3. Personal information and data storage – General Data Protection Regulation (2018)

Phase 1

The contact details of women who declined to take part at the time of the antenatal recruitment call, or who did not respond and return the first (antenatal) survey within eight weeks following recruitment, were permanently removed from the personal information database. If a woman returned survey 1 with an incomplete or no consent form, she was requested to complete and send it at the time of completing the next survey. All surveys were given a unique identification number rather than using women's names, to ensure confidentiality.

Both the personal details database of all MAMMI study participants and the SPSS survey databases are encrypted. Hard copies of surveys and consent forms are stored separately in locked cabinets only accessible to members of the MAMMI study team.

Phase 2

All data, including digitalised audio recordings and transcripts, were stored in a password protected folder held on the university's main server. The folder containing the audio recordings were further secured by a second password, only known to the researcher. Data stored on audio devices were kept in a locked cabinet in a locked office in the university until transferred to an encrypted hard drive and then deleted from the device. Any hardcopy records that contained participants' data including participants' consent forms were stored in a separate locked cabinet in a locked office within the university, only accessible to the researcher. Data were stored and managed according to the General Data Protection Regulation (GDPR) Act, May 2018.

Clinicians

Audio-recordings and transcripts were labelled with a participant number and were stored on TCD server accessible to the researcher and her supervisors only. For member checking, only clinicians who had agreed to this (question 4 on consent form of phase 2 (Appendix 14)) were sent the member checking forms (Appendix 21). None of the reports of the results contained information that would identify any clinician.

Women

Only women who had consented to be contacted regarding taking part in any interview (question 5 on consent form of phase 1 (Appendix 10)) were contacted for interviews in phase 2. Audio-recordings and transcripts were given a unique number, different from their case number in phase 1. For member checking, only women who had agreed to this (question 4 on consent form of phase 2 (Appendix 17)) were sent the member checking forms (Appendix 22). None of the reports of the results contained information that would identify any woman.

3.4.7.4. Data retention

Study data will be retained for at least 5 years after completion of the study. However, the final survey form contains a question asking women if they are interested in participating in further research, and if willing, to indicate this by providing their current contact details, which can be retained for five years after completion of the study.

The transcripts of the data collected in Phase 2 of the study will also be retained securely for 5 years. The audio recordings were deleted from the recording device after transferring to a secure hard drive.

3.4.7.5. Time commitment and multi-participation in interviews

Phase 1

Completing the MAMMI study surveys involved a time commitment from participants. Completing a single survey took about 45 minutes. The length of the surveys and time commitment when taking part in the study were

clearly communicated within the information leaflet (Appendix 9) and during the antenatal recruitment telephone conversation. This was also outlined in the cover letter in each survey.

Phase 2

Clinicians

Clinicians who were contacted to participate in the interviews were given an estimate interview duration of 45 to 60 minutes. Clinicians chose the date, time, and mode of interview (by telephone or face-to-face). All the 15 interviews with midwives and 18 interviews with obstetricians were conducted by telephone, and two obstetricians preferred face-to-face interviews. Interviews with clinicians were very specific to the CS strand of the study; hence, clinicians had no further commitments to participate in any other MAMMI study-related research.

Women

The women who were contacted regarding taking part in an interview were given an estimate of the duration of 30-40 minutes for the interview. Moreover, the location and time of the interview was chosen by the woman, for her convenience. Most women (n=17) preferred a telephone interview and three preferred a face-to-face interview.

3.4.7.6. Ethical issues

Phase 1

Ethical issues that were foreseen when conducting phase 1 (quantitative phase) included:

i. death of a woman during the antenatal period or around the time of the birth: a process of identifying these women had been established with the Information Technology (IT) midwives in the site hospitals. Lists of women recruited to the study were shared with the IT midwives who had agreed to identify these women. This process protected the confidentiality of women who were not taking part in the study and gave me information on women who declined access to their pregnancy and birth records.

ii. women becoming critically ill, hospitalised elsewhere or dying postpartum after discharge from hospital: I did not have access to this information, therefore the letter inviting participation in the postpartum surveys was sensitive to this possibility (Appendix 24).

iii. baby becoming critically ill, being hospitalised, dying or living apart from the mother during the study period: I did not have access to this information, therefore the letter inviting participation in the postpartum surveys was sensitive to this (Appendix 24). In these circumstances (mother and/or baby being critically ill or dying) the woman's details were removed from the study database.

Women who had a miscarriage in between a woman's booking visit and the researcher's telephone call were approached with empathy during recruitment and were given details of support services. Postpartum surveys were not sent to women who had completed survey 1 but subsequently had a miscarriage, stillbirth or neonatal death. No ethical issues were encountered during recruitment and follow-up during phase 1 of the study.

Phase 2

Ethical issues that were foreseen when conducting phase 2 (qualitative phase) included:

i. during the interview a woman disclosing information about herself, her baby or the care she has received that gave cause for concern: for such circumstances, a plan was made to suspend the interview and seek for a resolution with the woman's consent.

ii. becoming aware of negligence on the part of health professionals: a plan was in place to refer the matter to my supervisors. The researcher's professional duty to report such events was outlined in the information booklet (Appendix 13 & 16).

iii. becoming suspicious that the baby was being harmed: this would have presented a challenging and difficult scenario to be managed sensitively paying due concern to the welfare of the baby. A plan was in place to manage such circumstances by consulting my supervisors in order to refer to the appropriate authorities. (The researcher's professional duty to report such events is outlined on the information booklet (Appendix 13 & 16)).

iv. becoming aware of factors that pose a risk to the care of women or babies: it was agreed to bring these to the attention of my supervisors and refer the matter to concerned authorities. The researcher's professional duty to report such events was outlined in the information booklet for clinicians (Appendix 13 & 16).
v. The researcher at risk: TCD's 'Lone Researcher Guidelines' (Appendix 25) was followed when travelling to conduct the interviews.
However, no ethical issues were encountered during the interviews with the women or clinicians in phase 2 of this study.

Study Conduct Monitoring Group (SCMG)

A Study Conduct Monitoring Group (SCMG) was established alongside the MAMMI study in the first site, and was planned for the CWIUH; however, following discussion with the hospital authorities, a decision was made to refer any untoward incidences and/or complaints arising from the conduct of the study to the midwifery management. Hence, the SCMG was not established; however, no issues were encountered during the conduct of the study.

3.5. Summary and conclusion of chapter 3

The aim of my study was to identify and explore the non-clinical and clinical factors that influence the decision to perform CS in nulliparous women, and to identify postpartum morbidities experienced by women following birth by CS. This was achieved by adapting a pragmatic mixed methods design in two phases using a sequential explanatory design. Phase 1 of the study consisted of a longitudinal prospective cohort study using self-administered surveys to collect data from women at five time-points and hospital records of consenting women, and phase 2 involved one-to-one interviews with clinicians and women. The next four chapters present the quantitative (descriptive and inferential) analysis from phase 1 (Chapter 4), qualitative (thematic) analysis on clinicians' views (Chapter 5 Part one) and women's views (Chapter 5 Part two), discussion and integration of quantitative and qualitative findings (chapter 6), and conclusion including recommendations (Chapter 7).

4. Chapter 4 Quantitative findings

4.1. Introduction

This chapter presents findings from quantitative phase 1 to achieve objectives i and ii of the study;

Objective i. To identify the combination of pre-pregnancy, antenatal and intrapartum factors, non-clinical and clinical, and possible patterns, associated with birth by CS in 3047 nulliparous women in Ireland.

Objective ii. To identify the postpartum morbidities experienced by nulliparous women who birthed by CS and compare these to morbidities experienced by women who birthed vaginally.

Data included in the analyses are from women recruited to the study from three sites who completed the antenatal survey, consented to their hospital records being accessed and completed the 3-month postpartum survey. IBM SPSS version 24 was used to conduct analysis of data. Few variables were recoded for the purpose of analysis (Appendix 26).

4.2. Sample and study participants

4.2.1. Recruitment and retention rates

Recruitment of women to the study commenced on 31st January 2012 in the first study site, the RH, continued in the second site, the GUH, and ended in the third site, the CWIUH, on 31st March 2017. A total of 8135 women were offered the MAMMI study information packs in the three sites; of these 3047 (37.46%) women responded and took part in the study.

Data from all women recruited to the study from the three sites were included in my PhD study. Recruitment and retention rates are presented in Figure 4-1. Women who responded to the antenatal survey (survey 1) were included in the study and contacted for future surveys at different time-points. Women who were eligible to continue in the study but had withdrawn at any point were not contacted for future surveys. Every attempt was made to contact and retain women in the study who changed

their contact number or moved to a new address or when postal errors occurred. Hospital records were accessed for all women who gave consent (2898/3047, 95.11%); however, hospital records of women who had miscarriage, fetal or neonatal death, or records that were not available when women gave birth elsewhere were excluded (n=143). Hospital data of remaining women were included in analysis (2755/3047, 90.42%).

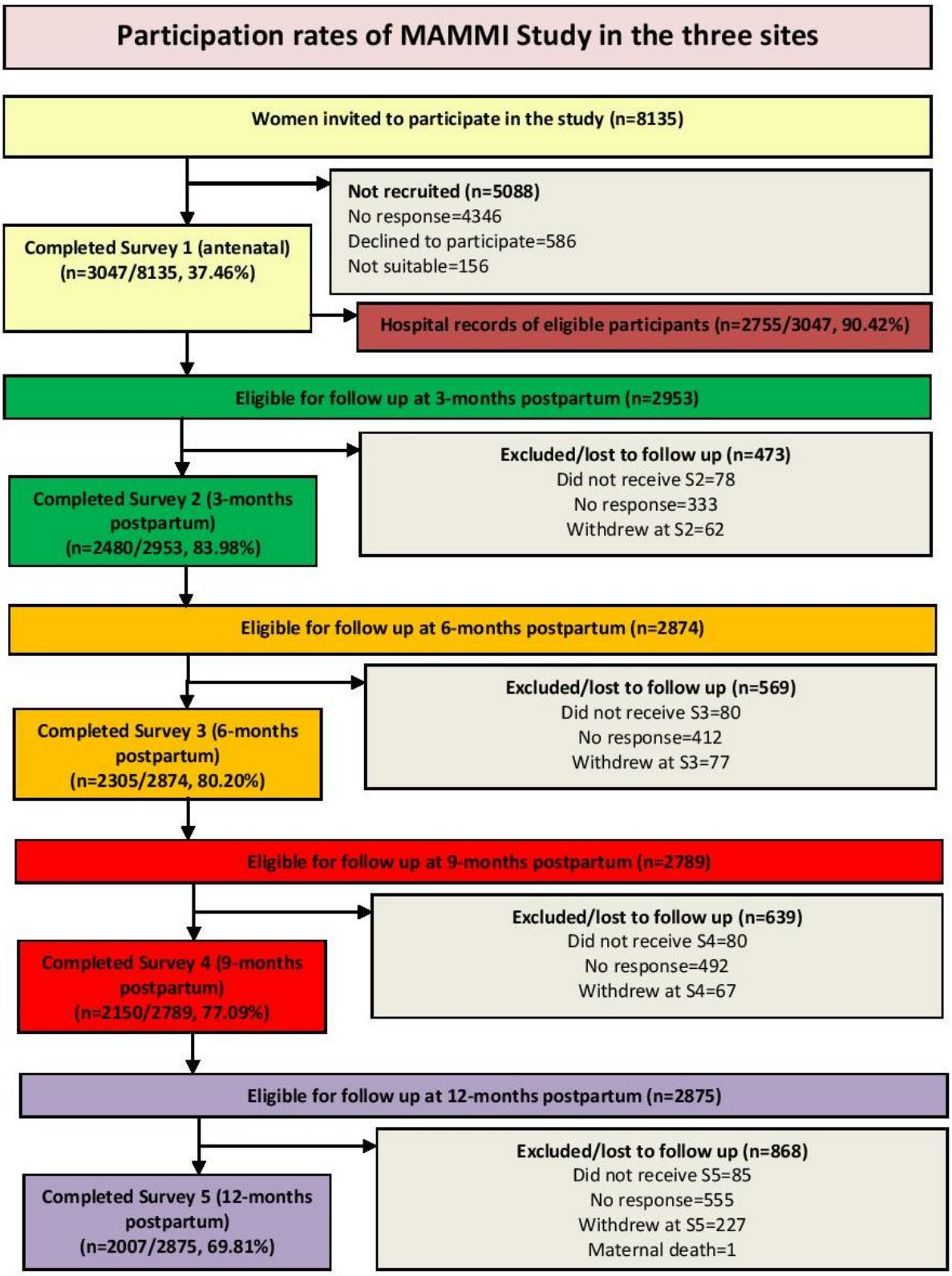

Figure 4-1 Flow diagram of recruitment and retention rates

4.2.2.Description of sample – women's socio-demographic characteristics

The characteristics of all women recruited to the study (n=3047) from the three study sites are described in this section. The representativeness of the study sample is assessed by comparing the sample with the national data (HPO 2018 and McMahon *et al*. 2019), where possible.

Maternal age

The study sample had, proportionately, fewer aged <24 years (n=239, 7.84%), 35-39 years (n=734, 24.09%) and ≥40 (n=138, 4.53%), and more women aged 25-29 (n=620, 20.35%) and 30-34 (n=1316, 43.19%) years compared to the national statistics (Table 4-1).

Table 4-1 Maternal age

Maternal age	Study participants		Perinatal Statistics Report (HPO 2018)	
	Frequency	%	Frequency	%
Up to 24 years	239	7.84	6327	9.9
25-29 years	620	20.35	11431	17.8
30-34 years	1316	43.19	23078	36.0
35-39 years	734	24.09	18829	29.4
40 years & over	138	4.53	4133*	6.4
Total	3047	100	64097**	100

*Includes up to 44-year old women

** Total births in Ireland in 2016 (nulliparous and multiparous)

Pre-pregnancy BMI

BMI was categorised into three groups; ideal, overweight and obese including very obese (detailed in abbreviations and definition of terms). The majority of the women were of ideal BMI (≤24.9kg/m^2) (n=1974, 64.78%), less than one-fifth were overweight (25-29.99kg/m^2) (n=539, 17.69%) and very few were obese and very obese (≥30 kg/m^2) (n=287, 9.42%) (Table 4-2).

Table 4-2 Pre-pregnancy BMI

Pre-pregnancy BMI	Study participants	
	Frequency	%

Ideal weight	1974	64.78
Overweight	539	17.69
Obese/very obese	287	9.42
Missing	247	8.11
Total	3047	100

BMI – Body Mass Index

Country of birth

More than two-thirds of the women who stated their country of birth were born in Ireland (n=2106, 70.22%), and less than one-fifth were born in other European countries, similar to the statistics of total number of births in Ireland in 2016. However, the study sample included more women born in the UK (n=137, 4.57%) and fewer women from Asia (n=77, 2.57%) compared to national data (Table 4-3).

Table 4-3 Country of birth

Region of birth	**Study participants**		**Perinatal Statistics Report (HPO 2018)**	
	Frequency	**%**	**Frequency**	**%**
Irish	2106	70.22	48937	76.3
Europe (excluding Ireland and UK)	568	18.94	8761	13.7
UK	137	4.57	1463	2.3
America	44	1.47	773	1.2
Asia	77	2.57	2344	3.7
Africa	53	1.77	1445	2.7
Australia	13	0.43	81	0.1
New Zealand and other Oceania	1	0.03	269*	0.4
Total	2999	100	64097	100
Missing	48			

*Not stated

UK – United Kingdom

Ethnicity

The majority of the women were Irish (n=2168, 71.20%) and less than a quarter were of 'other white background' (n=716, 23.51%). There are no national data available to compare the representativeness of women's ethnicity (Table 4-4).

Table 4-4 Ethnicity

Ethnicity	Study participants	
	Frequency	%
Irish	2168	71.20
Irish traveller	2	0.07
African	49	1.61
Chinese	13	0.43
Any other white background	716	23.51
Any other black background	4	0.13
Any other Asian background	63	2.07
Other including mixed background	30	0.98
Total	3045	100
Missing	2	

Educational qualification

More than two-thirds of women (n=2032, 68.03%) had attained third-level education (degree or postgraduate), and less than one-fifth (n=565, 18.91%) had completed a diploma or certificate or equivalent qualification. No data are available from national report for comparison (Table 4-5).

Table 4-5 Educational qualification

Educational qualification	Study participants	
	Frequency	%
Degree/postgraduate degree	2032	68.03
Diploma, Cert, or equivalent	565	18.91
Up to secondary level	390	13.06
Total	2987	100
Missing	60	

Employment status in early pregnancy

The majority of the women were in paid employment (n=2636, 87.87%), and a small proportion were unemployed (n=206, 6.87%). The 'others' included voluntary workers and students (n=158, 5.26%) (Table 4-6).

Table 4-6 Employment status in early pregnancy

Employment status in early pregnancy	Study participants	
	Frequency	%
Employed	2636	87.87
Unemployed	206	6.87
Other	158*	5.26

Not stated/not applicable	-	-
Total	3000	100
Missing	47	

**Voluntary job, student.*

Accommodation status in early pregnancy

Three-quarters of women (n=2225, 74.22%) were living in their own home, and less than a quarter (n=692, 23.08%) lived in a rented accommodation. A small proportion in the 'other' category included women living in hostel accommodation, mobile homes and living with parents. There are no national data for comparison (Table 4-7).

Table 4-7 Accommodation status in early pregnancy

Accommodation status in early pregnancy	Study participants	
	Frequency	%
Own house/apt	2225	74.22
Rented house/apt	692	23.08
Other	81	2.70
Total	2998	100
Missing	49	

Relationship status

Just under two-thirds (n=1828, 61.01%) of women were married, which was similar to the national data for all women who gave birth in Ireland in 2016 (HPO 2018). More than one-third of women (n=1046, 34.92%) were in a relationship, living with or without a partner, and a small proportion were single (n=92, 3.07%), and divorced, separated or widowed. (n=30, 1.00%) (Table 4-8).

Table 4-8 Relationship status

Relationship status	Study participants		Perinatal Statistics Report (HPO 2018)	
	Frequency	%	Frequency	%
Married	1828	61.01	39882	62.2
Single	92	3..07	23301	36.4
In relationship with or without partner	1046	34.92	21*	-
Other (Divorced, widowed, separated)	30	1.00	877	1.4

Total	2996	100	64097	100
Missing	51			

*Includes only civil partner

4.2.3. *Pregnancy and birth details of women included in analysis*

Data from women who had completed the antenatal survey and gave consent for their hospital records to be accessed (n=2755) were included in the analysis. To ensure completeness of data, hospital data were used for analyses of factors associated with birth by CS (objective i) and outcomes/morbidities in immediate postpartum period, and data from women's self-completed postpartum surveys were used for analysis of outcomes/morbidities up to 3-months postpartum (objective ii).

Data retrieved from self-completed antenatal survey (survey 1) and the hospital data provided all information on the potential factors associated with birth by both planned and unplanned CS. This section describes selected maternity details of the proportion of women with hospital data compared to national data, when available, for representativeness.

Treatment for infertility

The majority of women had conceived spontaneously (n=2452, 89.29%), and a small proportion of women had treatment for infertility (with fertility drugs, InVitro Fertilisation (IVF)/Intracytoplasmic Sperm Injection (ICSI)) (n=294, 10.71%) (Table 4-9). There are no national data available to compare the representativeness of this.

Table 4-9 Treatment for infertility

Treatment for infertility	**Study participants**	
	Frequency	**%**
No treatment	2452	89.29
Treatment for infertility (Fertility drugs, IVF/ICSI, other)	294	10.71
Total	2746	100
Missing	9	

IVF – In-Vitro Fertilisation
ICSI - Intracytoplasmic Sperm Injection

Type of care

Two-thirds of women in the study availed of public care (n=1795, 65.16%), one-fifth availed of semi-private (n=574, 20.83%) and about one in seven women chose private maternity care (n=386, 14.01%) (Table 4-10).

Table 4-10 Type of care

Type of care	Study participants	
	Frequency	%
Public	1795	65.16
Semi-private	574	20.83
Private	386	14.01
Total	2755	100

Number of fetus(es)

The majority of the women in the study had a singleton pregnancy (n=2700, 98.00%), and a small proportion (n=55, 2.00%) had multiple pregnancy, similar to the national report (Table 4-11).

Table 4-11 Number of fetus(es)

Number of fetus(es)	Study participants		IMIS Report (McMahon *et al*. 2019)	
	Frequency	%	Frequency	%
Singleton gestation	2700	98.00	58882	98.17
Multiple gestation	55	2.00	1099	1.83
Total	2755	100	59981	100

Gestational age at birth

The majority of women gave birth at term gestation (n=2594, 94.16%), and a small proportion birthed preterm and very preterm (n=161, 5.84%) (Table 4-12).

Table 4-12 Gestational age

Gestational age at birth	Study participants	
	Frequency	%
Term	2594	94.16
Preterm and very preterm	161	5.84
Total	2755	100

Presentation of fetus at birth

The majority of women had a fetus in cephalic presentation (n=2619, 95.06%) at the time of birth, and a small proportion had a fetus in breech presentation or another malpresentation (n=136, 4.94%) (Table 4-13).

Table 4-13 Presentation of fetus at birth

Presentation of fetus at birth	Study participants	
	Frequency	%
Cephalic	2619	95.06
Breech and other malpresentations	136	4.94
Total	2755	100

Induction of labour (IOL)

One-third of women in the study sample had their labour induced (n=1089, 39.69%) which is similar to the national report (McMahon *et al*. 2019) (Table 4-14).

Table 4-14 Induction of labour

IOL	Study participants		IMIS Report (McMahon *et al*. 2019)	
	Frequency	%	Frequency	%
No	1655	60.31	13936	60.47
Yes	1089	39.69	9111	39.53
Total	2744	100	23047	100
Missing	11			

IOL – Induction of Labour

The most common reasons for IOL were post-term pregnancy (after 40 weeks +7/10 days) (n=341, 31.31%), prolonged rupture of membranes (n=242, 22.22%) and pregnancy induced hypertension/Preeclampsia (n=109, 10.0%) (Table 4-15). The majority of the women whose labour was induced had a vaginal birth (699, 64.19%), and over one-third had a CS (n=390, 35.81%).

Table 4-15 Reasons for IOL

Reasons for IOL	Frequency (%)	Vaginal birth	CS
Post-term gestation (≥37 weeks)	341 (31.31%)	208 (61.0%)	133 (39.0%)
Prolonged rupture of membranes	242 (22.22%)	163 (67.36%)	79 (32.64%)
Pregnancy induced	109 (10.0%)	73 (66.97%)	36 (33.03%)

hypertension/ Preeclampsia			
Not indicated	74 (6.79%)	35 (47.3%)	39 (52.7%)
Reduced fetal growth	59 (5.42%)	44 (74.58%)	15 (25.42%)
Diabetes/gestational diabetes	58 (5.33%)	34 (58.62%)	24 (41.38%)
Reduced liquor volume	49 (4.50%)	30 (61.22%)	19 (38.78%)
Obstetric cholestasis	30 (2.76%)	23 (76.67%)	7 (23.33%)
Big baby	26 (2.39%)	13 (50.00%)	13 (50.00%)
Reduced fetal movements	25 (2.30%)	18 (72.00%)	7 (28.00%)
Antepartum haemorrhage	24 (2.20%)	18 (75.00%)	6 (25.00%)
Other maternal reasons*	16 (1.47%)	15 (93.75%)	1 (6.25%)
Multiple gestation	10 (0.92%)	7 (70.00%)	3 (30.00%)
Social reasons	7 (0.64%)	5 (71.43%)	2 (28.57%)
Maternal age	7 (0.64%)	4 (57.14%)	3 (42.86%)
Other fetal reasons**	5 (0.46%)	4 (80.00%)	1 (20.00%)
Pregnancy following treatment for infertility	3 (0.28%)	3 (100.00%)	0 (0.00%)
Fetal distress	2 (0.18%)	1 (50.00%)	1 (50.00%)
Increased liquor volume	2 (0.18%)	1 (50.00%)	1 (50.00%)
Total	1089 (100%)	699 (64.19%)	390 (35.81%)

*Other maternal reasons included pelvic pain (n=4), nephrotomy/hydronephrosis (n=2), maternal distress (n=1), anxiety (n=1), cardiac murmur (n=1), mature placenta (n=1), past poor obstetric history (n=1), proteinuria (n=1), gall stones (n=1), epilepsy (n=1), removal of cervical suture (n=1), history of cancer (n=1).
**Other fetal reasons included fetal anomaly (n=2), cystic hygroma (n=1), encephalocele (n=1), Triosomy 21 (n=1).

Intravenous (IV) oxytocin in labour

Data for all women who received IV oxytocin, for either induction or augmentation of labour, were included in analysis. More than half of the women in the study sample had IV oxytocin in labour (n=1417, 51.68%). No national data are available to assess the representativeness of use of IV oxytocin in labour (Table 4-16).

Table 4-16 IV oxytocin in labour

IV oxytocin in labour	Frequency	%
Labour without oxytocin	1325	48.32
Labour with oxytocin	1417	51.68
Total	2742	100
Missing	13	

IV – IntraVenous

Epidural for pain management in labour

All women who used epidural for pain management in labour were included and women who received spinal anaesthesia for CS were excluded from this analysis. A higher proportion of women in the study had an epidural (n=1554, 73.30%) in labour, compared to the proportion nationally (Table 4-17).

Table 4-17 Epidural for pain relief in labour

Epidural for pain management in labour	Study participants		IMIS Report (McMahon *et al*. 2019)	
	Frequency	%	Frequency	%
No epidural	566	26.70	36324	60.56
Epidural	1554	73.30	23657	39.44
Total	2120	100	59981*	100
Missing	635			

**All women (nulliparous and multiparous)*

Mode of birth

Compared with national data on nulliparous women's mode of birth, the study sample had fewer SVBs (n=926, 33.61%) and CSs (planned (n=166, 6.02%) and unplanned (n=722, 26.21%)), and more AVBs (n=941, 34.16%) (Fig 4-2) (Table 4-18).

Table 4-18 Mode of birth

Mode of birth	Study participants		IMIS Report (McMahon *et al*. 2019) (nulliparous women)	
	Frequency	%	Frequency	%
SVB	926	33.61	8246	35.78
AVB	941	34.16	6605	28.66
Planned CS	166	6.02	8196*	35.56
Unplanned CS	722	26.21	-	-
Total	2755	100	23047**	100

*Total CS (includes planned and unplanned CSs)
**Total number of nulliparous births in Ireland in 2018
SVB – Spontaneous Vaginal Birth
AVB – Assisted Vaginal Birth

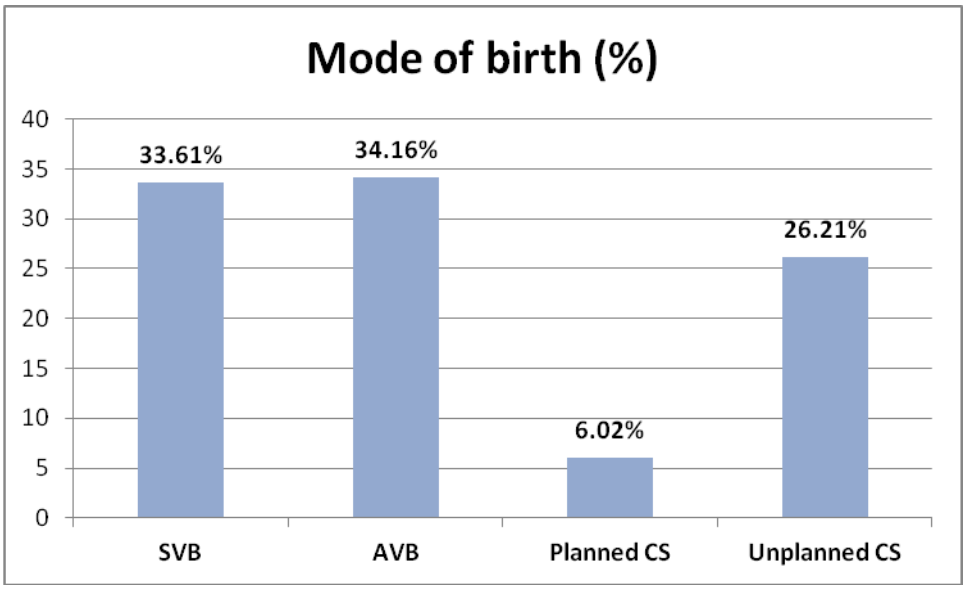

Figure 4-2 Mode of birth

The most common reasons for planned CS were breech presentation (n=74, 44.58%), maternal request (n=13, 7.83%), other maternal and fetal reasons as detailed in Table 4-19.

Table 4-19 Reasons for planned CS

Reasons for planned CS	Frequency	%
Breech presentation	74	44.58
Maternal request	13	7.83
Preeclampsia/Pregnancy induced hypertension	6	3.61
Placenta previa	6	3.61
Unstable lie	2	1.20
Not indicated	5	3.01
Other fetal reasons*	37	22.29
Other maternal reasons**	23	13.86
Total	166	100.00

*Other fetal reasons included: big baby (n=13), high vertex (n=13), reduced fetal growth (n=7), fetal anomaly (n=2), absent end diastolic flow (n=1), triplets (n=1)
**Other maternal reasons included infectious disease (genital herpes, HSV, HIV) (n=3), perforated uterus (n=3), fractured pelvis/hip replacement (n=3), cardiac condition (n=2), retinal detachment (n=2), previous myomectomy (n=2), maternal age/treatment for infertility (n=1), bleeding disorder (n=1), anal fistula (n=1), ovarian cyst (n=1), Ashermann's syndrome (n=1), past poor obstetric history (n=1), diabetes (n=1), increased liquor volume (n=1).

The most commonly reported reasons for unplanned CS were fetal distress (n=337, 46.68%), lack of progress in first (n=78, 10.80%) and second stage of labour (n=77, 10.66%), failed IOL (n=65, 9%) and breech presentation in labour (n=44, 6.09%) (Table 4-20).

Table 4-20 Reasons for unplanned CS

Reasons for unplanned CS	Frequency	%
Fetal distress	337	46.68
Lack of progress in first stage of labour	78	10.80
Lack of progress in second stage of labour	77	10.66
Failed IOL	65	9.00
Fetal breech presentation in labour	44	6.09
Other maternal reasons*	35	4.85
Hypertension/pregnancy induced hypertension/ Preeclampsia/HELPP syndrome	26	3.60
Antepartum haemorrhage/abruption/placenta previa	22	3.05
Other fetal reasons**	17	2.35
Unstable lie	3	0.42
Not indicated	18	2.49
Total	722	100.00

*Other maternal reasons included: pelvic pain/spinal problems (n=8), previous myomectomy (n=5), bleeding disorder (n=4), past poor obstetric history (n=4), other medical conditions (n=2), anal fistula/rectal prolapse (n=2), maternal request for social reasons (n=2), hyperstimulation with oxytocin (n=1), corneal ectopic (n=1), infectious disease (Genital herpes) (n=1), maternal age/treatment for infertility (n=1), fibroid (n=1), baby in occipito posterior position and postdate pregnancy (n=1), maternal pyrexia (n=1), increased liquor volume (n=1)
**Other fetal reasons included reduced fetal growth/reduced liquor volume (n=5), multiple gestation (n=4), high vertex (n=3), big baby (n=2), fetal malposition (n=2), cord prolapsed (n=1).
IOL – Induction of Labour
HELLP – High blood pressue Elevated Liver Enzymes and Low Platelets

4.3. Identification of factors associated with birth by CS

Factors associated with CS at different time-points, pre-pregnancy and pregnancy factors for planned CS, and pre-pregnancy, pregnancy and intrapartum factors for unplanned CS, are described. Planned CS relates to all elective (i.e., no labour) CSs, and unplanned relates to all other CSs.

The cohort of women included in the analysis of objective i (to identify factors associated with birth by CS) are women who had consented for the research team to access their hospital records (n=2755).

Eleven factors (Table 4-21), identified from literature as being associated with mode of birth, were chosen and categorised into pre-pregnancy, pregnancy and intrapartum factors to explore possible associations with

planned and unplanned CS. Mode of birth was the outcome (dependent) variable in this analysis.

Table 4-21 Factors associated with birth by CS

Factor	Time-point	Type of CS	Source of information	Literature
Maternal age	Pre-pregnancy	Planned and unplanned	Antenatal survey 1	Heffner *et al*. 2003, Renes *et al*. 2017, Burke *et al*. 2017,
Pre-pregnancy BMI	Pre-pregnancy	Planned and unplanned	Antenatal survey 1	Renes *et al*. 2017, Burke *et al*. 2017
Pre-existing medical conditions High BP Diabetes Asthma	Pre-pregnancy	Planned and unplanned	Antenatal survey 1	Linton *et al*. 2004, Renes *et al*. 2017
Treatment for infertility	Pre-pregnancy	Planned and unplanned	Antenatal survey 1	Renes *et al*. 2017
Type of care	Pregnancy	Planned and unplanned	Hospital records	Womak 2014, Schantz *et al*. 2016
Number of fetus(es)	Pregnancy	Planned and unplanned	Hospital records	Barber *et al*. 2011, Hofmeyr *et al*. 2015
Gestational age at birth	Pregnancy	Planned and unplanned	Hospital records	Heffner *et al*. 2003, Sebastiao *et al*. 2016
Presentation of fetus at birth	Pregnancy	Planned and unplanned	Hospital records	Hofmeyr *et al*. 2015
IOL	Intrapartum	Unplanned	Hospital records	Seyb *et al*. 1999, Heffner *et al*. 2003, Sebastiao *et al*. 2016
IV oxytocin in labour	Intrapartum	Unplanned	Hospital records	Gross *et al*. 2014, Budden *et al*. 2014
Epidural for pain management in labour	Intrapartum	Unplanned	Hospital records	Eriksen *et al*. 2011, Anim-Somuah *et al*. 2018

To explore possible associations between these factors and risk of CS, analysis was conducted using the cross-tabulation function in SPSS and univariate analysis using chi-square test. Prior to conducting analysis, the

underlying assumptions for using chi-square tests were checked (Peat & Barton 2005). Firstly, one of the major assumptions of chi-square test is independence, i.e., each woman is represented only once in the analysis; secondly, the expected frequency in 80% of the cells in the contingency table should exceed 5 and all expected cell frequencies should exceed 1.

Poisson regression analysis, also known as log linear model, was chosen to obtain a more accurate effect measure of the potential risk factors for CS. For common potential outcomes such as risk of CS, and with a large sample size, Poisson regression analysis is the preferred choice since it allows for a more accurate interpretation of the findings with use of Risk Ratios (RRs) (in univariate analysis) and Adjusted Risk Ratios (ARRs) (in multivariable analysis). The assumptions for using Poisson regression were also checked; firstly, Poisson regression assumes that the dependent variable is a count and dichotomous, therefore, all the outcome variables were recoded into two categories and count of '0' and '1' (e.g., planned CS (0) and other modes of birth (1)). Secondly, one of the unique assumptions of Poisson regression is that the mean and variance are equal. I checked the assumption of mean being equal to variance. There are times where the variance is slightly less than the mean or broadly similar, and hence it was considered acceptable. Thirdly, the explanatory or independent variables are continuous (e.g. age, BMI), dichotomous (e.g. High BP 'yes' or 'no') or ordinal (e.g., type of care 'public', 'semi-private' and 'private'). Fourthly, Poisson regression assumes that observations are independent of each other which means each woman is represented only once in the analysis (Cameron & Trivedi 2013). For the purpose of interpretation and reporting of results, the level of significance (p-value) was set at 0.05.

4.3.1.Factors associated with risk of planned CS

A number of potential pre-pregnancy and pregnancy factors outlined in Table 4-21 were analysed to explore their association with the risk of a planned CS. Results are presented as risk ratio (RR), 95% confidence interval (CI) and p-value (RR, 95% CI and p-value).

4.3.1.1. Univariate analysis of pre-pregnancy factors

Univariate analysis of pre-pregnancy factors such as maternal age, pre-pregnancy BMI, pre-existing medical conditions and treatment for infertility was conducted to explore their association with the risk of a planned CS (Table 4-22).

Univariate analysis was conducted with '25 to 29 years' as the reference group, as the ideal category. Maternal age was significantly associated with the risk of a planned CS. Compared to the reference group, being aged 35-39 years was significantly associated with the risk of a planned CS (RR 1.63, 95% CI 1.02-2.61, p<0.001). There was a four-fold increased risk of a planned CS for women aged ≥40 years (RR 4.0, 95% CI 2.30-6.96, p<0.001).

Pre-pregnancy BMI data were used from women's self-completed antenatal surveys in early pregnancy. Data on women with low BMI (≤18.5 kg/m^2) were combined with the ideal BMI (≤24.9kg/m^2) group due to the small proportion of women (n=144/3047, 4.70%) in the low BMI group. Data for women in the obese and very obese categories were merged into one group for analysis due to the small proportion of women in the very obese category (n=50/3047, 1.6%). Missing data is a common problem in most research, which can lead to invalid conclusions. Several strategies are recommended to handle missing data in analysis, mostly describing ways to either remove missing data from analysis or to include them using recommended strategies (Dong & Peng 2013, Kwak & Kim 2017). Removing all the missing data from analysis often limits the interpretation of findings by reducing the sample size. I recognised that there were lot of women (n=213) with no value for pre-pregnancy BMI. Thus, a decision was made to include the missing BMIs in analysis by categorising them with an arbitrary number. So I created a category to include these women as 'missing', so that they were included in the analysis and treated them as being in a different BMI category, not as the existing ones such as ideal, overweight and obese/very obese.

Univariate analysis was conducted with BMI ≤24.9kg/m^2 (ideal weight) as the reference category. There was no significant association between pre-pregnancy BMI and risk of a planned CS.

Self-reported pre-existing medical conditions, high blood pressure (BP), diabetes and asthma, were analysed using univariate analysis to identify the associated risk for a planned CS. There was no significant association between these pre-existing medical conditions and the risk of having a planned CS.

Self-reported treatment for infertility with use of IVF or ICSI method or fertility drugs was significantly associated with the risk of a planned CS (RR 2.76, 95% CI 1.94-3.93, p<0.001) (Table 4-22).

Table 4-22 Pre-pregnancy factors and risk of planned CS

Pre-pregnancy factors		**Mode of birth (n=2755)**		**p-value**	**Risk ratio (95% CI)**
		Planned CS (n=166) %	**Other modes of birth (n=2589) %**		
Maternal age	Up to 24 years	6 (2.82%)	207 (97.18%)	0.253	0.60 (0.25-1.45)
	25-29 years	26 (4.73%)	524 (95.27%)		1 (Ref)
	30-34 years	58 (4.87%)	1132 (95.13%)	0.897	1.03 (0.65-1.64)
	35-39 years	52 (7.70%)	623 (92.30%)	<0.001	1.63 (1.02-2.61)
	40 years & over	24 (18.90%)	103 (81.10%)	<0.001	4.00 (2.30-6.96)
Pre-pregnancy BMI	Ideal weight	107 (6.00%)	1678 (94.00%)		1(Ref)
	Overweight	31 (6.34%)	458 (93.66%)	0.784	1.06 (0.71-1.58)
	Obese/very obese	16 (5.97%)	252 (94.03%)	0.988	1.00 (0.59-1.68)
	Missing	12 (5.63%)	201 (94.37%)	0.839	0.94 (0.52-1.71)
High BP *M=43*	No high BP	155 (5.96%)	2447 (94.04%)		1 (Ref)
	High BP	9 (8.18%)	101 (91.82%)	0.355	1.37 (0.70-2.69)
Diabetes *M=45*	No Diabetes	163 (6.04%)	2535 (93.96%)		
	Diabetes	1 (8.330%)	11 (91.67%)	0.748	1.38 (0.19-9.85)

Asthma *M=29*	No Asthma	143 (6.28%)	2135 (93.72%)		1 (Ref)
	Asthma	21 (4.70%)	426 (95.30%)	0.215	0.75 (0.47-1.18)
Treatment for infertility *M=9*	No treatment for infertility	124 (5.06%)	2328 (94.94%)		1 (Ref)
	Treatment for infertility	41 (13.95%)	253 (86.05%)	<0.001	2.76 (1.94-3.93)

M – Missing

4.3.1.2. Univariate analysis of pregnancy factors

Univariate analysis of pregnancy related factors (type of care, multiple gestation, gestational age and presentation at birth) was carried out to explore associations with the risk of a planned CS (Table 4-23).

Semi-private (RR 1.83, 95% CI 1.27-2.64, p<0.001) and private care (RR 2.66, 95% CI 1.84-3.85, p<0.001), multiple gestation (RR 3.83, 95% CI 2.13-6.88, p<0.001), preterm and very preterm gestation (RR 1.96, 95% CI 1.20-3.20, p<0.05) and breech or other malpresentation of fetus at birth (RR 15.87, 95% CI 11.69-21.55, p<0.001) were significantly associated with the risk of a having a planned CS (Table 4-23).

Table 4-23 Pregnancy factors and risk of planned CS

Pregnancy factors		**Planned CS (n=166) %**	**Other modes of birth (n=2589)%**	**p-value**	**Risk ratio (95% CI)**
Type of care	Public care	77 (4.29%)	1718 (95.71%)		1 (Ref)
	Semi-private care	45 (7.84%)	529 (92.16%)	<0.001	1.83 (1.27-2.64)
	Private care	44 (11.40%)	342 (88.60%)	<0.001	2.66 (1.84-3.85)
Number of fetus(es)	Singleton gestation	154 (5.70%)	2546 (94.30%)		1 (Ref)
	Multiple births	12 (21.82%)	43 (78.18%)	<0.001	3.83 (2.13-6.88)
Gestati-onal age	Term	148 (5.71%)	2446 (94.29%)		1 (Ref)
	Preterm and very preterm	18 (11.18%)	143 (88.82%)	0.007	1.96 (1.20-3.20)
Present-ation of fetus at birth	Cephalic presentation	91 (3.47%)	2528 (96.53%)		1 (Ref)
	Breech and other	75 (55.15%)	61 (44.85%)	<0.001	15.87 (11.69-

	malpresent-ations	21.55)

4.3.1.3. Multivariable analysis of the pre-pregnancy factors

The model contained the variables maternal age, pre-pregnancy BMI and treatment for infertility. Pre-existing medical conditions were not significantly associated with the risk of a planned CS in univariate analysis, hence were not included in the multivariable Poisson regression model. Pre-pregnancy BMI was not identified to be significantly associated with the risk of planned CS, but it was included in the model due to its clinical importance.

Adjusting for the effect of the included variables on each other, being aged ≥40 years (ARR 2.77, 95% CI 1.52-5.05, p=0.001) and treatment for infertility (ARR 2.03, 95% CI 1.38-2.99, p<0.001) were significantly associated with planned CS (Table 4-24).

Table 4-24 Multivariable analysis of pre-pregnancy factors and risk of planned CS

Pre-pregnancy factors		**ARR**	**95% CI**	**p-value**
Maternal age	Up to 24 years	0.63	0.26-1.53	0.306
	25-29 years	1 (Ref)		
	30-34 years	1.00	0.63-1.59	0.984
	35-39 years	1.42	0.88-2.30	0.151
	40 years & over	2.77	1.52-5.05	0.001
Pre-pregnancy BMI	Ideal weight	1 (Ref)		
	Overweight	1.00	0.67-1.50	0.987
	Obese/very obese	1.04	0.62-1.77	0.876
	Missing	1.01	0.54-1.89	0.983
Treatment for infertility	Treatment for infertility	2.03	1.38-2.99	<0.001
	No treatment for infertility	1 (Ref)		

4.3.1.4. Multivariable analysis of pregnancy factors

The model contained the variables type of care, number of fetus(es), gestational age and presentation of fetus at birth.

Semi-private (ARR 1.92, 95% CI 1.33-2.78, p=0.001) and private care (ARR 2.78, 95% CI 1.92-4.04, p<0.001), multiple gestation (ARR 2.81, 95% CI 1.48-5.35, p<0.05) and breech including other malpresentations

(ARR 15.99, 95% CI 11.77-21.74, p<0.001) were significantly associated with the risk to birth by planned CS. Gestational age at birth was not significantly associated with planned CS (Table 4-25).

Table 4-25 Multivariable analysis of pregnancy factors and risk of planned CS

Pregnancy factors		ARR	95% CI	p-value
Type of care	Public care	1 (Ref)		
	Semi-private care	1.92	1.33-2.78	0.001
	Private care	2.78	1.92-4.04	<0.001
Number of fetus(es)	Singleton gestation	1 (Ref)		
	Multiple gestation	2.81	1.48-5.35	0.002
Gestational age at birth	Term	1 (Ref)		
	Preterm and very preterm	1.17	0.69-2.00	0.554
Presentation of fetus at birth	Cephalic presentation	1 (Ref)		
	Breech and other malpresentation	15.99	11.77-21.74	<0.001

4.3.2.Factors associated with risk of unplanned CS

Of the total cohort of women included in analysis (n=2755), a small proportion had a planned CS (n=166, 6.03%), the majority had an unplanned CS (n=722, 26.20%), and remaining had a vaginal birth (n=1867, 67.77%).

4.3.2.1. Univariate analysis of pre-pregnancy factors

Univariate analysis of pre-pregnancy factors (maternal age, pre-pregnancy BMI, pre-existing medical conditions and treatment for infertility) was conducted to explore possible associations with the risk of an unplanned CS (Table 4-26).

Being aged 35-39 years (RR 1.44, 95% CI 1.16-1.79, p=0.001) and ≥40 years (RR 2.28, 95% CI 1.67-3.12, p<0.001), overweight (RR 1.62, 95% CI 1.36-1.93, p<0.001) and obese/very obese (RR 1.49, 95% CI 1.18-1.87, p=0.001) (Fig 4.3), pre-existing medical conditions such as high BP (RR 1.68, 95% CI 1.25-2.26, p=0.001), diabetes (RR 2.29, 95% CI 1.09-4.82, p<0.05) and asthma (RR 1.30, 95% CI 1.08-1.56, p<0.05), and treatment for infertility (RR 1.52, 95% CI 1.23-1.87, p<0.001) significantly increased the risk of an unplanned CS. Being aged less than 24 years had a decreased risk (RR 0.58, 95% CI 0.39-0.87, p<0.05) compared to the reference category (Table 4-26).

Table 4-26 Pre-pregnancy factors and risk of unplanned CS

Pre-pregnancy factors		Mode of birth (n=2589)		p-value	Risk ratio (95% CI)
		Unplanned CS (n=722)%	Vaginal births (n=1867)%		
Maternal age	Up to 24 years	29 (14.01%)	178 (85.99%)	0.008	0.58 (0.39-0.87)
	25-29 years	127 (24.24%)	397 (75.76%)		1 (Ref)
	30-34 years	292 (25.80%)	840 (74.20%)	0.558	1.06 (0.86-1.31)
	35-39 years	217 (34.83%)	406 (65.17%)	0.001	1.44 (1.16-1.79)
	40 years & over	57 (55.34%)	46 (44.66%)	<0.001	2.28 (1.67-3.12)
Pre-pregnancy BMI	Ideal weight	403 (24.02%)	1275 (75.98%)		1 (Ref)
	Overweight	178 (38.86%)	280 (61.14%)	<0.001	1.62 (1.36-1.93)
	Obese/very obese	90 (35.71%)	162 (64.29%)	0.001	1.49 (1.18-1.87)
	Missing	51 (25.37%)	150 (74.63%)	0.712	1.06 (0.79-1.41)
High BP *M=41*	No high BP	664 (27.14%)	1783 (72.86%)		1 (Ref)
	High BP	46 (45.54%)	55 (54.46%)	0.001	1.68 (1.25-2.26)
Diabetes *M=43*	No Diabetes	704 (27.77%)	1831 (72.23%)		1 (Ref)
	Diabetes	7 (63.64%)	4 (36.36%)	0.029	2.29 (1.09-4.82)
Asthma *M=28*	No Asthma	568 (26.60%)	1567 (73.40%)		1 (Ref)
	Asthma	147 (34.51%)	279 (65.49%)	0.005	1.30 (1.08-1.56)
Treatment for infertility *M=8*	No treatment for infertility	618 (26.55%)	1710 (73.45%)		1 (Ref)
	Treatment for infertility	102 (40.32%)	151 (59.68%)	<0.001	1.52 (1.23-1.87)

M=Missing

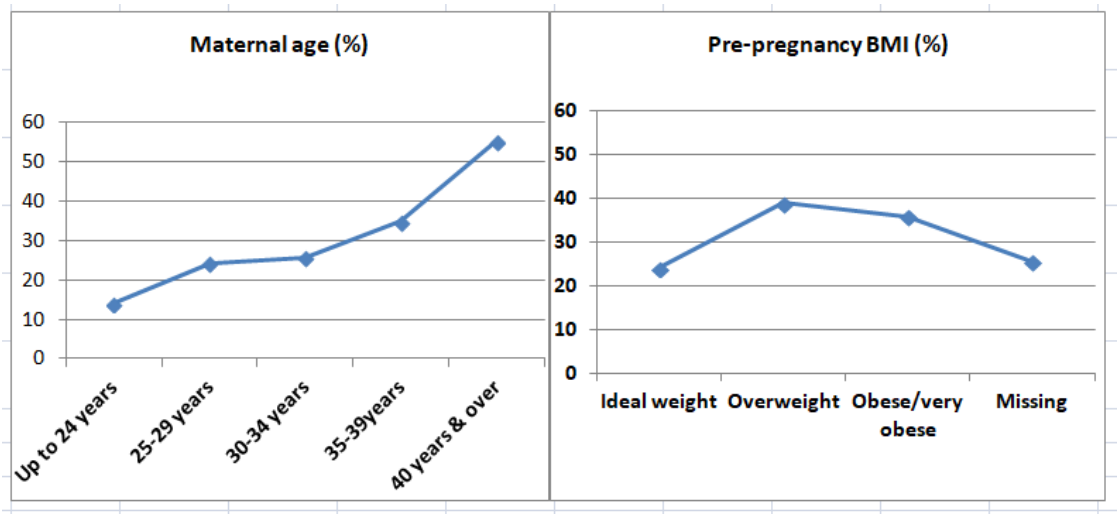

Figure 4-3 Maternal age and pre-pregnancy BMI and unplanned CS

4.3.2.2. Univariate analysis of pregnancy factors

Univariate analysis of pregnancy factors (type of care, multiple births, gestational age and fetal position and presentation at birth) was conducted to explore possible associations with the risk of an unplanned CS.

Private care (RR 1.48, 95% CI 1.22-1.80, p<0.001), multiple gestation (RR 2.30, 95%CI 1.57-3.38, p<0.001), preterm and very preterm gestation (RR 1.90, 95% CI 1.49-2.41, p<0.001), and breech or other malpresentation of fetus at birth (RR 3.62, 95% CI 2.77-4.73, p<0.001) were all significantly associated with the risk of an unplanned CS (Table 4-27).

Table 4-27 Pregnancy factors and risk of unplanned CS

Pregnancy factors		**Mode of birth (n=2589)**		**p-value**	**Risk ratio (95% CI)**
		Unplanned CS (n=722)%	**Vaginal births (n=1867)%**		
Type of care	Public care	442 (25.73%)	1276 (74.27%)		1 (Ref)
	Semi-private care	150 (28.36%)	379 (71.64%)	0.303	1.10 (0.92-1.33)
	Private care	130 (38.01%)	212 (61.99%)	<0.001	1.48 (1.22-1.80)
Number of fetus(es)	Singleton gestation	695 (27.30%)	1851 (72.70%)		1 (Ref)
	Multiple gestation	27 (62.80%)	16 (37.20%)	<0.001	2.30 (1.57-3.38)

Gestational age	Term	650 (26.57%)	1796 (73.43%)		1 (Ref)
	Preterm and very preterm	72 (50.35%)	71 (49.65%)	<0.001	1.90 (1.49-2.41)
Presentation of fetus at birth	Cephalic presentation	664 (26.27%)	1864 (73.73%)		1 (Ref)
	Breech and other malpresentations	58 (95.08%)	3 (4.92%)	<0.001	3.62 (2.77-4.73)

4.3.2.3. Univariate analysis of intrapartum factors

Univariate analysis of intrapartum factors (IOL, IV oxytocin in labour, epidural for pain management in labour) was carried out to explore possible associations with the risk of an unplanned CS.

IOL (RR 1.61, 95% CI 1.39-1.86, p<0.001) and epidural analgesia for pain management in labour (RR 2.20, 95% CI 1.72-2.82, p<0.001) were significantly associated with the risk of an unplanned CS. Use of IV oxytocin for induction or augmentation of labour had no significant association with the risk of an unplanned CS (Table 4-28).

Table 4-28 Intrapartum factors and risk of unplanned CS

Intrapartum factors		**Mode of birth (n=2589)**		**p-value**	**Risk ratio (95% CI)**
		Unplanned CS (n=722)%	**Vaginal births (n=1867)%**		
IOL	No IOL	334 (22.24%)	1168 (77.76%)		1 (Ref)
	IOL	388 (35.69%)	699 (64.31%)	<0.001	1.61 (1.39-1.86)
IV oxytocin in labour *M=1*	Labour without oxytocin	307 (26.22%)	864 (73.78%)		1 (Ref)
	Labour with oxytocin	414 (29.22%)	1003 (70.78%)	0.150	1.11 (0.96-1.29)
Epidural for pain management in labour *M=525*	No epidural in labour	73 (13.04%)	487 (86.96%)		1 (Ref)
	Epidural in labour	432 (28.72%)	1072 (71.28%)	<0.001	2.20 (1.72-2.82)

4.3.2.4. Multivariable analysis of pre-pregnancy factors

The model contained the variables maternal age, pre-pregnancy BMI, pre-existing high BP, diabetes and asthma, and treatment for infertility. Factors significantly associated with an unplanned CS were maternal age (35-39 years (ARR 1.42, 95% CI 1.13-1.78, p<0.05) and ≥40 years (ARR 2.12, 95% CI 1.52-2.96, p<0.001)), pre-pregnancy BMI (being overweight (ARR 1.53, 95% CI 1.28-1.83, p<0.001) and obese/very obese (ARR 1.44, 95% CI 1.14-1.82, p<0.05)), and pre-existing high BP (ARR 1.39, 95% CI 1.02-1.89, p<0.05) and asthma (ARR 1.25, 95% CI 1.04-1.51, p<0.05). Pre-existing diabetes and treatment for infertility had no significant association with unplanned CS (Table 4-29).

Table 4-29 Multivariable analysis of pre-pregnancy factors and risk of unplanned CS

Pre-pregnancy factors		ARR	95% CI	p-value
Maternal age	Up to 24 years	0.57	0.38-0.87	0.009
	25-29 years	1 (Ref)		
	30-34 years	1.10	0.89-1.36	0.395
	35-39 years	1.42	1.13-1.78	0.002
	40 years & over	2.12	1.52-2.96	<0.001
Pre-pregnancy BMI	Ideal weight	1 (Ref)		
	Overweight	1.53	1.28-1.83	<0.001
	Obese/very obese	1.44	1.14-1.82	0.003
	Missing	1.18	0.87-1.60	0.300
High BP	High BP	1.39	1.02-1.89	0.040
	No high BP	1 (Ref)		
Diabetes	Diabetes	1.79	0.84-3.82	0.130
	No Diabetes	1 (Ref)		
Asthma	Asthma	1.25	1.04-1.51	0.017
	No Asthma	1 (Ref)		
Treatment for infertility	Treatment for infertility	1.16	0.92-1.45	0.201
	No treatment for infertility	1 (Ref)		

4.3.2.5. Multivariable analysis of pregnancy factors

The model contained the variables type of care, number of fetus(es), gestational age and presentation of fetus at birth.

Type of care (private care (ARR 1.51, 95% CI 1.24-1.83, p<0.001)), multiple gestation (ARR 1.71, 95% CI 1.13-2.58, p=0.011), preterm and very preterm gestation (ARR 1.50, 95% CI 1.15-1.96, p=0.003) and breech or other malpresentation of fetus at birth (ARR 3.46, 95% CI 2.63-4.54,

p<0.001) were all significantly associated with the risk of an unplanned CS (Table 4-30).

Table 4-30 Multivariable analysis of pregnancy factors and risk of unplanned CS

Pregnancy factors		ARR	95% CI	p-value
Type of care	Public care	1 (Ref)		
	Semi-private care	1.14	0.94-1.37	0.177
	Private care	1.51	1.24-1.83	<0.001
Number of fetus(es)	Singleton gestation	1 (Ref)		
	Multiple gestation	1.71	1.13-2.58	0.011
Gestational age at birth	Term	1 (Ref)		
	Preterm and very preterm	1.50	1.15-1.96	0.003
Presentation of fetus at birth	Cephalic presentation	1 (Ref)		
	Breech and other malpresentations	3.46	2.63-4.54	<0.001

4.3.2.6. Multivariable analysis of intrapartum factors

The model contained the variables induction of labour and epidural for pain management in labour. Use of IV oxytocin was not significantly associated with unplanned CS in univariate analysis and, thus, was not included in multivariable analysis.

Induction of labour (ARR 1.84, 95% CI 1.54-2.21, p<0.001) and epidural for pain management in labour (ARR 1.95, 95% CI 1.52-2.50, p<0.001) were identified to be significantly associated with the risk of an unplanned CS (Table 4-31).

Table 4-31 Multivariable analysis of intrapartum factors and risk of unplanned CS

Intrapartum factors		ARR	95% CI	p-value
IOL	No IOL	1 (Ref)		
	IOL	1.84	1.54-2.21	<0.001
Epidural for pain management in labour	No epidural in labour	1 (Ref)		
	Epidural for pain management in labour	1.95	1.52-2.50	<0.001

4.3.2.7. Clinical scenarios associated with unplanned CS

This section describes the factors associated with unplanned CS in eight possible clinical scenarios detailed in Figure 4-4. The common clinical scenarios are around IOL, use of epidural for pain management in labour and use of IV oxytocin for induction and augmentation of labour. The two

main categories included ‘IOL’ and ‘no IOL’ and the subcategories were ‘IOL with or without epidural anaesthesia and oxytocin’ and ‘no IOL with or without epidural anaesthesia and oxytocin’.

This section describes the findings from analysis of each scenario on its own and, after adjusting for the pre-pregnancy, pregnancy and intrapartum factors.

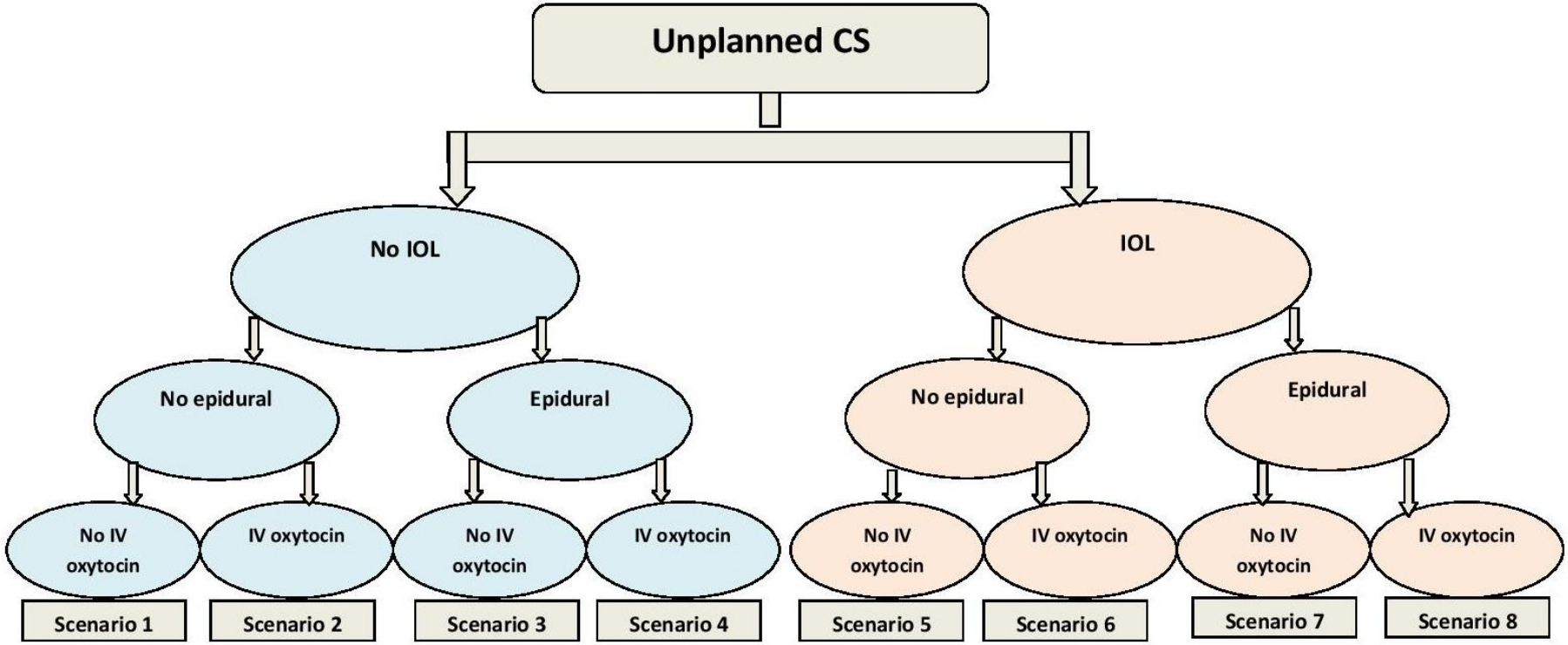

Figure 4-4 Scenarios to describe factors associated with unplanned CS

Univariate analysis of clinical scenarios and unplanned CS

Univariate analysis of each scenario was conducted to explore associations with the risk of having an unplanned CS. Findings indicated that IOL with epidural and without IV oxytocin (RR 2.07, 95% CI 1.52-2.80, p<0.001) and with IV oxytocin (RR 1.65, 95% CI 1.32-2.05, P<0.001) were significantly associated with the risk of an unplanned CS (Table 4-32).

Table 4-32 Scenarios and unplanned CS

Scenarios	**Mode of birth (n=2589)**		**p-value**	**Risk ratio (95% CI)**
	Unplanned CS (n=722)%	**Vaginal births (n=1867)%**		
i. No IOL, no epidural, no oxytocin	112 (22.05%)	396 (77.95%)		1 (Ref)
ii. No IOL, no epidural, oxytocin	5 (10.64%)	42 (89.36%)	0.111	0.48 (0.20-1.18)
iii. No IOL, epidural, no oxytocin	103 (24.41%)	319 (75.59%)	0.456	1.11 (0.85-1.45)
iv. No IOL, epidural, oxytocin	111 (21.31%)	410 (78.69%)	0.798	0.97 (0.74-1.26)
v. IOL, no epidural, no oxytocin	24 (25.53%)	70 (74.47%)	0.514	1.16 (0.75-1.80)
vi. IOL, no epidural, oxytocin	22 (24.72%)	67 (75.28%)	0.624	1.12 (0.71-1.77)
vii. IOL, epidural, no oxytocin	66 (45.52%)	79 (54.48%)	<0.001	2.07 (1.52-2.80)
viii. IOL, epidural, oxytocin	276 (36.36%)	483 (63.64%)	<0.001	1.65 (1.32-2.05)
Total	719 (27.81%)	1866 (72.19%)		
Missing	3	1		

Univariate analysis of each scenario found no significant association with scenarios i to vi (no IOL with or without epidural and oxytocin, and IOL without epidural and oxytocin) and unplanned CS, hence these were combined as one scenario for further analysis. When combined, the risk of

having an unplanned CS remained significantly associated for women who had an IOL with epidural and without oxytocin (RR 2.03, 95%CI 1.56-2.64, p<0.001) and with oxytocin (RR 1.62, 95%CI 1.39-1.89, P<0.001) (Fig 4.5) (Table 4-33).

Table 4-33 Three case scenarios and risk of unplanned CS

Three case scenarios	Mode of birth (n=2589)		p-value	Risk ratio (95% CI)
	Unplanned CS (n=722)%	Vaginal births (n=1867)%		
i. No IOL, and IOL with no epidural (with or without oxytocin)	377 (22.43%)	1304 (77.57%)		1 (Ref)
ii. IOL, epidural, no oxytocin	66 (45.52%)	79 (54.48%)	<0.001	2.03 (1.56-2.64)
iii. IOL, epidural, oxytocin	276 (36.36%)	483 (63.64%)	<0.001	1.62 (1.39-1.89)
Total	719 (27.81%)	1866 (72.19%)		
Missing	3	1		

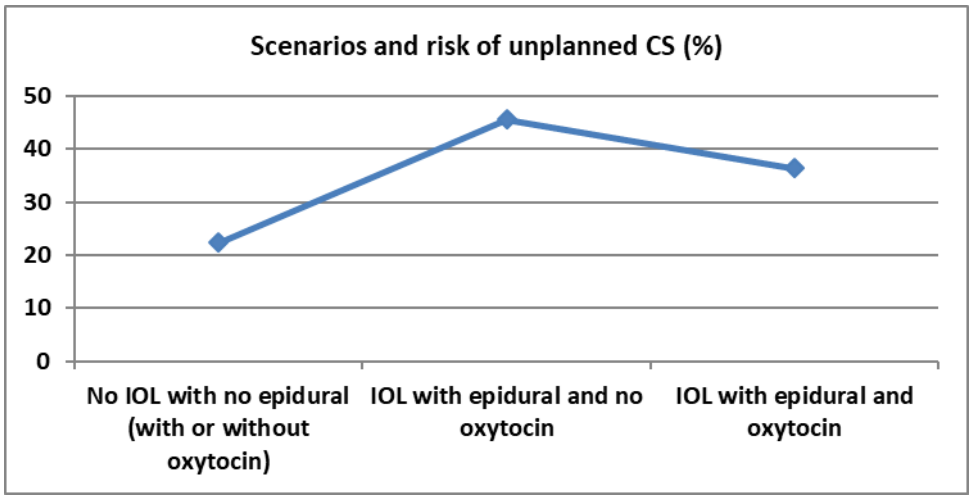

Figure 4-5 Scenarios and risk of unplanned CS

Multivariable analysis of scenarios with pre-pregnancy, pregnancy and intrapartum factors

The model was built with the scenario i [No IOL, and IOL with no epidural (with or without oxytocin)] as the reference category, adjusted with pre-

pregnancy and pregnancy factors that were found to be significantly associated with an unplanned CS on univariate analysis.

IOL with epidural, either without oxytocin (ARR 2.06, 95%CI 1.57-2.69, p<0.001) or with oxytocin (ARR 1.70, 95% CI 1.44-2.01, p<0.001) remained significantly associated with unplanned CS after adjusting for the other confounding factors (Table 4-34).

Table 4-34 Multivariable analysis of scenarios associated with unplanned CS and pre-pregnancy and pregnancy factors

Clinical scenarios and pre-pregnancy and pregnancy factors		ARR	95% CI	p-value
Case scenarios	i. No IOL, and IOL with no epidural (with or without oxytocin)	1 (Ref)		
	vii. IOL, epidural, no oxytocin	2.06	1.57-2.69	<0.001
	viii. IOL, epidural, oxytocin	1.70	1.44-2.01	<0.001
Age group	Up to 24 years	0.59	0.39-0.89	0.013
	25-29 years	1 (Ref)		
	30-34 years	0.99	0.80-1.23	0.958
	35-39 years	1.22	0.96-1.54	0.098
	40 years & over	1.75	1.25-2.46	0.001
Pre-pregnancy BMI	Ideal weight	1 (Ref)		
	Overweight	1.57	1.31-1.88	<0.001
	Obese/very obese	1.31	1.04-1.67	0.025
	Missing	1.16	0.85-1.57	0.360
High BP	No high BP	1 (Ref)		
	High BP	1.42	1.04-1.94	0.026
Diabetes	No Diabetes	1 (Ref)		
	Diabetes	1.61	0.75-3.42	0.219
Asthma	No Asthma	1 (Ref)		
	Asthma	1.24	1.03-1.50	0.022
Treatment for infertility	No treatment for infertility	1 (Ref)		
	Treatment for infertility	0.99	0.78-1.25	0.926
Type of care	Public care	1 (Ref)		
	Semi-private care	1.04	0.86-1.26	0.672
	Private care	1.28	1.04-1.59	0.022
Number of fetus(es)	Singleton gestation	1 (Ref)		
	Multiple gestation	1.57	1.02-2.41	0.042
Gestational age	Term gestation	1 (Ref)		
	Preterm and very preterm gestation	1.65	1.25-2.17	<0.001

Presentation of fetus at birth	Cephalic presentation	1 (Ref)		
	Breech and other malpresentations	4.22	3.16-5.64	<0.001

Maternal request and CS

In the context of factors influencing decision-making for CS 'maternal request' has been a topic of debate. One question in the 3-month postpartum survey asked women 'If you had a CS, did you request it?'. This variable captured information from the 3-month postpartum survey of women (n=707) recruited to the study from the third study site only. Thus, it was decided to present this information descriptively to report the number of women who requested a CS and their reasons for it.

A small proportion of women (n=48/707, 6.79%) said they requested a CS. Of these, the majority had an unplanned CS (39/48, 81.25%), five women (5/48, 10.42%) had a planned CS, one woman had a vaginal birth (1/48, 2.08%), and data were missing from three women. Of the total number of women who had a CS before labour (n=105), five women said they requested it (5/105, 4.76%). The reasons for planned CS in this cohort of women were increased maternal age (40 years and older) and treatment for infertility (n=3), fetal breech presentation (n=1) and Type-1 diabetes (n=1). The reasons for unplanned CS were fetal distress (n=9), and other maternal reasons (poor obstetric history (n=3), previous myomectomy (n=2), back problem (n=1), anal fistula (n=1), bleeding disorder (n=1)), fetal breech presentation (n=7), unsuccessful progress in labour (n=6), unsuccessful IOL (n=3), postdates (n=1), unstable lie (n=1), and reduced fetal growth (n=1)).

The proportion of women who had requested and had a CS (5/105, 4.76%) was slightly smaller than the proportion reported in the hospital records as maternal request being the reason for planned CS for all women in the study (13/166, 7.83%) (Table 4.19).

4.4. Summary of factors associated with the risk of CS

Maternal age ≥40 years, treatment for infertility, semi-private and private care, multiple gestation, breech and other malpresentations were significantly associated with the risk of a planned CS. Maternal age (35 to ≥40 years), being overweight and obese/very obese, pre-existing high BP and asthma, being in private care, multiple gestation, breech presentation, IOL and epidural use in labour were significantly associated with the risk of an unplanned CS. Women who had their labour induced and had an epidural for pain management in labour with or without the use of IV oxytocin in labour, were found to be at a significant risk of having an unplanned CS compared to those who had spontaneous onset of labour (i.e., no IOL), no epidural for pain management in labour with or without the use of IV oxytocin in labour, after controlling for potential pre-pregnancy and pregnancy factors. Only a small proportion of women had requested a CS.

4.5. Identification of the risk of outcomes/morbidities associated with mode of birth

This section addressed objective ii: To identify outcomes/postpartum morbidities experienced by women immediately after CS and up to 3-months postpartum and compare them with outcomes/postpartum morbidities experienced by women following SVB and AVB. Postpartum outcomes/morbidities were the outcome (dependent) variable in this analysis.

The outcomes, identified from the literature, included in the analysis and their source of information are detailed in Table 4-35. Data for most of the outcomes/morbidities in the immediate postpartum period, such as amount of blood loss at birth, hospital stay postpartum, baby's admission to NICU and maternal readmission to hospital following discharge postpartum, were obtained from hospital records, and data for other outcomes, e.g., wound infection, breast problems, administration of antibiotics in the postpartum period, number of visits to the general practitioner (GP) and attendance at a hospital emergency room (ER), etc., were gathered from women's self-completed surveys at 3-months postpartum. Data from women who had given consent to have their hospital records accessed (n=2755) were

included in the analysis to maintain consistency in the source of data to analyse the risk of outcomes/morbidities associated with mode of birth. The risk of wound infection following birth was analysed using data from all women who had completed the 3-months postpartum survey to maximise the response to this variable.

A number of outcomes/morbidities (Table 4-35), identified from literature, experienced in the immediate postpartum period (during hospital stay) and up to 3-months postpartum were analysed to identify their association with the four modes of birth (SVB, AVB, planned and unplanned CS).

Table 4-35 Outcomes/morbidities, time-points and source of information

Outcomes/ Morbidities	Time-point for analysis	Source of information	Literature
Amount of blood loss at birth	1 time-point (Immediate postpartum)	Hospital data	Liu *et al*. 2007
Wound infection (CS and perineal wound)	2 time-points (Immediate and 3-months postpartum)	3-months postpartum data	Liu *et al*. 2007, Panda *et al*. 2016
Baby's admission to NICU	1 time-point (Immediate postpartum)	Hospital data	Villar *et al*. 2007
Reasons for admission to NICU	1 time-point (Immediate postpartum)	3-months postpartum data	Villar *et al*. 2007
Breast problems (sore nipples, mastitis)	2 time-points (Immediate and 3-months postpartum)	3-months postpartum data	Thompson *et al*. 2002, Panda *et al*. 2016
Duration of hospital stay postpartum	1 time-point (Immediate postpartum)	Hospital data	Liu *et al*. 2007
Administration of antibiotics postpartum	1 time-point (Immediate postpartum)	3-months postpartum data	Villar *et al*. 2007
Maternal readmission to hospital following discharge postpartum	1 time-point (Immediate postpartum)	Hospital data	Lydon-Rochelle 2000, Thompson et al. 2002, Declercq *et al*. 2007, Panda *et al*. 2016
Reasons for readmission	1 time-point (Immediate	Hospital data	Panda *et al*. 2016

	postpartum)		
Treatment at readmission	1 time-point (Immediate postpartum)	Hospital data	Panda *et al*. 2016
Number of GP visits	1 time-point (at 3-months)	3-months postpartum data	
Attendance at hospital ER	1 time-point (at 3-months)	3-months postpartum data	

GP = General Practitioner
ER = Emergency Room
NICU = Neonatal Intensive Care Unit

4.5.1.Identification of outcomes/morbidities in immediate postpartum period

The two time periods explored were (i) immediate postpartum and (ii) up to 3-months postpartum. The immediate postpartum period is defined as the time period from the birth of the baby until discharge from the hospital, including maternal readmission to the hospital following discharge postpartum. Data were analysed using Poisson regression analyses to identify the risk of outcomes/morbidities associated with the modes of birth.

4.5.1.1. Univariate analysis of outcomes/morbidities in immediate postpartum period

This section describes the risk of outcomes such as blood loss, wound infection, duration of hospital stay postpartum, administration of antibiotics, breast problems (sore nipples and mastitis) in the immediate postpartum period, and maternal readmission following discharge associated with the mode of birth (SVB, AVB, planned and unplanned CS).

Amount of blood loss at birth

Data for amount of blood loss at birth (in millilitres (mls)) were presented in two categories; blood loss <500mls and ≥500mls. Blood loss ≥500mls was significantly associated with mode of birth ($p<0.001$). The risk of blood loss ≥500mls at birth was approximately four times higher with unplanned CS group compared to women who had SVBs (Table 4-36).

Table 4-36 Risk of blood loss at birth associated with mode of birth

Mode of birth (n=2755)		Blood loss at birth		P-value	Risk ratio (95% CI)
		<500mls	≥500mls		
SVB	n=926 (33.62%)	813 (87.80%)	113 (12.20%)		1 (Ref)
AVB	n=941 (34.17%)	750 (79.70%)	191 (20.30%)	<0.001	1.66 (1.32-2.10)
Planned CS	n=166 (6.03%)	124 (74.70%)	42 (25.30%)	<0.001	2.07 (1.46-2.96)
Unplanned CS	n=721 (26.18%)	382 (52.98%)	339 (47.02%)	<0.001	3.85 (3.11-4.77)
Total	n=2754 (100.0%)	2069 (75.10%)	685 (24.90%)		
Missing (1)					

SVB – Spontaneous Vaginal Birth
AVB – Assisted Vaginal Birth

Wound infection immediate postpartum

Wound infection is defined as infection in a perineal or CS wound. Data were obtained from women's self-completed 3-months postpartum survey (n=2474). For the purpose of comparison of the risk of wound infection for all modes of birth, a new variable (wound infection) was created (Appendix 26). Women who had an AVB (RR 4.17, 95%CI 1.83-9.49, p=0.001) and unplanned CS (RR 7.38, 95%CI 3.32-16.43, p<0.001) had an increased risk of having/developing a wound infection in the immediate postpartum period (Table 4-37).

Table 4-37 Wound infection in immediate postpartum period associated with mode of birth

Mode of birth (n=2474)		Wound infection in immediate postpartum period		P-value	Risk ratio (95% CI)
		No wound infection	Wound infection		
SVB	n=758 (33.14%)	751 (99.08%)	7 (0.92%)		1 (Ref)
AVB	n=779 (34.06%)	749 (96.15%)	30 (3.85%)	0.001	4.17 (1.83-9.49)
Planned CS	n=134 (5.86%)	132 (98.51%)	2 (1.49%)	0.549	1.62 (0.34-7.78)
Unplanned CS	n=616 (26.94%)	574 (93.18%)	42 (6.82%)	<0.001	7.38 (3.32-6.43)
Total	n=2287 (100.0%)	2206 (96.46%)	81 (3.54%)		

Missing (187)					

SVB – Spontaneous Vaginal Birth
AVB – Assisted Vaginal Birth

Baby's admission to NICU

Having an AVB (RR 1.43, 95% CI 1.07-1.91, p<0.05) and CS (planned (RR 1.72, 95% CI 1.09-2.72, p<0.05) and unplanned (RR 2.42, 95% CI 1.84-3.18, p<0.001)) were significantly associated with baby's admission to NICU (Table 4-38).

Table 4-38 Baby's admission to NICU associated with mode of birth

Mode of birth (n=2755)		**Baby's admission to NICU**		**P-value**	**Risk ratio (95% CI)**
		Transfer to the postnatal ward with mother	**Admission to NICU**		
SVB	n=701 (32.54%)	624 (89.02%)	77 (10.98%)		1 (Ref)
AVB	n=739 (34.31%)	623 (84.30%)	116 (15.70%)	0.015	1.43 (1.07-1.91)
Planned CS	n=127 (5.90%)	103 (81.10%)	24 (18.90%)	0.020	1.72 (1.09-2.72)
Unplanned CS	n=587 (27.25%)	431 (73.42%)	156 (26.58%)	<0.001	2.42 (1.84-3.18)
Total	n=2154 (100.0%)	178 (82.68%)	373 (17.32%)		
Missing (601)					

SVB – Spontaneous Vaginal Birth
AVB – Assisted Vaginal Birth

Reasons for baby's admission to NICU

Reasons for baby's admission to NICU data were gathered from the women's self-completed 3-month postpartum survey. These data were available only for women who responded to the reasons for transfer to NICU (n=200/373). The most common reasons for baby's admission to NICU were prematurity (n=46, 23.00%), respiratory difficulty (n=28, 14.00%), for observation (n=22, 11.00%) and meconium aspiration (n=18, 9.00%). The most common mode of birth for babies admitted with prematurity was unplanned CS (n=29, 63.04%) and with respiratory difficulty was AVB (n=11, 39.29%) (Table 4-39).

Table 4-39 Reasons for baby's admission to NICU

Reasons for baby's admission to NICU		Mode of birth			
		SVB	AVB	Planned CS	Unplanned CS
Prematurity	n=46 (23%)	12 (26.09%)	2 (4.35%)	3 (6.52%)	29 (63.04%)
Respiratory difficulty	n=28 (14%)	5 (17.86%)	11 (39.29%)	2 (7.14%)	10 (35.71%)
For observation	n=22 (11%)	3 (13.64%)	10 (45.45%)	1 (4.55%)	8 (36.36%)
Meconium aspiration	n=18 (9%)	3 (16.67%)	3 (16.67%)	-	12 (66.66%)
For antibiotics	n=17 (8.5%)	1 (5.88%)	9 (52.94%)	1 (5.88%)	6 (35.30%)
Post resuscitation care	n=7 (3.5%)	-	4 (57.14%)	-	3 (42.86%)
For temperature and blood glucose monitoring	n=6 (3%)	-	3 (50.00%)	-	3 (50.00%)
Other reasons*	n=10 (5%)	2 (20.00%)	5 (50.00%)	2 (20.00%)	1 (10.00%)
Not reported	n=46 (23%)	8 (17.39%)	13 (28.26%)	6 (13.04%)	19 (41.31%)

*Other reasons included: hyperinsulinism (n=2), heart condition (n=2), haematoma on head (n=1), large head (n=1), blood in lungs (n=1), pneumothorax (n=1), Bell's palsy (n=1), fractured humerous due to shoulder dystocia (n=1)
SVB – Spontaneous Vaginal Birth
AVB – Assisted Vaginal Birth
Duration of hospital stay postpartum

Duration of hospital stay postpartum is described as the number of days in the hospital from birth until discharge. Women who had a CS (planned (RR 9.53, 95% CI 6.84-13.30, p<0.001) and unplanned (RR 7.65, 95% CI 5.75-10.18, p<0.001)) were significantly more likely to have an in-hospital stay for ≥four days (Table 4-40).

Table 4-40 Duration of hospital stay postpartum associated with mode of birth

Mode of birth (n=2755)		Duration of hospital stay postpartum		P-value	Risk ratio (95% CI)
		≤4 days	≥4 days		
SVB	n=926 (33.61%)	871 (94.06%)	55 (5.94%)		1 (Ref)

AVB	n=941 (34.16%)	865 (91.92%)	76 (8.08%)	0.083	1.36 (0.96-1.92)
Planned CS	n=166 (6.02%)	72 (43.37%)	94 (56.63%)	<0.001	9.53 (6.84-13.30)
Unplanned CS	n=722 (26.21%)	394 (54.57%)	328 (45.43%)	<0.001	7.65 (5.75-10.18)
Total	n=2755 (100.0%)	2202 (79.93%)	553 (20.07%)		

Administration of antibiotics in hospital

Women who had an AVB (RR 1.71, 95% CI 1.32-2.22, P<0.001) and those who had an unplanned CS (RR 2.17, 95% CI 1.67-2.80, P<0.001) were at significant risk of treatment with antibiotics in the immediate postpartum period (Table 4-41).

Table 4-41 Administration of antibiotics associated with mode of birth

Mode of birth (n=2755)		**Self-reported treatment with antibiotics**		**P-value**	**Risk ratio (95% CI)**
		No treatment with Antibiotics	**Treatment with antibiotics**		
SVB	n=757 (33.43%)	666 (87.98%)	91 (12.02%)		1 (Ref)
AVB	n=772 (34.08%)	613 (79.40%)	159 (20.60%)	<0.001	1.71 (1.32-2.22)
Planned CS	n=133 (5.87%)	117 (87.97%)	16 (12.03%)	0.998	1.00 (0.59-1.70)
Unplanned CS	n=603 (26.62%)	446 (73.96%)	157 (26.04%)	<0.001	2.17 (1.67-2.80)
Total	2265 (100.0%)	1842 (81.32%)	423 (18.68%)		
Missing (490)					

Breast problems in immediate postpartum period

Most women breast fed (n=1855, 79.55%) their babies in the immediate postpartum period, and there was no significant association between breast feeding and mode of birth (Table 4-42).

Table 4-42 Breast feeding in immediate postpartum period

Mode of birth (n=2755)	**Breast feeding in the immediate postpartum period**	**P-value**	**Risk ratio (95% CI)**

		Yes	No		
SVB	n=776 (33.28%)	639 (82.34%)	137 (17.66%)		1 (Ref)
AVB	n=797 (34.18%)	628 (78.80%)	169 (21.20%)	0.111	1.20 (0.96-1.51)
Planned CS	n=137 (5.87%)	103 (75.18%)	34 (24.82%)	0.076	1.41 (0.97-2.05)
Unplanned CS	n=622 (26.67%)	485 (77.97%)	137 (22.03%)	0.067	1.25 (0.99-1.58)
Total	(n=2332, 100.0%)	1855 (79.55%)	477 (20.45%)		
Missing (423)					

There was no significant association between self-reported breast problems and mode of birth in the immediate postpartum period (Table 4-43).

Table 4-43 Risk of breast problems associated with mode of birth

Mode of birth (n=2755)		**Self-reported breast problems immediate postpartum**		**P-value**	**Risk ratio (95% CI)**
		No breast problems	**Breast problems**		
SVB	n=758 (33.19)	438 (57.78%)	320 (42.22%)		1 (Ref)
AVB	n=780 (34.15)	481 (61.67%)	299 (38.33%)	0.230	0.91 (0.78-1.06)
Planned CS	n=133 (5.82)	76 (57.14%)	57 (42.86%)	0.917	1.02 (0.77-1.35)
Unplanned CS	n=613 (26.84)	337 (54.98%)	276 (45.02%)	0.433	1.07 (0.91-1.25)
Total	n=2284 (100%)	1332 (58.32%)	952 (41.68%)		
Missing (471)					

Maternal readmission to the hospital

The association between AVB (RR 1.60, 95% CI 0.99-2.59, p=0.054) and risk of postnatal readmission was marginally significant (Table 4-44).

Table 4-44 Maternal readmission to hospital associated with mode of birth

Mode of birth (n=2755)	**Maternal readmission to hospital**		**P-value**	**Risk ratio (95% CI)**
	No readmission	**Readmission to hospital**		

		to hospital			
SVB	n=925 (33.59%)	898 (97.08%)	27 (2.92%)		1 (Ref)
AVB	n=941 (34.17%)	897 (95.32%)	44 (4.68%)	0.054	1.60 (0.99-2.59)
Planned CS	n=166 (6.03%)	164 (98.79%)	2 (1.21%)	0.227	0.41 (0.10-1.74)
Unplanned CS	n=722 (26.21%)	692 (95.84%)	30 (4.16%)	0.183	1.42 (0.85-2.39)
Total	n=2754 (100.0%)	2651 (96.26%)	103 (3.74%)		
Missing (1)					

SVB – Spontaneous Vaginal Birth
AVB – Assisted Vaginal Birth

Reasons for maternal readmission to hospital

Data on reasons for readmission were gathered from consenting women's hospital records. The most common reasons for readmission to the hospital were breast complications (engorgement, abscess and mastitis) (n=20, 19.80%), hypertension (n=16, 15.85%), perineal wound infection (n=13, 12.87%), CS wound infection (n=8, 7.92%), infection of unknown origin (n=13, 12.87%), and secondary PPH (n=8, 7.92%), and other reasons (Table 4-45). All women who had a readmission with CS wound infection had an unplanned CS (n=8, 100.00%) for their birth, and the majority of the women who were readmitted with a perineal wound infection had an AVB (n=12, 92.31%).

Table 4-45 Reasons for maternal readmission to hospital

Reasons for readmission to hospital		**Mode of birth**			
		SVB	**AVB**	**Planned CS**	**Unplanned CS**
Breast complications	n=20 (19.80%)	8 (40.00%)	8 (40.00%)	-	4 (20.00%)
Hypertension/ Preeclampsia	n=16 (15.85%)	5 (31.25%)	6 (37.50%)	-	5 (31.25%)
Perineal wound infection	n=13 (12.87%)	1 (7.69%)	12 (92.31%)	-	-
Infection of unknown origin	n=14 (13.86%)	3 (23.07%)	6 (46.2%)	1 (7.7%)	4 (30.8%)
CS wound infection	n=8 (7.92%)	-	-	-	8 (100.00%)

Secondary PPH/heavy blood loss	n=8 (7.92%)	4 (50.00%)	3 (37.50%)	-	1 (12.50%)
Urinary complications	n=6 (5.94%)	1 (16.67%)	2 (33.33%)	1 (16.67%)	2 (33.33%)
Suspected PE	n=3 (2.97%)	-	-	-	3 (100.00%)
Retained products of conception	n=2 (1.98%)	2 (100.00%)	-	-	-
Other maternal reasons*	n=10 (9.90%)	1 (10.00%)	6 (60.00%)	-	3 (30.00%)
Other neonatal reason**	n=2 (1.98%)	1 (50.00%)	1 (50.00%)	-	-

**Other maternal reasons include abdominal tenderness (2), anaemia (1), repair of perineum and perineal fistula (1), repair of episiotomy (1), Fenton procedure (1), dural headache (2), lump at CS wound site (1) and suspected endocarditis (1))*
***Other neonatal reasons include double phototherapy*
PPH: Postpartum Haemorrhage
PE: Pulmonary Embolism
SVB – Spontaneous Vaginal Birth
AVB – Assisted Vaginal Birth

Treatment during maternal readmission to hospital

Most women who were readmitted with any type of infection or suspected infection were treated with intravenous, oral or topical antibiotics (n=64, 63.65%), and symptomatically, with anti-hypertensives (n=12, 11.89%) (Table 4-46).

Table 4-46 Treatment during maternal readmission to hospital

Treatment	Frequency	%
Antibiotics	64	63.35
Antihypertensive	12	11.89
Analgesics	7	6.94
Surgical treatment (repair of fistula, removal of cervical mass, Fenton repair)	3	2.97
Anticoagulant	2	1.98
Neonatal double phototherapy	2	1.98
IV MgSo4	1	0.99
Blood transfusion	1	0.99
Blood patch	1	0.99
No treatment	2	1.98
Not reported	6	5.94%

IV MgSO4: Intravenous Magnesium Sulphate

4.5.2.Identification of outcomes/morbidities up to 3-months postpartum

The information on outcomes/morbidities from birth up to 3-months postpartum was obtained from women's self-completed 3-month postpartum surveys (Table 4-35). This section describes the findings on risk of birth outcomes at 3-months postpartum.

4.5.2.1. Univariate analysis of outcomes/morbidities up to 3-months postpartum

Outcomes analysed up to 3-months postpartum included wound infection, breast problems, number of GP visits, and attendance(s) at hospital ER.

Wound infection from birth up to 3-months postpartum

Women who had an AVB (RR 2.86, 95% CI 1.98-4.14, p<0.001) and unplanned CS (RR 3.42, 95% CI 2.36-4.95, p<0.001) were at a significantly increased risk of developing a wound infection (Table 4-47).

Table 4-47 Wound infection at 3-months postpartum associated with mode of birth

Mode of birth (n=2474)		**Wound infection at 3-months postpartum**		**P-value**	**Risk ratio (95% CI)**
		No wound infection	**Wound infection**		
SVB	n=769 (33.35%)	731 (95.06%)	38 (4.94%)		1 (Ref)
AVB	n=785 (34.04%)	674 (85.86%)	111 (14.14%)	<0.001	2.86 (1.98-4.14)
Planned CS	n=136 (5.90%)	125 (91.91%)	11 (8.09%)	0.150	1.64 (0.84-3.20)
Unplanned CS	n=616 (26.71%)	512 (83.12%)	104 (16.88%)	<0.001	3.42 (2.36-4.95)
Total	n=2306 (100.0%)	2042 (88.55%)	264 (11.45%)		
Missing (n=168)					

SVB – Spontaneous Vaginal Birth
AVB – Assisted Vaginal Birth

Breast problems

The majority of the women (n=1,180, 60.89%) were still breast feeding at 3-months postpartum. Breast feeding was not significantly associated with mode of birth (Table 4-48).

Table 4-48 Breast feeding at 3-months postpartum

Mode of birth (n=2755)		Breast feeding at 3-months postpartum period		P-value	Risk ratio (95% CI)
		Yes	No		
SVB	n=656 (33.85%)	412 (62.80%	244 (37.20%)		1 (Ref)
AVB	n=659 (34.00%)	392 (59.48%)	267 (40.52%)	0.334	1.09 (0.92-1.30)
Planned CS	n=111 (5.73%)	58 (52.25%)	53 (47.75%)	0.099	1.28 (0.95-1.73)
Unplanned CS	n=512 (26.42%)	318 (62.11%)	194 (37.89%)	0.847	1.02 (0.84-1.23)
Total	n=1938 (100.0%)	1180 (60.89%)	758 (39.11%)		
Missing (n=817)					

SVB – Spontaneous Vaginal Birth
AVB – Assisted Vaginal Birth

Mode of birth was not significantly associated with the risk of developing a mastitis at 3-months postpartum (Table 4-49).

Table 4-49 Breast problems associated with mode of birth

Mode of birth (n=2755)		Breast problems at 3-months postpartum		P-value	Risk ratio (95% CI)
		No breast problems	Breast problems		
SVB	n=748 (33.06%)	643 (85.96%)	105 (14.04%)		1 (Ref)
AVB	n=769 (33.98%)	655 (85.18%)	114 (14.82%)	0.687	1.06 (0.81-1.38)
Planned CS	n=134 (5.92%)	123 (91.79%)	11 (8.21%)	0.090	0.59 (0.31-1.09)
Unplanned CS	n=612 (27.04%)	529 (86.44%)	83 (13.56%)	0.815	0.97 (0.72-1.29)
Total	n=2263 (100.0%)	1950 (86.17%)	313 (13.83%)		
Missing (492)					

SVB – Spontaneous Vaginal Birth
AVB – Assisted Vaginal Birth

Number of GP visits

Number of GP visits were recoded into two groups considering the provision of two free postpartum GP visits; ≤2 GP visits and ≥3 GP visits, with '≤2 GP visits' as the reference category. The association between an unplanned CS and increased visits to GP (RR 1.33, 95% CI 1.00-1.78, p=0.052) was marginally significant (Table 4-50).

Table 4-50 Number of GP visits associated with mode of birth

Mode of birth (n=2755)		GP visits at 3-months postpartum		P-value	Risk ratio (95% CI)
		≤2 visits	≥3 visits		
SVB	762 (33.03%)	674 (88.45%)	88 (11.55%)		1 (Ref)
AVB	793 (34.37%)	691 (87.14%)	102 (12.86%)	0.459	1.11 (0.84-1.48)
Planned CS	135 (5.85%)	124 (91.85%)	11 (8.15%)	0.275	0.71 (0.38-1.32)
Unplanned CS	617 (26.75%)	522 (84.60%)	95 (15.40%)	0.052	1.33 (1.00-1.78)
Total	2307 (100%)	2011 (87.17%)	296 (12.83%)		
Missing (n=448)					

SVB – Spontaneous Vaginal Birth
AVB – Assisted Vaginal Birth
GP – General Practitioner

Attendance(s) at ER

Data were recoded as 'no attendance at ER' and '≥1 attendance(s) at ER', with 'No attendances at ER' as the reference category. One or more attendances at ER was significantly associated with an AVB (RR 1.34, 95% CI 1.01-1.78, p<0.05) (Table 4-51).

Table 4-51 Attendance at ER associated with mode of birth

Mode of birth (n=2755)		Attendance at ER at 3-months postpartum		P-value	Risk ratio (95% CI)
		No attendance at ER	≥1 attendance at ER		
SVB	n=772 (33.25%)	690 (89.38%)	82 (10.62%)		1 (Ref)
AVB	n=796 (34.28%)	683 (85.80%)	113 (14.20%)	0.046	1.34 (1.01-1.78)

Planned CS	n=137 (5.90%)	126 (91.97%)	11 (8.03%)	0.384	0.76 (0.40-1.42)
Unplanned CS	n=617 (26.57%)	540 (87.52%)	77 (12.48%)	0.310	1.18 (0.86-1.60)
Total	n=2322 (100.0%)	2039 (87.81%)	283 (12.19%)		
Missing (n=433)					

SVB – Spontaneous Vaginal Birth
AVB – Assisted Vaginal Birth
ER – Emergency Room

Having an unplanned CS increased the likelihood of all the outcomes/morbidities (amount of blood loss at birth, wound infection in immediate and up to 3-months postpartum, babies admission to NICU and administration of antibiotics in the immediate postpartum period), except for increased duration of hospital stay postpartum (≥4 days) which was higher for women who had a planned CS (Fig 4-6).

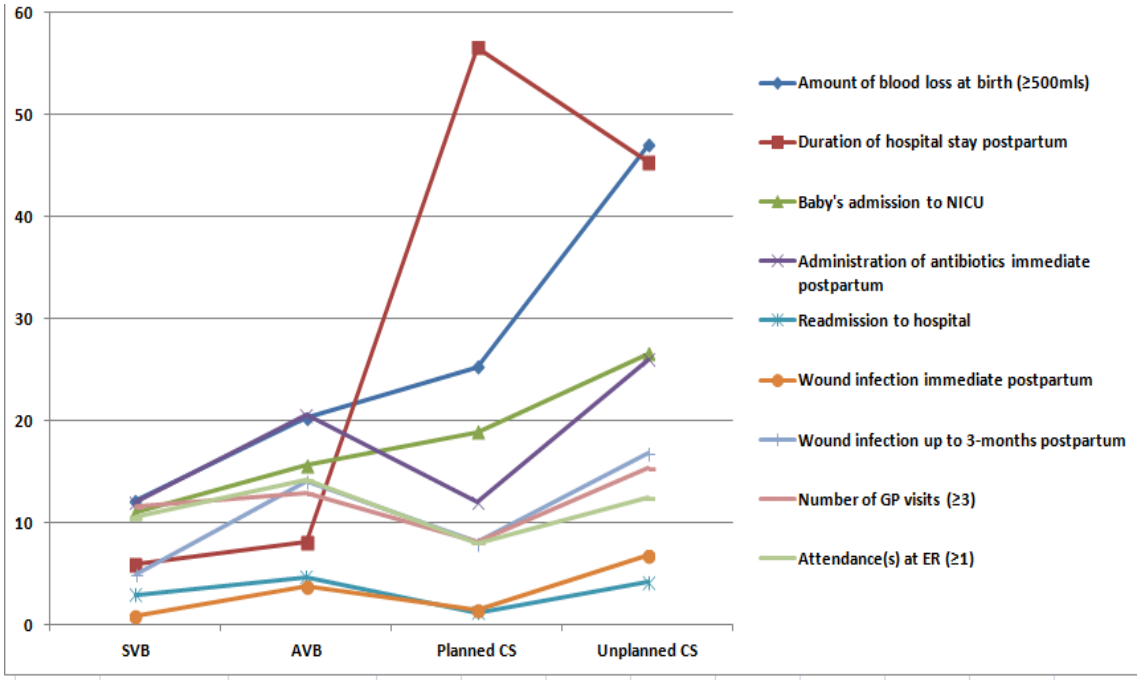

Figure 4-6 Outcomes/morbidities associated with mode of birth

4.5.3 Multivariable analyses of outcomes/morbidities

Outcomes/morbidities (i.e., amount of blood loss at birth, duration of hospital stay postpartum, administration of antibiotics, baby's admission to NICU, wound infection in the immediate and 3-months postpartum) that were significantly associated with mode of birth in the univariate analysis

were analysed adjusting for other confounding factors (such as pre-pregnancy (i.e., maternal age, pre-pregnancy BMI), pregnancy (i.e., type of care and number of babies), and intrapartum factors (i.e., IOL, IV oxytocin in labour and epidural for pain management in labour)). Readmission to hospital following discharge postpartum (p=0.054), number of GP (≥3) visits (p=0.052) and attendance(s) at ER (≥1) (p=0.046) were marginally associated with mode of birth in univariate analysis, thus, included in multivariable analysis. Breast problems in the immediate and up to 3-months postpartum did not show any significant association with mode of birth, and thus, were excluded from multivariable analysis.

Amount of blood loss at birth

When adjusted for the confounding factors, AVB (ARR 1.50, 95% CI 1.22-1.85, p<0.001) and CS (planned (ARR 2.05, 95% CI 1.44-2.93, p<0.001) and unplanned (ARR 3.24, 95% CI 2.67-3.93, p<0.001)), multiple gestation (ARR 1.65, 95% CI 1.17-2.33, p<0.05), IOL (ARR 1.18, 95% CI 1.02-1.38, p<0.05), and use of IV oxytocin in labour (ARR 1.22, 95% CI 1.03-1.44, p<0.05) significantly increased the risk of blood loss at birth (≥500mls). The risk of blood loss was three times higher for women who had unplanned CS compared to women who had SVB (Table 4-52).

Table 4-52 Multivariable analysis of blood loss at birth associated with mode of birth and pre-pregnancy, pregnancy and intrapartum factors

Amount of blood loss at birth		**ARR**	**95% CI**	**p-value**
Mode of birth	SVB	1 (Ref)		
	AVB	1.50	1.22-1.85	<0.001
	Planned CS	2.05	1.44-2.93	<0.001
	Unplanned CS	3.24	2.67-3.93	<0.001
Maternal age	Up to 24 years	1.29	0.96-1.73	0.087
	25-29 years	1 (Ref)		
	30-34 years	1.18	0.98-1.43	0.084
	35-39 years	0.97	0.78-1.20	0.768
	40 years & over	1.34	0.98-1.83	0.064
Pre-pregnancy BMI	Ideal weight	1 (Ref)		
	Overweight	1.11	0.94-1.31	0.240
	Obese/very obese	1.12	0.90-1.38	0.312
	Missing	0.89	0.68-1.17	0.386
Type of care	Public care	1 (Ref)		
	Semi-private care	1.14	0.97-1.34	0.125
	Private care	0.82	0.66-1.01	0.067

Number of fetus(es)	Singleton gestation	1 (Ref)		
	Multiple gestation	1.65	1.17-2.33	0.004
IOL	No IOL	1 (Ref)		
	IOL	1.18	1.02-1.38	0.028
IV Oxytocin in labour	Labour without oxytocin	1 (Ref)		
	Labour with oxytocin	1.22	1.03-1.44	0.021
Epidural for pain management in labour	No epidural in labour	1 (Ref)		
	Epidural in labour	1.04	0.86-1.26	0.663

SVB – Spontaneous Vaginal Birth
AVB – Assisted Vaginal Birth
IOL – Induction of Labour
IV - Intravenous

Duration of hospital stay postpartum

After controlling for the confounding variables, the risk of increased length of stay in the hospital (duration of ≥4 days) remained significantly associated with CS (planned (ARR 7.87, 95% CI 5.33-11.62, p<0.001) and unplanned (ARR 7.17, 95% CI 5.32-9.66, p<0.001)). Maternal age ≤24 years (ARR 1.57, 95% CI 1.01-2.43, p<0.05), being in semi-private (ARR 1.62, 95%CI 1.31-2.0, p<0.001) and private (ARR 1.87, 95% CI 1.49-2.33, p<0.001) care and multiple gestation (ARR 2.08, 95% CI 1.49-2.92, p<0.001) were significantly associated with an increased duration of hospital stay postpartum (Table 4-53).

Table 4-53 Multivariable analysis of duration of hospital stay postpartum associated with mode of birth and pre-pregnancy, pregnancy and intrapartum factors

Duration in hospital postpartum		**ARR**	**95% CI**	**p-value**
Mode of birth	SVB	1 (Ref)		
	AVB	1.39	0.97-1.99	0.070
	Planned CS	7.87	5.33-11.62	<0.001
	Unplanned CS	7.17	5.32-9.66	<0.001
Maternal age	Up to 24 years	1.57	1.01-2.43	0.045
	25-29 years	1 (Ref)		
	30-34 years	1.24	0.94-1.64	0.130
	35-39 years	1.29	0.94-1.74	0.087
	40 years & over	1.37	0.93-2.00	0.109
Pre-pregnancy BMI	Ideal weight	1 (Ref)		
	Overweight	1.05	0.85-1.30	0.663
	Obese/very obese	1.05	0.79-1.39	0.758
	Missing	1.03	0.73-1.46	0.870
Type of care	Public care	1 (Ref)		
	Semi-private care	1.62	1.31-2.00	<0.001

	Private care	1.87	1.49-2.33	<0.001
Number of babies	Singleton gestation	1 (Ref)		
	Multiple gestation	2.08	1.49-2.92	<0.001
IOL	No IOL	1 (Ref)		
	IOL	1.00	0.81-1.23	0.996
IV oxytocin in labour	Labour without oxytocin	1 (Ref)		
	Labour with oxytocin	0.97	0.78-1.22	0.812
Epidural for pain management in labour	No epidural in labour	1 (Ref)		
	Epidural in labour	0.83	0.66-1.05	0.125

SVB – Spontaneous Vaginal Birth
AVB – Assisted Vaginal Birth
IOL – Induction of Labour
IV – Intravenous

Administration of antibiotics

AVB (ARR 1.39, 95% CI 1.06-1.81, p<0.05), unplanned CS (ARR 1.86, 95% CI 1.42-2.45, p<0.001), use of IV oxytocin in labour (ARR 1.45, 95% CI 1.13-1.85, p<0.05) and epidural for pain management in labour (ARR 1.64, 95% CI 1.22-2.20, p=0.001) were significantly more likely to increase the risk of administration of antibiotics in the immediate postpartum period (Table 4-54).

Table 4-54 Multivariable analysis of administration of antibiotics associated with mode of birth and pre-pregnancy, pregnancy and intrapartum factors

Administration of antibiotics immediate postpartum		**ARR**	**95% CI**	**p-value**
Mode of birth	SVB	1 (Ref)		
	AVB	1.39	1.06-1.81	0.018
	Planned CS	0.91	0.50-1.63	0.739
	Unplanned CS	1.86	1.42-2.45	<0.001
Maternal age	Up to 24 years	1.32	0.85-2.06	0.218
	25-29 years	1 (Ref)		
	30-34 years	1.27	0.96-1.68	0.094
	35-39 years	1.14	0.84-1.57	0.404
	40 years & over	1.58	0.99-2.53	0.058
Pre-pregnancy BMI	Ideal weight	1 (Ref)		
	Overweight	1.00	0.78-1.29	0.997
	Obese/very obese	1.30	0.97-1.74	0.076
	Missing	0.87	0.57-1.32	0.519
Type of care	Public care	1 (Ref)		
	Semi-private care	0.91	0.71-1.16	0.431
	Private care	0.77	0.57-1.06	0.107

Number of babies	Singleton gestation	1 (Ref)		
	Multiple gestation	0.90	0.44-1.81	0.759
IOL	No IOL	1 (Ref)		
	IOL	0.89	0.72-1.10	0.294
IV oxytocin in labour	Labour without oxytocin	1 (Ref)		
	Labour with oxytocin	1.45	1.13-1.85	0.003
Epidural for pain management in labour	No epidural in labour	1 (Ref)		
	Epidural in labour	1.64	1.22-2.20	0.001

SVB – Spontaneous Vaginal Birth
AVB – Assisted Vaginal Birth
IOL – Induction of Labour
IV – Intravenous

Baby's admission to NICU

Baby's admission to NICU was analysed controlling for the pre-pregnancy, pregnancy and intrapartum factors. Gestational age was not controlled for other (amount of blood loss, duration of stay in hospital postpartum, administration of antibiotics, readmission to hospital, wound infection, number of GP visits and attendances at ER) multivariable analyses since it was not significantly associated with mode of birth in univariate analysis. However, multivariable analysis of baby's admission to NICU was conducted controlling for gestational age along with other confounding factors, since it is a known clinically significant factor for baby's admission to NICU.

AVB (ARR 2.10, 95% CI 1.35-3.27, p=0.001), unplanned CS (ARR 2.98, 95% CI 1.96-4.54, p<0.001), being aged ≥24 years (ARR 2.08, 95% CI 1.17-3.71, p<0.05) and preterm and very preterm gestation (ARR 9.27, 95% CI 6.57-13.07, p<0.001) were significantly associated with the risk of baby's admission to NICU when adjusted for confounding factors (Table 4-55).

Table 4-55 Multivariable analysis of baby's admission to NICU associated with mode of birth and pre-pregnancy, pregnancy and intrapartum factors

Baby's admission to NICU		ARR	95% CI	p-value
Mode of birth	SVB	1 (Ref)		
	AVB	2.10	1.35-3.27	0.001
	Planned CS	2.02	0.99-4.09	0.052
	Unplanned CS	2.98	1.96-4.54	<0.001
Maternal age	Up to 24 years	2.08	1.17-3.71	0.012
	25-29 years	1 (Ref)		

	30-34 years	1.28	0.84-1.96	0.247
	35-39 years	1.07	0.66-1.73	0.776
	40 years & over	1.06	0.53-2.11	0.879
Pre-pregnancy BMI	Ideal weight	1 (Ref)		
	Overweight	1.12	0.78-1.61	0.541
	Obese/very obese	1.06	0.66-1.70	0.801
	Missing	1.12	0.66-1.92	0.668
Type of care	Public care	1 (Ref)		
	Semi-private care	1.21	0.86-1.72	0.275
	Private care	0.72	0.44-1.18	0.198
Gestational age	Term	1 (Ref)		
	Preterm and very preterm	9.27	6.57-13.07	<0.001
Number of babies	Singleton gestation	1 (Ref)		
	Multiple gestation	0.78	0.42-1.46	0.431
IOL	No IOL	1 (Ref)		
	IOL	0.85	0.60-1.21	0.360
IV oxytocin in labour	Labour without oxytocin	1 (Ref)		
	Labour with oxytocin	1.13	0.78-1.64	0.514
Epidural for pain management in labour	No epidural in labour	1 (Ref)		
	Epidural in labour	1.04	0.72-1.51	0.830

SVB – Spontaneous Vaginal Birth
AVB – Assisted Vaginal Birth
IOL – Induction of Labour
IV – Intravenous

Readmission to the hospital following discharge

There was no significant association between mode of birth and readmission to hospital when adjusted for pre-pregnancy, pregnancy and intrapartum factors. However, readmission to the hospital was significantly associated with women being in private care (ARR 1.80, 95% CI 1.07-3.05, p<0.05) or having had IV oxytocin in labour (ARR 1.67, 95% CI 1.02-2.75, p<0.05) (Table 4-56).

Table 4-56 Multivariable analysis of readmission to the hospital following discharge associated with mode of birth and pre-pregnancy, pregnancy and intrapartum factors

Readmission to the hospital following discharge		**ARR**	**95% CI**	**p-value**
Mode of birth	SVB	1 (Ref)		
	AVB	1.35	0.82-2.23	0.244
	Planned CS	0.27	0.04-2.06	0.334
	Unplanned CS	1.31	0.76-2.26	0.334
Maternal age	Up to 24 years	0.98	0.43-2.23	0.967
	25-29 years	1 (Ref)		

	30-34 years	0.83	0.49-1.41	0.489
	35-39 years	0.80	0.44-1.47	0.473
	40 years & over	0.76	0.25-2.29	0.628
Pre-pregnancy BMI	Ideal weight	1 (Ref)		
	Overweight	0.69	0.39-1.23	0.213
	Obese/very obese	0.69	0.33-1.45	0.326
	Missing	0.90	0.43-1.92	0.791
Type of care	Public care	1 (Ref)		
	Semi-private care	0.89	0.51-1.54	0.678
	Private care	1.80	1.07-3.05	0.028
Number of babies	Singleton gestation	1 (Ref)		
	Multiple gestation	0.55	0.08-4.00	0.558
IOL	No IOL	1 (Ref)		
	IOL	1.06	0.69-1.63	0.777
IV oxytocin in labour	Labour without oxytocin	1 (Ref)		
	Labour with oxytocin	1.67	1.02-2.75	0.043
Epidural for pain management in labour	No epidural in labour	1 (Ref)		
	Epidural in labour	1.21	0.69-2.13	0.511

SVB – Spontaneous Vaginal Birth
AVB – Assisted Vaginal Birth
IOL – Induction of Labour
IV – Intravenous

Wound infection in the immediate postpartum period

When adjusted for the confounding factors the risk of developing a wound infection was significantly associated with mode of birth (AVB (ARR 4.22, 95% CI 1.81-9.83, p=0.001) and unplanned CS (ARR 7.05, 95% CI 3.09-16.08, p<0.001)), being overweight (ARR 1.83, 95% CI 1.06-3.16, p<0.05) and obese/very obese (ARR 3.02, 95% CI 1.68-5.43, p<0.001) (Table 4-57).

Table 4-57 Multivariable analysis of wound infection in the immediate postpartum period associated with mode of birth and pre-pregnancy, pregnancy and intrapartum factors

Wound infection in the immediate postpartum		**ARR**	**95% CI**	**p-value**
Mode of birth	SVB	1 (Ref)		
	AVB	4.22	1.81-9.83	0.001
	Planned CS	1.65	0.32-8.45	0.551
	Unplanned CS	7.05	3.09-16.08	<0.001
Maternal age	Up to 24 years	0.43	0.10-1.89	0.264
	25-29 years	1 (Ref)		
	30-34 years	1.20	0.67-2.17	0.538
	35-39 years	0.91	0.45-1.83	0.796
	40 years & over	1.14	0.41-3.21	0.798
Pre-pregnancy	Ideal weight	1 (Ref)		

BMI	Overweight	1.83	1.06-3.16	0.029
	Obese/very obese	3.02	1.68-5.43	<0.001
	Missing	1.57	0.65-3.77	0.317
Type of care	Public care	1 (Ref)		
	Semi-private care	0.73	0.41-1.30	0.283
	Private care	0.49	0.22-1.10	0.083
Number of babies	Singleton gestation	1 (Ref)		
	Multiple gestation	0.51	0.07-3.66	0.499
IOL	No IOL	1 (Ref)		
	IOL	0.84	0.52-1.36	0.477
IV oxytocin in labour	Labour without oxytocin	1 (Ref)		
	Labour with oxytocin	0.97	0.57-1.64	0.897
Epidural for pain management in labour	No epidural in labour	1 (Ref)		
	Epidural in labour	1.08	0.59-1.99	0.804

SVB – Spontaneous Vaginal Birth
AVB – Assisted Vaginal Birth
IOL – Induction of Labour
IV – Intravenous

Wound infection since birth up to 3-months postpartum

When adjusted for the confounding factors, the risk of developing a wound infection was significantly associated with mode of birth (AVB (ARR 2.80, 95% CI 1.91-4.11, p<0.001) and unplanned CS (ARR 3.25, 95% CI 2.20-4.79, p<0.001)), and being obese/very obese (ARR 2.30, 95% CI 1.65-3.21, p<0.001). Being in private care (ARR 0.62, 95% CI 0.41-0.94, p<0.05) was associated with reduced risk of developing a wound infection (Table 4-58).

Table 4-58 Multivariable analysis of wound infection since birth up to 3-months postpartum period associated with mode of birth and pre-pregnancy, pregnancy and intrapartum factors

Wound infection up to 3-months postpartum		**ARR**	**95% CI**	**p-value**
Mode of birth	SVB	1 (Ref)		
	AVB	2.80	1.91-4.11	<0.001
	Planned CS	1.52	0.74-3.12	0.252
	Unplanned CS	3.25	2.20-4.79	<0.001
Maternal age	Up to 24 years	0.66	0.33-1.32	0.242
	25-29 years	1 (Ref)		
	30-34 years	1.34	0.95-1.88	0.096
	35-39 years	1.04	0.70-1.55	0.842
	40 years & over	1.16	0.63-2.15	0.632
Pre-pregnancy BMI	Ideal weight	1 (Ref)		
	Overweight	1.28	0.93-1.75	0.134

	Obese/very obese	2.30	1.65-3.21	<0.001
	Missing	1.48	0.93-2.37	0.099
Type of care	Public care	1 (Ref)		
	Semi-private care	0.83	0.61-1.13	0.238
	Private care	0.62	0.41-0.94	0.025
Number of babies	Singleton gestation	1 (Ref)		
	Multiple gestation	1.23	0.58-2.63	0.589
IOL	No IOL	1 (Ref)		
	IOL	0.88	0.67-1.15	0.351
IV oxytocin in labour	Labour without oxytocin	1 (Ref)		
	Labour with oxytocin	0.96	0.71-1.28	0.759
Epidural for pain management in labour	No epidural in labour	1 (Ref)		
	Epidural in labour	1.18	0.84-1.66	0.338

SVB – Spontaneous Vaginal Birth
AVB – Assisted Vaginal Birth
IOL – Induction of Labour
IV – Intravenous

Number of GP visits

When adjusted with pre-pregnancy, pregnancy and intrapartum factors, women who had an unplanned CS (ARR 0.09, 95% CI 0.06-0.13, p<0.001) had a reduced risk of visits to GP (≥3 visits). However, being ≥24 years old (ARR 1.98, 95% CI 1.26-3.10, p<0.05) and being obese/very obese (ARR 1.56, 95% CI 1.10-2.20, p<0.05) were significantly associated with increased visits to GP (≥3 visits), from birth up to 3-months postpartum (Table 4-59).

Table 4-59 Multivariable analysis of number of GP visits associated with mode of birth and pre-pregnancy, pregnancy and intrapartum factors

GP visits		ARR	95% CI	p-value
Mode of birth	SVB	1 (Ref)		
	AVB	1.17	0.87-1.59	0.300
	Planned CS	0.74	0.38-1.45	0.379
	Unplanned CS	0.09	0.06-0.13	<0.001
Maternal age	Up to 24 years	1.98	1.26-3.10	0.003
	25-29 years	1 (Ref)		
	30-34 years	1.17	0.84-1.62	0.355
	35-39 years	1.07	0.74-1.56	0.707
	40 years & over	0.63	0.29-1.34	0.225
Pre-pregnancy BMI	Ideal weight	1 (Ref)		
	Overweight	1.20	0.88-1.62	0.247
	Obese/very obese	1.56	1.10-2.20	0.012
	Missing	1.34	0.88-2.02	0.171
Type of care	Public care	1 (Ref)		

	Semi-private care	1.11	0.84-1.47	0.471
	Private care	0.74	0.50-1.11	0.144
Number of babies	Singleton gestation	1 (Ref)		
	Multiple gestation	1.03	0.46-2.33	0.942
IOL	No IOL	1 (Ref)		
	IOL	1.03	0.80-1.34	0.820
IV oxytocin in labour	Labour without oxytocin	1 (Ref)		
	Labour with oxytocin	0.85	0.64-1.12	0.236
Epidural for pain management in labour	No epidural in labour	1 (Ref)		
	Epidural in labour	1.07	0.79-1.45	0.655

SVB – Spontaneous Vaginal Birth
AVB – Assisted Vaginal Birth
IOL – Induction of Labour
IV – Intravenous

Attendance(s) at ER

When adjusted with the confounding factors, the risk of attendance(s) at ER up to 3-months postpartum increased significantly for women who had AVB (ARR 1.45, 95% CI 1.11-1.89, p<0.05) and had IV oxytocin in labour (ARR 1.34, 95% CI 1.03-1.73, p<0.05) (Table 4-60).

Table 4-60 Multivariable analysis of attendance(s) at ER associated with mode of birth and pre-pregnancy, pregnancy and intrapartum factors

ER attendance(s)		ARR	95% CI	p-value
Mode of birth	SVB	1 (Ref)		
	AVB	1.45	1.11-1.89	0.006
	Planned CS	1.22	0.70-2.12	0.480
	Unplanned CS	1.15	0.86-1.55	0.356
Maternal age	Up to 24 years	1.13	0.71-1.79	0.611
	25-29 years	1 (Ref)		
	30-34 years	1.05	0.79-1.39	0.755
	35-39 years	0.89	0.64-1.24	0.487
	40 years & over	0.84	0.47-1.49	0.553
Pre-pregnancy BMI	Ideal weight	1 (Ref)		
	Overweight	0.83	0.62-1.11	0.214
	Obese/very obese	1.07	0.76-1.50	0.706
	Missing	0.99	0.66-1.48	0.951
Type of care	Public care	1 (Ref)		
	Semi-private care	0.98	0.76-1.27	0.878
	Private care	0.99	0.72-1.36	0.928
Number of babies	Singleton gestation	1 (Ref)		
	Multiple gestation	1.40	0.72-2.74	0.327
IOL	No IOL	1 (Ref)		
	IOL	0.98	0.78-1.23	0.849
IV oxytocin in	Labour without oxytocin	1 (Ref)		

labour	Labour with oxytocin	1.34	1.03-1.73	0.028
Epidural for pain management in labour	No epidural in labour	1 (Ref)		
	Epidural in labour	0.89	0.67-1.17	0.401

SVB – Spontaneous Vaginal Birth
AVB – Assisted Vaginal Birth
IOL – Induction of Labour
IV – Intravenous

4.5.4.Comparison of outcomes/morbidities experienced in the immediate postpartum period with those experienced at 3-months postpartum

The two outcomes/morbidities, breast problems and wound infection, assessed for univariate analysis at two time-points, immediate and up to 3-months postpartum, were compared. There was no significant association between breast problems and mode of birth when compared at both time-points.

Risk of wound infection was found to be significantly associated with an AVB and unplanned CS at both time-points. In the immediate postpartum period, the risk of developing a wound infection was four-times higher for women who had an AVB (RR 4.17), and seven-times higher for women who had an unplanned CS (RR 7.38) compared to those who had a SVB. This persisted with an approximately three-fold increased risk at 3-months postpartum for women who had an AVB (RR 2.86), and three and half-fold increased risk for women following an unplanned CS (RR 3.42) (Table 4-61).

Table 4-61 Comparison of birth outcomes experienced in the immediate postpartum period with those experienced at 3-months postpartum

Mode of birth	**Breast problems (mastitis)**		**Wound infection**	
	Immediate postpartum (n=2284) *M=471*	**Up to 3-months postpartum (n=2263) *M=492***	**Immediate postpartum (n=2287) *M=187***	**Up to 3-months postpartum (n=2306) *M=168***
SVB	320 (42.22%) 1(Ref)	105 (14.04%) 1(Ref)	7 (0.92%) 1(Ref)	38 (4.94%) 1(Ref)
AVB	299 (38.33%) P=0.230 RR 0.91 95% CI (0.78-1.06)	114 (14.82%) P=0.687 RR 1.06 95% CI (0.81-1.38)	30 (3.84%) ***P=0.001*** RR 4.17 95% CI (1.83-9.49)	111 (14.14%) ***P<0.001*** RR 2.86 95% CI (1.98-4.14)

Planned CS	57 (42.86%) P=0.917 RR 1.02 95% CI (0.77-1.35)	11 (8.21%) P=0.090 RR 0.59 95% CI (0.31-1.09)	2 (1.49%) P=0.549 RR 1.62 95% CI (0.34-7.78)	11 (8.09%) P=0.150 RR 1.64 95% CI (0.84-3.20)
Unplanned CS	276 (45.02%) P=0.433 RR 1.07 95% CI (0.91-1.25)	83 (13.56%) P=0.815 RR 0.97 95% CI (0.72-1.29)	42 (6.82%) ***P<0.001*** RR 7.38 95% CI (3.32-6.43)	104 (16.88%) ***P=<0.001*** RR 3.42 95% CI (2.36-4.95)

M – Missing
SVB – Spontaneous Vaginal Birth
AVB – Assisted Vaginal Birth

4.6. Summary and conclusion of outcomes/morbidities associated with mode of birth in the immediate and 3-months postpartum period

This section presents findings on outcomes/morbidities associated with mode of birth. Amount of blood loss (≥500 mls), baby's admission to NICU, duration of hospital stay postpartum (≥4 days), and administration of antibiotics were all found to be significantly associated with mode of birth in the immediate postpartum period. AVB and an unplanned CS significantly increased the risk of developing a wound infection in the immediate and up to 3-months postpartum. Having an AVB was significantly associated with increased number of attendances at ER following discharge up to 3-months postparum. Mode of birth was not significantly associated with the risk of developing breast problems in the immediate and up to 3-months postpartum.

5. Chapter 5 Qualitative findings

This chapter presents the findings of the qualitative phase of the study in two parts. The first part (5.1) presents the findings on clinicians' views of factors influencing decision-making for CS, and the second part (5.2) presents findings on women's views of factors influencing their birth by CS and their involvement in the decision-making process.

5.1. Chapter 5 Part one - Clinicians' views of factors influencing decision-making for CS

5.1.1.Introduction

This part of the chapter presents qualitative findings on clinicians' views on factors influencing the decision-making for CS for nulliparous women. The findings are presented as themes and subthemes (Figure 5-1.1) derived from individual in-depth interviews conducted with 35 clinicians (20 obstetricians and 15 midwives) recruited from the three study sites, the RH, the GUH and the CWIUH. A total of 33 clinicians were interviewed over the telephone and the remaining two clinicians took part in face-to-face interviews, as preferred. The length of the interviews ranged between 1 hour 27 minutes to 37 minutes, with an average duration of 62 minutes. The NVivo software package was used to manage interview data. Appendix 27 outlines the codings and categories on clinicians' views.

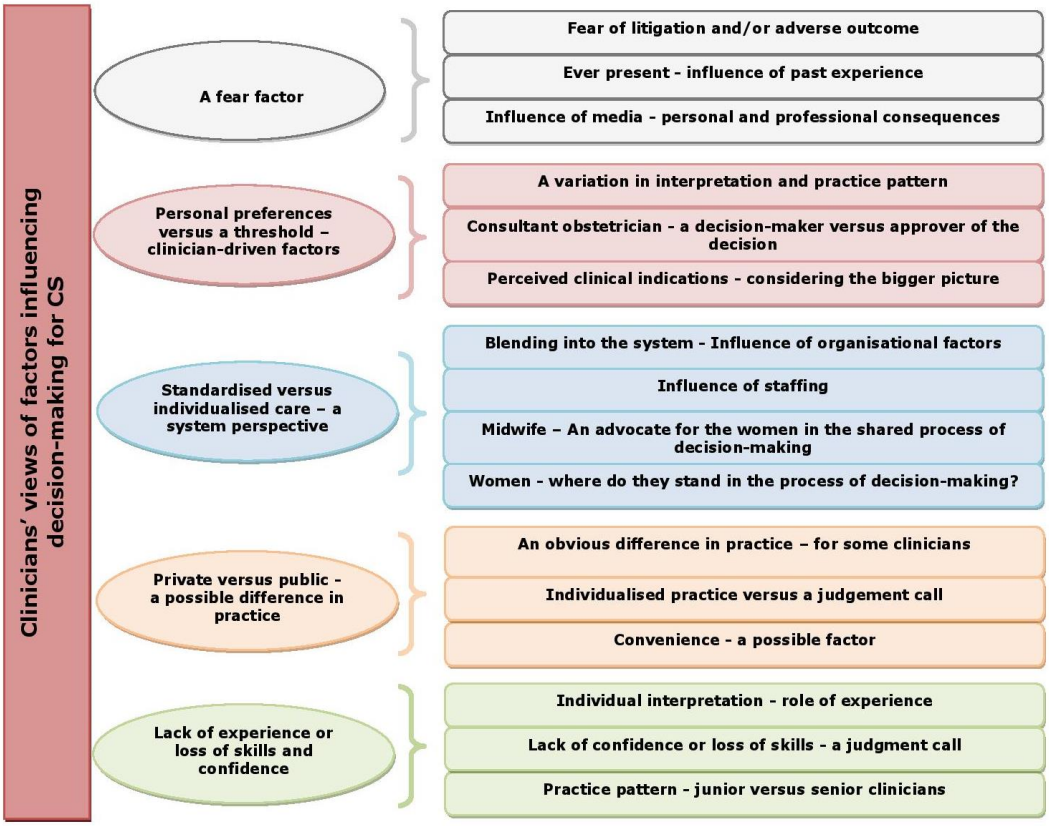

Figure 5-1.1 Clinicians' views of factors influencing decision-making for CS

5.1.2.Clinicians' characteristics and demographics

Clinicians' characteristics and demographics relevant to this research are presented under location of employment, current role and total number of years of experience in current role.

5.1.2.1. Location and current role of participants

A total of 11 consultant obstetricians, nine senior obstetric registrars, seven Clinical Midwife Managers (CMMs) and eight staff midwives participated in the interviews from the three study sites, RH, GUH and CWIUH (Table 5-1).

Table 5-1 Location and current role of participants

Participant	Current role	Number of participants		
		RH	GUH	CWIUH
Obstetrician	Consultant Obstetrician	4	3	4
	Senior Obstetric Registrar	2	3	4
Midwife	Clinical Midwife Manager	3	1	3
	Staff Midwife	2	3	3

5.1.2.2. Professional experience in current role

Interviews were conducted with obstetric consultants, senior obstetric

registrars and labour ward midwives with a range of experiences and who were actively involved in the decision-making process for CS in the site hospitals during the period of data collection (Table 5-2).

Table 5-2 Professional experience in current role

Participant		Total years of experience in current role		
		Less than 5 years	5 to 10 years	> 10 years
Obstetrician	Consultant Obstetrician	3	5	3
	Senior Obstetric Registrar	4	5	-
Midwife	Clinical Midwife Manager	-	3	4
	Staff Midwife	3	3	2

5.1.3.Emerging themes and sub-themes

Qualitative analysis of the interview data resulted in the emergence of five interrelated key themes (Table 5-3). These were 'A fear factor'; 'Personal preferences versus a threshold - clinician driven factors'; 'Standardised versus individualised care – a system perspective'; 'Private versus public - a possible difference in practice'; and 'Lack of experience or loss of skills and confidence'. Each of these themes had several subthemes. The following is a detailed presentation of midwives' and obstetricians' views of factors influencing decision-making for CS in their own words.

Table 5-3 Themes and sub-themes

Themes	Subthemes
1. A fear factor	1.1. Fear of litigation and/or adverse outcome 1.2. Ever present - influence of past experience 1.3. Influence of media - personal and professional consequences
2. Personal preferences versus a threshold - clinician driven factors	2.1. A variation in interpretation and practice pattern 2.2 Consultant obstetrician - a decision-maker versus approver of the decision 2.3. Perceived clinical indications - considering the bigger picture
3. Standardised versus individualised care – a system perspective	3.1. Blending into the system - Influence of organisational factors 3.2 Influence of staffing 3.3. Midwife – An advocate in the shared process of decision-making

	3.4. Women - where do they stand in the process of decision-making?
4. Private versus public - a possible difference in practice	4.1. An obvious difference in practice – for some clinicians 4.2 Individualised practice versus a judgment call 4.3. Convenience - a possible factor
5. Lack of experience or loss of skills and confidence	5.1. Individual interpretation - role of experience 5.2 Lack of confidence or loss of skills - a judgement call 5.3. Practice pattern - junior versus senior clinicians

5.1.3.1. Theme 1 A fear factor

A perceived fear of adverse outcomes and/or legal implications, influenced by clinicians' past experience, society and media, were reported to be a major influencing factor contributing to the decision-making for CS. Three subthemes were identified; 'Fear of litigation and/or adverse outcome'; 'Ever present - influence of past experience'; and 'Influence of media - personal and professional consequences'.

Subtheme 1.1 Fear of litigation and/or adverse outcome

Fear of adverse outcome from vaginal births, and possible legal consequences/litigation were reported by all the clinicians to be a major influencing factor in the decision-making to perform a CS.

> *"I suppose fear of litigation is a big thing...and there has been a sharp…increase in the amount of cases before the courts in recent years…If you have an abnormal CTG but not enough to warrant a caesarean section, it can potentially progress on to caesarean section for fear of litigation." (Mid 9)*

> *"Fear of litigation is huge now... So you know you do have to practise defensively sometimes…it's better to do a caesarean that's not necessary than…you end up with cerebral palsy or something awful like that." (Mid 11)*

> *"I certainly think the threshold for you know, allowing certain things to kind of come to a more natural conclusion has changed because of people's fear of…the legal implications." (Senior Obs Reg 7)*

> *"You're called…earlier than it used to be, to review cases, because of concern…So maybe not the rise of caesarean section, but certainly*

the rates of intervention (is increased due to fear of litigation)." (Senior Obs Reg 18)

Some midwives viewed 'fear' as a learned behaviour from their senior colleagues and working environment.

> *"I feel that the fear of litigation has been brought upon me by the senior staff. The fear has been embedded in me by them…I think that's a learned behaviour. I don't think you go into midwifery fearing your job." (Mid 13)*

For some, litigation was an inevitable part of a defensive practice.

> *"It's so hard to hit a happy balance. Because if you end up in a court case no matter how much you've written, or how little you've written, solicitors are trained to pick holes in it." (Mid 3)*

> *"You* [clinicians] *are more about self protection than…client protection." (Mid 1)*

> *"I think that those who are working in obstetrics…appreciate the fact that…we will be subject to litigation, no matter what we do. And it's kind of like part of what you live with. It's part of the job." (Consultant Obstetrician 16)*

While litigation was viewed as an inevitable part of practice, some clinicians felt it did not influence their own decision-making to perform a CS.

> *"Potential for legal action is there whether you do, or…don't do a caesarean. So, I don't think it influences your decision...You can equally have a disastrous caesarean in labour...So I don't really let that influence my decision about caesareans or not." (Consultant Obstetrician 10)*

> *"I personally don't think a caesarean section is the easy option...*[caesarean sections] *have a lot of complications and…side effects..." (Senior Obs Reg 12)*

There was a perceived opinion about fear of litigation being more evident among seniors compared to junior colleagues.

> *"I think the more senior you get the more scared you get. The junior regs, some of them are a bit fearless." (Senior Obs Reg 19)*

However, there were contrasting views among obstetricians and midwives in relation to fear of litigation among midwives.

"I think junior midwives are a bit more scared about adverse outcomes, and…the more senior ones who are kind of near retirement that don't have as much fear of litigation." (Senior Obs Reg 19)

"When they [midwives] *get more experience…they…get a bit more fearful. So, I'd say more senior staff would be a bit more worried about litigation." (Mid 10)*

Subtheme 1.2 Ever present - influence of past experience

Clinicians' past experience of an adverse outcome or litigation stayed with them forever, and this played a vital role in the decision-making process in the short-term as well as long-term, often for the rest of their professional life. In general, clinicians' past experience was believed to have ongoing influence on the decision-making process with a short-term as well as long-term effect.

"It (fear of litigation) comes with certain experiences. If someone has an experience of a case being taken…that will have a huge impact on them." (Mid 14)

"The two things that can hamper sound decision-making or influence unnecessary intervention are definitely experience of bad outcomes, and anybody who's been through something like that or has been close to it happening…it affects all the staff…they're terrified of…an adverse outcome that will be considered an error on their behalf." (Consultant Obstetrician 1)

"If you have just had a bad outcome a week or two ago, you are going to be feeling more cautious, and if you don't have a clear policy to go by, you might end up saying 'oh I think you should just have a caesarean section'." (Senior Obs Reg 3)

Clinicians changed their approach to practice forever, sometimes because of their past experience of an adverse outcome.

"Obstetricians are humans like everybody else…they might be influenced by their own personal experiences of giving birth or their partner giving birth and they might be heavily influenced by a small number of very tragic cases that have influenced their career from that point forward." (Consultant Obstetrician 1)

"So unfortunately, recent experiences can impact on how you go about your work, particularly the next few weeks until maybe you

kind of have addressed that situation or get over it or get your confidence back." (Senior Obs Reg 11)

Subtheme 1.3 Influence of media - personal and professional consequences

There was a general perception that Ireland had become a litigious country and negative attention from the media influenced clinicians' practice and day-to-day decision-making.

> *"I think the doctors probably have a little bit more stress on them. 'Cos in Ireland at the moment…the media are really out to get maternity services. And anything bad that happens, whether it's malpractice or not, once something ends up in a coroner's court the doctors are always named in the media…Especially for the consultants, I think that's a lot of pressure on them." (Mid 3)*

> *"In Ireland public shaming within the media, you know, that is something that, you know, if you meet anybody who that's happened to it's hugely damaging personally and has a big impact on decision-making." (Consultant Obstetrician 1)*

The public attitude towards a clinician's practice changes with legal cases, which in turn has a big impact on the clinicians' approach and future decision-making.

> *"People are frightened of the public criticism, well when you go to court everything is reported but, you know, that very adversarial, open criticism that will also be made public and makes you look like a dangerous, uncaring, incompetent person." (Consultant Obstetrician 1)*

> *"I think our society, we have become more litigious…nobody wants to stand in the court and defend themselves. So definitely one of the reasons why the rate of caesarean section is going over the board is the fear of litigation." (Senior Obs Reg 6)*

5.1.3.2. Theme 2 Personal preferences versus a threshold - clinician driven factors

Clinicians' personal beliefs, preferences and interpretation of situations played a major role in the decision-making process. Individual clinicians' level of tolerance and threshold to wait for the natural progression of labour or to act on and intervene early in situations with suspected fetal distress

had influenced their decision-making. Three subthemes were identified under the clinician driven factors; such as 'a variation in interpretation and practice pattern'; 'consultant obstetrician – a decision-maker versus approver of the decision'; and 'perceived clinical indications - considering the bigger picture'.

Subtheme 2.1 A variation in interpretation and practice pattern

Individual clinicians' interpretation of the overall clinical picture, whether it was related to progress of labour or making a diagnosis of fetal distress (through interpretation of Cardiotocograph (CTG)) varied, with an obvious variation in their management of the situation, and these variations influenced the outcome of the decision to perform a CS.

> *"There is no doubt…there is a difference…Some consultants have a very high vaginal delivery rate, some have a high section rate, some consultants are known for specialising in multiple births, some are known for being very passionate about vaginal deliveries, or VBACs…Practices do vary between consultants." (Mid 4)*

> *"Some clinicians will say the cervix was long and firm, uneffaced and they may allow eight hours for the cervix to change assuming that the fetal status is satisfactory. And then it might be another four hours before the cervix actually starts progressive change in terms of dilatation - others will call that failure to progress whereas in fact it may be a failed induction or failure to establish in labour." (Consultant Obstetrician 1)*

> *"There is definitely a difference in the interpretation of CTGs… midwives would be more used to looking at…a normal physiological change in the baby's heart rate coming to the end of the labour…but…quite a lot of doctors would…either examine or make the decision for fetal blood sampling." (Mid 9)*

Obstetricians' level of threshold and tolerance to wait for a natural progression of the physiological labour appeared to have direct influence on the decision-making, and that varied from one clinician to the other.

> *"I think maybe it's the lack of kind of patience…on the obstetrician's part…You know…first time labour can be so long and I suppose they* [obstetricians] *are coming to see this woman and she's distressed...I think sometimes…they rush…without allowing her…to really establish labour." (Mid 12)*

> *"There is a variation in the threshold to intervene* [among obstetricians]*. There are clinicians who are better at thinking from an etiological perspective…That's the first thing. The second thing is there are variations in the tolerance of how long health professionals are prepared to let an abnormal CTG continue…If your threshold is to intervene very quickly…they may make a decision to do a caesarean section…very quickly." (Consultant Obstetrician 1)*

Differences were described at both individual and professional group levels. Differences/inconsistencies in some senior midwives' and obstetricians' practice pattern and decision-making had an influence on the practice and decision of other midwives and obstetricians on a given shift. This ultimately determined the outcome of a women's labour depending on the most senior midwife or obstetrician on call for a given day or night.

> *"There's variation between professional groups, midwives and obstetricians…within professional groups and…within individuals." (Consultant Obstetrician 1)*

> *"Some* [senior] *midwives, you know if say there's fetal distress…will say turn off the syntocinon and some* [senior] *midwives will say leave it. You know it really depends as well who is on. And the midwife in the room…her experience, her expertise." (Mid 13)*

> *"I'm confused sometimes by the decisions they* [obstetricians] *make. Because one woman could have this decision made for her and the other woman would be* [in] *the same situation but…she's…allowed to labour for a couple more hours. So…it's inconsistent." (Mid 13)*

Subtheme 2.2 Consultant obstetrician - a decision-maker versus approver of the decision

Consultant obstetricians' availability on site influenced the decision-making and outcome. In absence of the consultant on site, the obstetric registrar on call discussed the clinical scenarios with the consultant over the telephone. Gaining approval for a decision to perform a CS over the telephone was dependent on the individual obstetric registrar's interpretation of the clinical scenario and their predetermined view of the possible outcome.

> *"The consultant would be heavily involved* [in the decision-making process] *if they were on site. If it's after hours, generally it's…a discussion over the telephone…If they hear that we've done three FBSs…they agree with going for a caesarean section." (Mid 4)*

"If the consultant is at home and you're the registrar on the labour ward, we all know how you sell the story of the patient. You…can tell the same story in two different ways, and look for two different outcomes…The consultants, even though ultimately it's their decision, they're relying very heavily that the information that they get from the registrars is correct and appropriate." (Senior Obs Reg 7)

"While the case may well be discussed with a consultant, often as a consultant you're at the mercy of what you're being told. Unless you're physically [present]*…you will often sanction a decision based on the other individual's interpretation of what they're seeing or what they've found." (Consultant Obstetrician 1)*

An obstetric consultant's familiarity with the registrar's level of expertise in making a decision was considered to determine the outcome of the decision.

"Because most of them [obstetric consultants] *are familiar with me and my practice, they generally are happy to make that decision on the phone, but occasionally I do need their help with that decision, and they'd come in and make that decision." (Obs reg 3)*

"I think the consultant gets the message from the registrar so it's when the registrar says, the consultant is not going to contradict. I think the registrar makes the decision, the consultant just agrees so it's not the consultant who makes the decision." (Consultant Obstetrician 17)

In general, midwives and obstetricians perceived that the presence of a consultant obstetrician in the labour ward was essential, particularly for decision-making for failure to progress in second stage of labour.

"Yeah I think they [consultants] *should be there…*[and] *should…be involved." (Mid 13)*

"If a registrar feels it's probably deliverable but they're not sure they can do it, then if there's a consultant who's willing to come in then that might change the outcome and that…patient definitely [will have a] *vaginal delivery. But if you have a consultant who is less likely to come in then the registrar is going to make the decision to just do the caesarean section." (Senior Obs Reg 7)*

"[Having a consultant on site] *actually doesn't influence...perinatal mortality and…morbidity. But…reduces caesarean section rates." (Consultant Obstetrician 14)*

Subtheme 2.3 Perceived clinical indications - considering the bigger picture

Fetal distress, failed induction and failure to progress in labour were considered to be the three most common reasons to perform a CS for a first-time mother. However, clinicians' personal beliefs in the ambiguous situations, for example establishing a diagnosis of dystocia or failed induction of labour, played a major role in determining the outcome of labour.

> *"For first time mothers…the most common reason* [for CS] *is induction, so whether it's a failed induction or…fetal distress* [that] *might develop during…induction." (Mid 3)*

> *"If* [the woman] *is in the active phase of labour…and…making progress, how long they've been on syntocinon doesn't really come into my decision-making. If they are in…the latent phase of labour and there is no cervical change…after six hours on maximum syntocinon, then I would…consider that to be dystocia." (Consultant Obstetrician 4)*

Besides the absolute clinical indications to perform a CS, consideration of the bigger picture and the overall clinical situation influenced the decision-making process.

> *"Suppose when…you meet somebody who, for example, has a fetal tachy, maternal tachy, borderline temperature, is going nowhere fast as regards dilatation…how long are you going to stretch this baby out…for a vaginal delivery." (Senior Obs Reg 9)*

> *"Either fetal distress or failure to advance* [are the most common reasons to perform a CS]*." (Consultant Obstetrician 17)*

Maternal characteristics such as women's age and BMI, and individual cases with fertility investigations or treatment, etc., were viewed as some major contributing factors in the decision to perform a CS.

> *"I suppose it's harder because the profile of women…BMI and all of that is changing…You've got women with…medical problems…plus you probably have…more IVF pregnancies. So, they* [consultant obstetricians] *are not going to take any chances…they'll bail out. Because I suppose in fairness, they* [consultant obstetricians] *have been with this woman for 9 months. They've seen her through.*

They've built up a relationship and they know what she's capable of, maybe that's a factor". (Mid 2)

"I think our women are very unfit…A lot of…our primigravida aren't young…healthy and fit and slim. They're…a bit older…a lot heavier…I suppose our diabetes, blood pressure all…are on the rise…so therefore our caesareans are on the rise…" (Mid 8)

"People have been going through a long hard and expensive process to become pregnant. And I think if I had someone in that age group who was saying to me I don't want any risk for this baby, I do not want a vaginal delivery, I would be more than happy and I'd stand over that 100 times to do an elective caesarean section for someone who is 48 and has probably spent 5 or 6 years trying to get to that point to have a healthy baby at term. So those are the situations. But that is, there's a cohort of the older mum who it may be her first pregnancy, despite several years of miscarriages and different things like that.…I would be more than happy…happy to do a caesarean section for her." (Consultant Obstetrician 8)

5.1.3.3. Theme 3 Standardised versus individualised care – a system perspective

Clinicians' beliefs and their practice within the system of a clinical setting had a major influence on their decision-making. Whether or not care was individualised or standardised was dependent on the practice within the culture of the institution which influenced the decision-making to perform a CS. Four subthemes emerged within the system perspective; 'blending into the system - influence of organisational factors'; 'influence of staffing'; 'Midwife – an advocate in the shared process of decision-making'; and 'Women – where do they stand in the process of decision-making?'

Subtheme 3.1 Blending into the system - influence of organisational factors

One of the major influencing factors was the criteria for inducing labour. There was a general perception among clinicians about induction being a major contributing factor to the rise of caesarean sections and that not all inductions of labour were for absolute clinical indications. Many decisions for inducing a woman's labour were based on ambiguous clinical reasons, what were described as 'reduced fetal movements', 'big baby', etc., and there

was clear evidence of flexibility in the criteria for inducing labour. Most of the midwives and obstetricians perceived the rates of induction in their institutions to be very high, particularly for first-time mothers. The decision to induce a woman's labour, and subsequent progress or lack of progress, influenced other/later decisions, and ultimately the outcome.

> *"I think one of the greatest challenges in modern obstetrics is induction of labour and the significant caesarean section rate in primigravids, who have their labour induced. So a really important factor, when we're considering induction of labour, is evaluating…if the induction fails does this woman really warrant a caesarean section?" (Consultant Obstetrician 5)*

> *"So some of the women can be induced for…good medical reasons, such as post dates, or…small baby, or decreased amount of fluid around the baby…and then you'll get ladies who'll have social inductions…They often tend to be the ones that more likely end up with caesarean sections because their cervix may actually not be ready for induction. And therefore, they end up as failed inductions, or failure to progress during the induction process." (Mid 3)*

In general, clinicians agreed that the criteria for inducing labour were flexible, which resulted in a high induction rate. A high rate of induction of labour was directly linked to a high rate of CS, mostly as a result of failed induction of labour, and thus was reported to be one of the most common reasons influencing the decision to perform a CS for first-time mothers.

> *"With primigravida, the most obvious reason for an emergency caesarean, is the failed induction. So, our policy on it being term plus 10 at post dates…does probably have quite a big impact on our caesarean rate." (Mid 8)*

Inducing a woman's labour was regarded as a major factor that influenced the decision to perform a CS. Clinicians' personal beliefs of induction of labour being a right way to end a pregnancy had an impact on their decision-making to induce a woman. This was further contributed to by pressure from women and a general belief among women about induction of labour being one of the possible options to end the pregnancy.

> *"Once people hit their due date there is a lot of pressure to induce, and I think a lot of non-medical and medical staff, and even obstetric staff, don't view induction as a bad thing…whereas actually it is a huge intervention on somebody in their pregnancy, and I think a lot*

more care should be taken about not inducing people unnecessarily because…it doesn't lead to natural labour." (Senior Obs Reg 3)

Lack of consistency in the approach to induce labour and flexible criteria for induction allowed many clinicians to decide to induce labour for what were considered to be ambiguous clinical reasons.

"I think if you have a standard policy for all women, and if everyone sticks to that policy, then actually the outcomes…are better for everyone…because making a decision based on anecdotal evidence, or based on a gut feeling, or based on someone's personal wishes, doesn't necessarily lead to the best care." (Senior Obs Reg 3)

"There is no real set structure. It [the decision to induce a woman] *depends…on if the patient is private or public and it would depend on the doctor who is dealing with." (Mid 9)*

"I feel hospitals should have a policy and they should stand over it. If there's any deviation from that policy, then definitely it has to be a consultant decision and documented. What I find very difficult is there's no documentation sometimes why a decision has been made, who made it and what the reason was." (Senior Obs Reg 6)

Besides varied flexible criteria and guidelines for inductions, other guidelines related to management of labour or making a diagnosis of dystocia or fetal distress also had an influence on decision-making for CS.

"So, we…do up to three FBSs. And if we're still, if, like we won't do a fourth FBS. So even if we have a normal result…the consultant will be involved at that time. And the decision will be made whether to go for a caesarean section or continue. But yea, more likely…after three FBSs, if it's still non-reassuring then we will go for a section." (Mid 4)

"I suppose there's a guideline on the active management of the second stage. And there's no guideline on, I suppose from a doctor's point of view, of when to do instrumental or not, what instrument to use, there's no guidelines like that." (Senior Obs Reg 19)

Management of women with breech presentations was also said to have a big impact on the overall CS rates.

"Another direct influence would be the guideline for external cephalic version. So, if a hospital has a guideline that is very restrictive on the amount of external cephalic version that's performed, that's obviously

going to increase the caesarean section rate for breech." (Consultant Obstetrician 5)

Clinical setting and its infrastructure were believed to have some influence on the decision-making to perform a CS. Smaller maternity units were viewed as being more flexible allowing for 'softer' criteria (such as for social reasons, etc.) for inducing labour compared to the induction criteria in bigger units.

Labour ward capacity and overcrowding were occasionally viewed by some obstetricians to have an influence on the decision-making process.

> *"Sometimes it creeps in where there is a backlog of women waiting to get on to the labour ward and there's a huge induction list and you've somebody going very slowly or causing concern and there's the…decision…*[to] *do a caesarean section and…we have another labour room…Obviously that's a very unattractive part of our caseload and capacity problem." (Consultant Obstetrician 1)*

Overall, a culture within the system and an institutional attitude was perceived to have some influence in the decision-making process, which was further influenced by an infrastructure limitation.

> *"The different hospitals do have a different culture towards caesareans. Some…have lots of caesareans, some…vaginal delivery at all costs…There is definitely a cultural, or an institutional attitude which does sort of influence your practice" (Consultant Obstetrician 10)*

> *"And also, infrastructure limitations, you know, all our labour wards are overburdened...we have* [x] *labour ward rooms…close to* [x] *deliveries annually. That's a huge through put every single day on a labour ward room. So, I think those infrastructural limitations do unfortunately influence our decision." (Consultant Obstetrician 5)*

Subtheme 3.2. Influence of staffing

There were different perspectives to levels of staffing influencing the decision-making to perform CS. Lack of availability of midwives to provide one-to-one care and lack of an appropriate skill mix were some of the factors reported by both midwives and obstetricians as influencing the decision to perform CSs.

"The age profile and the skill profile of our midwives would be that they're quite junior. And we're depending upon them…to make good clinical judgements. They're not always capable. And they don't always have the experience to do that. So, then they're reliant upon the clinical midwifery manager, who…goes from room to room…it's very difficult…it [staffing] *definitely does have an impact." (Mid 5)*

Midwives believed some of the decisions to perform a CS were made sooner than required because of shortages of obstetric colleagues, particularly with one obstetric registrar on call during a night shift. Obstetricians had similar views as midwives about rushing into the decision to perform a CS, due to lack of staffing at obstetric registrar level.

"Yeah sometimes like if, you know, say there's a reg [obstetric registrar] *on at night and they're on their own, and then they're ringing the consultant about a trace every…half an hour or whatever. So the consultant might just say oh do a section, you know, because they don't want to be called in the middle of the night, you know…Like obviously they'll have a reason for sectioning but they might do it a bit sooner than if there was, you know two regs* [obstetric registrars] *on." (Mid 10)*

"You can feel that there are maybe three problems stacking up, three women you're very worried about, and rather than giving a women the benefit of the doubt for another one or two hours you think, 'well actually I'm just going to deliver her now because these next two are really a worry to me and I don't want the three coming to a head at the same time!'". (Consultant Obstetrician 1)

"it's the lack of human resources…if you have a very full labour ward and…there are ten women…waiting to come to the labour ward, a woman in the emergency room, who's four centimetres and waiting for a bed…If you have a woman who's been there on the labour ward all day and is making very slow progress, for right or wrong you do make decisions based on the other external influences which are…too many patients and…too few staff." (Consultant Obstetrician 5)

Subtheme 3.3 Midwife – an advocate for women in the shared process of decision-making

The midwife's role in most occasions was viewed as an 'advocate' for the women. Although obstetricians were the final decision-makers for all CSs, they viewed the midwives' role as being vital to the decision-making

process since midwives, on most occasions, were the first person to alert the obstetrician to any deviation from normal. Decision-making for CS was viewed as a shared process, with obstetricians as the final decision-maker. Midwives' roles in this shared process varied widely on any given day and depending on the clinical situation and obstetrician on call for the labour ward.

> *"It* [the decision-making] *depends on how empowered the woman is and how empowered the midwife is. If there is a consultant who believes in the midwife's role…who is very…supportive of it and includes her in the decision-making you…can achieve a lot there by supporting the woman, being on her side." (Mid 13)*

Some midwives considered their role as being vital in the process of decision-making, whereas others did not feel as though they were part of the process. However, on most occasions' midwives viewed their role as an advocate for the woman.

> *"Midwife's role is a lot to prepare* [the woman]*…It certainly much easier for a mum to recover from a caesarean section…when she…was part of the…decision making." (Mid 6)*

> *We do contact…*[the] *CMM…*[or] *the registrar for…a lack of progress…I suppose you're caring for the woman, but you're not really overly involved in the decision-making for the caesarean section." (Mid 8)*

> *"Well I mean obstetricians are, you know their decisions, their practice is medicalised, we* [midwives] *are the holistic part of it, we are the advocates for the woman, for normality. Definitely I think an obstetrician going into a room, he's programmed to look for things that are wrong and look for trouble. Whereas we tend to kind of keep it normal…We* [obstetricians and midwives] *don't share the same perspective." (Mid 13)*

On the other hand, obstetricians viewed midwives' role as being vital in the joint process of decision-making, and that most of the decision-making for CS relied on midwives and their interpretation, since midwives were with the woman throughout their process of labour.

> *"It* [the decision-making] *is shared…I think it's very much joint decision-making but there can be differences in where the power is held or where the greatest influence is exerted." (Consultant Obstetrician 1)*

> *"They* [midwives] *are the first-line people that are really in the room and with the patient all the time…So I think it's really a team decision in the end." (Consultant Obstetrician 15)*

However, it was believed by some obstetricians that midwives had a tendency to pass over the responsibility to the obstetricians in difficult situations, which, occasionally, influenced the decision-making. In general, midwives' predetermined view was perceived by obstetricians to have some influence in the decision-making process.

> *"Passing over all the responsibility to the doctor too early isn't helpful...They* [midwives] *need to…be with the woman on the journey." (Senior Obs Reg 3)*

Overruling a senior midwife's decision was considered to be challenging by obstetricians, junior obstetricians in particular, and that, according to obstetricians, had some influence in the decision-making process for CSs.

> *"Less commonly, but sometimes happens, where you get a very experienced midwife who puts it to the registrar* [obstetric registrar] *that this is how they should manage the patient and I've certainly seen that with inexperienced registrars or locums who are just trying to stay safe when they're only working in a short time situation and really the decision has been driven by the midwife." (Consultant Obstetrician 1)*

Subtheme 3.4 Women - where do they stand in the process of decision-making?

In general, maternal request for CS was not regarded as being a major factor influencing the decision to perform a CS.

> *"Well maybe elective sections for first-time mums who don't want to maybe labour, now it's not very common but maybe you know certain private patients might…have an elective." (Mid 10)*

> *"In terms of first-time mothers requesting it* [for CS]*…in my practice it's extremely uncommon. I see mostly women who are really looking for every opportunity to have a vaginal birth and a good experience." (Consultant Obstetrician 1)*

Some obstetricians were open about accepting and approving maternal request CS when the woman was aware of the risks associated with CS.

> *"I completely support maternal request for a caesarean section, if they're aware of the risks associated with doing the procedure." (Consultant Obstetrician 17)*

Professionals' role was regarded to be vital and crucial in explaining to a woman about CS to obtain consent prior to the procedure. Ensuring that the woman was aware of all the risks, long-term and short-term, associated with the birth by CS was a vital responsibility of obstetricians. Midwives sometimes were unsure if all first-time mothers were provided with all the information prior to consenting to have a CS.

> *"I mean it's their* [women's] *choice, it's their body...But I think we as professionals have a duty to make them fully aware of what is involved and the long-term consequence of having a caesarean, that it is a major operation, that things can go wrong." (Mid 2)*

> *"If they* [women] *request a caesarean section fair enough.* [But] *I'm not sure I would be 100% confident that...primips are…given all of the information…for future pregnancies." (Mid 4)*

Women who had a predetermined view and argument about CS being a safe option for their baby and for themselves proved challenging for obstetricians.

> *"You'll get* [women] *who book with, privately, who want a caesarean section because…they may say, well I will take the recovery from a caesarean section…in preference to a third degree tear or a baby that needs brain cooling and…it's very hard to argue with somebody who says they fully understand those issues and this is their well informed preference, given that elective caesarean section is relatively safe." (Consultant Obstetrician 1)*

> *"I would usually say for anyone who is having a section, you know the risks are bladder, bowel and blood vessel and blood loss and you know reduced mobility and all of that for a period of time after a caesarean section. So, I kind of go through that. I would hope that others would do the same. But I would feel that maybe that extensive discussion probably doesn't happen." (Consultant Obstetrician 8)*

There were contradictory findings in relation to women's active involvement in the decision-making process for CS. Some clinicians perceived that

women were more informed, and hence, they played an active role in the decision-making process for CS, but others disagreed.

> *"Because they* [women] *are much more informed it makes our life a little bit easier, as in explaining it to them…Some women…are so heavily involved in their pregnancy and have done so much research into it…have attended all the antenatal classes…Some women that…don't go to their antenatal classes or…see pregnancy as this completely normal thing…they require a lot more attention from midwives." (Mid 4)*

> *"Women probably…aren't as involved in the…actual making of the decision. It's…discussed with them as…the plan of care and this is what's going to happen. It's only women who are very adamant or very strong…might have a very strong birth plan, or birth preferences, who are very well informed that might push for…longer time" (Mid 7)*

In most scenarios, women's involvement and her decision-making were influenced by the information presented to her by the clinical team. Women were not fully empowered to have an active say in the decision-making process, and some obstetricians viewed women as playing more of a passive role in the decision-making process for CS.

> *"So, it's hard for them* [women] *because they…don't feel empowered to actually make that decision. They're pretty much presented with our version of the story…their involvement is quite limited." (Mid 13)*

> *"It is very important that* [in] *the process of decision-making…there's a lot of communication with the mother in that length of time. But…how much can you say that it's a vital role? Because there isn't that much that she* [the woman] *can change." (Consultant Obstetrician 14)*

Women's predetermined view of CS as a safe, easy and end option and their underlying fear had an influence on their decision-making for CS.

> *"There is a perception by women that it* [CS] is an *easy option. I don't think they look at the long-term health consequences, they're not aware that the fertility reduces after your first caesarean section, scar tissue, pain down the line…They think it's the easy option." (Mid 2)*

> *"I think caesarean section they* [women] *see as this clean, neat, tidy thing to happen. So…some women…do think…it is the better option". (Senior Obs Reg 3)*

Advancements in anaesthesia, and a perceived low morbidity and mortality associated with planned CSs had an influence on the belief system among clinicians and women, and this influenced clinicians' acceptance of women's request as a reasonable choice, particularly with individual profiles of older women with history of infertility.

> *"it's very important that you tease out the particular indicators for it and…living in the western world as we do with you know, with low morbidity and mortality related to elective caesarean section and related to advances in anaesthesia, there may be...many patients...maternal request caesarean section is an entirely legitimate choice for them" (Consultant Obstetrician 5)*

> *"It drives me insane when they keep comparing us to the Netherlands…I mean…they are…taller than the average Irish person…healthier* [and]*…slimmer. We are fat, old and short. That's basically the Irish population of women who are giving birth. So it is a huge influence in terms of what, what the caesarean section rate should be for your country…But I think…a couple of percent here or there, or either side of 30% is where it stands and that seems to be consistent with an awful lot of countries." (Consultant Obstetrician 10)*

5.1.3.4. Theme 4: Private versus public - a possible difference in practice

According to some clinicians, women's health insurance status, private or public, influenced the decision to perform a CS. Midwives were always involved in the care of all women regardless of their healthcare coverage category, public or private. While many midwives felt obstetricians were influenced by women's insurance status, in general, most consultants viewed their practice not being any different for women under private and public category. Three subthemes were derived under this theme; 'An obvious difference in practice – for some clinicians'; 'individualised practice versus a judgement call' and 'convenience – a possible factor'.

Subtheme 4.1 An obvious difference in practice – for some clinicians

There was a difference in decision-making process for women booking for care under public category compared to those under private category. It was mostly dependent on the individual consultant obstetrician and their practice pattern.

Women booking for private care were, in general, believed to be with either a complex medical or obstetrical background, which ultimately influenced their outcome and birth by CS in most cases. Some maternal factors such as history of IVF, maternal age, etc., were perceived to influence the decision-making for women under private care.

> "*Decision-making process is the same. But…the sort of patient that seeks private antenatal care now is different…People, particularly for their first pregnancy who choose private care…through reasons of their own, do so because they are those older,* [with] *complicated… past history* [and] *medical problem." (Consultant Obstetrician 16)*

> *"Private caesarean section rate is higher than the public caesarean section rate…and…there are a lot more primary caesarean sections in private practice than in public practice." (Senior Obs Reg 19)*

There was an inclination to follow the standardised guidelines in decision-making for women under the public category, whereas, the decision-making for women under private care was more individualised with wide variations among individual consultant obstetricians.

> *"I think private patients have a higher incidence of caesarean section in first time mothers." (Mid 7)*

> *"If you are a public patient you will be left for ten to twelve days before you are induced, provided everything is ok on your ultrasound scan. Whereas private patients would be generally…delivered before forty-one weeks, by their consultant." (Mid 15)*

> *"If you have a consultant obstetrician looking after you, they'd be much quicker to bailout of a labour...where I think if you have public patients the registrars…have to answer to the consultants and…attend…meetings where…the case might be looked back at, they're more likely to try and prove…that there is fetal distress before…they go to section." (Mid 11)*

Lack of transparency of management and outcomes of care for women attending in the private category was viewed as influencing the decision-making because obstetricians made more individualised decisions for women booking under their care. Consultant obstetricians were not being questioned on their decisions. When women were under private care of a consultant obstetrician, their management of labour and their labour outcome were never discussed at meetings, leading to more individualised decision-making by consultants for their private women; however, they felt they followed hospital guidelines for women under public care since there is a possibility of the public care being discussed or audited, and that was an obvious difference. Hospital guidelines were applied consistently to women attending publicly, but not women attending privately and the decisions regarding the care of women attending privately were not discussed at audit meetings.

> *"There's no one auditing or criticising their* [consultants'] *practice* [of] *their private ladies. But there is someone criticising their practice on the public ladies…So they tend to…step back a bit more with the public ladies and follow hospital guidelines or national guidelines." (Mid 3)*

> "[sometimes private] *patients are dictating their own care…The consultant's hands are tied. But in other jurisdictions, let's say in Canada and in America where it's very much private care, if you're doing too many caesarean sections you are audited and pulled up on it." (Senior Obs Reg 9)*

> *"I mean there's no doubt about it that the private group* [women] *can basically say how they'd like to be delivered and it will be done…I think if a first time primip said that she wanted a caesarean section because of anxiety or you know that she wasn't comfortable with this…then I think that a lot of consultants probably…will be happy to do it for her. Whereas if you were in the public sector…we would probably get them to come back in a couple of weeks and…get them to talk to someone else as well. So, I think definitely in the private sector there's probably an easier recourse to a section in a primip rather than in the public sector." (Consultant Obstetrician 8)*

There was a perception that women under private care had more choices in relation to requesting a CS compared to women booking for public care.

Women booking for care privately were more likely to have their request approved compared to women under the public category where getting approval for a CS on request in the absence of a medical indication was not viewed as an easy option.

> *"Well, without a doubt it is frustrating to see private women do get more of a choice…they mightn't be the most well informed in some respects." (Mid 2)*

> *"It* [maternal request] *is definitely higher* [in the private category]*…because I think they get a choice. Whereas a public patient…it wouldn't really be spoken about." (Mid 12)*

> *"I would think in a public clinic where you have a woman who states, I want a caesarean section for back pain, and you explain to her that there's no evidence that that's in her best interests and that you'd strongly encourage her to think of alternatives or to keep an open mind. It's easier to do that when she's not paying you for her care." (Consultant Obstetrician 1)*

Being under private care gave a feeling of being in control of the decision-making, and that was perceived to have some influence which contributed to the rise of CSs from maternal request point of view among women in private category.

> *"I think some…*[women] *feel that they might have some more control over their decision-making if they have gone privately…you have continuity, and…opportunity for exploring women's reasons for opting for certain choices." (Consultant Obstetrician 20)*

> *"I always think that women who book privately anyway think that they own the consultant and they just make demands and often consultants feel like their hands are tied." (Senior Obs Reg 9)*

Subtheme 4.2 Individualised practice versus a judgement call

Obstetricians' own preferences and individualised practices were perceived to be more evident when caring for women booked privately than for those in the public category, and this influenced their decision-making process and the rate for the individual consultant obstetrician and the institution as a whole.

"If you're a private patient your consultant will [diagnose] *you in labour…and it's a way of getting her* [the woman] *into the labour ward quickly." (Mid 2)*

"They [consultants in private practice] *just seem to have a lower threshold for section and…my perception is that maybe it's* [because] *they don't have to answer to anybody so they're much quicker just to bailout with the section." (Mid 11)*

I encounter, women in the over forty, IVF and a very long journey to get to pregnancy and those women often assume that they will have to be delivered by caesarean section, I don't assume that at all, but that would be a more frequent one." (Consultant Obstetrician 1)

"We're all aware of colleagues who among their clinics, or their private patients have higher caesarean section rates than other colleagues, and it's not necessarily that one [CS] *rate is right, and one…is wrong. But…it does show that there are differences in practice which can impact on caesarean section rates." (Consultant Obstetrician 5)*

Subtheme 4.3 Convenience – a possible factor

'Convenience' was perceived as a factor that influenced the decision-making for induction and management of labour and ultimately, a decision to perform a CS.

"They [consultant obstetricians] *are on a time limit…they have to be somewhere for…their…personal occasion or…they just want to go home to bed basically. If it's a public woman there's not the same pressure on them to jump in and do a caesarean section, 'cos at the end of the day they're not going to do the caesarean section, they're going to get the registrar to do it…but if it's a private lady…you would see them jump in quicker." (Mid 3)*

"If they [women] *think they* [the consultant obstetricians] *are not going to be there…then they're like, 'okay I will go for induction while you are there' or…'can we plan my caesarean section while you are there'. So, I…think private practice is…very different than public and semi-private." (Mid 4)*

"I think there is certainly an element of time keeping, for private consultants, and some of that is unreasonable. It's just at a certain point they want to get home. But some of it is reasonable as well, in

that…they're expected to be in two places at once, as part of their public job…So they just make a decision to [do a CS]*" (Obs 7)*

5.1.3.5. Theme 5. Lack of experience or loss of skills and confidence

Clinicians' level of experience and confidence was regarded as a major influence on the overall decision-making process. However, few clinicians did not hold the view true to their own and others' practice. Three subthemes emerged under this theme; 'individual interpretation - role of experience'; 'lack of confidence or loss of skills - a judgement call'; and 'practice pattern – junior versus senior clinicians'.

Subtheme 5.1 Individual interpretation – role of experience

Clinicians' level of experience influenced their interpretation and management of the situation, which ultimately determined the outcome of the decision.

> *"It* [influence of clinicians' experience] *can go two ways. You can either have the very experienced obstetrician who knows their skills and knows what they can* [or]*…can't do…and then you can have the very under skilled, or less experienced obstetrician who over estimates their abilities…they're more likely to be the ones who will end up with failed instrumental and…caesarean section birth." (Mid 3)*

> *"It may be that the midwife doesn't recognise the abnormality and doesn't call sufficiently early or it may be that the midwife has less confidence in observing that CTG. Because she is less experienced and obviously, she may call, it can be a knock on effect." (Consultant Obstetrician 5)*

Subtheme 5.2 Lack of confidence or loss of skills – a judgement call

Clinicians' level of confidence and skill in managing a clinical situation had a major influence on the decision-making process. Clinicians mostly interpreted it as a judgement call for a given clinical scenario; however, it was influenced by their experience, skill and confidence in managing the situation, and this was evident, mostly, for decision-making for failure to progress in second stage of labour. Balancing between the decisions to proceed with an assisted vaginal birth versus performing a CS was very much dependent on an obstetrician's level of confidence and skill.

> *"People's confidence does influence it* [decision-making]*…For the registrars…if you have done the difficult instrumental and…someone*

else…is making slow progress with a biggish baby…you are much more likely to look for a reason…to…do a section." (Consultant Obstetrician 2)

"If the obstetrician…doesn't feel confident…they might just say that it's not suitable for vaginal delivery and then proceed to section..or…a midwife manager, who feels that an obstetrician doesn't have the skill…she might suggest that a caesarean would be a better option for the woman." (Mid 7)

Performing a vaginal breech birth was regarded as a 'lost skill' among midwives and obstetricians with most, if not all, women presenting with breech presentations proceeding for a planned CS.

"Unfortunately, there was one big study that has done damage to obstetric practice probably forever, the 'Term Breech Trial', and actually the evidence in that [study] *isn't that strong. There has been subsequent studies…that actually showed it* [vaginal breech birth] *is perfectly safe if you pick the correct patients. So I think actually it was poor obstetric practice that was leading to the bad outcomes in the breech babies, not the fact that they* [women with breech babies] *weren't having a caesarean section. So, I think if you pick any woman that shouldn't be having a labour, with a giant baby, or a baby with a giant head, then of course that baby's head is going to get stuck, or that baby is going to get damaged. So, I think it is your patient selection that is the problem with breech. And I think it is a real shame that all these women are having caesarean section for breech babies, and that we are losing our skill in breech delivery because of one study." (Senior Obs Reg 3)*

Subtheme 5.3 Practice pattern – junior versus senior clinicians

The way clinicians practised varied widely according to their level of experience, whether it was in relation to monitoring a fetal heart rate continuously or intermittently during labour or interpreting the CTG or intervening at an early stage. Some midwives perceived that junior obstetricians had a tendency to be quick to intervene compared to the seniors, whereas others thought it was the other way around.

"I guess maybe a more junior doctor would be a bit more quick to intervene and do a section rather than someone who is, maybe, more experienced." (Mid 10)

"We would find that…the older consultants would tend to bail out quicker than the…younger consultants." (Mid 15)

"Very…senior consultants would be less inclined to section women straight away without a hard indication, whereas younger consultants would be sectioning women for softer indications." (Senior Obs Reg 6)

Obstetricians had similar views in relation to midwives' experience and level of confidence, which ultimately had some influence on the decision to intervene.

"A very junior person [midwife] *sometimes…feels…'there might be something wrong here…I'll call the doctor'…that increases the anxiety for the woman…you* [as obstetrician] *can't keep visiting a room…without doing something, because the couple expect…you to do something." (Senior Obs Reg 3)*

"You know having a junior midwife can be excellent in the room [for one-to-one care]*. But…certainly very senior people…have a lower tendency to do caesarean section than someone who's very junior and gets nervous." (Senior Obs Reg 13)*

5.1.4. Member checking

A member checking questionnaire and findings (Appendix 21) were sent out to all the 35 clinicians (15 midwives and 20 obstetricians) requesting their feedback on whether or not they recognised their views in the themes and subthemes that emerged from analysis of interview data. Responses were received from 23 (66%) clinicians, (ten (67%) midwives and 13 (65%) obstetricians). The majority agreed that the findings were very true or fairly true in their own practice and the practice of others. Very few reported that the findings were not really true for their practice and the practice of others (Table 5-4).

Table 5-4 Member checking response - Clinicians

Response	Theme 1		Theme 2		Theme 3		Theme 4		Theme 5	
	Views of self	Views of others	Views of self	Views of others	Views of self	Views of others	Views of self	Views of others	Views Of self	Views of others
Very true	6/23, 26.09%	10/23, 43.48%	10/23, 43.48%	10/23, 43.48%	10/23, 43.48%	11/23, 47.83%	11/23, 47.83%	10/23, 43.48%	4/23, 17.40%	5/23, 21.74%
Fairly true	17/23, 73.91%	12/23, 52.17%	11/23, 47.83%	11/23, 47.83%	12/23, 52.17%	9/23, 39.13%	7/23, 30.43%	11/23, 47.83%	16/23, 69.56%	15/23, 65.22%
Not really true	0	1/23, 4.35%	2/23, 8.69%	2/23, 8.69%	1/23, 4.35%	3/23, 13.04%	5/23, 21.74%	1/23, 4.35%	3/23, 13.04%	3/23, 13.04%
Not true at all	0	0	0	0	0	0	0	1/23, 4.35%	0	0
Total	23, 100%	23, 100%	23, 100%	23, 100%	23, 100%	23, 100%	23, 100%	23, 100%	23, 100%	23, 100%

Clinicians were asked to share any additional comments. Some provided additional comments on the emerged themes/subthemes and overall findings. In the context of maternal request one midwife said that maternal request is becoming more common since women are more aware of current guidelines and their recommendations to facilitate women's preferences.

> *"I would be of the opinion that maternal request for CS is becoming more prevalent especially as the NICE guidelines recommended that if a woman prefers a CS as opposed to vaginal birth this should be facilitated. Women are more educated and aware of these guidelines and therefore will request a CS more readily." (Mid 2)*

In the context of hospital guidelines and their influence, a midwife described the importance of hospitals having a policy for performing CS on a justifiable indication.

> *"The hospitals must have a policy for CS, and there have to be a proper indication. Some women don't know the risks as they haven't been explained properly." (Mid 6)*

One obstetrician viewed women's views in decision-making as an important aspect covered in the findings.

> *"Importance of woman's voice in shared decision- making." (Obs 20)*

Although most clinicians agreed with all/most of the findings, some clinicians did not fully agree to some of the findings.

> *"Majority of the factors influencing caesarean section is included* [in the findings]*. I do not agree with the points raised in section 5* [lack of experience and loss of skills and confidence]*. I would say senior clinicians are more likely to exhaust every possible scenario before performing caesarean sections. However, when considering the points raised in section 2* [Consultant obstetrician – a decision-maker vs approver of the decision]*, the absence of the on-call consultant in decision making, this could lead to premature decision to delivery." (Mid 9)*
>
> *"I don't feel that what is quoted here is a reflection of my views. However, I "fairly" agree with the quotes." (Obs 4)*
>
> *"I think categorising your findings in to 'themes' – oversimplifies what is a really difficult situation. No two scenarios are the same and I think to 'headline' things into relatively simplistic themes is a false. Don't forget, many women attend privately because they 'know' they*

are going to have a section e.g. for previous complications, maternal age or whatever – they choose to attend privately so they will know who is doing their section and so that they have a possibility of a private room for their [more prolonged] *hospital stay. I think the simplistic division of findings into themes is an over exaggeration." (Obs 5)*

"The impact of changing maternal demographics – age, BMI etc., have not been mentioned – these have impacted on CS rates." (Obs 6)

"I don't think Junior or Senior consultant really impacts on the decision making – it is more to do with comfort around who continues to manage a case once you're gone / not there and ability to take responsibility for the case." (Obs 8)

"Overall I feel that this is a realistic view of practice in the delivery suite and those that work in it. The only section that I wouldn't agree with is the public vs private care view." (Obs 16)

"Time of day (night vs daytime), Day of week (Weekday vs weekend) can have an impact on decision making for CS. Theme 5: Lack of experience or loss of skills and confidence has been exaggerated." (Obs 18)

Most clinicians provided a positive feedback on the findings and described that the findings represented and interpreted their views very well.

"There are many factors that influence the rate of caesarean section, especially among primiparous women, I felt that the majority of those reasons have been well represented in this study and I look forward to examining the completed product." (Mid 9)

"I feel that a lot of my views were also expressed by obstetricians and midwives in this study. It was good for me to see this, possibly, the "convenience" factor. I don't experience this scenario very often. I hope that something positive comes out of your study because the caesarean section rate is out of control in my opinion. It's not only the surgery involved but the knock-on effect it has, e.g., over use of antibiotics and the huge pressure that is put on the midwives to try and give optimum care under very poor working conditions. Every hospital should have a protocol in place so that consultants are not left to do their own thing without any thought for anybody else." (Mid 15)

"Very interesting study. Interesting to see the varying views on such a huge topic in obstetric practice." (Mid 14)

Overall, the obstetricians and midwives agreed to the findings and regarded the study as timely and valuable.

Following analysis of the member checking responses, I went back to the interview data from clinicians to re-analyse Theme 4 and 5. Re-analysis of data related to Theme 4 showed that 31 of the 35 clinicians (89%) had agreed that there is a possible influence in private vs public system of care, which was a factor that influenced decision-making. During member-checking, Theme 4 (Private vs public - a possible difference in practice) was not agreed by 22% of the clinicians as being **really true in their own practice**. The majority of respondents felt that private care influenced decision-making, but few clinicians (22%) felt it was other clinicians who were influenced in this way, and it applied to their colleagues, not themselves. Hence, a minor change was made to one of the Subthemes in Theme 4. Subtheme "4.1. An obvious difference in practice" was changed to "4.1. An obvious difference in practice – for some clinicians".

Re-analysis of data related to Theme 5 showed that 28 of 35 clinicians (80%) viewed their experience, skills and confidence as factors influencing decision-making process. In the member-checking process, Theme 5 (Lack of experience and loss of skills and confidence) 13% of the clinicians did not agree that this was really true in their own and others' practice. This suggested that a minority (13%) of the clinicians did not hold this view. I reviewed the section presenting Theme 5, and made a note that few clinicians did not hold the view of Theme 5 true to their own and others' practice (Section 5.1.3.5). This was done to ensure transparency and authenticity by acknowledging views of the 13% of clinicians (who responded to the member checking process).

5.1.5.Summary and conclusion of chapter 5 part one

This chapter presents clinicians' views on factors influencing decision-making for CS for first-time mothers. Role and predetermined views of

obstetricians, midwives and women had an influence at most of the stages of the process of decision-making. However, it was clearly evident that clinicians' personal beliefs and individual interpretation, further influenced by the culture of the organisation had a major influence on the decision to perform a CS. Obstetricians' and midwives' individual interpretation of the clinical picture, whether it was in interpreting a CTG, or establishing a diagnosis of labour or diagnosing a fetal distress or dystocia, were all crucial to the decision-making process. This individualised interpretation widely varied among midwives and obstetricians regardless of their level of seniority or experience and expertise, which had a direct influence on the overall decision to proceed for a CS or wait for natural progression of labour. Another predominant factor that influenced the decision-making was 'organisational policy'. The decision to induce a woman's labour, the criteria for IOL, diagnosis of establishment or progress of labour, and/or offering/performing ECVs for women presenting with breech presentations were all pathways to or part of factors influencing decision-making for CS. The influence of clinicians' level of experience, an obvious difference in decision-making for women in private versus public category and a fear factor among clinicians were other prominent factors that were perceived to be crucial to the decision-making process. There were perceived differences in views among obstetricians and midwives in relation to the role of women, being active or passive, in the decision-making for CS; however, the midwife's role was mostly viewed as being an advocate for the women. Predominantly, a woman's experience was considered to be important regardless of her mode of birth. Clinicians' beliefs and the culture of the organisation were the key driving factors in the decision-making process for CS.

5.2. Chapter 5 Part two - Women's views of factors influencing birth by CS and their involvement in the decision-making process

5.2.1.Introduction

This part of the chapter presents women's views on factors influencing the decision to birth by CS and their involvement in the decision-making process. The findings are presented as themes and subthemes (Figure 5-2.1) derived from one-to-one in-depth interviews with 20 women from one study site, the CWIUH. Women's names were replaced with pseudonyms, to maintain anonymity. A total of 17 women were interviewed by telephone and three in-person, and interviews lasted from 19 minutes to 1 hour 50 minutes, with an average duration of 38 minutes. NVivo software package was used to manage interview data. Appendix 28 outlines the codings and categories on women's views.

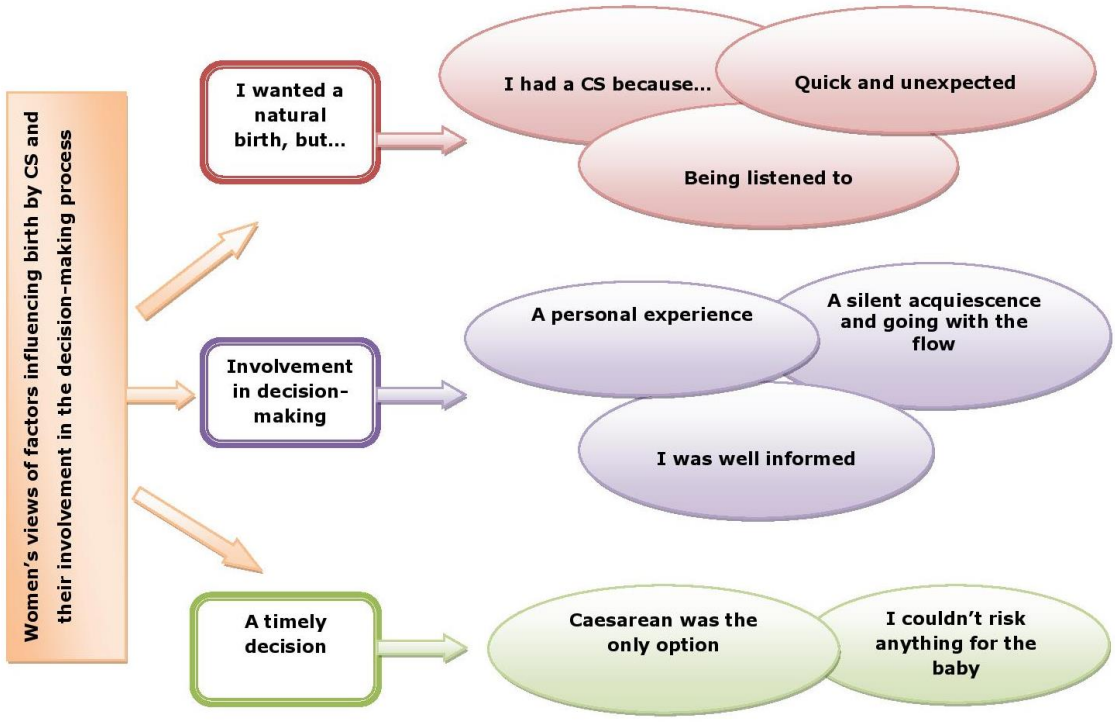

Figure 5-2.1 Diagrammatic presentation of women's views of factors influencing birth by CS and their involvement in the decision-making process

5.2.2.Women's characteristics

The 20 women who participated in the interviews had no medical conditions prior to pregnancy and had birthed by CS at term gestation (after 37 completed weeks). These women were recruited from one study site, the CWIUH, and represented a sub-sample of women who participated in Phase 1 of this study. One-to-one interviews continued until data saturation was achieved. The mean age of the participants was thirty-three years (range 27-39 years). Fourteen women used the public healthcare scheme, three were semi-private, and two used private healthcare insurance. One woman had private insurance but chose to use the public healthcare scheme for her pregnancy and birth. Women were four to ten months postpartum at the time of interview. Fifteen (75%) women had an unplanned CS, due to lack of progress in first (n=5) or second stage of labour (n=2), fetal distress (n=5), and failed induction (n=3), and five (25%) had a planned CS for breech presentation (n=2), past poor obstetric history (n=1), previous myomectomy (n=1) and unstable fetal lie (n=1). Table 5-5 summarises women's characteristics and demographic details obtained from the self-administered surveys completed by women and one-to-one interviews.

Table 5-5 Women's characteristics and demographics

Pseudonym	Age (in years)	Type of care	Type of CS	Reason for CS	Time since birth
Fiona	37	Semi-private	Planned	Breech presentation	8 months
Katarina	39	Private	Planned	Previous myomectomy	7 months
Dorothy	31	Public	Planned	Breech presentation	6 months
Louise	37	Public	Planned	Maternal request. Poor obstetric history	6 months
Emma	28	Public	Unplanned	Unsuccessful progress in 2nd stage	7 months
Annabel	33	Public	Unplanned	Unsuccessful progress in 1st stage	6 months
Ann Marie	33	Public	Unplanned	Fetal distress and unsuccessful progress in 1st stage	4 months
Mairead	39	Private	Unplanned	Unsuccessful progress in 1st stage	10 months
Rheona	27	Public	Unplanned	Failed induction	10 months
Loretta	35	Public	Unplanned	Fetal distress	9 months

Rosie	36	Public	Unplanned	Failed induction	10 months
Breda	33	Public	Unplanned	Unsuccessful progress in 2nd stage	8 months
Niamh	36	Semi-private	Unplanned	Failed induction	7 months
Sarah	35	Public	Unplanned	Fetal distress	9 months
Jennifer	34	Public	Unplanned	Unsuccessful progress in 1st stage, fetal distress and maternal pyrexia	10 months
Joanna	32	Semi-private	Unplanned	Unsuccessful progress in 1st stage	9 months
Barbara	39	Public	Unplanned	Unsuccessful progress in 1st stage	10 months
Carmel	29	Public	Unplanned	Fetal distress	10 months
Angie	34	Public	Unplanned	Fetal distress	9 months
Nessa	36	Public*	Planned	Unstable lie	10 months

*Had Private insurance but chose public care

5.2.3.Emerging themes and sub-themes

Interview data were managed using NVivo software package and thematically analysed. Three key themes emerged: 'I wanted a natural birth, but…'; 'Involvement in decision-making' and 'A timely decision', each with several subthemes (Table 5-6), and findings are presented using women's verbatim quotations.

Table 5-6 Themes and sub-themes

Themes	Subthemes
Theme 1 I wanted a natural birth but…	1.1. I had a CS because… 1.2. Quick and unexpected 1.3. Being listened to
Theme 2 Involvement in decision-making	2.1. A personal experience 2.2. A silent acquiescence and going with the flow 2.3. I was well informed
Theme 3 A timely decision	3.1. Caesarean was the only option 3.2. I could not risk anything for the baby

5.2.3.1. Theme 1 I wanted a natural birth, but…

Many women expressed a desire to birth naturally and described the decision to perform a CS as being unexpected, frustrating and disappointing. Others felt having a CS was an overwhelming experience.

This did not hold true for some women who had a planned CS. Although every woman's personal experience was different, in general, women who had a planned CS had a more positive experience of being involved in the decision-making process and birthing by CS compared to those who had an unplanned CS. Three subthemes emerged; 'I had a CS because…', 'Quick and unexpected', and 'Being listened to'.

Subtheme 1.1 I had a CS because…

Women's views on being involved in the decision-making process were influenced by whether labour onset was spontaneous or induced, and the progress of labour. Women who had a CS as a result of failed induction described not being involved in the decision-making. For these women, having to have a CS was inextricably linked with IOL. Many women felt that, despite all their attempts to experience a normal and natural birth, they still had to have a CS, and perceived that the circumstances and decision-making around their mode of birth were beyond their control.

> *"It was an emergency section…It wasn't really something that I did consider. So it was a bit of shock because I didn't really factor it into one of my options. Even though I knew it was there, I never thought that I would end up with one...There were a couple of reasons* [for my CS]*, mostly meconium in the fluid* [and] *he* [baby] *was…stressed…It* [The decision for CS] *happened very fast…I felt like definitely out of control. Because there was nothing they could do about it." (Sarah, Unplanned CS)*

> *"I had preeclampsia* [in] *the last week of my pregnancy…So they decided* [for] *induction and* [it] *failed, and…they had to do…C section." (Rosie, Unplanned CS)*

Having to have a CS was inextricably linked with IOL. 'Failed' IOL was one of the common reasons for an unplanned CS in women whose labour was induced. These women described their negative experiences with the decision-making to be induced, ultimately leading up to a CS, which could possibly have been avoided.

> "[I had a CS] *because we were basically forced to have an induction at thirty-nine weeks because they* [the obstetrician] *said baby was measuring big. I didn't have gestational diabetes, they just said that he was measuring big from their scans, which they also told us were inaccurate after thirty weeks. They said that if we didn't induce and…let it go to forty weeks…that there was a strong chance of*

shoulder dystocia, that baby could have nerve damage…They induced, it took three days…During induction I had planned to have as natural birth as I could – so I didn't have any pain relief, I just had gas and air during the induction – got to eight centimetres and then as they [increased] *up the oxytocin, baby's heart rate started to dip. So, they did three oxygen tests. The first was fine, the second was borderline, it was a point above kind of being worrying, the third one was fine but each time they* [increased] *up the oxytocin his* [baby's] *heart rate dipped a bit, so they said we'd have to have a C Section." (Carmel, Unplanned CS)*

Women who had a planned CS, mostly due to breech presentation, previous poor obstetric history, and maternal request, were pleased with the decision. Most of them described being in control of their birth as positive.

"My caesarean section was actually planned…For quite a long time I knew that I would deliver by caesarean section. Therefore, it was quite straightforward…easy for me" (Katarina, Planned CS)

"Two weeks before the…C-section…they asked me [to have ECV] *and I didn't think it was a good option…because of complications that can occur. They were…like 'are you happy to go ahead with a C-section or turn her', so I said C-section. So, it was definitely my choice to have the C-section." (Dorothy, Planned CS)*

The desire to have complete control over the birth process was another reason why some women requested a CS. One woman requested a CS because of sad experiences and outcomes from previous pregnancies. Women described about being involved in decisions in terms of being in control of events related to their labour and birth. The experience of birthing in a planned and controlled environment and being involved in the decision-making was described as positive by these women.

"I had no control over what was going on in my body…[and] *the* [bad] *results* [from previous early pregnancies]*. So…when it came to having my baby now I wanted to have some control over this…My baby will be delivered in a safe and controlled environment…I said…I will face the physical side of it* [birthing by CS]*, I don't mind the recovery, I don't mind if it* [recovering from CS] *is going to be harder on me…I just want her out…So it was an elective section with absolutely no medical requirements for me or for my baby…I did feel a sense of calm about the whole thing* [with CS] *and I suppose that would be very different to people going through an emergency caesarean section." (Louise, Planned CS)*

"[My] *Caesarean was planned* [because] *my baby was breech. So we had the dates and…time…so it was all very relaxed." (Dorothy, Planned CS)*

Some women felt that their outcome of birth would have been different if they had stayed at home for longer when labour started, and perceived that being admitted to the hospital at an early stage of labour influenced the outcome of their birth.

"I felt, in hindsight, I would probably say 'look, I'm going to go home. And when I've dilated a bit more I'll come back in.' Because I think I would've progressed much better…if I'd been at home, I may not have had any other interventions." (Jennifer, Unplanned CS)

Despite one woman's various attempts to turn her baby into cephalic presentation in order to have a natural birth, she had a planned CS for breech presentation.

"We agreed I would like a natural birth…she [the consultant] *hinted at several things that I could try to help baby turn around again, until thirty eight* [weeks]*…So I tried acupuncture,* [and] *a method…called Moksha …warming up certain…reflex points in your system,…visiting a website…called Spinning Babies,…lying on my ironing board…upside down. But…it didn't help…It looked as if he…didn't grow around the tummy area, according to their…estimates…and the decision then was quickly made that he would be delivered the next day* [by CS]*." (Fiona, Planned CS)*

Most women who had an unplanned CS wanted a natural birth without epidural anaesthesia. However, most of them did have an epidural, especially when their labour was induced or augmented with IV oxytocin infusion. Lack of continuous and one-to-one support and care by a midwife in labour was described by one woman as a reason why she had an epidural, which ultimately influenced her labour progress and outcome.

"I went to the delivery unit…They gave me the gas and [it] *wasn't working very well…So they give me…the* [epidural]*…I was having contraction very intense with the induction...And through the process I saw a midwife,* [she] *was too busy. She had to mind more women in…labour. So most of the time I wasn't with the same midwife. I was with…a student. Yea, she and the midwife just popped in sometimes." (Rosie, Unplanned CS)*

One woman described epidural as one of the reasons for her slow, and ultimately, lack of progress that put her on the pathway towards CS.

> *"I had a sweep…and I naturally went* [into labour]*…I…remember getting to about seven* [centimeters dilatation]*…I'd gone a long way myself* [but] *I couldn't really handle it near the end…I was on gas and air, then I took the epidural. And then everything* [the labour]*…just slowed down and stopped." (Sarah, Unplanned CS)*

Another woman wondered if receiving the pethidine injection for pain relief was the reason for her to slow down in early labour.

> *"I was only about one centimetre* [when I was admitted to the antenatal ward]…[and] *I'd already had a good day and a half…of contractions, very heavy pain…I spent the time…walking and trying to get things moving and the bouncing ball and everything else.* [But]*…things hadn't really moved a huge amount. Then I did have pethidine* [in the] *middle of the night…because…I was just in huge pain...I kind of regret getting the pethidine, now. But in hindsight, you know, I think, I don't know. I wonder…if it* [pethidine] *potentially slowed things down." (Jennifer, Unplanned CS)*

Subtheme 1.2 Quick and unexpected

Childbirth was regarded as an important event in a woman's life, but a decision to birth by CS and not having enough time to experience and reflect back on this event was described as an overwhelming experience. A few women who had planned CS described it as a hazy memory of a very quick event. They interpreted it as 'being done' within minutes instead of 'giving birth'. The events in labour and birth were mostly described as quick and unexpected with very limited or no time to process the events.

> *"A natural birth is probably a bit easier…This* [CS] *was now done within…minutes and the little one was there...It's such an important event in a woman's life... And it was over so quick." (Fiona, Planned CS)*

> *"Loads of things* [were]*…happening in very short span of time. But…when you're giving birth…vaginally you probably have more time to realise that it's really happening. It was…like I was pregnant, pregnant…pregnant…and then within fifteen minutes we had a baby…it was overwhelming." (Katarina, Planned CS)*

The decisions surrounding birth, whether they were related to induction or management of spontaneous labour, were described as unexpected events.

> *"Five days later* [of my due date]*…my waters released at home…so I went in…But…I was hoping to go back home to labour at home…and they said no…because the baby is measuring big, so I was surprised…because…baby was measuring big the whole pregnancy…*[but] *I was never told I was* [at risk]*, so I was a little disappointed to be kept in…The next day…they said…at the twenty-four hour mark we're going to induce you. It was…complete opposite to what I had prepared for." (Emma, Unplanned CS)*

One woman hoped to reach full term gestation and go into spontaneous labour and was surprised by the decision to birth sooner.

> *"The decision…was quickly made that he* [baby] *would be delivered the next day* [by CS]*…I…*[and] *my partner…were a bit taken by surprise, because obviously you hope for the full term…and…hoped that we can reach the thirty-nine weeks at least." (Fiona, Planned CS)*

A possible explanation why women were taken by surprise and disappointed with the decision was their lack of preparedness for the unexpected outcomes of a CS following IOL.

> *"Yea it was really tough to end up with it* [CS]*. Because I hadn't even thought…that was going to happen…People were telling me that you go in for the induction and you have the baby. I didn't even think it* [CS] *was an option until the first one* [induction] *failed…that was…a bit of a shock. Because I obviously had an idea of a natural birth…That was quite disheartening when that* [CS]*…happened." (Niamh, Unplanned CS)*

Most women described their labour and birth as quick and unexpected, with frustration and disappointment. In the context of factors that influenced decision-making for their CS, and their experiences of being involved in the process, most women reflected back to the decision to be induced and the process of going through IOL. These women described it as an unpleasant and traumatic experience of not being in control.

> *"I'd been told I had to have an induction…It* [the process of going through induction] *was horrible…We waited for eleven hours to be given a room to get my waters broken…Then we spent another day with the prostaglandin and…by this stage…I'd had…thirteen vaginal*

exams…[by] *about five or six different people who I'd never met before…I just…gave up, I felt so violated…I just felt like I was another patient they had to get in and out."(Carmel, Unplanned CS)*

The inevitability of being induced leading up to an unplanned CS for failed induction was described as a disappointing and traumatic experience by one woman. This was mostly linked to not wanting to be induced, and not being listened to.

> *"I don't know why people say that it* [induction] *is gentle. If that's gentle I would hate to think what something non gentle is. Because it* [the process]*…violently attacked my body…So I was a bit disappointed at the inevitability of it all. I have no problem with having a C section…and…I knew that things weren't ready for me…to have a natural labour…But knowing it statistically, I wasn't likely to end up with a…vaginal delivery, I just felt it had been an exercise in ticking the box, proving that this C section was necessary, and putting me through that additional layer of trauma…I understand it's a more expensive decision. Because of the additional care required and…stuff required. But the most sensible decision to take would've been to take me in for planned C section, where I could've come in rested…I would've been in the best possible position for recovery and for minding my baby." (Barbara, Unplanned CS)*

In contrast, one woman described her disappointment around not being given an opportunity to experience going into spontaneous labour. A decision to be induced, ultimately leading up to an unplanned CS was expressed as a reason for her disappointment.

> *"I felt like that whole experience of going in to labour, I never got that.... as a person, as a first-time mother I would have liked that chance, no one really cared about the human aspect of it." (Carmel, Unplanned CS)*

Frustration was also expressed by another woman with the process of her labour, with unexpected outcomes at the end.

> *"I did get to ten centimetres, and…I pushed for about an hour…and fifteen minutes, and they* [midwives] *said that the baby…wasn't coming down…So I was really frustrated…The…doctor…said to me that…they were bringing me to theatre…and he* [the doctor] *examined me again* [in theatre] *and…decided…the safest thing…was to go straight in to a section," (Emma, Unplanned CS)*

Subtheme 1.3 Being listened to

In their very personal moment of labour and birth, some women felt that, at times, they were not listened to. Women who had an unplanned CS described their experiences mostly around the process of arriving at the decision to birth by CS; for some it was related to being induced, and for others it was the final decision to birth by CS. Women who had CS as a result of failed induction described how their concerns were ignored, demonstrating not being listened to, or included in the decision-making for their induction, ultimately leading up to a failed induction and CS.

> *"It's absolutely appalling, I'd never…go back there again…A hospital that's meant to be a teaching hospital…one person said you need to be induced and that was it…We were told come in tomorrow morning at six a.m. to be induced, goodbye…For someone who's spent nearly nine months planning…hoping for this nice natural birth and…excited…I feel…that was all taken away, I was just told in a fifteen minute meeting come in tomorrow…and that's it." (Carmel, Unplanned CS)*

One woman who had raised concerns about her cervix being unfavourable for induction and who queried the possibility of avoiding induction and giving birth by planned CS, described how her concerns were ignored by the clinicians in the process of decision-making.

> *"I didn't want to go down the route of an induction. Because my cervix was still unfavourable and I knew that unless you have a favourable…cervix…an induction would be setting me up for failure…I expressed these concerns…But there weren't any consultants there that day…I was scheduled for the induction the following day. And I spoke to…the midwife and then to a registrar and expressed my concerns…And it just seemed that a C-section wasn't an option to be discussed…I really felt that they were ignoring my concerns. And even ignoring the fact that I didn't have a favourable cervix." (Barbara, Unplanned CS)*

While some felt their concerns were ignored, others did not feel able to question the professional's decisions in some situations.

> *"I didn't feel very…empowered…to question things…I had to go along with…what I was being told to do. I didn't ask as much as I would have liked to." (Emma, Unplanned CS)*

However, one woman felt that she was listened to in the process of decision-making and that she was given the opportunity to wait for further progress in labour.

> *"They kept me informed…They knew that I didn't want a C-section. So, they really were very good about letting me try to get there on my own." (Breda, Unplanned CS)*

5.2.3.2. Theme 2 Involvement in decision-making

Women talked about being/not being involved, and the degree of involvement in or exclusion from the decision-making process in terms of type of CS. In general, most women who had a planned CS described being actively involved in the process of arriving at the decision to birth by CS, compared to women who had an unplanned CS. In the context of involvement in decision-making, women who had an unplanned CS described their views, not only around the final decision to birth by CS, but also in the process of arriving at the decision, which mostly included their views of their involvement in the decision and process of induction. Three subthemes were identified under this theme; 'A personal experience', 'A silent acquiescence and going with the flow' and 'I was well informed'.

Subtheme 2.1 A personal experience

Most women whose CS was planned felt that they were actively involved in the decision and described it as a positive experience. However, one woman, despite having a planned CS, described not being involved in the decision-making process and accepting professional advice to birth by CS.

> *I don't think* [I was involved in the decision-making process]*…I was going on medical advice and taking…the advice of professionals…I was just told that this is what's going to happen…I don't feel like I was given a choice or that it was my decision to kind of change my mind." (Nessa, Planned CS)*

This was different for women who had an unplanned CS. Women who had an unplanned CS described their involvement at different stages during the process of spontaneous or induction of labour, leading up to the birth by CS. Having an unplanned CS was the end point of a cascade of events, the end of the continuum that started with being induced. Few women described not

being involved in the decision-making process, with feelings of disappointment on how their induction and labour were managed.

> *"I didn't feel like I had an active say in anything really, we were just kind of told baby's heart rate is dipping so we need to do this, and when you're told that…your baby's heart rate is dipping you think, 'Oh God, okay', and then afterwards, because we got our records and everything afterwards, and all three of the tests, the oxygen pricks that they had done, all three of them was normal, one was one point above border line and the other two were normal, but we were told that we have to do this because the heart rate is dipping, but the heart rate was, you know, technically still normal – now I'm not medically trained so I don't know, you know, but it certainly didn't seem like right there and then that was our only option that we had to do, but yet that's what they did, you know." (Carmel, Unplanned CS)*

In the context of involvement in decision-making, one woman described her feelings of the need to have a CS earlier than she did, and in hindsight, regarded private care to be an option to avoid delays in decision-making.

> *"Before having my baby I really was convinced that I was going to have a natural labour and that it was all going to be very easy – my mum had very natural labour and I just thought it was going to go the same way for me, so I…was very confident going in to the hospital, that I'd have an easy labour and then when it started to go wrong I just really wanted to have my baby out safely…yeah I suppose* [things could have been better for me]*…I asked my husband recently what advice would he give to somebody having…their first baby and he said 'to go private'…We had gone public and I was surprised that he said that…he felt if we had gone private and we had a consultant to look…after us and that we would have had the C Section a lot earlier and it would have saved us a lot of worry and stress." (Angie, Unplanned CS)*

However, a woman who had availed of the home birth service, felt actively involved in her care and decision to birth by CS, because she had done most of her labour at home.

> *"I definitely felt like* [I was actively involved in decision-making]*…I not only understood what was going on, but felt able to say, yes or no, I guess…because it was a homebirth…I never felt like I was pressured to do anything. But I think that's because I did most of the labour at home." (Ann Marie, Unplanned CS)*

Although most women did not have an active say or control over the final decision, and agreed to go with the professional advice, one woman described how she had to argue her point of view when she was advised by an obstetrician to be induced, when she was four days overdue.

> *"Before I was induced I really had to stand my ground in the hospital…I said* [to the obstetrician] *'if you had your way now what would you do?', and she said 'I'd have you in tomorrow for induction.' And I said…'no way.' So, I kind of had to fight my corner in that one* [not to be induced at term plus four]*." (Jennifer, Unplanned CS)*

Most women perceived that they had been actively involved in the decision-making process when they were given a good explanation about the decision and reasons for the decision. These women equated being involved with being informed, and having events explained.

> *"Well they did keep me fairly involved, which kind of surprised me…I did feel reasonably involved with discussion of the process…To be honest I don't know if there would've been another choice, other than that* [CS]*…It seemed to be the right decision for both of us at that point." (Niamh, Unplanned CS)*

Subtheme 2.2 A silent acquiescence and going with the flow

Many women described 'accepting' the clinicians' decision without question. Some women did not feel empowered enough to question the professional decision, while others believed that 'going with the flow' and accepting the recommendation of professionals was the right decision for themselves and their baby. A few women felt they had some degree of involvement in the decision-making process for their labour and birth, but many were unsure about their involvement in any decisions. Going with the flow and the professional recommendation to have a CS was perceived to be a safe option by most women, mostly with concerns related to their own health or safety of the baby.

> *"The main concern was my own health and…the way she* [baby] *had turned…She [baby] was going to be very awkward…coming out…*[and] *might've ended up dislocating her shoulder...*[With] *all those factors…the decision was left to me, but I thought there wasn't really a decision to be made." (Mairead, Unplanned CS)*

Some women felt that the decision to induce their labour, which ultimately led to a CS, was unnecessary, forced upon them and that they were not given much of a choice in the decision-making process, hence they had to go with professionals' advice.

> *"It was a completely unnecessary reason for an induction…I mean I was pregnant at the time, I was so stressed…I just took what I was told and I took that as being the truth but in hindsight I've researched…it* [baby measuring big] *is not enough of a reason* [to be induced]*. I didn't have gestational diabetes, we had no other issues…so we were basically forced to have this medical intervention that we didn't want at all that then turned out we didn't need it." (Carmel, Unplanned CS)*

Some women were worried about declining a professional decision, and hence agreed to go with it.

> *"With the induction, I don't know if you get any choice of when they decide to book you in…But I was…aware that if you decline it* [the induction]*, or if you…push it back…the hospital might refuse to help you give birth." (Niamh, Unplanned CS)*

Sometimes women felt they did not have enough knowledge to get involved in the decision-making process, thus they relied on the professionals' advice and decisions.

> *"I did* [feel involved in the decision-making]*...The midwife…explained everything that was being done and…asked me was I okay with everything…but…because it was all getting kind of panicky…I wanted them to make a decision, because I didn't feel…educated enough…on…medical needs…so I wanted guidance from them." (Angie, Unplanned CS)*

Trust in the 'experts' was described as a factor that influenced women's perception of their involvement in the decision-making process, where some felt very involved, and others did not.

> *"I felt very involved…these guys* [clinicians] *are experts, they deliver babies all the time, they know what they're doing, I'm sure there are standards and policies in place. I feel like I'm being listened to but at the same time I, I would never have argued with them either because I myself personally felt that my baby wasn't going to be delivered via my vagina." (Annabel, Unplanned CS)*

> *"Not really* [involved in the decision-making process]*…I just went with their decision. I didn't kind of fight it too much, I mean I did say,*

oh I don't really want to have a C section. But I wasn't going to say, oh no I think we should wait. Because I mean they're the professionals and…the whole time I said to myself, no just trust them and go with whatever they think is professionally needed." (Joanna, Unplanned CS)

Subtheme 2.3. I was well informed

Women described being well informed during the decision-making process, and equated this with being actively involved, when events and procedures, or the reasons for these, were well explained to them.

"The discussion was very good, and…constructive...All my questions were answered [and] *all my…anxieties or worries were addressed. And they* [the team] *explained well why she* [the obstetrician] *would recommend to bring him* [baby] *out now…that…the lungs are fully developed. But outside the womb…they could control how well he gets nurtured. But they can't really check this now inside. Because…he* [is] *not growing as much as he used to in the previous weeks." (Fiona, Planned CS)*

Some women felt that having to have a CS was out of their control but that the reasons were well explained. Others described having no knowledge of what was going on and felt uninformed.

"It happened very fast, so I was very scared. And I felt like definitely out of control. Because there was nothing they could do about it. But it was explained to me why and why they were doing it. And they were constantly keeping me up to date when it was time for it, it just was very rapid. It was quite scary." (Sarah, Unplanned CS)

"No [I wasn't involved in the decision-making for my birth]*…'You're…getting a C section' that's it. No,* [I wasn't given a good explanation]*, only what I had looked up myself* [about CS]*." (Rheona, Unplanned CS)*

Although most women wanted to avoid a CS, they agreed to go with the medical decision, when they were given the explanation about the reason for it.

"The midwife and the doctors…leading towards a C-section… explained…everything. I didn't decide [the] *C-section. But I was aware and happy with the decision that the doctor made* [and] *I agreed…It was a medical decision…*[and] *I was happy with what was happening." (Loretta, Unplanned CS)*

5.2.3.3. Theme 3. A timely decision

The timing of the decision to perform a CS was perceived as 'right' by many women, mostly due to their lack of progress in labour or related to concerns with fetal distress. Two subthemes emerged under this theme; 'Caesarean was the only option' and 'I couldn't risk anything for the baby'.

Subtheme 3.1 Caesarean was the only option

Many women described their birth by CS as a timely and justified decision, because of reasons to do with their own or their baby's health and wellbeing or progress in labour. Although some perceived it to be a positive outcome, others described it as unexpected cascade of events.

> *"I was not progressing and they gave it enough time…I stayed at six centimetres…my amniotic fluid had gone at this stage, there was a risk of infection, she* [baby] *wasn't coming out naturally, so the best thing to do for me and the baby was…an emergency C Section." (Annabel, Unplanned CS)*

> *"For me…it* [CS] *was the only option… Because…I wasn't progressing, so* [CS] *was the only way he was going to get out." (Ann Marie, Unplanned CS)*

> *"It* [the induction] *hadn't worked...and…the only way* [was] *to…have a C section…They said if I had…opened even like a centimetre to get like that needle hook thing to do something. But I* [the cervix] *didn't open…at all." (Rheona, Unplanned CS)*

A few women described CS as the ultimate, appropriate and timely decision after hours of exhausting labour.

> *"I was worn out; near the end I was nearly ready for it* [CS] *to happen. Because it was a long time, and we'd been through all the steps* [labour]*." (Sarah, Unplanned CS)*

Subtheme 3.2 I couldn't risk anything for the baby

Concern related to safety of the baby was one of the main reasons why most women agreed with the obstetrician's recommendation to have a CS. Although disappointed with the decision to birth by CS, some described it as the only option, for the safety of the baby.

> *"Initially…I was opting…for vaginal birth. But as the time went I could see…little more weight onto the risk…I was a little bit disappointed*

that…I couldn't give birth vaginally. On the other hand, if anything would happen [to baby] *I would be just…blaming myself until the end of my life." (Katarina, Planned CS)*

Women described accepting the possible difficulties in recovering from CS, because a safe outcome for the baby was their priority, and hence they perceived their birth by CS as a timely and appropriate decision.

> *"I was okay with the C section. Because I wanted to make sure that the baby was…okay. Because…I could get over it* [the CS]*, but…you don't want to risk anything for the baby." (Loretta, Unplanned CS)*

Despite a desire to experience a vaginal birth, most women prioritised baby's health to be the ultimate goal, and viewed CS as a timely and appropriate choice, when recommended.

> *"I just wanted to make sure that he* [baby] *was coming out…healthiest…*[and] *there was…going to be no complications. And I thought…if I had…said no…to have a C section…something…bad might've happened. And I'd never forgive myself." (Joanna, Unplanned CS)*

> *"For the safety of the baby yeah, I probably would have opted for a C- section." (Nessa, Planned CS)*

A woman who was allowed to try and wait for progress of events in labour, ultimately perceived CS as an appropriate decision due to the safety of her baby.

> *"For a while, for long enough until they decided, like they were really good. Because they knew that I wanted to deliver him vaginally. So they were very good about doing everything they could…To let me have that until they decided that there was no way that he was coming down. He was stuck they did an ultrasound and whatever way his head was facing…The way that his head was turned, it wouldn't have been safe for him to come out* [vaginally]*." (Breda, Unplanned CS)*

5.2.4.Member checking

All 20 women who participated in the interviews were contacted via text message before sending the member checking forms, 16 of whom indicated their interest in being sent feedback. The member checking questionnaire and findings (Appendix 22) were sent to these 16 women requesting for their feedback on whether or not they recognised their own and others'

views in the themes and subthemes that emerged from analysis of interview data. Responses were received from 13 (81.25%) women. The majority agreed that the findings were very true or fairly true for themselves and others (Table 5-7).

Table 5-7 Member checking response - Women

Response	Theme 1		Theme 2		Theme 3	
	Views of self	**Views of others**	**Views of self**	**Views of others**	**Views of self**	**Views of others**
Very true	7/13, 53.85%	7/13, 53.85%	8/13, 61.54%	8/13, 61.54%	8/13, 61.54%	8/13, 61.54%
Fairly true	2/13, 15.38%	5/13, 38.46%	5/13, 38.46%	4/13, 30.77%	5/13, 38.46%	5/13, 38.46%
Not really true	1/13, 7.69%	1/13, 7.69%	-	1/13, 7.69%	-	-
Not true at all	3/13, 23.08%	-	-	-	-	-
Total	13, 100%	13, 100%	13, 100%	13, 100%	13, 100%	13, 100%

Women were asked to share any additional comments. Some provided a few additional comments on the emerged themes/subthemes and overall findings. A woman who had a planned CS for breech presentation said

> *"The fact that CS was planned for several weeks due to breech baby. We were informed if baby does not move head down, C-section might be an option, but they left it open until last check up. But after this there was no real choice given for example to give birth in breech position." (Fiona, Planned CS)*

Two women described their feelings and disappointment on being induced.

> *"I wasn't strictly against CS as I was induced, and I was informed that there is higher chance of it* [CS] *due to possible stress it could cause to baby. However, it* [CS] *wasn't my first choice." (Loretta, Unplanned CS)*

> *"The lack of choice regarding the initial induction(s) of labour, the majority of the times such failed inductions will lead into a C-section delivery. Nobody really explains this as a possible outcome at the time." (Niamh, Unplanned CS)*

Analysis of member checking response showed that 23% of women (3 of 13) who responded to the member checking questionnaire viewed Theme 1 (I wanted a natural birth, but…) and related subthemes ('I had a CS

because…', 'Quick and unexpected', and 'Being listened to') as not being at all true for themselves. One woman, in the member checking response, provided an additional comment on the reason for viewing Theme 1 as not being true.

> *"I feel this very much represents my views other than in the first question. The only reason it does not represent my views* [for Theme 1] *was, I was an elective CS from early on in my pregnancy. Very much enjoyed participating in this study and communication was easy and very accessible." (Louise, Planned CS)*

I went back and re-analysed women's interview data related to Theme 1. Mostly, women who had a planned CS had a more positive experience. This was noted in the description of Theme 1 (section 5.2.3.1). This was done to ensure transparency and authenticity by acknowledging views of the 23% of women.

5.2.5.Summary and conclusion of chapter 5 part two

These findings describe women's views of factors influencing the decision for their birth and their involvement in the decision-making process for CS. Breech presentation and poor past obstetric history were some of the reasons why women had a planned CS. Lack of progress in labour, failed induction and fetal distress were the most common reasons why women had an unplanned CS. Women described being admitted to the hospital in the early stage of labour (not labouring at home for longer), having pethidine and/or epidural to manage pain as factors that contributed to slow and/or lack of progress in labour, ultimately leading up to an unplanned CS. While women's views differed according to their personal experience, in general, women who had a planned CS described their experience of being involved in decisions as being a positive one, compared to women who had an unplanned CS. Women who had a planned CS described their active involvement in the final decision to birth by CS. However, those who had an unplanned CS mainly described their lack of involvement in the events that led up to the CS, including having their labour induced. Not being listened to and not feeling empowered enough to question the professional decision was described as a disappointing experience by most women. However, one woman felt she was listened to

and was given more time to progress through her labour. Most women expressed that going through a planned CS was a positive experience due to their level of involvement in arriving at the decision to birth by CS. Despite having a desire and plan to have a natural birth, and feeling disappointed with the way decisions were made, the baby's safety was a priority for all. When concerns relating to the baby's wellbeing were raised, most women felt the decision was appropriate and timely. While some women were unsure about their role, and if they were empowered enough to ask questions, one woman clearly described 'taking a stand' in the decision-making process. Not objecting to professional decisions, and going with the flow of professionals' advice, when left with no other choice, was one of the key findings. In general, most women who felt they were well informed about the reason to have a CS described themselves as being involved in the decision-making process. Women who had a planned CS found it a positive and relaxing experience due to their level of involvement in the decision-making process. However, most women who had an unplanned CS described their labour and birth as a frustrating and traumatic experience with concerns about future birth. With regards to involvement in decision-making, in general, 'being informed and given explanations' about the events was equated with 'being involved' in the process of decision-making.

6. Chapter 6 Discussion

6.1. Introduction

This chapter discusses the integrated key findings that emerged from this study. The strengths and limitations in relation to the findings and methodology are identified.

6.2. Discussion of methods

The two goals of my study were, first, to identify and explore factors associated with and influencing decision-making for CS in nulliparous women and, second, to identify outcomes for women following birth by CS. To achieve these goals, I chose to embed and establish my study within the ongoing MAMMI study, a longitudinal cohort study of first-time mothers' health and morbidities during pregnancy and up to one year postpartum. My research study focused on establishing the caesarean section strand, and extending the study to a third site, the CWIUH. Understanding participants' personal values is a valuable component in any research process (Kivunja & Kuyini 2017), and as a midwife and a researcher, I was motivated to understand and tease out issues that influenced the decision to perform a CS in nulliparous women. Multiple complex factors influence the decision to perform CS and these needed to be explored from different dimensions and multiple perspectives. Meeting the research objectives of this study thus required the use of quantitative and qualitative methodologies, and an integration of both (Johnson *et al*. 2007). Data obtained from women's self-completed surveys and hospital records of consenting women, and one-to-one interview data from midwives, obstetricians and women were integrated to achieve the goals of this research.

6.3. Summary of key findings

This section summarises the key findings of the study for each objective.

Objective i. To identify the combination of pre-pregnancy, antenatal and intrapartum factors, non-clinical and clinical, and possible patterns, associated with birth by CS in 3047 nulliparous women in Ireland.

The key quantitative findings (chapter 4) showed a significant association between maternal age (≥40 years), treatment for infertility, being in private and semi-private care, multiple gestation, breech and other malpresentations of the fetus and the risk of having a planned CS. The risk of having an unplanned CS increased significantly with maternal age (35 to 39 years and ≥40 years), being overweight and obese/very obese, pre-existing high blood pressure and asthma, being in private care, multiple gestation, breech and other malpresentations, IOL, and use of epidural for management of pain in labour. Furthermore, when combined, women who had their labour induced and had used epidural analgesia for pain management in labour, with or without the use of an IV oxytocin infusion were at an increased risk of having an unplanned CS. In relation to maternal request, findings suggested that only a small proportion of women (4.76%) requested a CS.

Objective ii. To identify the postpartum morbidities experienced by nulliparous women who birthed by CS and compare these to morbidities experienced by women who birthed vaginally.

Quantitative findings are presented on mode of birth with outcomes/morbidities in the immediate and up to 3-months postpartum periods (Chapter 4). The key findings suggested that birthing by CS was significantly associated with the risk of increased blood loss at birth (≥500mls), baby's admission to NICU, increased duration of hospital stay postpartum (≥4 days), and administration of antibiotics in the immediate postpartum period. The risk of developing a wound infection was significantly associated with an unplanned CS in the immediate and up to 3-months postpartum period compared to women who had vaginal births.

Objective iii: To explore, from the perspectives of obstetricians (n=20), midwives (n=15) and women (n=20), the factors that influenced the decision to perform a CS, and women's views of their involvement in the decision-making process.

Analysis of clinicians' interview data (Chapter 5 Part one) suggested that clinicians' beliefs and predetermined views on CS were key drivers in the decision-making process for CS. Decision-making for CS was influenced by clinicians' perceived fear of adverse outcomes from vaginal birth and subsequent litigation, their individual interpretation, practice pattern, convenience and organisational guidelines, for example, criteria for inducing labour, diagnosis of fetal distress or labour dystocia, etc. A difference in practice for women in public versus private care was described as a factor influencing the decision to perform a CS; however, some clinicians believed that it did not influence their own practice.

Analysis of women's interview data (Chapter 5 Part two) suggested that maternal request due to poor outcomes (miscarriage and termination of pregnancy) in previous pregnancies, and breech presentation, were some of the reasons for having a planned CS. Lack of progress in labour, IOL, and fetal distress were common reasons for having an unplanned CS. To some extent, women's views varied depending on the type of CS. Women who had a planned CS mostly described positive experiences with their level of involvement in the process of arriving at the decision to have a CS. Women who had an unplanned CS, mostly viewed themselves as not being involved, going along with professional advice, sometimes with disappointment and frustration around the decision-making process and subsequent outcome. Despite a desire to have a natural birth, and lack of involvement in and frustrations around decision-making, the baby's safety was regarded as a priority by every woman. Women regarded 'being informed and given explanations' about the events as 'being involved' in the process of decision-making.

6.4. Integration of key findings

There are several suggested strategies to integrate, interpret and report findings from mixed methods research, such as integration through narratives, data transformation and joint display. Integration through narratives involves describing both quantitative and qualitative findings together theme-by-theme; transformation converts one type to the other, and joint display enables integration and interpretation by bringing the

quantitative and qualitative findings together in order to draw new conclusions through a visual presentation (Fetters *et al*. 2013). Joint display was chosen to integrate and report a visual representation of the findings of this study (Figure 6-1) from both phases, drawing comprehensive and new conclusions (Guetterman *et al*. 2015).

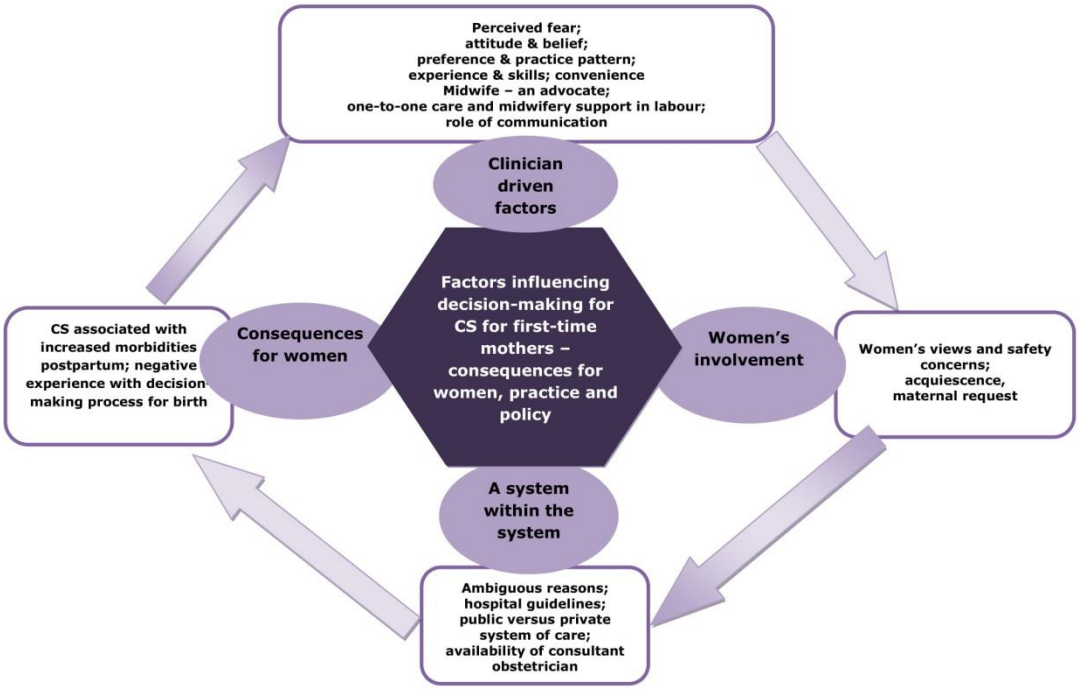

Figure 6-1 Factors influencing decision-making for CS and consequences for women, practice and policies - integration of findings from quantitative and qualitative phases

The key findings derived, and conclusions drawn from integration of findings are presented in Table 6-1 alongside the supporting findings from the qualitative and quantitative phase.

Table 6-1 Joint display of key findings on factors associated with and influencing decision-making for CS and consequences for women with supporting findings from qualitative and quantitative phases

Key findings	Supporting findings from qualitative phase – clinicians' and women's views	Supporting findings from quantitative phase
A system within the system:		
Ambiguous reasons**:** Consideration of the broad clinical picture – maternal characteristics (age, BMI, treatment for infertility)	**Clinicians:** Clinicians viewed maternal characteristics such as women's age and BMI, and individual cases with fertility investigations or treatment etc., as some of the major influencing factors in the decision to perform a CS.	Being aged ≥ 40 years (ARR 2.77, 95% CI 1.52-5.05, p=0.001) and treatment for infertility (ARR 2.03, 95% CI 1.38-2.99, p<0.001) were significantly associated with planned CS. Factors significantly associated with an unplanned CS were maternal age (35-39 years (ARR 1.42, 95% CI 1.13-1.78, p=0.001) and ≥40 years (ARR 2.12, 95% CI 1.52-2.96, p<0.001)) and pre-pregnancy BMI (being overweight (ARR 1.53, 95% CI 1.28-1.83, p<0.001) and obese/very obese (ARR 1.44, 95% CI 1.14-1.82, p=0.001))
Breech presentation	**Clinicians:** Breech presentation was viewed as one of the common reasons for planned CS, and ECV was regarded as an essential procedure to avoid CS. **Women:** Women who had a planned CS, mostly due to breech presentation, were pleased with the decision and described being in control of their birth as a positive experience.	Breech including other malpresentations were significantly associated with the risk of having a CS (planned (ARR 15.99, 95% CI 11.77-21.74, p<0.001) and unplanned (ARR 3.46, 95% CI 2.63-4.54, p<0.001 CS).
Hospital guidelines: IOL, use of IV oxytocin, epidural for management of pain in labour	**Clinicians:** IOL was perceived to be a major contributing factor. High rates of IOL with flexible criteria and ambiguity in reasons for inducing labour were viewed as influencing the overall rise of CS rates. **Women:** Having to have a CS was linked with IOL. Failed IOL was one of the common reasons for an unplanned CS in women whose labour was induced. One woman linked having an epidural for pain	The risk of an unplanned CS increased significantly for women who had IOL with epidural and both, with IV oxytocin (ARR 1.70, 95% CI 1.44-2.01, p<0.001) and without IV oxytocin (ARR 2.06, 95%CI 1.57-2.69, p<0.001). The risk of having an unplanned CS increased significantly for women who had an epidural for pain management in labour (ARR 1.95, 95% CI 1.52-2.50, p<0.001).

	management in labour as the reason for her slow progress leading to CS.	
Public versus private system of care and outcomes	**Clinicians:** Clinicians believed that there was an obvious difference in public versus private system of care with an inclination to follow standardised guidelines for women in public care, and more individualised care for women in private care. However, some clinicians did not agree that this reflected their practice. Care and outcomes of women attending privately were not discussed at audit meetings, which were believed to influence decision-making for these women. **Women:** One woman, in public care, regarded private care as an option to avoid delays in decision-making.	Women in private care were significantly more likely to birth by planned (ARR 2.78, 95% CI 1.92-4.04, p<0.001) and unplanned (ARR 1.51, 95% CI 1.24-1.83, p<0.001) CS.
Availability of consultant obstetricians	**Clinicians:** Presence of a consultant obstetrician in the labour ward was viewed as essential for decision-making, especially for lack of progress in the second stage of labour.	There are no quantitative findings to support this.
Women's involvement: Women's view & safety concerns	**Clinicians:** Clinicians perceived that women viewed CS as a safe, easy and end option, and described that women's underlying fear had an influence on their decision-making for CS. **Women:** Concern related to safety of the baby was one of the main reasons why most women 'agreed' with the obstetricians' recommendation to have a CS.	There are no direct results to quantify this key finding. However, women in private care received direct care from their consultant obstetrician, and decision-making for these women was directly influenced by the consultant obstetricians' decision. Quantitative findings support this key finding indicating a significant association of private care with increased risk of CS (planned (ARR 2.78, 95% CI 1.92-4.04, p<0.001) and unplanned (ARR 1.51, 95% CI 1.24-1.83, p<0.001)).
Involvement/ Acquiescence	**Clinicians:** There were contradictory findings in relation to women's active involvement in the decision-making process for CS. Some clinicians perceived women as being informed, and hence, they played an active role, whereas others viewed women as having a	There are no quantitative findings to support this.

	limited role in the decision-making process for their birth, especially for unplanned CS. **Women:** Some women did not feel empowered enough to question the professional decision, while others believed that 'going with the flow' and accepting professionals' recommendation was the right decision for themselves and their baby.	
Maternal request	**Clinicians:** Maternal request was not regarded as being a major factor influencing the decision to perform a CS. Some obstetricians were open to accepting and approving maternal request when the woman was aware of the risks associated with CS. **Women:** Of the 20 participants, one woman requested a CS, to have a sense of control in her birth due to poor outcomes from previous pregnancies (a spontaneous miscarriage in first pregnancy and termination of second pregnancy due to fetal anomaly).	Data were available for a small proportion of women (48/707, 5.5%) on maternal request for CS. Of these, the majority had an unplanned CS (39/48, 81.25%), five women (5/48, 10.42%) had a planned CS, one woman had a vaginal birth (1/48, 2.08%), and data were missing for three. This indicated that only a small proportion of women (5/105, 4.76%) who requested a CS had a CS.
Clinician driven factors: Perceived fear and safety concerns	**Clinicians:** Fear of adverse outcome from vaginal births, and possible legal consequences/litigation were reported by all the clinicians to be a major influencing factor.	The quantitative findings on increased morbidities for women who had a CS compared to women who had SVBs disprove clinicians' perceived 'fear of adverse outcome from vaginal birth'. Quantitative findings indicated that an unplanned CS significantly increased the risk of blood loss at birth (≥500mls) (planned CS (ARR 2.05, 95% CI 1.44-2.93, p<0.001) and unplanned CS (ARR 3.24, 95%CI 2.67-3.93, p<0.001)), increased duration (≥4 days) of hospital stay postpartum (planned (RR 9.53, 95%CI 6.84-13.30, p<0.001) and unplanned (RR 7.65, 95%CI 5.75-10.18, p<0.001)), and increased use of antibiotics (ARR 1.86, 95%CI 1.42-2.45, p<0.001) postpartum, developing wound infection in the immediate (ARR 7.05, 95%CI 3.09-16.08, p<0.001) and up to 3-months postpartum (ARR 3.25, 95%CI 2.20-4.79, p<0.001)

		period.
Attitude, belief, preference & practice pattern	**Clinicians:** Clinicians' attitude and beliefs had a major influence on their decision-making for CS. Individual obstetrician's preference, practice pattern and interpretation, level of threshold and tolerance to wait for a natural progression of labour had direct influence on decision-making. **Women:** Clinicians' attitude and beliefs were viewed as limiting their choices of care. For example, women who wanted to wait for spontaneous onset of labour felt they had to agree to the obstetricians' decision to be induced.	The quantitative findings indicated a significant association of private care with CS (planned (ARR 2.78, 95% CI 1.92-4.04, p<0.001) and unplanned (ARR 1.51, 95% CI 1.24-1.83, p<0.001)), which supports this key finding on influence of individual obstetricians' attitude, preference and practice pattern on the decision-making process for CS.
Experience, skills & confidence	**Clinicians:** Clinicians' level of experience, confidence and skill in managing a clinical situation influenced their interpretation and management of the situation.	There are no quantitative findings to support this.
Convenience	**Clinicians:** Obstetricians' 'convenience' was perceived as a factor that influenced decision-making for induction and management of labour and, ultimately the decision for CS.	There are no quantitative findings to support this.
Midwife – an advocate for women	**Clinicians:** The midwife's role in most circumstances was viewed as an 'advocate' for the women. However, their role varied widely depending on the clinical situation and obstetrician on call for the labour ward.	There are no quantitative findings to support this.
One-to-one care and midwifery support in labour	**Clinicians:** Clinicians viewed one-to-one midwifery care as important aspects in care of women, which ultimately influenced decision-making for CS. **Women:** Lack of continuous and one-to-one midwifery support was described by some women as factors influencing their progress in labour and outcome.	There are no quantitative findings to support this.
Role of communication	**Clinicians:** Women's involvement in decision-making was influenced by the information presented to them by the clinical team and was regarded as vital.	There are no quantitative findings to support this.

	Communication among clinicians; midwives with their obstetric colleagues, and junior obstetricians with their senior colleagues, influenced the outcome of the decision. **Women:** Women viewed being 'informed' during the decision-making process as equating with 'being actively involved'.	
Consequences for women	**Women:** Most women who had an unplanned CS described their frustration, disappointment and negative experiences with the decision-making for their CS and outcomes of birth. Most women viewed a lack of involvement in the decision-making process as disappointing. Some women described their experience as being a positive one with satisfaction over the outcome of decision-making, while others explained it as a traumatic experience.	There are no quantitative findings to equate women's emotional feelings and outcomes. However, findings from women's self-completed surveys at 3-months postpartum and hospital data suggested increased postpartum morbidities associated with birth by CS compared to those experienced by women who had vaginal births. Risk of increased blood loss at birth (≥500mls) was higher for women who had a CS (planned (ARR 2.05, 95% CI 1.44-2.93, p<0.001) and unplanned CS (ARR 3.24, 95%CI 2.67-3.93, p<0.001)), with an increased duration (≥4 days) of hospital stay postpartum (planned (RR 9.53, 95%CI 6.84-13.30, p<0.001) and unplanned (RR 7.65, 95%CI 5.75-10.18, p<0.001)), and increased use of antibiotics in the immediate postpartum period (ARR 1.86, 95%CI 1.42-2.45, p<0.001). CS increased the risk of developing wound infection in the immediate (ARR 7.05, 95%CI 3.09-16.08, p<0.001) and up to 3-months postpartum (ARR 3.25, 95%CI 2.20-4.79, p<0.001) period.

6.5. Discussion of key findings with reference to literature

This section discusses the key findings in the context of empirical and theoretical literature. The discussion is presented for the key findings derived from integration of findings from quantitative and qualitative phase of the study.

6.5.1. A system within the system

6.5.1.1. Ambiguous reasons

Consideration of the broad clinical picture

Lack of clarity in the reason(s) to perform a CS was one of the key findings. In recent years, a number of factors have been under consideration as possible influences in the decision-making process to perform a CS. Changing risk profiles and maternal characteristics, such as increasing maternal age and high BMI (Womack *et al*. 2014, Brick *et al*. 2016, Sebastio *et al*. 2016), treatment for infertility (Renes *et al*. 2017) etc., are reported as contributing to the rise in CS. Often there is ambiguity around what health professionals believe are clinical indications for CS (Panda *et al*. 2018b). These support the findings of this study which found a significant association of CS between maternal age (being aged ≥ 40 years (ARR 2.77, 95% CI 1.52-5.05, p=0.001) with planned CS and aged 35-39 years (ARR 1.42, 95% CI 1.13-1.78, p=0.001) and ≥40 years (ARR 2.12, 95% CI 1.52-2.96, p<0.001) with unplanned CS)), pre-pregnancy BMI (being overweight (ARR 1.53, 95% CI 1.28-1.83, p<0.001) and obese/very obese (ARR 1.44, 95% CI 1.14-1.82, p=0.001) with unplanned CS), and treatment for infertility (with planned CS (ARR 2.03, 95% CI 1.38-2.99, p<0.001)). These were confirmed by clinicians in the qualitative phase as being major factors influencing decision-making for and contributing to the rise in CSs. A clarity and consistency in the pathway of care underpinned by the belief in normal birth, managing early labour and avoiding IOL were regarded by Swedish clinicians as vital aspects in their decision-making process (Panda *et al.* 2018a). Change in maternal demographics partly contributes to the decision-making for CS; however, this does not fully explain the overall decision-making, and rising CS rates in nulliparous women (Brick *et al*. 2016). In Sweden, the CS rates have stayed at a 15-18% level for decades

(Euro-Peristat Project 2018), despite an increase in average maternal age (Eurostat Fertility Indicators 2019) and obesity (Molarius *et al*. 2016). Some literature has suggested that women with higher BMIs have their labour managed differently, with greater use of epidural and IV oxytocin in labour, and earlier decisions to perform CS in the second stage (Abenhaim & Benjamin 2011). Clinicians' views from other studies support this, indicating that care of women with obesity is complex and challenging, with over-medicalisation of intrapartum practices, and have suggested challenging the current practices as a way to promote normality and optimise normal birth among obese women (Kerrigan *et al*. 2015). It may be that, in countries with a culture and attitude that supports vaginal birth, clinicians are more willing to 'allow' women of increased age or higher BMI to continue labouring for longer, provided that the fetal health is maintained.

6.5.1.2. Breech and other malpresentations

Fetal breech presentation was one of the most common reasons for planned (ARR 15.99, 95% CI 11.77-21.74, p<0.001) and unplanned (ARR 3.46, 95% CI 2.63-4.54, p<0.001) CS, supported by qualitative findings, and other studies (Kamal *et al.* 2005, Colomar *et al.* 2014, Brick *et al.* 2016). Clinicians viewed performing vaginal breech birth as a lost skill, and all interviewed women with a fetus persisting in breech presentation had a CS. One woman described her reluctance to have ECV, and how all her other attempts to turn the baby to cephalic presentation had failed. If she was in her country of birth, she felt she would have had the option to try for a vaginal birth, but giving birth in Ireland left her with no choice. Since the publication of the findings of the term breech trial (Hannah *et al*. 2000), planned CS has become the preferred mode of birth for all women with breech presentations. Although the methodology and findings of the trial were critiqued (Glezerman 2006, Lawson 2012), it led to changes in clinicians' practice. Some obstetricians and midwives in this study described the 'term breech trial' as having done the biggest damage to obstetrics by changing the practice which led to a loss of skill of conducting vaginal breech births. Guidelines from the Health Service Executive (HSE) in Ireland recommend conducting vaginal breech births (HSE Guideline 2017); however, the practice has remained unchanged in all the maternity units in

Ireland. The National Institute of Healthcare and Excellence (NICE) guidelines recommend offering ECV to all women with singleton and uncomplicated pregnancy presenting with breech presentation before proceeding to a planned CS (NICE Guidelines 2011). However, restrictive hospital guidelines on offering and performing ECV was regarded as a substantial factor in the care pathways for women with breech presentation in the current study. Clinicians agreed that with the ongoing practice of planned CS for all women with breech presentations, clinicians lack the practice and necessary skills to facilitate a vaginal breech birth and regarded it as a 'lost skill'. Clinicians viewed this as a challenge to reverse the current trend in practice. These accumulating factors affecting current clinical practice have left women with breech presentations, who wish to plan a vaginal birth, with limited choice, and this is supported by the literature (Roumen & Nijhuis 2001, Hunter 2014). However, recent studies that reported an increased risk of neonatal morbidities following a vaginal breech birth compared to planned CS for breech presentations (Bin *et al*. 2016, Berhan & Haileamlak 2016) added to the controversies associated with the safety of vaginal breech birth.

6.5.1.3. Hospital guidelines

Many clinical factors, taken together within an organisational context or system of practice had an influence on the decision-making process for CS. Organisational guidelines for IOL, use of epidural for management of pain in labour and use of IV oxytocin in labour, etc., influence decision-making and contribute to the rise in CS rates. The risk of CS in the current study increased significantly for women whose labours were induced and who used epidural analgesia for management of pain in labour, with IV oxytocin (ARR 1.70, 95% CI 1.44-2.01, $p<0.001$) or without IV oxytocin (ARR 2.06, 95%CI 1.57-2.69, $p<0.001$). This is supported by other studies which report an increased rate of CS following IOL, and use of epidural (Chaillet *et al*. 2007, Yazdizadeh *et al*. 2011, Kupens *et al*. 2013, Sebastio *et al*. 2016). Apart from clinical indications, performing an IOL was linked with convenience and not performing IOL over weekends (Chaillet *et al*. 2007). In this study, the rate of IOL was reported, by clinicians in all three study sites, as being very high. Most clinicians perceived IOL as one of the major

factors contributing to the rise of CS rates. Clinicians described flexibility in the criteria for inducing labour and lack of consistency in the decision to induce as leading to the high rates of IOL, ultimately, leading to more 'failed inductions' and CSs. According to clinicians, their personal beliefs, combined with pressure from women, and a belief among women about IOL being the right way to end a pregnancy, influenced the rates of IOL, although women's views did not concur with the same. Women in the study linked their CS with IOL, with frustration, disappointment and other negative experiences in the process of making the decision to be induced, which is supported by recent studies that found women's negative birth experiences being associated with failed IOL (Chen *et al*. 2018).

Hospital guidelines or criteria for performing IOL varied. Some considered term plus twelve days as the correct gestation for IOL, others had documented term plus ten. Regardless of the guidelines, IOL was viewed as a common and frequent practice among consultant obstetricians for women in their private care with no or limited rationale for the decision to perform IOL.

While some guidelines, such as criteria for IOL, were flexible, others, such as guidelines for managing labour, diagnosis of labour dystocia, fetal distress, etc., had a major influence on clinicians' day-to-day decision-making for CS. For example, the management of labour guidelines required a woman to go through a vaginal examination every two hours to check progress of labour, and augmentation of labour with artificial rupture of membranes and/or IV oxytocin if the progress was not satisfactory (1cm cervical dilatation per hour in active phase of labour). Past Cochrane reviews have reported routine two hourly vaginal examination (Downe *et al*. 2013), artificially rupturing the membranes (Smyth *et al*. 2013) or augmentation of labour with IV oxytocin infusion (Bugg *et al*. 2013) as having no association with reducing CSs. These interventions, in most occasions, followed the cascade of interventions due to potential hyperstimulation of the uterus due to use of IV oxytocin, use of epidural for pain relief, resulting fetal distress, and intervention in the natural progression of labour through frequent vaginal examinations, and fetal

blood sampling (FBS) tests. FBSs are performed to assess fetal well-being through testing a sample of blood obtained from the fetal scalp to check fetal oxygenation levels, etc., which helped to decide if the woman can wait to progress in labour or requires a CS. FBS is a common practice to diagnose fetal distress in labour, however, some hospitals have strict guidelines to repeat the test a maximum of three times, following which a decision is made to proceed for CS, regardless of the fetal heart rate pattern on the cardiotocograph (CTG) recording. Clinicians described this cascade of events as a routine way of managing labour or IOL in their day-to-day clinical practice. This, in the first place, could have been possibly avoided by giving the woman time to progress naturally with no or limited interventions such as frequent vaginal examinations, artificial rupture of membranes, IV oxytocin, etc. Studies support this by reporting no reduction in CSs through a proactive management of labour compared with an expectant management with no or limited intervention (Kuppens *et al*. 2013). Clinicians from countries with low CS rates, like Sweden, have described expectant management as substantial in promoting normal births, and believed this helped them maintain low rates of CS in their settings (Panda *et al*. 2018a).

6.5.1.4. Public versus private system of care

The influence of private practice on decision-making is reported frequently in literature (Potter *et al*. 2001, Arikan *et al*. 2011, Womak 2014, Colomar *et al*. 2014, Litorp *et al.* 2015b, Schantz *et al*. 2016). There are different factors influencing decision-making in private practice, mainly related to the pay and reimbursement system. The financial incentives associated with CS and benefit to the consultants in private practice is one of the frequently reported factors that influenced decision-making for CS (Yazdizadeh *et al*. 2011, Litorp *et al*. 2015b, Parás Valljos *et al*. 2018). Continuity of care by a private consultant is another explanation that is often described as a factor influencing private consultants' decision-making for women in their care, and women are inclined to rely on their care provider's recommendation in any given situation, as described in other studies (Murphy & Fahey 2013). The influence of 'convenience' emerged, in many studies, as one of the major factors influencing obstetricians' decision-making, for women in their

private care, mainly because of a lack of consensus on indications for performing CS, and lack of audit of consultants' private practice (Arikan *et al*. 2011, Litorp *et al*. 2015b). Women in private care often chose their care provider with a predetermined plan for a type of birth, and obstetricians' belief in women's right to choose a CS were other factors influencing their decision-making (Arikan *et al*. 2011, Litorp *et al*. 2015b). Findings from this study resonate with what has been reported previously in relation to the influence of private practice on decision-making for CS by Sinnott *et al*'s (2016). Women in private care were two and half times more likely to birth by planned CS (ARR 2.78, 95% CI 1.92-4.04, $p<0.001$) and one and half times more likely to birth by unplanned CS (ARR 1.51, 95% CI 1.24-1.83, $p<0.001$), compared to women in public care. Midwives, who were involved in providing care to women in both public and private care, and their obstetric colleagues, agreed that private care influenced decision-making, and offered different explanations for this. First, the care and decision-making for women attending privately was influenced by the consultant's personal preference, attitude and practice pattern. Whether it was to do with induction or diagnosis of labour or threshold to intervene, management and care of women in private practice differed to women with similar profiles or comparable complex histories in public practice. Women attending privately were viewed as having complex medical/obstetrical histories which influenced the decision-making for their mode of birth. Second, the lack of audit of private care practices was viewed as another reason for individualised practice by consultant obstetricians, based on their own preference, practice pattern and convenience. Regular audit of clinical practice, indications for CS and feedback to professionals is frequently reported as being associated with helping clinicians in decision-making, ultimately reducing CSs (Chaillet *et al*. 2015). Third, clinicians viewed that being in private care gave women a sense of being in control of their care, with more choices, compared to women in public care. Regardless of the different explanations, an individual consultant obstetrician's own belief, attitude and practice pattern was the key driver in determining the mode of birth for women in private care. This is supported by other studies which showed the influence of private practice on decision-making for CS, not fully accounted for by medical/obstetric risks (Murphy & Fahey 2013, Nijagal *et*

al. 2015, Brick *et al*. 2016, Sinnott *et al*. 2016, Hoxha *et al*.2017, Rivo *et al*. 2018). Maternity units with no private practice had consistency and transparency in care pathways for women, and these were regarded as promoting normal birth in settings with a low rate of CS (Panda *et al*. 2018a). Clinicians in these units described their practice as being transparent and consistent for all women and not being influenced by personal attitude, preference and individualised practice pattern (Panda *et al*. 2018a).

6.5.1.5. Availability of consultant obstetrician

With the existing hospital policy, consultant obstetricians are not bound to be present in the hospital over the 24-hour period, and decision-making in out-of-hours times relies on a telephone discussion between the senior registrar on call and the consultant obstetrician. Consultants in the study described themselves as 'being at the mercy' of what was communicated to them by the registrar on call. The presence of a consultant obstetrician on labour ward out of hours was viewed as an important aspect to have an expert decision. Consultants' approval of the decision to perform a CS or wait for a vaginal birth was mostly influenced by the level of experience of the obstetric registrar who discussed the case scenario with the consultant obstetrician over the phone. Overall, most clinicians in the study stated that a consultant obstetrician's presence made a difference to decision-making. Lack of input from a senior clinician as influencing decision-making is discussed in literature (Althabe *et al*. 2004, Panda *et al*. 2018a, Kingdon *et al*. 2018) with suggestions of potential benefits to outcomes for mothers and babies when senior personnel are available on site.

6.5.2.Women's involvement

6.5.2.1. Women's views and safety concerns

The importance of respectful and balanced maternity care is frequently highlighted in literature (Miller *et al*. 2016, Downe *et al*. 2018, Begum *et al*. 2018). 'Respectful' care means genuinely involving women in their care, not just making them feel part of the process, and 'balanced' care means maintaining a balance between 'too little too late (TLTL)' and 'too much too soon (TMTS)', the two concepts introduced by Miller *et al.* (2016).

Understanding and considering women's views in the process of shared decision-making is essential in the pathway to providing respectful maternity care. The concept of 'shared decision-making' has been widely used in theory and practice in recent years with greater emphasis on engaging women in their care and 'genuinely involving' them in their care as opposed to 'making them feel' part of the decision-making process for their care (Begley *et al.* 2019).

Women's views and concerns relating to their baby's safety were described by clinicians as a factor that determined their mode of birth. Clinicians in the study believed that women viewed CS as a safe, easy and end option, and that their underlying fear of labour influenced their decision-making for CS. This was not evident from interviews with women in this study. Women described concerns related to safety of their baby as one of the main reasons why they 'agreed' with the obstetrician's recommendation to have a CS. Although disappointed with the decision, some women described their CS as a timely and appropriate decision, for the safety of their baby.

6.5.2.2. Involvement/Acquiescence

Women in the study described having varying degrees of involvement in the process of decision-making. Those who had a planned CS described positive experiences compared to those who had an unplanned CS. Giving birth to a healthy baby was a priority for every woman in the study, supported by other literature (Sharpe *et al*. 2015, Downe *et al*. 2018), along with experiencing a sense of control in getting involved in active decision-making (Downe *et al*. 2018). In this study, the integration of findings from multiple perspectives indicated a 'parallel system' within the current system of care. Clinicians claimed their decision to be appropriate for women in their care and made in consultation with women, and women believed the clinicians' decision to be appropriate and timely, and described themselves as 'going with the flow', regardless of their desire to give birth naturally. There existed an opposing view of decision-making from clinicians' and women's views. Most clinicians believed that women were playing an active role, although some viewed women's role as being limited in the process of decision-making; the women, however, equated 'being informed' to 'being

involved'. Other studies have also reported clinicians' views in the context of women's role and involvement in decision-making by equating 'informed consent' with 'shared decision-making' (Bryant *et al*. 2007). Obstetricians in Bryant *et al*'s study (2007) believed that certain clinical situations limited women's choice, and women on the other hand described their experience as having to go through a CS as it was 'needed' and recommended, and not being involved in the decision-making process, similar to the views of clinicians and women in my study.

6.5.2.3. Maternal request

Analysis of available data on maternal request for CS found that only a small proportion of women sought a CS (n=48/873, 5.5%), and a small proportion (5/105, 4.76%) who requested a CS had one. This was smaller compared to the proportion reported in hospital records as maternal request being the reason for planned CS (13/166, 7.83%). This was agreed by clinicians in the qualitative phase. Maternal request was not perceived as a major factor in the decision to perform CS for first-time mothers. Most clinicians in the study said they would agree to perform a CS on request when the woman was aware of the risks involved. Only one woman who participated in the qualitative phase requested a CS, because of her history with previous pregnancies, and described having a sense of control, and a positive experience. Although maternal request was not viewed as a key factor, the findings of my systematic review on clinicians' views of factors influencing decision-making for CS found maternal request as a key factor influencing clinicians' decision-making (Panda *et al.* 2018b). However, many studies have found that maternal request had minimal effect on overall decision-making for CS (Gamble & Creedy 2000, McCourt *et al*. 2007). Gamble and Creedy (2007) emphasised the inadequate acknowledgement of obstetric factors in relation to women's request for CS. Often there are differences between midwives' and obstetricians' attitude towards maternal request. Most studies stated that obstetricians, more so than midwives, tend to agree to and approve a woman's request for CS, and believed in women's right to have a CS in absence of medical indications (Bryant *et al*. 2007, Josefsson *et al*. 2011). Apart from obstetric and medical factors, many studies have identified the need to understand other factors that

contribute to maternal preferences or requests for CS, such as psychological factors with fears and worries about labour and birth, background factors such as treatment for infertility, etc. (McCourt *et al.* 2007). This is supported by the quantitative findings suggesting a significantly increased risk of planned CS among women in the study who had treatment for infertility (ARR 2.03, 95% CI 1.38-2.99, p<0.001). Professionals often interpreted women's concerns as their preferences and as a request to give birth by CS, and attributed the decision-making for CS largely to women's request, more so than what women themselves said (McCourt *et al*. 2007). A woman's description of her concern and a clinicians' interpretation of the same concern as a preference or request creates a question around communication between women and their care provider, and the adequacy of information provided to women on the risks associated with birth by CS (Malik 2017, Chen *et al.* 2018). Although women have the authority to make their birthing choices, their thinking and decisions are often guided by care providers' beliefs and an institutional discourse of 'safe/unsafe', which eventually steers a woman's decision to 'agree' to a professional's recommendation (Bryant *et al*. 2007).

6.5.3.Clinician driven factors

6.5.3.1. Perceived fear

Clinicians' perceived fear was the key driver in the decision-making process. All the clinicians in the study reported its influence and described three dimensions to it. First, fear about adverse outcomes and subsequent litigation was described as a major influence. Some midwives described their fear as a 'learned behaviour' from senior midwives or colleagues or the clinical environment, while others described it as an 'inevitable' part of the defensive practice. Few said that it did not influence their practice. While some newly qualified midwives believed in applying evidence to their practice; others, mostly very senior midwives and managers, preferred to continue with their own way of practice. Although it was claimed to be very much joint decision-making, clinicians in the study believed that there were differences in where the power was held or where the greatest influence was exerted. This was the case among obstetricians too, where, despite the

inclination to follow evidence-based practice and standard hospital guidelines, many junior obstetricians agreed with their senior colleagues, which is supported by other studies (Litorp *et al*. 2015b). The second dimension to the concept of 'fear' was in the context of past experience of dealing with a bad outcome or witnessing a colleague going through one, which had an ongoing impact on decision-making, similar to findings from other studies (Yazdizadeh *et al.* 2011) which reported about social stigma being associated with litigation issues, and the ultimate impact on decision-making. The general perception that Ireland was a litigious society with public shaming in the media of bad outcomes from birth was the third dimension which impacted on clinicians' decision-making forever. Ireland is ranked 22 out of 179 countries as being a safe place to give birth (State of the world's mothers 2015), yet questions have been raised in the media in the past in relation to shortcomings in maternity services for mothers giving birth in Ireland (Shannon 2017). The current rising rates of interventions, steady rise in CS rates over the years, and an increased number of enquiries (State Claim Agency Report 2015) have raised concerns over maternity services and the safety of giving birth in Ireland. The concept of safety will need to be debated against decision-making to justify if the care for women and practice is 'evidence based' versus 'fear-based', and related to clinicians' preference, attitude, practice pattern and convenience, which is largely supported by other studies (Adinma 2016, AlDakhil 2016, Kingdon *et al*. 2018, Hadjigeogius *et al*.2018). Incidents pertaining to CS were one of the most common claims reported by the State Claims Agency over a period of five years (from 2010 to 2014) (State Claim Agency Report 2015). Clinicians suggested that the media portrayal of incidents in Ireland's maternity services has ultimately led to defensive practice among care providers. This was a key finding in my systematic review (Panda *et al*. 2018b). Clinicians, often not being in a position to explain their individual clinical circumstances, described increasing concerns about the power of social media and its negative impacts on their short-term and long-term practice, which was evident from the views of clinicians from 21 different countries in the systematic review (Panda *et al*. 2018b).

6.5.3.2. Attitude, belief, preference and practice pattern

Clinicians' personal beliefs and attitude influenced their decisions. Individual obstetricians' and midwives' preferences and interpretation was viewed to have a major influence on the decision-making on any given day. For example, while some clinicians attempted to manage signs of fetal distress with either a change of position, IV fluids, etc., others preferred to intervene, through repeated vaginal examinations, FBSs, etc., at an early stage. The influence of individualised practice pattern among senior midwives and on-call senior obstetricians ultimately determined how any given situation was managed and the overall outcome for women. Anecdotally, some obstetricians and midwives, often very senior ones, intervened as soon as any signs of fetal distress were evident on the CTG monitor. These early interventions, such as a decision to perform a FBS, put the woman on the pathway towards further interventions, performing frequent vaginal examinations, repeated FBSs, which ultimately lead to a CS, which could possibly be avoided by understanding the reasons for early signs of fetal distress and attempting alternative measures to correct them. As discussed earlier, individualised practice and its influence was more evident among consultant obstetricians in private practice. Clinicians from countries with low rates of CS have described a 'belief in normal birth' as a key to maintaining a low rate of CS (Panda *et al.* 2018a). Obstetric care providers' preferences and attitude and a belief that CS is safer than vaginal births, despite ongoing debate surrounding unnecessary CSs, are key factors influencing their preference and decision to perform CSs (Rivo *et al*. 2018, Vallejos Parás *et al*. 2018).

6.5.3.3. Experience and skills

Clinicians emphasised the importance of experience, skills and confidence in the process of decision-making. Whether it was a midwife's skill and confidence in helping a woman experience a normal vaginal birth or an obstetrician's skills and confidence in managing a difficult instrumental birth, the clinicians' level of experience and skill were valued as essential factors. Again, this was linked to clinicians' perceived fear of adverse outcomes and subsequent legal consequences and drove their decision-making. Most clinicians viewed themselves as being in a system of

defensive practice. Clinicians from countries with no pressure and fear of litigation issues viewed their practice and decision-making as not being influenced by any external pressure or fear and regarded clinicians' experience as an important factor in the decision-making process (Panda *et al.* 2018a). Some studies have reported clinicians' perception of being skilled in conducting a CS as one of the factors influencing their preference to perform CS over vaginal births (Vallejos Parás *et al*. 2018), and found performing a CS more convenient compared to waiting for the uncertainties of vaginal birth.

6.5.3.4. Convenience

Obstetricians' convenience was regarded as another factor that influenced the outcome of decision-making in the current study, similar to the findings from the systematic review (Panda *et al.* 2018b) and other studies that attributed 'convenience' to obstetricians' perception of CS being an orderly, planned and convenient option compared to vaginal birth (Litorp *et al*. 2015b, Carrera *et al*. 2017, Hardjigeorgeus *et al*. 2018, Kingdon *et al*. 2018, Panda *et al*. 2018b). In the current study 'convenience' was evident mostly among consultants' private practice where IOL was planned for ambiguous reasons such as reduced fetal movements, large for gestational age (big baby), with no ultrasonograhic evidence to suggest these. IOL, as discussed earlier, lead to a cascade of events, and ultimately a CS. Consultants in private practice often claimed that women frequently chose private care to get the type of birth they desired, which was reported in past studies as one of the reasons for higher rates of CS in private practice (Murphy & Fahey 2013). Although maternal request was viewed as having no or limited influence on the decision to perform a CS among first-time mothers, consultants in private practice described their inclination to go with a woman's choice since she was paying for the service. However, women's descriptions of 'going along' with professionals' recommendations contradict clinicians' explanation of 'CS on demand', indicating a complex and 'parallel system' of care within the existing system. Clinicians in other studies have raised concerns about 'CS on demand' in private practice, describing it as malpractice (Litorp *et al*. 2015b).

6.5.3.5. Midwife – an advocate for women

Midwives in the study viewed their role as an advocate for the women in the process of decision-making, which is supported by the Nursing and Midwifery Board of Ireland (NMBI) in the practice standards for midwifery care. Midwives' role is vital in ensuring that every woman is respected as a primary decision-maker with regards to her own and her baby's health (NMBI 2015). Most obstetricians and midwives in the study viewed midwives' role as vital in the process of decision-making since they were the ones present with the woman throughout her labour. The Association for Improvements in Maternity Services (AIMS), Ireland stated women want their midwife to be an 'advocate' (AIMS 2012). In relation to maternal request, midwives were often less inclined to favour a maternal request for CS compared to their obstetric colleagues. Midwives believed that maternal request was more evident in private care, similar to other studies (Sharpe *et al*. 2015, Panda *et al*. 2018b). However, recognition of a midwives' role in the decision-making process is often hidden in the hierarchy and culture of practice (Bryant *et al*. 2007) with obstetricians being the final decision-maker. Midwives in the study viewed their role as advocates for women and did not consider maternal request as being a factor influencing decision-making for CS, except for private practice, where they believed the decision was dependent solely on the consultant obstetrician.

6.5.3.6. One-to-one care and midwifery support in labour

One-to-one care and midwifery support in labour, in the current study, were regarded as factors influencing the decision-making not to perform a CS. The presence of a midwife to support the woman continuously in labour, through one-to-one care, was valued by women (Rahimiyan *et al*. 2015, Sosa *et al*. 2018). Women's positive experience and satisfaction in the care they received, regardless of their type of birth, was valued by all the clinicians in the study. Women in the study perceived that lack of continuous midwifery support and one-to-one care were some reasons why they chose to use epidural for pain relief in labour, which ultimately led to slow progress and other series of interventions/events leading to a CS. Large studies, comparing midwifery model of care with other models, have shown that midwifery models of care were associated with a positive

outcome for women, with increased satisfaction (Bernitz *et al.* 2016), less use of epidural, less intervention in labour and more spontaneous vaginal births (Sandall *et al.* 2015, Bohren *et al.* 2017). Furthermore, one-to-one and continuous midwifery support in labour is associated with a shorter duration of labour (Sehatti *et al*. 2012), and enhanced women's experience. Studies on women's views have strongly supported continuity of midwifery care through building a trusting relationship with the midwife which made women feel empowered with a more individualised care (Perriman *et al.* 2018). In the current system of care, public and private, midwives provide care to all women. However, in the public care, midwives play an active role in decision-making with a shared approach of care compared to private care, where mostly the consultant obstetrician is the only decision maker. However, the presence of and support from a midwife and one-to-one care is always valued by all women and most obstetricians regardless of the hierarchy or organisation of care within the system.

6.5.3.7. Role of communication

In this study, communication was regarded as a key aspect in the process of decision-making. Whether it was communication between a junior and senior obstetrician, or an obstetrician and a midwife, or clinicians and women, it had a substantial influence on decision-making for CS. At clinician level, communicating a clinical scenario to a consultant over the phone for final decision-making or for a second opinion varied from one obstetrician to another. The role of the senior obstetrician (consultant) in the process of decision-making was viewed as being limited by and dependent on the scenarios presented at the time, and ultimately determined the final decision and outcome. In relation to communication between clinicians and women, most women stated the reason for their CS was communicated and explained very well, and they often equated 'being informed' about the decision to have a CS as 'being involved' in the process of arriving at the decision. The way information is presented to the woman plays a vital role in the process of decision-making (McCourt *et al*. 2007). The language used in communicating a decision is discussed in literature from different dimensions. Use of a specialised language in institutional discourse is described as a form of abstraction that removes one from the reality behind

the words (Fox Keller & Longino 1996). 'Institutional discourse' is a code language or a specialised language in institutions, often used to present information in a way that the institution can make sense of, and maternity care and obstetrics are full of examples of such discourse. For example, 'failure to progress', 'fetal distress', 'cephalopelvic disproportion', etc. These terms and the type of language used, for example 'failure', overlook what is 'real'. It is like a parallel system of care, where clinicians believed their decision to be safe and made in consultation with women, while women described it as 'agreeing' to the clinicians' decision for a safe outcome for their baby. This indicated a complex system of care where decision-making was mostly driven by clinicians' perceived fear, personal attitude, preference and convenience more so than evidence.

6.5.4.Consequences for women

Discussions around decision-making for CS often overlook the fact that a CS is a surgical procedure with numerous potential complications for both women and babies. A number of selected outcomes/postpartum morbidities, identified from previous studies, were analysed in the current study to assess their association with mode of birth in the immediate and up to 3-months postpartum periods. CS (planned (ARR 2.05, 95% CI 1.44-2.93, $p<0.001$) and unplanned (ARR 3.24, 95%CI 2.67-3.93, $p<0.001$)) was significantly associated with the risk of having an increased blood loss at birth (≥500mls). The risk of blood loss was three times higher with an unplanned CS compared to SVB. These findings are supported by other large studies indicating an increased risk of blood loss, even necessitating a hysterectomy, in planned CS compared to planned vaginal birth (Liu *et al.* 2007; Karlstrom *et al.* 2013). PPH, associated with CSs, has been frequently reported to be one of the leading causes of maternal deaths (Alexander *et al.* 2003; Esteves-Pereira *et al.* 2016) and one of the commonly reported incidents for legal claims in Ireland (State Claims Agency 2015).

Wound infection is one of the most frequently reported preventable morbidities associated with birth by CS (Karlstrom *et al.* 2013, Zuarez-

Easton *et al.* 2017), which supports the findings of this study indicating a significantly increased risk of wound infection following an unplanned CS (ARR 7.05, 95% CI 3.09-16.08, p<0.001) in the immediate postpartum period, and up to 3-months postpartum (RR 3.25, 95% CI 2.20-4.79, p<0.001)). Consideration should be given to maternal sepsis in general. One of the study hospitals, the CWIUH, reported that out of 210 women admitted to the High dependency Unit (a critical care unit within a maternity hospital) in 2017, 6 (3%) had sepsis (Sheehan 2017). In relation to diagnosis of maternal sepsis, a recent discussion paper suggests bed-side diagnosis for early recognition of signs of sepsis (Turner 2019), and a recent study in the CWIUH has suggested potential benefits of bed-side clinical criteria for early diagnosis (O'Regan *et al*. 2019), regardless of the reason for sepsis. Maternal sepsis is a preventable morbidity, thus, awareness of the risk factors leading to sepsis is essential. An unplanned CS has been identified, in a recent study in the Cork University Maternity Hospital in Ireland, to be one of the major risk factors for wound infection (AOR 3.50, 95% CI 1.09-11.30, p<0.001), along with other factors such as being obese and having repeated vaginal examinations in labour (Saeed *et al*. 2019), leading to increased use of antibiotics in the postpartum period. In the immediate postpartum period an unplanned CS (ARR 1.86, 95% CI 1.42-2.45, p<0.001) was associated with a significantly increased risk of use of antibiotics similar to findings from other studies that indicate a five-times increased risk of use of antibiotics associated with CS compared to vaginal births (Villar *et al*. 2007). Every woman receives one dose of prophylactic antibiotics according to the hospital policy (Anti microbial prescribing guidelines HSE 2017), which then continues, with increased use of antibiotics in the immediate postpartum period as found in this study and other studies in the past (Villar *et al*. 20107).

Birth by CS has been associated with an increased duration of stay in hospital (Liu *et al.* 2007), similar to the findings of the current study. There was an increased duration (≥4 days) of hospital stay postpartum following birth by CS (planned (ARR 7.87, 95% CI 5.33-11.62, p<0.001) and unplanned (ARR 7.17, 95% CI 5.32-9.66, p<0.001)), similar to Ireland's

maternal statistics on duration of hospital stay (≥6 days) following CS (HPO 2018).

Baby's admission to NICU was found to be significantly associated with an unplanned CS (ARR 2.98, 95% CI 1.96-4.54, p<0.001). The most common reasons for admission being prematurity (n=46, 23%) and respiratory difficulty (n=28, 14%), which are supported by other studies (Villar *et al*. 2007, Fallah *et al*. 2011) where the authors observed increased neonatal mortality and morbidity even after adjusting for confounding variables such as gestational age at birth and fetal distress (Villar *et al*. 2007).

Association between AVB and risk of readmission to the hospital following discharge for mother's health was marginally significant (p=0.054) in the current study; however, when adjusted for pre-pregnancy, pregnancy and intrapartum factors, no significant association was found between mode of birth and risk of readmission to hospital. This is contradicted by findings of previous studies that found a significant association between mode of birth and readmission to the hospital postpartum (Lydon-Rochelle 2000, Thompson *et al*. 2002, Declercq *et al*. 2007, Panda *et al*. 2016).

A significant association was found between unplanned CS and attending the GP (<3 times) for two routine postpartum visits at 3-months postpartum for the mother's own health (ARR 0.9, 95% CI 0.06-0.13, p<0.001). Women who had AVBs were significantly more likely to attend ER (≥1) at 3-months postpartum for mother's own health (ARR 1.45, 95% CI 1.11-1.89, p<0.05).

Breast problems (mastitis), number of GP visits and attendances at ER were not significantly associated with mode of birth in the current study which contradicts findings from other studies that show an increased risk of these outcomes/postpartum morbidities associated with mode of birth (Thompson *et al*. 2002, Villar *et al*. 2007, Fallah *et al*. 2011).

6.6. Strengths of the study

The strength of this study is its uniqueness of presenting findings from multiple perspectives: obstetricians, midwives and women. This is the first mixed methods study in the context of decision-making for CS with quantitative findings from a longitudinal prospective cohort study with 3047 first-time mothers, integrated with qualitative findings from clinicians and women describing factors influencing CS.

A large study sample adds strength to the findings of this study. Women recruited from the three maternity hospitals in the Republic of Ireland (two with 8500 births, and one site with 3000 births, per annum) enhanced the generalisability of the findings. Clinicians were recruited from the three maternity hospitals allowing for a wider perspective of clinicians working in different maternity hospitals with varying hospital policies and clinical guidelines and different cultures of practice within each organisation.

This is the first longitudinal prospective cohort study in Ireland that involved recruitment of women in early pregnancy and follow-up to 12-months postpartum with a reasonably satisfactory response to the 12-months postpartum survey (75.82% of the total women eligible for follow-up at 12 months postpartum (Figure 4-1)). Using the survey data from the MAMMI study permitted access to a wealth of information, and analysis of multiple factors and outcomes/postpartum morbidities associated with birth by CS. Collection of data from hospital records of consenting women allowed for the use of information documented by clinicians, the primary care providers that, when combined with women's survey data, made the findings comprehensive through use of multiple sources.

The mixed methods design allowed for integration of quantitative findings with views from clinicians and women, to provide deep insights into factors influencing decision-making for CS and women's involvement. There is limited research on Irish clinicians' views of what factors influence their decision to perform a CS, and there are limited studies on women's views of their involvement in the decision to birth by CS. One of the strengths of this study is the unique findings which show interesting observations about the

complexities associated with the decision-making process for CS and its consequences for women in a 'parallel system' within the existing system of care, with difference in practice for women in public versus private care, and concerns with clinicians' practice being 'evidence-based' versus 'fear-based' and defensive, mostly related to their attitude, preference, practice pattern and convenience.

6.7. Limitations to the study

A number of potential limitations have been identified and considered in this study. I acknowledge the potential for recruitment bias. At the outset, the surveys were available in the English language only and this precluded the recruitment of women who did not read or understand English. The proportion of women who did not read or understand English in each site was not known at the time of recruitment as there were no data recorded on the use of interpreter services. In each site, recruitment of eligible women was reviewed at regular monthly meetings with midwives, the gate keepers, and every attempt was made to find ways of ensuring that all eligible women were offered the study information. In comparison to national data, analysis of demographic data in my study showed that participants were broadly representative for the age group of ≤24 years (7.84% versus 9.9%), 25-29 years (20.35% versus 17.8%) and ≥40 years (4.53% versus 6.4%), over representative for women aged 30-34 years (43.19% versus 36%), and under representative for 35 to 39 years (24.09% versus 29.4%). Although not a limitation, often I was challenged on my decision to conduct individual interviews over focus group discussions. Conducting focus group interviews might have helped increase the number of participants with more participants taking part in each focus group discussions. However, after careful consideration, I chose to use one-to-one interviews. This facilitated in-depth discussions with women about their personal experiences, and disclosure of intimate information which may not have been possible in a group session. Hence, a focus group discussion would not have been appropriate for this study. In-depth one-to-one interviews with clinicians enabled honest disclosure with no influence of others' presence and others' interpretation. Women who had a CS within a year before taking part in the interviews were recruited from only one study

site, the third site, the CWIUH, to conduct interviews. This is a potential limitation because it explored women's views of their involvement in decision-making which may be attributed to the practice within that unit, and may be different to the practices in the other two study sites. However, in general, literature from other countries largely supports the findings explored in this study confirming limited involvement of women in the decision-making process, and women 'going with the flow' of professionals' recommendations (Kingdon *et al*. 2018, Downe *et al*. 2018)

6.8. Summary

This chapter presents the key findings of this study with reference to the existing literature. Findings from the quantitative and qualitative phases have been integrated to present the key discussion points in relation to factors associated with and influencing the decision-making and consequences for women. The key findings indicate that there are complex and multiple factors such as maternal age, pre-pregnancy BMI, treatment for infertility, ambiguous reasons to perform a CS, clinicians' fear and safety concerns, interpretation, practice pattern, a difference in public versus private system of care, clinicians' experience and convenience, etc., that are associated with and influencing the decision to perform a CS. However, 'clinicians' belief' was the key driver in the process of decision-making. Underpinning beliefs regarding mode of birth play a vital role in everyday clinical practice. Clinicians viewed CS as a reasonable solution for many, if not all women, even with awareness of the risks and complications associated with CS. Finally, one of the key discussions in relation to women's involvement described women's perspectives on 'acquiescence' and equating 'being well informed' with 'being involved' in the decision-making process. As reported in other studies, birth by CS increased the risk of blood loss at birth, increased duration of hospital stay postpartum, increased admission of babies to NICU, use of antibiotics, and wound infection immediately after birth and up to 3-months postpartum. The complexities of factors influencing decision-making for CS are presented in this chapter from the multiple perspectives of key stakeholders; the obstetricians, midwives and women. This study provides an insight into a 'parallel system' within the existing system of practice, with 'evidence

based' versus 'fear-based' (defensive) care, difference in practice for women in public versus private care, and difference in clinicians' and women's perspectives. Chapter 7 concludes this thesis, outlining the recommendations that have emerged from this study.

7. Chapter 7 Conclusion and recommendation

7.1. Introduction

This final chapter provides recommendations emerging from the findings of this research for practice, education, future research and policy. A dissemination plan is presented, and a personal reflection through this PhD journey concludes the thesis.

7.2. Conclusion

Numerous reports worldwide have emphasised the importance of understanding the factors that influence the decision to perform CS, with the goal of reducing inappropriate CSs safely and effectively (Betran *et al*. 2018). The findings from this prospective mixed methods study present the factors that were associated with birth by CS, and clinicians' and women's views of factors influencing decision-making for CS, women's involvement in the decision-making process, and postpartum morbidities associated with birth by CS.

Pre-pregnancy factors such as maternal age (35 to 39 years and ≥40 years), being overweight, obese/very obese, pre-pregnancy medical conditions such as high BP and asthma and treatment for infertility; pregnancy factors such as private and semi-private care, multiple gestation, preterm gestation, breech and other malpresentations; and intrapartum factors such as IOL and epidural for management of pain in labour were all identified as being associated with the risk of birthing by CS. When combined, women who had their labour induced, and had an epidural for pain management in labour with or without the use of IV oxytocin, were significantly more likely to have an unplanned CS compared to those who had spontaneous onset of labour and no epidural with or without use of IV oxytocin. In relation to maternal request, only a small proportion of women requested a CS.

Women who had a CS experienced increased blood loss at birth (≥500mls), increased risk of baby's admission to NICU, increased duration of hospital stay postpartum (≥4 days), and increased use of antibiotics in the

immediate postpartum period. The risk of having a wound infection increased significantly with unplanned CS in the immediate and up to 3-months postpartum period. CS increased the risk of these consequences for women as they start first-time motherhood. The benefits of this study are in the generation of information about women's health and morbidities associated with CSs. Understanding the morbidities associated with CS will create a general awareness among clinicians and women of the immediate and short-term risks associated with CS.

Midwives' and obstetricians' personal beliefs, perceived fear of adverse outcomes and/or litigation, predetermined views and their individual interpretation and practice pattern of managing a situation based on their preference had a major influence at most stages of the decision-making process, whether it was to do with IOL or decision to perform a CS. This was further added to by the healthcare system and culture of the organisation where clinicians' practice had blended into the culture of belief. There is evidence to suggest that a cultural belief of 'normal birth' and close monitoring of CSs helps promote normal births and low rates of CSs (Panda *et al*. 2018a). Clinicians' individualised interpretation had a direct influence on the overall decision to perform a CS or wait for natural progression of labour. Organisational policies and guidelines such as criteria for inducing labour, and offering/performing ECVs for women presenting with breech presentations, etc., were perceived as direct or indirect factors influencing the decision to perform a CS. A difference in practice for women in private care, clinicians' level of experience, obstetricians' convenience, where decision-making was based on viewing CS as a convenient, controlled and easy option compared to waiting for uncertainties of labour and vaginal birth, were other crucial factors in the decision-making process. The midwife's role was mostly viewed as being an advocate for the women. Midwives were present with women during their most crucial time of labour and birth, and women trusted their midwives. Predominantly, a woman's experience was considered to be important regardless of her mode of birth. These findings show some interesting observations about the complexities associated with the decision-making process for CS which are new in an Irish context, hence local application/sharing of findings is a real possibility

to raise awareness of factors that can be addressed to reduce unnecessary CSs. The study information will help clinicians to re-analyse and understand if there is any avoidable factor that influences decision-making for CS and implement this knowledge into practice to help move to the next step of using this knowledge to change practice.

While women's views differed according to their personal experience, in general, women who had a planned CS described their experience of being involved in decisions as being a positive one, compared to women who had an unplanned CS. Not being listened to and not feeling empowered enough to question the professional decision was described as a disappointing experience by most women. Their baby's safety was a priority for all women; thus, despite a desire to have a natural birth, when concerns relating to the baby's wellbeing were raised most women felt the decision was appropriate and timely, even though the 'baby safety issue' may have emerged after their labour had been induced, or they had an epidural for pain management or they were started on IV oxytocin. This directly or indirectly linked to the decision-making at every stage of the process, which subsequently lead to a concern with 'baby's safety'. In general, women regarded 'being informed and given explanations' about the events as equating with 'being involved' in the process of decision-making. These findings will be of interest and benefit to women, women's organisations and clinicians. Women's views, in a broader context, will give women an insight into the concept of their involvement, and understanding their role and standing in the decision-making process. There existed a parallel system within the existing system of care, where on one side, clinicians believed their decision to be safe and appropriate, and made in consultation with women, and on the other side, women described themselves as 'agreeing' and 'going along with' the professional's decisions. Clinicians' decision-making was mostly driven by their fear, attitude, preference, practice pattern and convenience.

7.3. Dissemination plan

Dissemination of findings through peer-reviewed publications, presentations to clinicians and students within and outside the Republic of Ireland, and

conference presentations (Appendix 29) has been ongoing. The following is a plan for future disseminations:

- Five more manuscripts
    - Title: Clinicians' views of factors influencing decision-making for CS – an Irish perspective. Planned submission to PLOS One, July 2020.
    - Title: Women's perspectives on being involved in the decision to birth by caesarean section. Planned submission to Women and Birth, September 2020.
    - Title: Factors associated with caesarean sections in nulliparous women – a multicentre prospective cohort study. Planned submission to BJOG, December 2020.
    - Title: Maternal outcomes following caesarean section – findings from a multicentre cohort study. Planned submission to Journal of Maternal Fetal and Neonatal Medicine, March 2021.
    - Title: Revisiting the challenges in choosing a mixed methods design: the process of adaptation from a basic model. Planned submission to Journal of Research in Nursing, August 2021.
- Dissemination through Knowledge Exchange and Dissemination Scheme (KEDS) award. I was awarded a Health Research Board (HRB) Knowledge Exchange Dissemination Scheme (KEDS) award (€25,483.34) for 12 months (1st December 2018-30th November 2019 – Extended to 30th November 2020) to disseminate the findings on 'clinicians' views of factors influencing decision-making for caesarean section'. This involves two activities: (i) development of an information video on the findings (in progress), and (ii) sharing the findings through a seminar at each study site, the RH, GUH and CWIUH.
- Dissemination through presentations at national and international conferences.
    - Two abstracts; (i)'Clinicians' views of strategies to reduce CS - An Irish perspective' and (ii)'Factors associated with unplanned caesarean sections' submitted to International Confederation of Midwives (ICM), Bali, June 2020. Abstract ii has been accepted for oral presentation.

- Abstract has been submitted for presentation at the Maternity Festival (in Ireland) February 2020 on 'Involvement in decision-making – women's perspective'.
- Abstract has been accepted for oral presentation at the Midwifery Conference, Royal College of Surgeons Ireland (RCSI), February 2020 on 'Strategies to reduce caesarean section – perspectives of Irish clinicians'.
- Abstract has been accepted for oral presentation at The Conf, School of Nursing and Midwifery, March 2020 on 'Factors associated with planned caesarean section among first-time mothers: findings from a multicentre cohort study in Ireland'.

- Presentations to midwifery and obstetric students and clinicians within and outside the Republic of Ireland.
  - Teaching session on 'Trends in CS' for Undergraduate Midwifery Students on 6th September 2019, and Masters Students on 20th April 2020, at School of Nursing and Midwifery, TCD.
  - Future teaching and presentation sessions will be held as opportunities arise.

7.4. Recommendations

Recommendations are made for practice, education and training, research and policymakers with an acknowledgement that resources, human and financial, will be required to implement these recommendations effectively. This will require funding in order to make thse recommendations happen to achieve HSE's current aim to stop the rate of CS increasing in frist-time mothers.

7.4.1.Recommendations for practice

Obstetricians and midwives are directly involved in the decision to perform a CS and are the key drivers to change practice. Findings of this study indicated a number of factors associated with and influencing the decision to perform CS. This study has increased knowledge and understanding in information related to some of the complexities associated with the decision-making process from multiple perspectives of obstetricians,

midwives and women. It has offered insight into the 'why' behind the factors influencing rising rate of CS, despite the considerable evidence that vaginal birth is safer and associated with fewer complications compared to birth by CS. Understanding these factors is vital to take necessary action in future to stop the rise of and reduce unnecessary CSs.

Recommendations for practice:

- A working group of clinicians (WGC) (consisting of senior clinical midwife managers and newly qualified midwives, senior obstetric consultant and senior obstetric registrar) should be established at the hospital level to monitor the following recommendations.
- Hospital guidelines on criteria for IOL, offering/performing ECV, diagnosis of fetal distress in labour, etc., should be revised on basis of best evidence, and monthly audits should be conducted to ensure adherence to the guidelines for all women; public, semi-private and private. This can be monitored/implemented by the WGC.
- Weekly audits of clinical practice should be run to assess specific parameters, such as to monitor rates and reasons for IOL, ECVs, rates and reasons for planned/unplanned CSs. This can be implemented by the WGC through retrospective audit of clinical records, and follow up discussion at ward level among clinicians, and at hospital level with the multidisciplinary team.
- Monthly audit of care pathways for women in public versus private care through retrospective audit of clinical records should be conducted to assess similarities and differences in practice through close monitoring of practices and their outcomes. The WGC can be responsible for implementation of this.

7.4.2. Recommendations for education and training

Undergraduate and further education is recommended to establish how some of the factors identified can be addressed to avoid unnecessary CSs.

Recommendations for education and training:

- Workshops and skill-based training should be held for obstetricians on management of difficult vaginal births. It can be led by senior consultant obstetricians for their junior colleagues in groups.
- Combined training for midwives and obstetricians should be held on routine clinical practices such as diagnosis of fetal distress/CTG interpretation, diagnosis of labour/labour dystocia, etc. It can be implemented by senior obstetricians and midwife managers for all midwives and obstetricians involved in providing care to women antenatally and during labour and birth and must be evidence-based.
- Training workshops should be organised on performing ECV in every maternity setting, led by senior obstetricians with expertise in conducting ECVs successfully. It can be implemented by each organisation and should be targeted at obstetricians, senior and junior, who are involved in the decision-making process for CSs.
- A specific and focussed session on informed decision-making and shared decision-making should be included in antenatal education for women. It can be implemented by midwives working in the parent education department.
- Educational support programmes for women through childbirth training or birth preparation workshops should be organised to address childbirth fear and pain management, including non-pharmacological and pharmacological pain relief measures, advantages and disadvantages of vaginal birth and CS, etc. This can be implemented by a multidisciplinary team consisting of midwives, obstetricians, anaesthetists and neonatologists.
- A training and education session for undergraduate and postgraduate midwifery students detailing the rising trend of CSs, factors influencing the rising trend and recommended strategies to reduce unnecessary CSs.

7.4.3. Recommendations for research

These findings can be used to plan and carry out future research with a long-term goal of reducing unnecessary CSs for first-time mothers, and repeat CSs in subsequent pregnancies.

Recommendations for research:

- Future intervention studies should be conducted focusing on effectiveness of clinical audit in reducing CS rates.
- Future research on the long-term consequences of CSs for women and their babies should be conducted.
- Research on cost implications of birth by CS compared to vaginal births should be conducted.
- A multicountry multicentre research study (involving countries with a CS rate of 25-35%) to compare and contrast clinical practice and pathways of intrapartum care for nulliparous women should be established and run with an aim to drive change through implementation of best and evidence-based practice.

7.4.4. Recommendations for policymakers

These findings will be of significant benefit to policymakers to revise the institutional policy with an aim to improve and promote normal births and avoid any unnecessary CSs at a local and national level.

Recommendations for policymakers:

- Hospital guidelines, for example criteria of IOL, offering/performing ECVs, diagnosis of labour and labour dystocia and management of labour should be revised and adherence to the guidelines ensured across all levels of care; public, semi-private and private.
- Monthly audit of clinical practice and clinical records of all CSs for all women in both public and private care should be introduced.
- Mandatory second opinion policy at local and national level for decision-making for CS, by a consultant obstetrician who is present on the labour ward should be enforced into practice.

7.5. Personal reflection through the PhD journey

A journey is often more valuable than the goal. When one is focused on accomplishing a big task, the goal becomes everything. However, it is the journey that matters the most. The process of accomplishing this PhD thesis has been a magnificent learning experience from the very start of the PhD programme to completion of this thesis. Being a midwife in the labour and

birth suite I was always passionate about normality and decision-making around mode of birth and enhancing a positive experience for every woman I cared for. This was a starting point for me to think about initiating a study to explore the factors influencing decision-making and women's involvement in the process.

Learning the steps of mixed methods research while applying it in my own study was a phenomenal experience. From basic learning to getting into deeper knowledge of each research component, quantitative and qualitative, integration of the findings and justifying every action was a rewarding experience.

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Appendices

Appendix 1 Search strategy

Search string for PubMed

"cesarean section" OR "cesarean sections" OR "caesarean section" OR "caesarean sections" OR "caesarean delivery" OR "caesarean deliveries" OR "cesarean delivery" OR "cesarean deliveries" OR "caesarian delivery" OR "caesarian deliveries" OR "caesarean birth" OR "caesarean births" OR "cesarean birth" OR "cesarean births" OR "caesarian birth" OR "caesarian births" OR "abdominal delivery" OR "abdominal deliveries" OR "surgical birth" OR "surgical births" OR "surgical birthing" OR cesarean OR cesareans OR caesarean OR caesareans OR caesarian OR caesarians OR LSCS OR "C-Section" OR "C-Sections" OR "C Section" OR "C Sections" OR "medicalized childbirth" OR "medicalized childbirths" OR "medicalised childbirth" OR "medicalised childbirths"

AND

clinician OR clinicians OR midwife OR midwives OR obstetrician OR obstetricians OR "obstetric-nurse" OR "obstetric-nurses" OR "obstetric nurse" OR "obstetric nurses" OR "Nurse Midwives" OR "Nurse Midwife" OR "Nurse-Midwife" OR "Nurse-Midwives" OR "care provider" OR "care providers" OR "health care provider" OR "health care providers" OR professional OR professionals OR physician OR physicians OR doctor OR doctors OR "obstetric consultant" OR "obstetric consultants" OR "consultant obstetrician" OR "consultant obstetricians" OR "clinical manager" OR "clinical managers" OR "midwife manager" OR "midwife managers" OR "midwife-manager" OR "midwife-managers" OR "nurse manager" OR "nurse managers" OR "nurse-manager" OR "nurse-managers" OR "certified professional midwife" OR "certified professional midwives" OR "certified nurse-midwife" OR "certified nurse-midwives" OR "certified midwife" OR "certified midwives" OR "consultant midwife" OR "consultant midwives" OR "advanced midwife practitioner" OR "advanced midwife practitioners" OR "clinical midwife specialist" OR "clinical midwife specialists"

AND

experience OR experiences OR experienced OR view OR views OR viewpoint OR viewpoints OR perception OR perceptions OR perceive OR perceived OR attitude OR attitudes OR belief OR beliefs OR perspective OR perspectives OR opinion OR opinions OR concept OR concepts OR thought OR thoughts OR intuition OR awareness OR comprehension OR value OR values OR understanding

AND

(attitude of health personnel[Mesh Terms] OR attitude to health[Mesh Terms] OR choice behavior[Mesh Terms] OR communication[Mesh Terms] OR consumer participation[Mesh Terms] OR cooperative behavior[Mesh Terms] OR decision making[Mesh Terms] OR decision support techniques[Mesh Terms] OR decision theory[Mesh Terms] OR educational technology[Mesh Terms] OR health education[Mesh Terms] OR informed consent[Mesh Terms] OR professional-

family relations[Mesh Terms] OR psychology [Subheading] OR affective aspect* OR choice behavio* OR clinical support technique* OR cognitive aspect* OR collaboration* OR communication* OR compliant behavio* OR consensus OR consent* OR consumer* OR participation* OR cooperative behavio* OR co-operative behavio* OR decision* OR disput* OR dissent* OR doctor patient relationship OR doctor patient relationships OR doctor-patient relationship OR doctor-patient relationships OR educational technology OR emotional aspect* OR health attitude* OR health education OR health information OR health literacy OR illness behavio* OR informed assent OR informed choice* OR informed decision* OR misinformation OR negotiati* OR nursing role* OR (nurse* AND role*) OR patient acceptance OR patient adherence OR patient attitude* OR patient compliance OR patient cooperation OR patient co-operation OR patient education OR patient involvement OR patient non adherence OR patient noncompliance OR patient nonadherence OR patient non-adherence OR patient noncompliance OR patient non-compliance OR patient participation OR patient preference* OR patient satisfaction OR physician attitude OR physician patient relationship OR physician patient relationships OR physician-patient relationship OR physician-patient relationships OR professional family disagreement* OR professional family relation* OR professional patient disagreement* OR professional-family disagreement* OR professional-family relationship OR professional-family relationships OR professional-patient disagreement* OR psychosocial aspect* OR psychosomatic aspect* OR refusal participat* OR shared decision* OR sharing decision* OR staff attitude* OR treatment refusal* OR uncertainty)

Search string for all other Databases: CINAHL, PSYCHINFO, Web of Science, Maternity & infant Care Database

"cesarean section" OR "cesarean sections" OR "caesarean section" OR "caesarean sections" OR "caesarean delivery" OR "caesarean deliveries" OR "cesarean delivery" OR "cesarean deliveries" OR "caesarian delivery" OR "caesarian deliveries" OR "caesarean birth" OR "caesarean births" OR "cesarean birth" OR "cesarean births" OR "caesarian birth" OR "caesarian births" OR "abdominal delivery" OR "abdominal deliveries" OR "surgical birth" OR "surgical births" OR "surgical birthing" OR cesarean OR cesareans OR caesarean OR caesareans OR caesarian OR caesarians OR LSCS OR "C-Section" OR "C-Sections" OR "C Section" OR "C Sections" OR "medicalized childbirth" OR "medicalized childbirths" OR "medicalised childbirth" OR "medicalised childbirths"

AND

clinician OR clinicians OR midwife OR midwives OR obstetrician OR obstetricians OR "obstetric-nurse" OR "obstetric-nurses" OR "obstetric nurse" OR "obstetric nurses" OR "Nurse Midwives" OR "Nurse Midwife" OR "Nurse-Midwife" OR "Nurse-Midwives" OR "care provider" OR "care providers" OR "health care provider" OR "health care providers" OR professional OR professionals OR

physician OR physicians OR doctor OR doctors OR "obstetric consultant" OR "obstetric consultants" OR "consultant obstetrician" OR "consultant obstetricians" OR "clinical manager" OR "clinical managers" OR "midwife manager" OR "midwife managers" OR "midwife-manager" OR "midwife-managers" OR "nurse manager" OR "nurse managers" OR "nurse-manager" OR "nurse-managers" OR "certified professional midwife" OR "certified professional midwives" OR "certified nurse-midwife" OR "certified nurse-midwives" OR "certified midwife" OR "certified midwives" OR "consultant midwife" OR "consultant midwives" OR "advanced midwife practitioner" OR "advanced midwife practitioners" OR "clinical midwife specialist" OR "clinical midwife specialists"

AND

experience OR experiences OR experienced OR view OR views OR viewpoint OR viewpoints OR perception OR perceptions OR perceive OR perceived OR attitude OR attitudes OR belief OR beliefs OR perspective OR perspectives OR opinion OR opinions OR concept OR concepts OR thought OR thoughts OR intuition OR awareness OR comprehension OR value OR values OR understanding

AND

"attitude of health personnel" OR "health personnel Attitude" OR "health personnel attitudes" OR "staff attitude" OR "staff attitudes" OR "attitude to health" OR "attitudes to health" OR "health attitude" OR "health attitudes" OR "choice behavior" OR "choice behaviour" OR "choice behaviors" OR "choice behaviours" OR communication OR "personal communication" OR "personal communications" OR communications OR "consumer involvement" OR "consumer participation" OR "consumer participations" OR "cooperative behavior" OR "cooperative behaviors" OR "cooperative behaviour" OR "cooperative behaviours" OR "decision making" OR "decision support technique" OR "decision support techniques" OR "decision theory" OR "decision theories" OR "educational technology" OR "educational technologies" OR "health education" OR "health educations" OR "informed consent" OR "informed consents" OR "professional-family relation" OR "professional-family relationship" OR "professional-family relationships" OR "affective aspect" OR "affective aspects" OR "clinical support technique" OR "clinical support techniques" OR "cognitive aspect" OR "cognitive aspects" OR "collaboration" OR "collaborations" OR "compliant behavio" OR behavior OR behaviors OR behaviour OR behaviours OR behavioral OR behavioural OR behaviorally OR behaviourally OR behaviorism OR behaviorisms OR behaviourism OR behaviourisms OR "acceptance process" OR "acceptance processes" OR consensus OR consumer OR consumers OR consumers' OR consent OR consents OR participation OR participations OR "cooperative behavio" OR "cooperative behavior" OR "cooperative behaviors" OR "co-operative behavio" OR "co-operative behavior" OR "co-operative behaviors" OR "co-operative behaviour" OR "co-operative behaviours" OR decision OR decisional OR decisions OR disput OR disputes OR dissent OR dissents OR "doctor patient relation" OR "doctor patient relations"

OR "doctor-patient relation" OR "doctor-patient relationship" OR "doctor-patient relationships" OR "educational technology" OR "educational technologies" OR "emotional aspect" OR "emotional aspects" OR "cognitive aspect"OR "cognitive aspects" OR "psychosomatic aspect" OR "psychosomatic aspects" OR "psychiatric aspect" OR "psychiatric aspects" OR "psychogenic aspect" OR "psychogenic aspects" OR "psychosocial aspect" OR "psychosocial aspects" OR "psycho-social aspect" OR "psycho-social aspects" OR "affective aspect" OR "affective aspects" OR "mental aspect" OR "mental aspects" OR "health education" OR "health educations" OR "health information" OR "health literacy" OR "illness behavio" OR "illness behavior" OR "illness behaviors" OR "illness behaviour" OR "illness behaviours" OR "informed assent" OR "informed assents" OR "informed choice" OR "informed decision" OR "informed decisions" OR "misinformation" OR negotiation OR negotiations OR "nursing role" OR "nursing roles" OR "patient acceptance" OR "patient adherence" OR "patient attitude" OR "patient attitudes" OR "patient compliance" OR "patient cooperation" OR "patient co operations" OR "patient co-operation" OR "patient co-operations" OR "patient education" OR "patient educations" OR "patient involvement" OR "patient non adherence" OR "patient non compliance" OR "patient non adherence" OR "patient non-adherence" OR "patient noncompliance" OR "patient non-compliance" OR "patient participation" OR "patient preference" OR "patient satisfaction" OR "physician attitude" OR "physician attitudes" OR "physician patient relation" OR "physician patient relations" OR "physician-patient relation" OR "physician-patient relationship" OR "physician-patient relationships" OR "professional family disagreement" OR "professional family disagreements" OR "professional patient disagreement" OR "professional patient disagreements" OR "professional-family disagreement" OR "professional-family disagreements" OR "professional-patient disagreement" OR "professional-patient disagreements" OR "refusal to participate" OR "shared decision" OR "shared decisions" OR "sharing decision" OR "sharing decisions"

Maternity and Infant Care – (using search without inverted commas)

cesarean section OR cesarean sections OR caesarean section OR caesarean sections OR caesarean delivery OR caesarean deliveries OR cesarean delivery OR cesarean deliveries OR caesarian delivery OR caesarian deliveries OR caesarean birth OR caesarean births OR cesarean birth OR cesarean births OR caesarian birth OR caesarian births OR abdominal delivery OR abdominal deliveries OR surgical birth OR surgical births OR surgical birthing OR cesarean OR cesareans OR caesarean OR caesareans OR caesarian OR caesarians OR LSCS OR C-Section OR C-Sections OR C Section OR C Sections OR medicalized childbirth OR medicalized childbirths OR medicalised childbirth OR medicalised childbirths

AND

clinician OR clinicians OR midwife OR midwives OR obstetrician OR obstetricians OR obstetric-nurse OR obstetric-nurses OR obstetric nurse OR obstetric nurses OR Nurse Midwives OR Nurse Midwife OR Nurse-Midwife OR Nurse-Midwives OR

care provider OR care providers OR health care provider OR health care providers OR professional OR professionals OR physician OR physicians OR doctor OR doctors OR obstetric consultant OR obstetric consultants OR consultant obstetrician OR consultant obstetricians OR clinical manager OR clinical managers OR midwife manager OR midwife managers OR midwife-manager OR midwife-managers OR nurse manager OR nurse managers OR nurse-manager OR nurse-managers OR certified professional midwife OR certified professional midwives OR certified nurse-midwife OR certified nurse-midwives OR certified midwife OR certified midwives OR consultant midwife OR consultant midwives OR advanced midwife practitioner OR advanced midwife practitioners OR clinical midwife specialist OR clinical midwife specialists
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attitude of health personnel OR health personnel Attitude OR health personnel attitudes OR staff attitude OR staff attitudes OR attitude to health OR attitudes to health OR health attitude OR health attitudes OR choice behavior OR choice behaviour OR choice behaviors OR choice behaviours OR communication OR personal communication OR personal communications OR communications OR consumer involvement OR consumer participation OR consumer participations OR cooperative behavior OR cooperative behaviors OR cooperative behaviour OR cooperative behaviours OR decision making OR decision support technique OR decision support techniques OR decision theory OR decision theories OR educational technology OR educational technologies OR health education OR health educations OR informed consent OR informed consents OR professional-family relation OR professional-family relationship OR professional-family relationships OR affective aspect OR affective aspects OR clinical support technique OR clinical support techniques OR cognitive aspect OR cognitive aspects OR collaboration OR collaborations OR compliant behavio OR behavior OR behaviors OR behaviour OR behaviours OR behavioral OR behavioural OR behaviorally OR behaviourally OR behaviorism OR behaviorisms OR behaviourism OR behaviourisms OR acceptance process OR acceptance processes OR consensus OR consumer OR consumers OR consumers' OR consent OR consents OR participation OR participations OR cooperative behavio OR cooperative behavior OR cooperative behaviors OR co-operative behavio OR co-operative behavior OR co-operative behaviors OR co-operative behaviour OR co-operative behaviours OR decision OR decisional OR decisions OR dispute OR disputes OR dissent OR dissents OR doctor patient relation OR doctor patient relations OR doctor-patient relation OR doctor-patient relationship OR doctor-patient relationships OR educational technology OR educational technologies OR

emotional aspect OR emotional aspects OR cognitive aspect OR cognitive aspects OR psychosomatic aspect OR psychosomatic aspects OR psychiatric aspect OR psychiatric aspects OR psychogenic aspect OR psychogenic aspects OR psychosocial aspect OR psychosocial aspects OR psycho-social aspect OR psycho-social aspects OR affective aspect OR affective aspects OR mental aspect OR mental aspects OR health education OR health educations OR health information OR health literacy OR illness behavio OR illness behavior OR illness behaviors OR illness behaviour OR illness behaviours OR informed assent OR informed assents OR informed choice OR informed decision OR informed decisions OR misinformation OR negotiation OR negotiations OR nursing role OR nursing roles OR patient acceptance OR patient adherence OR patient attitude OR patient attitudes OR patient compliance OR patient cooperation OR patient co operations OR patient co-operation OR patient co-operations OR patient education OR patient educations OR patient involvement OR patient non adherence OR patient noncompliance OR patient non adherence OR patient non-adherence OR patient noncompliance OR patient non-compliance OR patient participation OR patient preference OR patient satisfaction OR physician attitude OR physician attitudes OR physician patient relation OR physician patient relations OR physician-patient relation OR physician-patient relationship OR physician-patient relationships OR professional family disagreement OR professional family disagreements OR professional patient disagreement OR professional patient disagreements OR professional-family disagreement OR professional-family disagreements OR professional-patient disagreement OR professional-patient disagreements OR refusal to participate OR shared decision OR shared decisions OR sharing decision OR sharing decisions

Appendix 2 The 12-assessment criteria Checklist by Thomas *et al*. (2003) - Original tool

Quality of study reporting	**Met the criteria**	**Did not meet the criteria**
Aims and objectives were clearly reported		
Adequate description of context of research		
Adequate description of the sample and sampling methods		
Adequate description of data collection methods		
Adequate description of data analysis methods		
There was good or some attempt to establish the		
Reliability of data collection tools		
Validity of data collection tools		
Reliability of data analysis		
Validity of data analysis		
Quality of methods for research with children		
Used appropriate data collection methods for helping children to express their views		
Used appropriate methods for ensuring the data analysis was grounded in the views of children		
Actively involved participants in the design and conduct of the study		
Quality of methods for research		
Used appropriate data collection methods to allow for expression of views		
Used appropriate methods for ensuring the data analysis was grounded in the views		
Actively involved children in the design and conduct of the study		

Appendix 3 Modified version of tool for assessment of methodological quality of included studies (Thomas *et al*. 2003)

Quality of study reporting	**Met the criterion (Score 1)**	**Did not meet the criterion (Score 0)**
Aims and objectives were clearly reported		
Adequate description of context of research		
Adequate description of the sample and sampling methods		
Adequate description of data collection methods		
Adequate description of data analysis methods		
There was good, or some, attempt to establish the: Reliability of data collection tools		
Validity of data collection tools		
Reliability of data analysis		
Validity of data analysis		
Quality of methods for research: Used appropriate data collection methods to allow for expression of views		
Used appropriate methods for ensuring the data analysis was grounded in the views		
Actively involved participants in the design and conduct of the study		

Scores	**category**
0-6	Weak
7-9	Moderate
10-12	Strong

Appendix 4 Results of assessment of methodological quality

Author(s) and year	Aims and objectives were clearly reported	Adequate description of context of research	Adequate description of the sample and sampling methods	Adequate description of data collection methods	Adequate description of data analysis methods	Reliability of data collection tools	Validity of data collection tools	Reliability of data analysis	Validity of data analysis	Used appropriate data collection methods to allow for expression of views	Used appropriate methods for ensuring the analysis was grounded in the views	Actively involved participants in the design and conduct of the study	Weak (0-6)	Moderate (7-9)	Strong (10-12)
Appleton *et al.* (2000)	√	√	√	√	√	√	√	√	√		√				10
Arikan *et al*. (2011)	√	√	√	√	√		√	√	√					8	
Bagheri *et al.* (2013)	√	√	√	√	√	√	√	√	√	√	√				11
Bailit *et al*. (2007)	√	√	√	√	√			√	√	√	√	√			10
Bergholt *et al.* (2004)	√	√	√	√	√			√	√					7	
Bette *et al.* (2007)	√	√	√	√	√			√	√					7	
Bryant *et al.* (2007)	√	√	√	√	√	√	√	√	√	√	√				11
Chaillet *et al.* (2007)	√	√	√	√	√	√	√	√	√	√	√				11
Chalmers *et al.* (1992)	√	√	√	√	√			√	√	√	√			9	
Chigbu *et al*.	√	√	√	√	√		√				√			7	

(2010)															
Coleman *et al.* (2005)	√	√	√	√	√	√		√	√	√				9	
Coleman-Cowger *et al.* (2010)	√	√	√	√	√	√	√	√	√			√			10
Colomar *et al.* (2014)	√	√	√	√	√	√	√	√	√	√	√				11
Cotzias *et al.* (2001)	√	√	√	√					√	√	√			7	
Cox (2011)	√	√	√	√	√	√	√	√	√	√	√				11
Danishevski *et al.* (2008)	√	√	√	√	√		√		√					7	
Doret *et al.* (2010)	√	√	√	√	√			√	√					7	
Faas-Fehervary *et al.* (2005)	√	√	√		√			√	√		√			7	
Foureur *et al.* (2016)	√	√	√	√	√			√	√	√	√			9	
Fuglenes and Kristiansen (2009)	√	√	√	√	√		√	√	√		√			9	
Huang *et al.* (2013)	√	√	√	√	√		√	√	√		√			9	
Josefsson *et al.* (2011)	√	√	√	√	√			√	√		√			8	
Kabakian-Khasholian *et al.* (2007)	√	√	√	√	√					√	√	√		8	
Kamal *et al.* (2005)	√	√	√	√	√	√	√	√	√	√	√	√			12
Karlstrom *et al.* (2009)	√	√	√	√	√			√	√	√	√	√			10
Kenton *et al.* (2005)	√	√	√	√	√			√	√	√	√			9	

Koigi-Kamau *et al.* (2005)	√	√	√	√	√					√	√	√		8	
Kwee *et al.* (2004)	√	√	√	√	√			√	√	√	√	√			10
Litorp *et al.* (2015a)	√	√	√	√	√			√	√	√	√	√			10
Litorp *et al.* (2015b)	√	√	√	√	√			√	√	√	√	√			10
Monari *et al.* (2008)	√	√	√	√	√	√	√	√	√	√	√				11
Samadi *et al.* (2013)	√	√	√	√	√	√	√			√				8	
Weaver *et al*. (2007)	√	√	√	√	√			√	√	√	√	√			10
Yazdizadeh *et al.* (2011)	√	√	√	√	√			√	√	√	√			9	
Updated search results, November 2018															
Begum *et al.* (2018)	√	√	√	√	√	√	√	√	√	√	√	√			12
Carrera *et al.* (2017)	√	√	√	√	√			√	√	√	√			9	
Kisa *et al.* (2017)	√	√	√	√	√			√	√		√			8	
Kucuk *et al.* (2017)	√	√	√	√	√			√	√	√	√			9	
Melman *et al.* (2017)	√	√	√	√	√			√	√		√			8	
Munro *et al.* (2017)	√	√	√	√	√			√	√		√			8	
Panda *et al.* (2018a)	√	√	√	√	√	√	√	√	√	√	√	√			12

Appendix 5 Studies conducted in OECD and Non-OECD countries (Adapted from Panda *et al*. 2018b)

Author(s)/Year	Study location	OECD/ Non-OECD	Number of studies
Bailit *et al.* (2007), Bettes *et al.* (2007), Coleman *et al.* (2005), Coleman-Cowger *et al.* (2010), Colomar *et al.* (2014), Cox (2011), Kenton *et al.* (2005)	United States	OECD	7
Cotzias *et al.* (2001), Kamal *et al.* (2005), Weaver and Richards (2007)	United Kingdom	OECD	3
Appleton *et al.* (2000), Bryant *et al.* (2007), Foureur *et al.* (2016)	Australia	OECD	3
Josefsson *et al.* (2011), Karlstrom *et al.* (2009)	Sweden	OECD	2
Chaillet *et al.* (2007)	Canada	OECD	1
Arikan *et al.* (2011)	Turkey	OECD	1
Bergholt *et al.* (2004)	Denmark	OECD	1
Doret *et al.* (2010)	France	OECD	1
Faas-Fehervary *et al.* (2005)	Germany	OECD	1
Fuglenes and Kristiansen (2009)	Norway	OECD	1
Kwee *et al.* (2004)	Netherlands	OECD	1
Monari *et al.* (2008)	Italy	OECD	1
Bagheri *et al.* (2013), Samadi *et al.* (2013), Yazdizadeh *et al.* (2011)	Iran	Non-OECD	3
Litorp *et al.* (2015a), Litorp *et al.* (2015b)	Tanzania	Non-OECD	2
Chalmers *et al.* (1992)	South Africa	Non-OECD	1
Chigbu *et al.* (2010)	Nigeria	Non-OECD	1
Danishevski *et al.* (2008)	Russia	Non-OECD	1
Huang *et al.* (2013)	China	Non-OECD	1
Kabakian-Khasholian *et al.* (2007)	Lebanon	Non-OECD	1
Koigi-Kamau and Kiarie (2005)	Kenya	Non-OECD	1

Updated search, November 2018			
Carrera *et al*. (2017)	United States	OECD	1
Kisa *et al*. (2017), Kucuk 2017	Turkey	OECD	2
Melman *et al.* (2017)	Netherlands	OECD	1
Munro *et al*. (2017)	Canada	OECD	1
Panda *et al*. (2018a)	Sweden	OECD	1
Begum *et al*. (2018)	Bangladesh	Non-OECD	1

Appendix 6 Similarities and differences in clinicians' views in OECD versus Non-OECD countries (Adapted from Panda *et al*. 2018b)

Key issues within cultural context - OECD countries	Key issues within cultural context - Non-OECD countries
Similarities in views among clinicians from OECD and Non-OECD countries	
Women's request for CS Clinicians from OECD countries believed in women's right to choose a CS. *"At the end of the day, I feel very strongly that women, at the end of the day it's their body and it's their right to choose. And I certainly feel that as long as it's an informed consent, I would be very agreeable to obliging either way." (Obstetrician) (Bryant et al. 2007 p.1194)* Women's perceived fear was viewed to be a reason for their request for CS. *"There are a lot of women who are afraid of everything. They have no trust in their bodily functions or that we are made to give birth." (Focus group discussion with midwives and obstetricians) (Karlstrom et al. 2009 p. 60)*	**Women's request for CS** Similar to OECD countries, clinicians from Non-OECD countries believed in women's right to choose a CS. *"I tell them all the advantages and disadvantages and a complication of caesarean section, but this is the mother, who should choose the type of delivery." (Obstetrician) (Bagheri et al. 2013 p.46)* *"Natural birth is painful. Sometimes they have pain for 24 hours... Some have negative experiences from their previous deliveries. They might have a difficult one... When we tell them that second delivery is much easier they don't believe us, and if we resist, they go to another doctor." (Obstetrician) (Bagheri et al. 2013 p.46)*
CS being a 'safe option' Clinicians from OECD countries believed CS to be a 'safe option'. *"Elective caesarean sections I view as being quite safe. Emergency caesarean sections, because you're rushing, and may be … a bit more dangerous, although still it's a relatively safe operation." (Obstetrician) (Bryant et al. 2007 p.1197)*	**CS being a 'safe option'** Similar to OECD countries, clinicians from Non-OECD countries believed CS to be a 'safe option'. *"Earlier on, CS was very dangerous in our setting. Nowadays that we feel that CS is safe, we tend to do more CSs." (Senior obstetrician) (Litorp et al. 2015a p.717)*
Personal convenience CS was viewed to be a convenient option. *"It is certainly easier to do a repeat C-*	**Personal convenience** CS was viewed to a convenient option. *"We should manage our work. The*

section, so why not just say, 'Shoot, I don't have to deal with VBACs, great…and I get to have a little bit of easier life.' I think when you get to the heart of it, that's what's going on." (Obstetrician) (Cox, 2011. p.6)	*caesarean section gives us the opportunity to manage our schedules, finding someone to work instead of us, tell the hospital when we are leaving. Of course, physicians welcome this". (Obstetrician) (Bagheri et al. 2013 p.e47)* *"With CS I minimize my time and I earn more!" (Obstetrician) (Litorp et al. 2015b. P.235)*
Differences in views among clinicians from OECD and Non-OECD countries	
Litigation (fear of adverse outcome and related legal consequences) Fear of adverse outcome and subsequent litigation was a major issue among clinicians from OECD countries. *"...sometimes you feel fearful about the outcome, like the old primipara with her fifth IVF treatment. You feel nothing must go wrong and wouldn't it be better with a CS just in case." (Obstetrician) (Karlstrom et al. 2009, Sweden p. 60)* *"I just think it's a bunch of crap that you have to change your practice when you know something is safe because somebody might sue you. Anytime you get a less than optimal outcome, people want to blame, people want to sue... It's just kind of a personal philosophy, too. I just think that most long-term midwives get to that point. Otherwise you'd be too afraid to do anything. Birth is amazing, and not always predictable." (Midwife) (Cox 2011, p. 5)*	**Litigation (social stigma)** Social stigma associated with litigation was a major concern among clinicians from Non-OECD countries. *"Being brought to the court, even once, makes the physician and her near friends keep away from vaginal deliveries for ever. In the court they behave rudely towards the physician, making her behave in a similar manner towards others." (Obstetrician) (Yazdizadeh et al. 2011 p.5)*
Resources (staff shortages and workload related stress) Staff shortages and workload-related stress were issues among clinicians from OECD countries. *"The major rise in the CS rate in Sweden is due to stress in the delivery units." (midwife) (Karlstrom et al. 2009 p. 60)*	**Resources (physical and manpower resources)** Lack of infrastructure and physical resources were issues among clinicians from Non-OECD countries. *"Our centre is too crowded, and this is an important factor. We send expectant mothers who can*

	be C-sectioned rapidly to the operation room in order to have more vacant beds." (Midwife) *(Yazdizadeh et al. 2011.p.7)* In Chalmer *et al*'s study, 15% (n=35 of 233) of obstetricians stated lack of access to facilities influenced their decision to perform CS.
Private versus public system Difference in practice among private and public sectors, and possible influence of financial factors, were some concerns among clinicians from OECD countries. Obstetricians working in private hospitals were reported to perform CS on maternal request at a significantly higher level than those working in public hospitals (Obstetrician) (Arikan *et al*. 2011) *"In the private sector, providers are reimbursed approximately $700 for normal childbirth and $1500 for caesarean section, so the doctor prefers to perform caesarean." (Obstetricians) (Colomar et al. 2014. P.2388)*	**Insurance and payment issues** Issues related to insurance system and related financial matters were concerns among clinicians from Non-OECD countries. *"In Iran, the insurance companies sign a contract with healthcare providers and pay them rather than compensating the service itself. Considering the fact that the service provided by the midwives is not covered by insurance companies, expectant moms prefer to go to a specialist. In this situation the rate of additional interventions and C-sections would increase." (Midwife) (Yazdizadeh et al. 2011 p.4)* The payment system to obstetricians was viewed as a factor. *"Many midwives claim that physicians receive all the money so why should a midwife spend long hours in the labor room; physicians, on the other hand, claim they should receive more money as they are in charge of any possible legal problems linked to labor." (Obstetrician) (Yazdizadeh et al. 2011 p.4)*

Appendix 7 Media portrayal of findings from systematic review

1) Press release, Trinity College Dublin, Ireland

https://www.tcd.ie/news_events/articles/fear-of-litigation-and-perceived-safety-concerns-are-key-factors-in-decision-to-perform-c-sections-new-trinity-research/

2) Media coverage in Ireland

RTE Radio One - Drivetime https://www.rte.ie/radio/utils/radioplayer/rteradioweb.html#!
Irish Independent
RTE Radio One - Drivetime https://www.rte.ie/radio/utils/radioplayer/rteradioweb.html#!
Irish Independent (attached)
Irish Mirror https://www.irishmirror.ie/lifestyle/health/irish-researchers-find-most-maternity-13006775
Irish Times https://www.irishtimes.com/news/ireland/irish-news/fear-of-natural-birth-and-litigation-behind-rise-in-caesarean-sections-study-1.3581232 and also attached.
Science Business https://sciencebusiness.net/network-news/fear-litigation-and-perceived-safety-concerns-are-key-factors-decision-perform-c
Irish Examiner attached and here https://www.irishexaminer.com/breakingnews/ireland/fear-of-litigation-a-key-influence-on-caesarean-section-rates-858858.html
Times (Ireland) attached and here https://www.thetimes.co.uk/article/caesareans-used-because-doctors-fear-being-sued-pmbb6hcsw
Daily Mail
The Medical Independent: https://www.medicalindependent.ie/102893/fear_of_litigation_and_perceived_safety_concerns_are_key_factors_in_decision_to_perform_c_sections
Breaking News.ie https://www.breakingnews.ie/ireland/doctors-choosing-c-sections-over-fears-they-will-be-sued-if-something-goes-wrong-with-traditional-birth-study-858987.html

3) International media coverage

https://scienmag.com/fear-of-litigation-is-a-key-factor-in-decision-to-perform-c-sections/
https://www.sciencedaily.com/releases/2018/07/180730104859.htm
https://www.dotemirates.com/en/details/1298690364?from=dot
https://medicalxpress.com/news/2018-07-litigation-key-factor-decision-c-sections.html
http://jerseytribune.com/2018/07/30/fear-of-litigation-is-a-key-factor-in-decision-to-perform-c-sections/

https://www.originmaternityhospitals.com/news/2018/8/14/origin-responds-on-first-study-looking-at-why-doctors-carry-out-caesareans
https://www.originmaternityhospitals.com/news/2018/8/14/origin-responds-on-first-study-looking-at-why-doctors-carry-out-caesareans
https://www.rcm.org.uk/news-views/rcm-opinion/clinicians-views-of-factors-influencing-cs-decision-making/

Appendix 8 Letter of invitation to participate in MAMMI Study– Phase1

Coláiste na Tríonóide, Baile Átha Cliath
Trinity College Dublin
Ollscoil Átha Cliath | The University of Dublin

School of Nursing and Midwifery
Trinity College Dublin
24 D'Olier Street
Dublin 2

Date

Dear Mother-to-be,

I am Sunita Panda, a PhD student in the School of Nursing and Midwifery, Trinity College Dublin.

I am conducting a study in the Coombe Women and Infants University Hospital called The MAMMI Study and it is about first-time mothers' health during pregnancy and after the birth of their baby.

It is known that some women really enjoy becoming mothers for the first time and experience the joy and fulfilment that motherhood brings. Other women experience health problems. Some of these problems may be physical, such as backache or pain if they have had stitches or wounds after the birth. Some women may have problems controlling when they pass urine (water). Some women may have emotional/mental health problems such as low mood or depression.

At this time in Ireland, we do not know much about the health of first-time mothers once they leave hospital after the birth and during the 12 months after the birth.

I would like to ask you to consider taking part in the study. If you feel this is something that would interest you, I should be grateful if you would read the study information, the consent form and the first survey form (enclosed).

Thank you for taking the time to consider my request.

Please feel free to contact me on the study mobile number 087 2290989 or email contact@mammi.ie

I look forward to hearing from you and wish you well with your pregnancy.

Yours sincerely

Sunita

Sunita Panda
On behalf of the MAMMI Study Team
Telephone 087 2290989

The MAMMI Study team members are:
Professor Cecily Begley, Principal Investigator, & Professor Mike Clarke,
Deirdre Daly, Post doctoral researcher
Deirdre O Malley, PhD student, HRB Research Fellow
Francesca Wuytack, PhD student
Sunita Panda, PhD student
Jamile Marchi, PhD student

Appendix 9 Information booklet - Phase 1

Your invitation to join

The MAMMI Study

A study to find out more about the health and health problems of first-time mothers during pregnancy and during the first year after the baby's birth.

The MAMMI study has been approved by the Research Ethics Committees of the Coombe Women and Infants University Hospital (CWIUH) and the Faculty of Health Sciences, Trinity College Dublin. MAMMI stands for **M**aternal health **A**nd **M**aternal **M**orbidity in **I**reland.

If you have any questions about this study, please contact any researcher from the MAMMI team at 087 2290989.

Contents

Why have I been given this booklet?

You were given this booklet because you are having your first baby. This booklet tells you about the MAMMI study and what it means if you decide to take part.

What is the MAMMI study?

MAMMI stands for **M**aternal health **A**nd **M**aternal **M**orbidity in **I**reland. It is a study to look into the health and health problems of first-time mothers during pregnancy and during the year after the birth.

Why are you doing this study?

We want to find out:

- what health problems, if any, women experience during pregnancy and after the birth of their first baby;
- what health services, if any, pregnant women use; and
- how to improve women's health during and after pregnacy.

What sort of questions will you ask me?

We will ask you about:

- your general health and whether you have any medical conditions or have had any operations;
- what you eat and the type of activity and exercise, if any, that you do (in survey 1A)
- any problems you have passing urine (water);
- any problems you have with your bowel movements such as soiling yourself or passing wind when you don't mean to;
- any problems or pain you may have during sex;
- your relationship with your partner and if you are worried about or experiencing violence in the home;
- how often you talk to a doctor, nurse or midwife about your health problems;

- your work or study;
- the type of flat, apartment or house you live in; and
- your thoughts on some issues.

Who else is taking part in this study?

We are inviting women, aged 18 and over, who are having their first baby to take part in the study. Women who have had miscarriages or abortions before this pregnancy are welcome to take part. Altogether, we are asking 2,600 women, 600 women attending the Coombe Hospital, to take part.

What does taking part in the study mean for me?

We are asking you to complete **six** surveys please. You should fill out the first survey (which came with this booklet) while you are pregnant and the second attenatal survey, 1A, when you are about 7 or 8 months pregnant (about 28 to 36 weeks) (we will post this one to you closer to the time). The other four surveys you will be completing at 3, 6, 9 and 12 months after you have given birth. We will post these surveys to you closer to the time also. The surveys are also on the website, www.MAMMI.ie. Each survey takes about 45 minutes to complete.

If you decide to take part in the study, we will ask you to:

- sign the consent form which came with this booklet;
- fill out the survey form that came with this booklet while you are pregnant and a second one, two months later (about your diet and physical activity);
- complete four surveys about your health and health problems at 3, 6, 9 and 12 months after your baby's birth; and
- agree to let the research team have access to your and your baby's medical records held by the Coombe Hospital.

Are there any risks for me or my baby?

We do not see any risks with taking part in this study. However, if we find out during the study that a woman or her baby is being harmed or that there may have been a problem with the care a woman received, we must tell the Study Conduct Monitoring Group.

What is the Study Conduct Monitoring Group?

The Study Conduct Monitoring Group (SCMG) has been set up to:

- guide the research team;
- manage any problems that may arise during the study; and.
- deal with complaints.

If you raise a serious complaint, the group will discuss it. They won't know who you are. If they decide that your complaint should be brought up with midwives or medical regulatory authorities, they will ask your consent to share your personal details but can no longer protect your identity. The regulatory bodies need to know who they are representing.

The group is made up of senior staff from the Coombe Hospital and Trinity College Dublin.

Are there any benefits for me or my baby?

The study will not benefit you personally. The information you give will be pooled with the information given by all the other women in the study. This will help us to better understand some of the health problems that women experience during pregnancy and after birth and what can be done to help them.

By taking part in the study you will be helping other mothers and their babies in the future.

Can anyone take part in the study?

To take part in the study you must be aged 18 or over and able to read and understand English.

How will you protect my personal information?

- We will keep all the information you give us private and confidential.

- We will give your survey information a unique number (a code). We will also remove your personal details from the first survey. This means that your answers will not be linked to your personal details.

- We will store your personal details and your code number securely and separately from the completed surveys. They will be kept in a locked cabinet, in a locked office in an area where few people have access.

- Paper copies of the information you give on the surveys will be identified by your code.

- We will keep an electronic version of the information you give us on a computer. Only the research team will have access to this information. We will use passwords, encryption (special software to scramble the information so it cannot be read) and anti-virus software to protect the information on the computer.

- If we do a face-to-face interview with you, we will record the interview. We will make a paper copy of the recording and show it to you so that you can confirm it is an accurate copy of the interview. We will transfer the audio recording to a secure hard disk, and then destroy the recording. We will use your code number to identify you on the paper copy. We will store the paper copy in a locked cabinet, in a locked office in an area to which few people have access.

- All members of the study team who have access to your information must sign a confidentiality agreement form.

- We will only disclose your personal details in **exceptional circumstances** for example if you or your baby is being harmed or you complain about the researchers (for more information see 'What is the Study Conduct Monitoring Group' on page 6).

What happens to the information at the end of the study?

We will publish the findings from the study and may give talks about the findings at healthcare conferences. It will not be possible to identify you or your answers in these publications or talks.

The information from the surveys may also be used in future research projects. However, the **researchers will not contact you unless you give your consent** to future contact. This is explained below.

What do the options on the consent form mean?

The consent form asks you to sign your name to show that you agree to take part in this study.

The consent form also asks you to agree to the following options:

- **Paragraph 5** lets you say if you want a member of the research team to call you after your baby's birth. If you say yes, they will contact you and invite you to take part in an interview.

- **Paragraph 9** lets you agree to information collected from you as part of this study being used for future research studies.

- **Paragraph 10** lets you say if you want your personal details such as your name and address to be destroyed after stage 1 of this research. If you

say yes, the research team will not be able to contact you when this stage of the research is over.

- **Paragraph 11** lets you agree to us keeping your personal details for five years after the end of the first stage of this research. If you say yes, the research team will contact you and invite you to take part in future studies.

Remember, **you do not have to agree to any of these options.** However, if you do agree, you will help us to continue our study of the health problems of pregnant women, mothers and their babies.

What do I do next?

1. Sign the consent form.
2. Keep a copy for yourself.
3. Post the original signed consent form and your completed survey form using the stamped address envelope that came with this booklet.

Can I leave the study?

Taking part in the study is voluntary. You can withdraw from the study at any time without giving a reason. This will not affect the care you or your baby receives.

How can I get in touch with you?

You can get in touch with any member of the MAMMI team, Deirdre Daly, Sunita Panda, Jamile Marchi, Deirdre O' Malley and Francesca Wuytack, by texting or calling 087 2290989.
You can also get information on our website, www.mammi.ie.

Appendix 10 Consent Form-Phase1

Trinity College Dublin

Coombe Women & Infants University Hospital

CONSENT FORM

Research title: Maternal health And Maternal Morbidity in Ireland (The MAMMI study)
Researcher: Sunita Panda and Jamile Marchi
Tel: 087 2290989 E-mail: contact@mammi.ie

DECLARATION by participant: Please tick (X o r √) and provide your initials

1.	I have read the information booklet for this research study and I understand the contents.	**Yes [ ] No [ ] initials [ ]**
2.	I have had the opportunity to ask questions and all my questions have been answered to my satisfaction.	**Yes [ ] No [ ] initials [ ]**
3.	I fully understand that my participation is completely voluntary and that I am free to withdraw from the study at any time (prior to publication) without giving a reason and that this will not affect my care or the care that my baby receives in any way.	**Yes [ ] No [ ] initials [ ]**
4.	I agree that my medical records and those of my baby will be accessed by the research team for the purpose of this research.	**Yes [ ] No [ ] initials [ ]**
5.	I understand that I may be contacted by a member of the research team and requested to participate in interview(s) on one or more topics covered by this research and I consent to this.	**Yes [ ] No [ ] initials [ ]**
6.	I understand that I will be given an opportunity to review the transcript of such interview(s) to confirm accuracy.	**Yes [ ] No [ ] initials [ ]**
7.	I understand that the transcript will not identify me by name but will use the study code and that the original digital recording will be erased once the accuracy of the transcript has been confirmed.	**Yes [ ] No [ ] initials [ ]**
8.	I understand that information from this research will be published but that I will not be identified as a participant in this research in any publication.	**Yes [ ] No [ ] initials [ ]**
9.	I agree that information obtained from me in this research which has been coded so as not to identify me may be stored and used for the purpose of future research which will have obtained Research Ethics Committee approval without the need for further consent from myself.	**Yes [ ] No [ ] initials [ ]**

10.	I understand that my personal details (name and address and other identifying information that links my identity to the study data) will be destroyed when this study is complete **unless** I have agreed to its retention after that date and to being contacted about future research.	**Yes [ ] No [ ] initials [ ]**
11.	I consent to my personal details being retained for a further period of 5 years after this study has been completed and used to invite me to participate in future research in accordance with this consent.	**Yes [ ] No [ ] initials [ ]**
12.	I consent to being contacted in the future regarding participation in research *relating to the topics covered by this research* which will have Research Ethics Committee approval.	**Yes [ ] No [ ] initials [ ]**
13.	I consent to being contacted in the future in relation to participation in research *unrelated to topics covered by this research* which will have Research Ethics Committee approval.	**Yes [ ] No [ ] initials [ ]**
14.	I understand that the researchers undertaking this research will hold in confidence and securely all collected data and other relevant information.	**Yes [ ] No [ ] initials [ ]**
15.	I freely and voluntarily consent to participating in this research study.	**Yes [ ] No [ ] initials [ ]**

PARTICIPANT'S NAME ……..

Contact Address……..

……..

Phone number:……

Participant's signature: …… **Date:** ……

E-mail ……..

One copy of this form must be retained by the participant and one copy must be retained by the researcher

2

Appendix 11 Letter of invitation for clinicians - Phase 2

Coláiste na Tríonóide, Baile Átha Cliath
Trinity College Dublin
Ollscoil Átha Cliath | The University of Dublin

The MAMMI Study

School of Nursing and Midwifery
Trinity College Dublin
2 Clare St
Dublin D02 CK80
Date

Re. Caesarean section in nulliparous women: Factors influencing the decision-making process and outcomes for women - the MAMMI Study Caesarean Section Strand.

Dear Clinician

My name is Sunita Panda and I am a PhD student in the School of Nursing and Midwifery, Trinity College Dublin and a midwife in the Coombe Women and Infants University Hospital (CWIUH).

The MAMMI (Maternal health And Maternal Morbidity in Ireland) Study is exploring the health and health problems experienced by first-time mothers during pregnancy and up to one year after the birth of their baby.

I am doing the Caesarean Section (CS) Strand of the MAMMI Study to find out more about the factors influencing the decision-making process for CS in first-time mothers and, as part of this study, I am asking midwives and obstetricians if they would be willing to talk to me about the factors ***they*** believe influence the decision to perform a CS in first-time mothers.

I would like to ask you to consider taking part in the study please. If you feel this is something that would interest you, I should be grateful if you would read the study information enclosed and, if you would like to take part, please text/call me or complete the 'willingness to participate' form included in this information pack and return it using the FREEPOST addressed envelope provided.

Thank you for taking the time to consider my request and please feel free to contact me on the study mobile number 087 7815593 or email me at contact@mammi.ie.

I look forward to hearing from you.

Yours sincerely

Sunita Panda

Appendix 12 Willingness to participate form for clinicians - Phase 2

Willingness to Participate Form

Research title:
Caesarean section in nulliparous women: Factors influencing the decision-making process and outcomes for women - the MAMMI Study Caesarean Section Strand.

Researcher: Sunita Panda Tel: 087 7815593

DECLARATION by participant

I have read the information booklet for this research study and I understand the contents.

I understand that completing this form indicates my willingness to be contacted by the researcher, Sunita Panda and, that when I am contacted, I will be given an opportunity to ask questions about the study.

I understand that I can change my mind and decide not to take part at any stage.

Clinician's NAME ……

Contact Address……

Phone number:……**Email**:……

Participant's signature: ……**Date:**……

Appendix 13 Information leaflet for clinicians - Phase 2

Information Booklet

Your invitation to take part in a study on

Caesarean section in nulliparous women: Factors influencing the decision-making process and outcomes for women - the MAMMI Study Caesarean Section Strand.

The study has been approved by the Research Ethics Committees of Trinity College Dublin, Rotunda Hospital, Galway University Hospital and Coombe Women and Infants University Hospital.

MAMMI stands for **M**aternal health **A**nd **M**aternal **M**orbidity in **I**reland.

If you have any questions about this study, please contact researcher Sunita Panda at 087 7815593.

Contents

WHY HAVE I BEEN GIVEN THIS BOOKLET

You were given this booklet because you are employed in the Rotunda Hospital, Galway University Hospital or the Coombe Women and Infants University Hospital (CWIUH), and have experience of caring for women giving birth by caesarean section. This booklet tells you about the MAMMI study, and the Caesarean Section (CS) strand, and what it means if you decide to take part in one-to-one interviews about the factors influencing the decision-making process for caesarean section in nulliparous women.

WHAT IS THE MAMMI STUDY?

MAMMI stands for **M**aternal health **A**nd **M**aternal **M**orbidity in **I**reland. It is a study looking into the health and health problems of first-time mothers during pregnancy and during the first year after the birth.

The caesarean section strand of the study is asking midwives, obstetricians and women to take part in one-to-one interviews about what they think are the factors that influence the decision to perform a caesarean section (CS) in first-time mothers.

WHY ARE YOU DOING THIS STUDY?

By doing this study, I want to find out:
what health problems, if any, women who birth by caesarean section experience during the 12 months postpartum;
what health and other services, if any, women use when they have health problems;
how to improve women's health during and after pregnancy and birth by caesarean section;
how women and clinicians make decisions about giving birth by caesarean section; and
what factors influence the decision for first-time mothers to birth by caesarean section (CS).

WHAT SORT OF QUESTIONS WILL YOU ASK ME?

The number of first-time mothers giving birth by caesarean section has increased in the last decade. Now, almost one third of first-time mothers in Ireland give birth by caesarean section, and I would like to ask you what you think are the factors and circumstances that influence the decision to perform a caesarean section in these women.

WHO ELSE IS TAKING PART IN THIS STUDY?

I am inviting 2600 women, aged 18 years and over, who are having their first baby to take part in the MAMMI study. A small number of these women (about 20-25) who have birthed by CS will be asked to take part in one-to-one interviews about their experiences, their health and the factors they think influenced the decision to perform the caesarean section.

WHAT DOES TAKING PART IN THE STUDY MEAN FOR ME?

If you decide to take part in the one-to-one interview of this study, I will ask you to:
text/call me, or complete the 'willingness to participate' form that came with this booklet;
take part in an audio recorded one-to-one interview which will take approximately 30-45 minutes of your time.

ARE THERE ANY RISKS FOR ME?

I do not foresee any risks with taking part in this study. However, if a problem arises during the interview (for example, information comes to light that a woman or baby has been harmed) I must tell the appropriate people in the relevant study site.

ARE THERE ANY BENEFITS FOR ME?

The study will not benefit you personally. The information you give will be pooled with the information given by all other clinicians and women in the study and will help us to understand the factors that influence the decision-making for caesarean section for first-time mothers, which may help improve care for mothers and babies in the future.

CAN ANYONE TAKE PART IN THE STUDY?

To take part in the study you must be employed in the Rotunda Hospital, the CWIUH or the Galway University Hospital, and be willing to be take part in a one-to-one interview.
Midwives must be working on the labour ward at the time of the study, and obstetricians must be responsible for making decisions about performing caesarean sections in the hospital.

HOW WILL YOU PROTECT MY PERSONAL INFORMATION?

I will keep all the information you give me private and confidential. I will audio record the one-to-one interview and, when I make a paper copy of the recording, I will replace your name with a unique study number (a code). I will offer you the chance to see this paper copy so that you can confirm it is an accurate copy of the interview. I will then transfer the recording to a secure hard drive and then delete the information from the recording device once analysis of data has been completed. I will use your study number at all times to identify you and I will not use any information that might identify you personally in any publications arising from the study. I will store the paper copy of the interview in a locked cabinet, in a locked office in an area to which few people have access.

I will use passwords and anti-virus software to protect the information held on the computer.
All members of the study team who have access to this information must sign a confidentiality agreement form. I will only disclose your personal details in **exceptional circumstances** for example, if information emerges that a mother or baby is being harmed, or if you complain about the researcher.

WHAT HAPPENS TO THE INFORMATION AT THE END OF THE STUDY?

I will publish the findings from the study and may give talks about the findings at healthcare conferences. It will not be possible to identify you or your answers in these publications or talks.

WHAT DO I DO NEXT?

If you are interested in taking part in a one-to-one interview, please text/call me or complete the '**Willingness to participate'** form that came with this booklet and post it to me in the FREEPOST envelope provided.
I will then contact you to answer any questions you have, arrange a suitable time and place for interview and gain your written consent.

CAN I LEAVE THE STUDY?

Taking part in the study is voluntary. You can withdraw from the study at any time without giving a reason.

HOW CAN I GET IN TOUCH WITH YOU?

My name is Sunita Panda and you can contact me on 087 7815593 by calling or texting.

You can also get information on our website www.mammi.ie.

Appendix 14 Consent form for clinicians – Phase 2

CONSENT FORM
Research title:
Caesarean section in nulliparous women: Factors influencing the decision-making process and outcomes for women - the MAMMI Study Caesarean Section Strand.
Researcher: Sunita Panda Tel: 087 7815593

DECLARATION by participant: Please tick (X o r √) and provide your initials

1.	I have read the information booklet for this research study and I understand the contents.	Yes [ ] No [ ] initials [ ]
2.	I have had the opportunity to ask questions and all my questions have been answered to my satisfaction.	Yes [ ] No [ ] initials [ ]
3.	I fully understand that my participation is completely voluntary and that I am free to withdraw from the study at any time (prior to publication).	Yes [ ] No [ ] initials [ ]
4.	I understand that I am being asked to participate in an interview on the factors that influence the decision to perform a caesarean section in first-time mothers and I consent to this.	Yes [ ] No [ ] initials [ ]
5.	I understand that I will be given an opportunity to review the transcript of such an interview(s) to confirm accuracy.	Yes [ ] No [ ] initials [ ]
6.	I understand that the transcript will not identify me by name but will use the study code and that the original digital recording will be erased once the accuracy of the transcript has been confirmed.	Yes [ ] No [ ] initials [ ]
7.	I understand that information from this research will be published but that I will not be identified as a participant in this research in any publication.	Yes [ ] No [ ] initials [ ]
8.	I agree that information obtained from me in this research which has been coded so as not to identify me may be stored and used for the purpose of future research which will have obtained Research Ethics Committee approval without the need for further consent from myself.	Yes [ ] No [ ] initials [ ]

9.	I understand that my personal details (name and address and other identifying information that links my identity to the study data) will be destroyed when this study is complete.	Yes [ ] No [ ] initials [ ]
10.	I understand that the researchers undertaking this research will hold in confidence and securely all collected data and other relevant information.	Yes [ ] No [ ] initials [ ]
11.	I freely and voluntarily consent to participating in this research study.	Yes [ ] No [ ] initials [ ]

PARTICIPANT'S NAME .....

Contact Address.....

Phone number:..... **Email:**.....

Participant's signature:..... **Date:**.....

Name of person taking consent: ..... Signature: ..... Date:.....

Researcher: ..... Signature: ..... Date:.....

One copy of this form must be retained by the participant and one copy must be retained by the researcher

Appendix 15 Letter of Introduction for women - Phase 2

School of Nursing and Midwifery
Trinity College Dublin
2 Clare St
Dublin 2 D02 CK80

Date

Dear

My name is Sunita Panda and I am a PhD student on the MAMMI study in the School of Nursing and Midwifery, Trinity College Dublin, and a former midwife in the Coombe Women and Infants University Hospital, Dublin.

As you know from taking part, the MAMMI (Maternal health And Maternal Morbidity in Ireland) study is about the health and health problems, if any, women experience during pregnancy and during the first year after the birth of their first baby.

I am doing the Caesarean Section (CS) Strand of the study to find out more about the factors influencing decision-making for CS in first-time mothers.

As part of this study, I am writing to ask you if I could talk to you, on a one-to-one basis, about what you think are the factors that influence the decision to perform a CS.

If you feel this is something that would interest you, I should be grateful if you would read the enclosed study information, and if you would like to take part, please text or call me on 087 2290989 or email at spanda@tcd.ie

Thank you for taking the time to consider my request, and I look forward to hearing from you.

Yours sincerely

Sunita Panda

Appendix 16 Information leaflet for women - Phase 2

Coláiste na Tríonóide, Baile Átha Cliath
Trinity College Dublin
Ollscoil Átha Cliath | The University of Dublin

Galway University Hospitals
Ospidéil na hOllscoile Gaillimh
UNIVERSITY HOSPITAL GALWAY
MERLIN PARK UNIVERSITY HOSPITAL

NUI Galway
OÉ Gaillimh

Coombe Women & Infants University Hospital

The MAMMI Study

Information Booklet

Your invitation to take part in a study on
Caesarean section in first-time mothers: Factors influencing the decision-making process and outcomes for women - the MAMMI Study Caesarean Section Strand.

This study has been approved by the Research Ethics Committees of Trinity College Dublin, Galway University Hospital and the Coombe Women and Infants University Hospital.

MAMMI stands for **M**aternal health **A**nd **M**aternal **M**orbidity in **I**reland.

If you have any questions about this study, please contact, text or call, Sunita Panda (the researcher) on 087 2290989 or email me at spanda@tcd.ie

Contents

INTRODUCTION

My name is Sunita Panda and I am a PhD student on the MAMMI study in the School of Nursing and Midwifery, Trinity College Dublin, and a former midwife in the Coombe Women and Infants University Hospital, Dublin. As you know from taking part, the MAMMI (Maternal health And Maternal Morbidity in Ireland) Study is about the health and health problems, if any, women experience during pregnancy and for the first year after the birth of their first baby. I am doing the Caesarean Section (CS) Strand of the MAMMI Study to find out more about the factors influencing decision-making for CS in first-time mothers.

WHY HAVE I BEEN GIVEN THIS BOOKLET?

You were given this booklet because you are a MAMMI study participant, and you had a caesarean section for the birth of your baby. This booklet tells you about the MAMMI study and the Caesarean Section (CS) strand, and what it means if you decide to take part in one-to-one interviews about the factors that influenced the decision-making for your CS, your involvement, if any, in the decision-making process, and your health, wellbeing and experiences since you gave birth.

WHAT IS THE MAMMI STUDY?

MAMMI stands for **M**aternal health **A**nd **M**aternal **M**orbidity in **I**reland. It is a study looking into the health and health problems of first-time mothers during pregnancy and during the first year after the birth. As part of the caesarean section strand of the study, I am asking women if they would be willing to talk to me on a one-to-one basis (interviews) about what they think are the factors that influence the decision to perform a caesarean section (CS) in first-time mothers. As part of this study, I have also talked with 35 midwives and obstetricians about their views of factors influencing decision-making for CS in first-time mothers.

WHY ARE YOU DOING THIS STUDY?

By doing this study, I hope to find out:

i. what health problems, if any, women who birth by CS experience during the 12 months after the birth and what health and/or other services, if any, women use if and when they have health problems;
ii. women's views on the factors that influenced the decision for their CS and their level of involvement, if any, in this decision
iii. how clinicians make decisions about giving birth by CS;
iv. what factors influence the decision for first-time mothers to birth by CS; and
v. if there is anything that might help improve women's health postpartum.

WHAT SORT OF QUESTIONS WILL YOU ASK ME?

The number of first-time mothers giving birth by CS has increased in the last decade. Now, almost one third of first-time mothers in Ireland give birth by CS, and I would like to ask you

questions about what you think are the factors and issues that influenced the decision for your birth by CS, your involvement in the decision-making process, and your health, wellbeing and experiences since the birth.

WHO ELSE IS TAKING PART IN THIS STUDY?

A total of 1,200 first-time mothers who gave birth in the Galway University Hospital and the Coombe Women and Infants University Hospital took part/are taking part in the MAMMI study. I will be inviting a number of women who gave birth by CS and who agreed to be contacted about MAMMI-related studies to take part in one-to-one interviews, and I hope to interview approximately 20 women.

WHAT DOES TAKING PART IN THE STUDY MEAN FOR ME?

If you decide to take part in the one-to-one interview of this study, I will ask you to:
Text, call or email me to let me know you are interested in talking to me, sign and post the consent form to me (in the FREEPOST envelope enclosed), and take part in an audio recorded interview which will take approximately 30-45 minutes of your time.

ARE THERE ANY RISKS FOR ME?

I do not foresee any risks to you or your baby with taking part in this study. However, if a problem arises during the interview (for example, information comes to light that you or your baby has been harmed) I must inform the appropriate people (my supervisors in the School of Nursing and Midwifery, Trinity College Dublin and the Master and the Director of Midwifery in the relevant hospital). During the interview, it is possible that a woman may become distressed while recalling her experiences. If this happens to you, I would stop the interview and start it again only if and when you wish to do so.

ARE THERE ANY BENEFITS FOR ME?

The study will not benefit you personally. The information you give will be pooled with the information given by all other women and clinicians in the study, and will help me to understand the factors and issues that influence the decision to perform a CS in first-time mothers. When the study is complete, the information from you and other women, and the clinicians, may help improve care and services for mothers and babies in the future.

CAN ANYONE TAKE PART IN THE STUDY?

To take part in this CS strand of the MAMMI study, you must

i. have completed the MAMMI study surveys at three months after your baby's birth;
ii. be healthy and well before your pregnancy, that is, have no medical conditions that might indicate the need to give birth by CS only;
iii. have given birth by CS at or after you were 37 weeks of pregnant (at term); and
iv. have agreed to be contacted about taking part in a one-to-one interview;
v. consent to taking part in a one-to-one interview.

HOW WILL YOU PROTECT MY PERSONAL INFORMATION?

I will keep all the information you tell me private and confidential. I will audio record the one-to-one interview and, when I make a paper copy of the recording, I will replace your name with a unique study number (a code). I will use this study number at all times to identify you and I will not use any information that might identify you personally in any publications or presentations arising from the study. The information from the interview (data) will be only accessible to my supervisors, Dr Deirdre Daly and Professor Cecily Begley, and me. I will send you the paper copy of your interview, if you wish to have it, so that you can confirm it is accurate. I will then transfer the recording to a secure hard drive on a computer and delete the information from the digital recording device once I have analysed all the interview data, and the study has been completed. I will store the paper copy of the interview in a locked cabinet, in a locked office in an area which is accessible to the MAMMI study research team members only.

I will use passwords and anti-virus software to protect the information held on the computer. I will only discuss your personal details in **exceptional circumstances** for example, if information emerges that you or your baby was/is being harmed, or if you complain about the researcher.

WHAT HAPPENS TO THE INFORMATION AT THE END OF THE STUDY?

I will publish the findings from the study in scientific journals, and give talks about the findings at healthcare conferences. It will not be possible to identify you in these publications or talks.

WHAT DO I DO NEXT?

If you are interested in taking part in a one-to-one interview, please text/call me on 087 2290989 or email me at spanda@tcd.ie. I will then contact you to answer any questions you have, ask you if you are still willing to take part and, if you are, ask you to post your signed consent form to me in the FREEPOST envelope enclosed. Then, I will arrange a time and place for interview that suits you.

CAN I LEAVE THE STUDY?

Taking part in the study is voluntary. You can withdraw from the study at any time without giving a reason.

HOW CAN I GET IN TOUCH WITH YOU?

To get in touch with me (Sunita Panda), call or text on 087 2290989, or email me at spanda@tcd.ie.

Appendix 17 Consent form for women - Phase 2

CONSENT FORM

Research title:

Caesarean section in first-time mothers: Factors influencing the decision-making process and outcomes for women - the MAMMI Study Caesarean Section Strand.

Researcher: Sunita Panda Tel: 087 2290989

DECLARATION by participant: Please tick (X o r √) and provide your initials

1.	I have read the information booklet for this research study and I understand the contents.	Yes [ ] No [ ] initials [ ]
2.	I have had the opportunity to ask questions and all my questions have been answered to my satisfaction.	Yes [ ] No [ ] initials [ ]
3.	I fully understand that my participation is completely voluntary and that I am free to withdraw from the study at any time (prior to publication).	Yes [ ] No [ ] initials [ ]
4.	I understand that I am being asked to take part in an audio recorded interview on the factors that influence the decision to perform a caesarean section, and I consent to this.	Yes [ ] No [ ] initials [ ]
5.	I understand that I will be given an opportunity to review the written paper copy of such an interview to confirm accuracy.	Yes [ ] No [ ] initials [ ]
6.	I understand that the transcript will not identify me by name but will use the study code and that the original digital audio recording will be erased (deleted) once the accuracy of the transcript has been confirmed.	Yes [ ] No [ ] initials [ ]
7.	I understand that information from this research will be published but that I will not be identified as a participant in any publication.	Yes [ ] No [ ] initials [ ]

8.	I understand that my personal details (name and address and other information that links my identity to the interview data) will be destroyed when the caesarean section strand of the study is complete.	Yes [ ] No [ ] initials [ ]
9.	I understand that the researcher undertaking this study will hold in confidence and securely all collected data and other relevant information.	Yes [ ] No [ ] initials [ ]
10.	I freely and voluntarily consent to participating in this research study.	Yes [ ] No [ ] initials [ ]

PARTICIPANT'S NAME .....

Contact Address.....

Phone number:..... **Email:**.....

Participant's signature:..... **Date:**.....

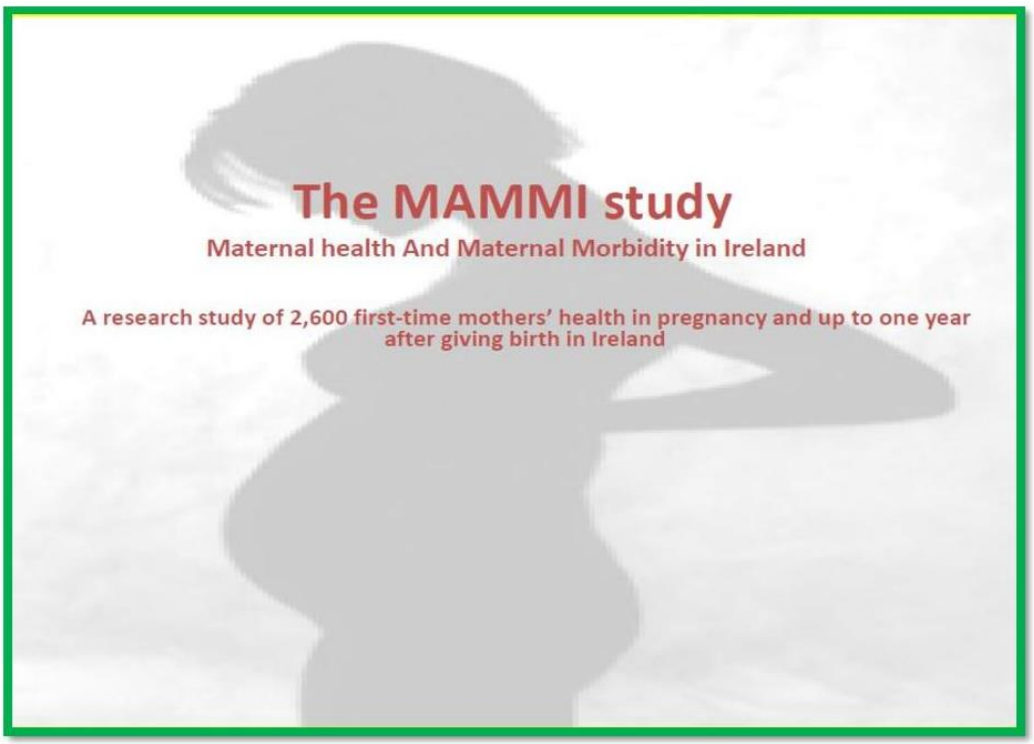
Name of person taking consent: ..... Signature: ..... Date:.....

Researcher: ..... Signature: ..... Date:.....

One copy of this form must be retained by the participant and one copy must be retained by the researcher

Appendix 18 MAMMI SURVEY 2 - 3 month postpartum survey

Study No ☐☐☐☐☐



Survey Booklet Two: 3 Months Postnatal 2

Thank you for taking the time to complete this survey. It will take you about **45 minutes** to complete it and your answers are **confidential**. If you have any questions about any part of this survey, or need help answering any of the questions, please feel free to call us **on 087 229 0989.**

The MAMMI study has been approved by the Research Ethics Committees of the Coombe Women and Infants University Hospital and the Faculty of Health Sciences, Trinity College Dublin.

Please tick here if you do not want to complete this or future surveys ☐

Coombe Women & Infants University Hospital
Excellence in the Care of Women and Babies
Foirfeachtí i gCúram Ban agus Naíonán

TRINITY COLLEGE DUBLIN
COLÁISTE NA TRÍONÓIDE, BAILE ÁTHA CLIATH
THE UNIVERSITY OF DUBLIN

Contact: MAMMI Research Team
(Deirdre Daly, Sunita Panda, Jamile Marchi and Deirdre O Malley)
Tel: 087 229 0989
E-mail: contact@mammi.ie

Structure of the MAMMI Survey

The **M**aternal health **A**nd **M**aternal **M**orbidity in **I**reland (**MAMMI**) study is in six (6) parts: (1) antenatal (early pregnancy); (1A) antenatal (middle to late pregnancy - when you are about 7 months pregnant); (2) 3 months after the birth; (3) 6 months after the birth; (4) 9 months after the birth and (5) 12 months after the birth.

Thank you for completing surveys 1 and 1 A. This is the first postnatal survey and is about your health NOW (3 months after your baby's birth) and your labour and birth.

This part of the survey has ten (10) sections, numbered A through to J:

A questions about you and your baby;
B your labour and baby's birth;
C life with a new baby;
D your health since the birth of your baby;
E sex after childbirth;
F your emotional health and well-being now;
G contacts with health services;
H about you and your household;
I you and your relationships;
J comments on the survey.

Please note, there is space in Section J for any comments you might like to make on the survey.

How to fill in the Survey

Most of the questions can be answered by putting a tick in the box next to the answer that best applies to you. For example:

Has tiredness been a problem for you in the past month?

Yes ☑
No ☐

A few questions may ask you to fill in a number in a box. For example:

What is your date of birth?

Day /Month / Year
3 0 / 0 4 / 1 9 8 0

This filled-in sample represents a date of birth of 30th April 1980

Section A: This section is about you and your baby

A1 What is today's date?

☐☐ / ☐☐ / ☐☐☐☐
d d *m m* *y y y y*

A2 How many babies did you have?

One	Twins	Triplets or more
☐ 1	☐ 2	☐ 3

A3 On what date was your baby born?
(Additional copies of this survey are provided if you had more than one baby).

☐☐ / ☐☐ / ☐☐☐☐

A3 a What weight was your baby? *(Please fill one of these options)*

_____pounds and _____ ounces **OR** _____Kilograms

A4 How did your labour start? Please complete this question even if you gave birth by planned or emergency caesarean section)

a. *Spontaneously* *(This means you went into labour yourself and needed no medical intervention such as a syntocinon drip or having your waters broken)* ☐ 1

b. Induced *(your labour was started by one/some of the following* (*Please tick **all** that apply)*

Vaginal Pessary/pessaries	My waters were broken artificially	I had a syntocinon drip
☐ 2	☐ 3	☐ 4

c. Accelerated (*you started labour yourself but your labour was speeded up)*

My waters were broken artificially	I had a syntocinon drip
☐ 5	☐ 6

d. I had no labour (I had a caesarean section (CS) but never went into labour) ☐ 7 *(Please Go to B8)*

d1. If you had CS, did you ask /request it? **Yes** 8 ☐ **No** 9 ☐

Please comment if you wish

_____

_____

Section B: Your labour and baby's birth

B1 During labour, did you use any of the following to help relieve pain?

	Yes	No	Not sure
a. Gas and oxygen *(Nitrous Oxide)*	☐ 1	☐ 2	☐ 3
b. Injections of Pethidine *(or pain killing drugs)*	☐ 1	☐ 2	☐ 3
c. Epidural or spinal injection in your back	☐ 1	☐ 2	☐ 3
d. TENS	☐ 1	☐ 2	☐ 3
e. Water pool or bath	☐ 1	☐ 2	☐ 3
f. Complementary therapies	☐ 1	☐ 2	☐ 3
g. Hypnotherapy	☐ 1	☐ 2	☐ 3
h. Other (please give details)	☐ 1	☐ 2	☐ 3

_____

_____

B2 During labour, did you use any of the following to help you deal with contractions?

	Yes	No	Not sure
a. Had a shower	☐ 1	☐ 2	☐ 3
b. Moved around or tried different positions	☐ 1	☐ 2	☐ 3
c. Had a massage	☐ 1	☐ 2	☐ 3
d. Used hot packs	☐ 1	☐ 2	☐ 3
e. Listened to music / Watched TV	☐ 1	☐ 2	☐ 3
f. Went for a walk	☐ 1	☐ 2	☐ 3
f. Birthing ball	☐ 1	☐ 2	☐ 3

Please comment on how you coped/dealt with contractions or on any aspect of your labour in hospital or at home prior to going to the hospital

_____

_____

B3 **During your labour, did you have:**

	Yes	No	Not sure
a. a catheter (tube) inserted *(to empty your bladder)* and LEFT in place during your labour	☐ 1	☐ 2	☐ 3
b. a catheter (tube) inserted *(to empty your bladder)* ONCE	☐ 1	☐ 2	☐ 3
c. a catheter (tube) inserted *(to empty your bladder)* every few hours	☐ 1	☐ 2	☐ 3

B4 **During the second stage of labour *(after your cervix was fully dilated and/or you started pushing)*, did you spend time in any of the following positions?** *(Tick as many as necessary)*

		Yes	No	Not sure
a.	Lying on side	☐ 1	☐ 2	☐ 3
b.	Lying flat on back	☐ 1	☐ 2	☐ 3
c.	Propped up leaning back on pillows	☐ 1	☐ 2	☐ 3
d.	Standing	☐ 1	☐ 2	☐ 3
e.	Kneeling	☐ 1	☐ 2	☐ 3
f.	On hands and knees	☐ 1	☐ 2	☐ 3
g.	Squatting	☐ 1	☐ 2	☐ 3
h.	Sitting	☐ 1	☐ 2	☐ 3
i.	In stirrups	☐ 1	☐ 2	☐ 3
j.	In water pool	☐ 1	☐ 2	☐ 3
k.	Other positions *(please describe)*	☐ 1	☐ 2	☐ 3

_____

_____

B5 Which of the following methods of pushing were you encouraged to use?
(Tick as many as necessary)

		Yes	No	Not sure
a.	I was encouraged to follow my own inclinations/urges to push	☐ 1	☐ 2	☐ 3
b.	I was encouraged to hold my breath when pushing	☐ 1	☐ 2	☐ 3
c.	I was encouraged to push down like having a bowel movement	☐ 1	☐ 2	☐ 3
d.	Other *(please describe)*	☐ 1	☐ 2	☐ 3

_____

_____

B6 What was the main method of pushing you used?

_____

B7 a. Were you told what position your baby was in during the latter *(later/end)* part of your labour?

a. I was told my baby was in the correct position for the birth ☐ 1

b. I was told my baby was not in the correct position for the birth ☐ 2

c. I was not told what position my baby was in ☐ 3

d. Not sure ☐ 4

B7 b. If your baby was not in the correct position, were you told:

a. that your baby was in a posterior position *(with your baby's back towards your back)* ☐ 1

b. that your baby's head was (stuck) in a transverse position *(head looking sideways)* ☐ 2

B8 How was your baby born?

	Yes	No	Not sure
a. Vaginal birth	☐ 1	☐ 2	☐ 3
b. Vaginal breech *(bottom first)* birth	☐ 1	☐ 2	☐ 3
c. Birth assisted with forceps *(with no rotation of your baby's head)*	☐ 1	☐ 2	☐ 3
d. Birth assisted with rotation forceps *(to turn your baby's head into the correct position for the birth)*	☐ 1	☐ 2	☐ 3
e. Vacuum extraction or ventouse *(with no rotation of your baby's head)*	☐ 1	☐ 2	☐ 3
f. Vacuum extraction or ventouse *(with rotation of your baby's head)*	☐ 1	☐ 2	☐ 3
g. Birth assisted with vacuum AND forceps	☐ 1	☐ 2	☐ 3
h. Doctor rotated your baby's head manually using his/her hands *(to turn your baby's head into the correction position for the birth)*	☐ 1	☐ 2	☐ 3
i. Caesarean section after unsuccessful attempt to deliver your baby using forceps or vacuum extraction	☐ 1	☐ 2	☐ 3
j. Caesarean section *(no other procedure used first)*	☐ 1	☐ 2	☐ 3

*Please comment if you wish*_____

_____

B9 How long were you pushing before your baby was born? (Skip from B9 to B13 if you had no labour CS)

☐☐ hours ☐☐ minutes *(please comment if you wish)*

_____

B10 How long were you in labour <u>in hospital</u> before your baby was born (including the time you spent pushing)?

☐☐ hours ☐☐ minutes (*Please comment if you wish)*

_____

B11 What position were you in when your baby was being born?

		Yes	No	Not sure
a.	Lying on side	☐ 1	☐ 2	☐ 3
b.	Lying flat on back	☐ 1	☐ 2	☐ 3
c.	Propped up leaning back on pillows	☐ 1	☐ 2	☐ 3
d.	Standing	☐ 1	☐ 2	☐ 3
e.	Kneeling	☐ 1	☐ 2	☐ 3
f.	On hands and knees	☐ 1	☐ 2	☐ 3
g.	Squatting	☐ 1	☐ 2	☐ 3
h.	Sitting	☐ 1	☐ 2	☐ 3
i.	In stirrups	☐ 1	☐ 2	☐ 3
j.	In water pool	☐ 1	☐ 2	☐ 3
k.	Other positions *(please describe)*	☐ 1	☐ 2	☐ 3

_____

_____

_____

B12 It is common for women who have a vaginal birth to have either a perineal tear or surgical cut (episiotomy) when their baby is born. (*The perineum is the area around the entrance to the vagina including the labia and other external genital organs.)*

a. Did you have an episiotomy (surgical cut to your perineum)?

a. Yes ☐ 1 b. No ☐ 2 c. Not sure ☐ 3

B12 b. Did you have a perineal tear?

a. Yes ☐ 1 b. No ☐ 2 c. Not sure ☐ 3

B12 c. Did you have stitches for a tear or episiotomy?

a. Yes ☐ 1 b. No ☐ 2 c. Not sure ☐ 3

B13 a. Did you have a tear that affected your rectum?

a. Yes ☐ 1 b. No ☐ 2 c. Not sure ☐ 3

b. If YES, did the midwife or doctor tell you

	Yes	**No**	**Not sure**
a. That the tear had extended to your anal sphincter *(the muscle that you tighten when you move your bowels)*	☐ 1	☐ 2	☐ 3
b. That the tear went all the way around to the lining of the rectum	☐ 1	☐ 2	☐ 3

Please comment if you wish _____

_____

B14 Thinking back about your labour and birth, were you happy with your methods of pain relief?

a. Yes ☐ 1 b. No ☐ 2 c. Not sure ☐ 3

Please comment if you wish _____

_____

_____

B15 While you were in hospital <u>immediately</u> after you had your baby, were you:

		Yes	No	Not sure
a.	Advised to use laxatives *(Tablets/treatments to help you pass a bowel motion (stools/faeces)*	☐ 1	☐ 2	☐ 3
b.	Told not to strain when passing bowel motions	☐ 1	☐ 2	☐ 3

B16 Did any of the following happen to you, either FOR THE BIRTH or immediately afterwards?

		Yes	No	Not sure
a.	I had a general anaesthetic	☐ 1	☐ 2	☐ 3
b.	I had an epidural and/or spinal anaesthetic	☐ 1	☐ 2	☐ 3
c.	I had a local anaesthetic *(e.g. when stitches were done)*	☐ 1	☐ 2	☐ 3
d.	I had a catheter inserted *(to empty my bladder)*	☐ 1	☐ 2	☐ 3

B17 Do you think you were given an active say in making decisions about what happened during your labour and/or birth?

a.	Yes, in all cases	☐ 1
b.	Yes, in most cases	☐ 2
c.	At some times and not others	☐ 3
d.	Rarely	☐ 4
e.	Not at all	☐ 5
f.	Not sure	☐ 6

*Please comment if you wish*_____

_____

B18 a. Was your baby admitted to a special care nursery or neonatal intensive care unit while you were in hospital?

a. Yes, immediately after the birth (within 2 hours of being born) ☐ 1

b. Yes, more than 2 hours after the birth ☐ 2

c. No ☐ 3

B18 b. If yes, why was your baby admitted?

_____

_____

_____

_____

B18 c. How many days did your baby stay in the special care nursery and/or neonatal intensive care unit?

☐☐☐ days *(If your baby was admitted to the nursery for less than 24 hours, please write "00" in the boxes.)*

B19 How long did you stay in hospital after your baby was born?

a. Less than 1 day ☐ 1

b. Between 1 – 2 days ☐ 2

c. 3 or 4 days ☐ 3

d. 5 or 6 days ☐ 4

e. 7 or 8 days ☐ 5

f. 9 days or more ☐ 6

B20 While you were in hospital after the birth, did you experience any of the following medical complications or health problems?

		Yes	No	Not sure
a	Extreme tiredness or exhaustion	☐ 1	☐ 2	☐ 3
b.	Severe headaches or migraines	☐ 1	☐ 2	☐ 3
c.	Back pain	☐ 1	☐ 2	☐ 3
d.	Fever temperature of 38^{O}C or higher	☐ 1	☐ 2	☐ 3
e.	Painful or sore perineum *(from episiotomy or tear)*	☐ 1	☐ 2	☐ 3
f.	Perineum wound infection	☐ 1	☐ 2	☐ 3
g.	Pain from caesarean section wound	☐ 1	☐ 2	☐ 3
h.	Caesarean section wound infection	☐ 1	☐ 2	☐ 3
i.	Postpartum haemorrhage	☐ 1	☐ 2	☐ 3
j.	Uterine (womb) infection	☐ 1	☐ 2	☐ 3
k.	Pain when passing urine	☐ 1	☐ 2	☐ 3
l.	Urinary tract infection *(please give details below)*	☐ 1	☐ 2	☐ 3
m.	Pain when passing bowel motion	☐ 1	☐ 2	☐ 3
n	Bleeding when passing a bowel motion	☐ 1	☐ 2	☐ 3
o.	Constipation *(opening your bowels only twice a week or less, or pushing and straining to open your bowel more than every fourth time you go)*	☐ 1	☐ 2	☐ 3
p.	Haemorrhoids *(swollen veins around your back passage sometimes called piles)*	☐ 1	☐ 2	☐ 3
q.	Leaked urine when you did not mean to *(e.g., when you coughed, laughed or sneezed)*	☐ 1	☐ 2	☐ 3
r.	Unable to pass urine	☐ 1	☐ 2	☐ 3

		Yes	No	Not sure
s.	Had trouble controlling bowel motions or experienced leakage when you did not mean to	☐ 1	☐ 2	☐ 3
t.	Feeling depressed, low or blue	☐ 1	☐ 2	☐ 3
u.	Feeling anxious or not able to cope	☐ 1	☐ 2	☐ 3
v	Breast problems *(e.g., sore nipples, mastitis)*	☐ 1	☐ 2	☐ 3
w.	Other *(please describe)*	☐ 1	☐ 2	☐ 3

_____

_____

B21 While you were in hospital after the birth, did you use any of the following medications for pain?

	Yes	No	Not sure
a Paracetamol *(e.g., Panadol®)*	☐ 1	☐ 2	☐ 3
b. Paracetamol and codeine *(panadeine)*	☐ 1	☐ 2	☐ 3
c. Ponstan®	☐ 1	☐ 2	☐ 3
d. Difene (Voltarol) *(taken orally [by mouth])*	☐ 1	☐ 2	☐ 3
e. Difene (Voltarol) *(suppository inserted into the back passage)*	☐ 1	☐ 2	☐ 3
f. Nurofen/Isobrufen	☐ 1	☐ 2	☐ 3
g. Aspirin	☐ 1	☐ 2	☐ 3
h. Local anaesthetic gel	☐ 1	☐ 2	☐ 3
i. Herbal remedies	☐ 1	☐ 2	☐ 3
j. Other *(please describe)*	☐ 1	☐ 2	☐ 3

_____

_____

B22 While you were in hospital after the birth, did you use any other medications?
(Please tick one response on each line.)

		Yes	No	Not sure
a.	Antibiotics	☐ 1	☐ 2	☐ 3
b.	Anti-depressants	☐ 1	☐ 2	☐ 3
c.	Haemorrhoid cream	☐ 1	☐ 2	☐ 3
d.	Laxatives	☐ 1	☐ 2	☐ 3
e.	Sleeping tablets	☐ 1	☐ 2	☐ 3
f.	Other (*please describe*)	☐ 1	☐ 2	☐ 3

_____

_____

_____

B23 What did you weigh at the end of your pregnancy without clothes or shoes?

☐☐☐ kgs OR ☐☐ stones and ☐☐ pounds

B24 What do you weigh NOW without clothes or shoes?

☐☐☐ kgs OR ☐☐ stones and ☐☐ pounds

Section C: Life with a new baby

The next few questions are about your life with a new baby. If you feel uncomfortable answering any of these questions or they are too personal, you do not have to answer them. However, if you have experienced any of the symptoms or issues asked about, it would help us to understand them and it might help other women to know they are not alone in their experiences when the findings are published. Again, we would like to reassure you that all the information that you provide is **strictly confidential** and all the findings from this survey will be presented and published in a way that does not identify **you** or **any** individual woman.

C1 Looking back to your first week at home with your new baby, how would you describe your own health at that time? Did you feel

a. Extremely well ☐ 1

b. Very well ☐ 2

c. OK ☐ 3

d. Not very well ☐ 4

e. Extremely unwell ☐ 5

C2 How confident did you feel about looking after your baby in the first week at home?

a. Very confident ☐ 1

b. Fairly confident ☐ 2

c. Mixed ☐ 3

d. Fairly anxious ☐ 4

e. Not confident ☐ 5

C3 a. Did your baby cry a lot in the first few weeks?

a. Yes ☐ 1

b. No ☐ 2

C3 b. Now that your baby is three months old, does she/he cry very much?

a. Yes ☐ 1

b. No ☐ 2

C3 c. How easy is it to settle your baby now once she/he starts crying?

a. Usually very easy ☐ 1

b. Usually fairly easy ☐ 2

c. Sometimes easy and sometimes difficult ☐ 3

d. Often difficult ☐ 4

e. Often very difficult ☐ 5

C4 In the last week, which one of the following best describes your baby's pattern of sleeping?

a. My baby has not woken up during the night AT ALL in the past week ☐ 1

b. My baby has rarely woken up during the night in the last week ☐ 2

c. My baby has woken up several nights in the last week ☐ 3

d. My baby has woken up once a night most nights in the last week ☐ 4

e. My baby has woken up twice a night most nights in the last week ☐ 5

f. My baby has woken up three or more times a night most nights in the last week ☐ 6

C5 Do you feel like you are getting enough sleep yourself?

a. Yes ☐ 1

b. No ☐ 2

C6 a. Did you breastfeed your baby *(or give expressed breastmilk)*?

Yes ☐ 1

No ☐ 2 *(please go to C7)*

b. Are you still breastfeeding your baby *(or giving expressed breastmilk)*?

Yes ☐ 1

No ☐ 2

C7 Has your baby had any problems feeding (breast or bottle) since leaving hospital?

a. Yes, quite a lot ☐ 1

b. Yes, some ☐ 2

c. No, none ☐ 3

C8 a. Has your baby had any health problems, or problems with development that have had a major impact on your life in the last three months?

Yes ☐ 1

No ☐ 2

b. If YES, please describe

_____

_____

_____

_____

C9 How confident do you feel NOW about looking after your baby?

a. Very confident ☐ 1

b. Fairly confident ☐ 2

c. Mixed ☐ 3

d. Fairly anxious ☐ 4

e. Not confident ☐ 5

C10 Is there anything else you would like to tell me about your baby?

Please comment if you wish _____

_____

_____

_____

Section D: Your health since the birth of your baby

The next few questions are about your health SINCE the birth of your baby. Again, if you feel uncomfortable answering any of these questions or they are too personal, you do not have to answer them. However, if you have experienced any of the symptoms or issues asked about, it would help us to understand them and it might help other women to know they are not alone in their experiences when the findings are published. Again, we would like to reassure you that all the information that you provide is **strictly confidential** and all the findings from this survey will be presented and published in a way that does not identify **you** or **any** individual woman.

D1 SINCE THE BIRTH, apart from when you were in hospital immediately after having your baby, have you experienced any of the following *(Please tick one response on EACH line)*

	Never	Rarely	Occasionally	Often
a. Extreme tiredness or exhaustion	☐ 1	☐ 2	☐ 3	☐ 4
b. Frequent coughs, colds or other minor illnesses	☐ 1	☐ 2	☐ 3	☐ 4
c. Severe headaches or migraines	☐ 1	☐ 2	☐ 3	☐ 4
d. Back pain (in your lower back)	☐ 1	☐ 2	☐ 3	☐ 4
e. Back pain (in the upper or middle part of your back	☐ 1	☐ 2	☐ 3	☐ 4
f. Painful or sore perineum *(from episiotomy / tear)*	☐ 1	☐ 2	☐ 3	☐ 4
g. Perineal wound infection	☐ 1	☐ 2	☐ 3	☐ 4
h. Pain from caesarean section wound	☐ 1	☐ 2	☐ 3	☐ 4
i. Caesarean section wound infection	☐ 1	☐ 2	☐ 3	☐ 4
j. Uterine (womb) infection	☐ 1	☐ 2	☐ 3	☐ 4
k. Pain when you pass urine	☐ 1	☐ 2	☐ 3	☐ 4
l. Urinary tract infection	☐ 1	☐ 2	☐ 3	☐ 4
m. Pain when passing a bowel motion	☐ 1	☐ 2	☐ 3	☐ 4
n. Bleeding when you pass a bowel motion	☐ 1	☐ 2	☐ 3	☐ 4

		Never	Rarely	Occasionally	Often
o.	Constipation *(opening your bowels only twice a week or less, or pushing and straining to open your bowel more than every fourth time you go)*	☐ 1	☐ 2	☐ 3	☐ 4
p.	Haemorrhoids *(swollen veins around your pack passage sometimes called piles)*	☐ 1	☐ 2	☐ 3	☐ 4
q.	Sore nipples	☐ 1	☐ 2	☐ 3	☐ 4
r.	Mastitis	☐ 1	☐ 2	☐ 3	☐ 4
s.	Pelvic pain	☐ 1	☐ 2	☐ 3	☐ 4
t.	Major postpartum haemorrhage	☐ 1	☐ 2	☐ 3	☐ 4
u.	Heavy vaginal bleeding or bleeding that worried you	☐ 1	☐ 2	☐ 3	☐ 4
v.	Other health issues *(please describe)*	☐ 1	☐ 2	☐ 3	☐ 4

_____

_____

_____

_____

D2 a. SINCE THE BIRTH, have you felt depressed for two weeks or longer?

a. Yes, and I still feel depressed ☐ 1

b. Yes, I felt depressed a while ago, but I feel better now ☐ 2

c. No ☐ 3 *(Please go to D3)*

D2 b. When did you start feeling depressed?

a. Before pregnancy ☐ 1

b. During pregnancy ☐ 2

c. After the birth ☐ 3

D2 c. Are you taking tablets or medication, or having treatment for depression?

Yes, I'm taking tablets or medications ☐ 1

Yes, I'm having treatment ☐ 2

No ☐ 3

Please comment if you wish _____

_____

_____

D3 a. SINCE THE BIRTH, have you experienced intense anxiety or panic attacks?

a. Never ☐ 1

b. Rarely ☐ 2

c. Occasionally ☐ 3

d. Often ☐ 4

D3 b. When did you start experiencing intense anxiety or panic attacks?

a. Before pregnancy ☐ 1

b. During pregnancy ☐ 2

c. After the birth ☐ 3

D3 c. Are you taking tablets or medication, or having treatment for intense anxiety or panic attacks?

Yes, I'm taking tablets or medication ☐ 1

Yes, I'm having treatment ☐ 2

No ☐ 3

Please comment if you wish _____

_____

_____

D4 SINCE THE BIRTH, have you experienced relationship problems with your partner or husband?

a. Never ☐ 1

b. Rarely ☐ 2

c. Occasionally ☐ 3

d. Often ☐ 4

D5 SINCE THE BIRTH, have you leaked even SMALL amounts of urine:

a. When you coughed, laughed, sneezed or did physical exercise

No, never ☐ 1

Yes, less than once a month ☐ 2

Yes, one or several times a month ☐ 3

Yes, one or several times a week ☐ 4

Yes, every day ☐ 5

b. When you were on the way to the toilet

No, never ☐ 1

Yes, less than once a month ☐ 2

Yes, one or several times a month ☐ 3

Yes, one or several times a week ☐ 4

Yes, every day ☐ 5

c. When you had to wait to use the toilet

No, never	☐ 1
Yes, less than once a month	☐ 2
Yes, one or several times a month	☐ 3
Yes, one or several times a week	☐ 4
Yes, every day	☐ 5

d. If you did not go to the toilet immediately

No, never	☐ 1
Yes, less than once a month	☐ 2
Yes, one or several times a month	☐ 3
Yes, one or several times a week	☐ 4
Yes, every day	☐ 5

D6a SINCE THE BIRTH, have you ever felt an URGENT need to pass urine which was accompanied by a fear of leakage?

No, never	☐ 1
Yes, sometimes	☐ 2

D6b SINCE THE BIRTH, have you ever felt an URGENT need to pass urine which was accompanied by actual leakage?

No, never	☐ 1
Yes, sometimes	☐ 2

If you answered NO to all of the questions in D5 and D6, please go to D11

Physiotherapist ☐ 6

Other health professional ☐ 7

Partner ☐ 8

Friend ☐ 9

Sister ☐ 10

Mother ☐ 11

Other (please describe) ☐ 12

_____

D 9c **If no, is it because**

I have thought about it but haven't felt able to talk about it ☐ 1

I don't want to discuss it ☐ 2

Other (please describe) ☐ 3

_____

D10 **If you have experienced bladder problems since the birth, how would you describe these problems now?**

About the same ☐ 1

Better than before ☐ 2

It's no longer a problem ☐ 3

Please comment if you wish _____

_____

D11 a. Have you taken, or have you been prescribed, antibiotics for urinary infections since the birth of your baby?

Yes ☐ 1

No ☐ 2

D11 b. If yes, how many times have you been prescribed or taken antibiotics for urinary infections since the birth?

Once ☐ 1

Twice ☐ 2

Three times or more ☐ 3

Please comment if you wish _____

_____

The next few questions ask about bowel symptoms. Please do not include problems during short-term illnesses such as the flu or a short viral infection.

D12 SINCE THE BIRTH have you

	No, never	Minor amount	Major amount
a. noticed soiling from your back passage on your underwear?	☐ 1	☐ 2	☐ 3
b. passed wind when you really didn't want to?	☐ 1	☐ 2	☐ 3

D13 SINCE THE BIRTH have you ever, even very occasionally,

a. experienced leakage of <u>LIQUID</u> bowel motions at an inappropriate time or an inappropriate place?

- No, never ☐ 1
- Yes, less than once a month ☐ 2
- Yes, one or several times a month ☐ 3
- Yes, one or several times a week ☐ 4
- Yes, every day ☐ 5

b. If YES, when this happened how much leakage typically occurred?

- Small amount *(with stain about the size of a 50 cent coin)* ☐ 1
- Moderate amounts *(often requiring a change of pad or underwear)* ☐ 2
- Large amounts *(often requiring a complete change of clothes)* ☐ 3

D14 a. SINCE THE BIRTH have you ever, even very occasionally, experienced leakage of <u>SOLID</u> bowel motions at an inappropriate time or inappropriate place?

- No, never ☐ 1
- Yes, less than once a month ☐ 2
- Yes, one or several times a month ☐ 3
- Yes, one or several times a week ☐ 4
- Yes, every day ☐ 5

D14 b. If YES, when this happened how much leakage typically occurred?

- Small amount *(with stain about the size of a 50 cent coin)* ☐ 1
- Moderate amounts *(often requiring a change of pad or underwear)* ☐ 2
- Large amounts *(often requiring a complete change of clothes)* ☐ 3

D15 SINCE THE BIRTH, have you ever experienced an URGENT need to open your bowels that made you rush to the toilet immediately?

- No, never ☐ 1
- Yes, less than once a month ☐ 2
- Yes, one or several times a month ☐ 3
- Yes, one or several times a week ☐ 4
- Yes, every day ☐ 5

D15a SINCE THE BIRTH, have you ever experienced an URGENT need to open your bowels that you could not delay or defer for more than 5 minutes?

- No, never ☐ 1 *(Please go to D19)*
- Yes, less than once a month ☐ 2
- Yes, one or several times a month ☐ 3
- Yes, one or several times a week ☐ 4
- Yes, every day ☐ 5

D16 Which of the following best describes how you manage?

It doesn't happen very often and I just cope with it when it does	☐ 1
I carry a change of underwear with me wherever I go and change whenever I need to	☐ 2
I make sure I know where the nearest toilet is whenever I go out	☐ 3
I wear protection *(e.g., pads or panty liners)* when I need to	☐ 4
I wear protection *(e.g., pads or panty liners)* **all** the time	☐ 5
Other *(please describe)*	☐ 6

_____

_____

D17 a. SINCE THE BIRTH have you discussed your bowel problems with anyone?

Yes ☐ 1

No ☐ 2

D17 b. If YES, who did you discuss this with *(Please tick ALL that apply)*

General practitioner / local doctor	☐ 1
Public Health Nurse	☐ 2
GP Practice nurse	☐ 3
Midwife	☐ 4
Obstetrician/gynaecologist	☐ 5
Physiotherapist	☐ 6
Other health professional	☐ 7
Partner	☐ 8
Friend	☐ 9
Sister	☐ 10

Mother ☐ 11

Other *(please describe)* ☐ 12

_____

D17 c. If no, is it because

I have thought about it but haven't felt able to talk about it ☐ 1

I don't want to discuss it ☐ 2

Other *(Please describe)* ☐ 3

_____

_____

D 18 If you have experienced bowel problems since the birth, how would you describe these problems now?

About the same ☐ 1

Better than before ☐ 2

It's no longer a problem ☐ 3

The next few questions ask about perineal pain and pelvic floor problems you may have experienced since the birth. The perineum is the area around the entrance to the vagina, including the labia and other external genital organs. Please answer these questions even if you had a caesarean section.

D19 How would you describe the <u>worst</u> pain or discomfort you feel CURRENTLY in the perineal area *(around the entrance to your vagina)* **when you are?**

Please tick ONE response on EACH line. The words used to describe pain are in increasing order of intensity.

	No pain	Mild	Discomforting	Distressing	Horrible	Excruciating
a. Lying in bed	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6
b. Shifting positions in bed	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6
c. Getting in and out of bed	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6
d. Feeding your baby	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6
e. Sitting in a chair	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6
f. Lifting your baby	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6
g. Walking	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6
h. Bathing or showering yourself	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6
i. Doing physical exercise e.g., running, aerobics, climbing stairs	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6
j. Carrying your baby for extended periods	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6
k. Passing urine	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6
l. Passing a bowel movement	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6

(Please note that questions about sex are included in section 'E')

Please comment if you wish _____

_____

_____

a. In the past four weeks, have you used any tablets/medication or other therapies for pain or tenderness in the perineal area *(the area around the entrance to the vagina)***?**

Yes ☐ 1

No ☐ 2

b. If yes, which of the following have you used?

	Yes	No	Not sure
a Paracatemol *(e.g. Panadol®)*	☐ 1	☐ 2	☐ 3
b. Paracetamol and codeine *(panadeine)*	☐ 1	☐ 2	☐ 3
c. Ponstan®	☐ 1	☐ 2	☐ 3
d. Difene (Voltarol) *(taken orally [by mouth])*	☐ 1	☐ 2	☐ 3
e. Difene (Voltarol) *(suppository inserted into the back passage)*	☐ 1	☐ 2	☐ 3
f. Nurofen/Isobrufen	☐ 1	☐ 2	☐ 3
g. Aspirin	☐ 1	☐ 2	☐ 3
h. Local anaesthetic gel	☐ 1	☐ 2	☐ 3
i. Herbal remedies	☐ 1	☐ 2	☐ 3
j. Other *(Please describe)*	☐ 1	☐ 2	☐ 3

_____

_____

_____

L **a.** **SINCE THE BIRTH have you discussed your perineal pain with anyone?**

Yes ☐ 1

No ☐ 2

b. **If YES, who did you discuss this with** *(Please tick ALL that apply)*

General practitioner / local doctor ☐ 1

Public Health Nurse ☐ 2

GP Practice nurse ☐ 3

Midwife ☐ 4

Obstetrician/gynaecologist ☐ 5

Physiotherapist ☐ 6

Other health professional ☐ 7

Partner ☐ 8

Friend ☐ 9

Sister ☐ 10

Mother ☐ 11

Other *(Please describe)* ☐ 12

_____

_____

_____

When you became pregnant you may have been encouraged to do **pelvic floor exercises.** These exercises involve contracting *(tightening)* your pelvic floor, as you would do if you interrupted the flow of urine midstream. **The pelvic floor is the muscular structure that supports your rectum, uterus and bladder.**

D22 **a.** **To what extent would you say your pelvic floor feels 'back to normal' as opposed to too loose or slack?**

- Completely back to normal ☐ 1
- Almost back to normal ☐ 2
- Moderately back to normal ☐ 3
- Somewhat back to normal ☐ 4
- Not at all back to normal ☐ 5

b. **If your pelvic floor does not feel completely back to normal, please describe the way(s) in which it feels different?**

_____

_____

_____

_____

D23 **a.** **Did you do pelvic floor exercises during your pregnancy?**

- Yes ☐ 1
- No ☐ 2

b. **In the last month, have you been doing pelvic floor exercises?**

- Yes, regularly ☐ 1
- Yes, when I remember ☐ 2
- No ☐ 3

c. **If YES, approximately how often do you do them?**

☐ Number of days each week ☐☐ Number of times per day

D24 a. **SINCE THE BIRTH, has there been any period when you felt as if something was bulging or falling down in the vaginal area?**

Yes, often ☐ 1

Yes, sometimes ☐ 2

No, not at all ☐ 3

b. **Are you CURRENTLY having trouble with a feeling of bulging or falling down in the vaginal area?**

Yes, often ☐ 1

Yes, sometimes ☐ 2

No , not at all ☐ 3

D25 a. **To what extent would you say your vagina feels 'back to normal' or like it did before you got pregnant?**

Completely back to normal ☐ 1

Almost back to normal ☐ 2

Moderately back to normal ☐ 3

Somewhat back to normal ☐ 4

Not at all back to normal ☐ 5

b. **If your vagina does not feel completely back to normal, please describe the way(s) in which it feels different?**

_____

_____

_____

_____

This section asks about abdominal (tummy) pain you may have experienced since the birth. Please answer this question whether you had a caesarean section or a vaginal birth.

D26 How would you describe the worst pain or discomfort you feel CURRENTLY in your lower abdomen *(below your tummy)* when you are?

Please tick ONE response on EACH line. The words used to describe pain are in increasing order of intensity.

	No pain	Mild	Discomforting	Distressing	Horrible	Excruciating
a. When you are lying in bed	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6
b. Shifting positions in bed	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6
c. Getting in and out of bed	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6
d. Feeding your baby	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6
e. Sitting in a chair	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6
f. Lifting your baby	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6
g. Walking	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6
h. Bathing or showering yourself	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6
i. Doing physical exercise e.g. running, aerobics, climbing stairs	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6
j. Carrying your baby for extended periods	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6
k. Passing urine	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6
l. Passing a bowel movement	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6

*Please comment if you wish*_____

_____

_____

_____

D27 a. **In the past four weeks have you used any medication or other therapies for pain or tenderness in your tummy area?**

Yes ☐ 1

No ☐ 2

D27 b. **If yes, which medication have you used?** *(Please tick ALL that apply)*

	Yes	No	Not sure
a Paracetamol *(e.g. Panadol®)*	☐ 1	☐ 2	☐ 3
b. Paracetamol and codeine *(panadeine)*	☐ 1	☐ 2	☐ 3
c. Ponstan®	☐ 1	☐ 2	☐ 3
d. Difene (Voltarol) *(taken orally)*	☐ 1	☐ 2	☐ 3
e. Difene (Voltarol) *(suppository inserted into the back passage)*	☐ 1	☐ 2	☐ 3
f. Nurofen/Isobrufen	☐ 1	☐ 2	☐ 3
g. Aspirin	☐ 1	☐ 2	☐ 3
h. Local anaesthetic gel	☐ 1	☐ 2	☐ 3
i. Herbal remedies	☐ 1	☐ 2	☐ 3
j. Other *(please describe)*	☐ 1	☐ 2	☐ 3

_____

_____

_____

_____

D28 a. **SINCE THE BIRTH have you discussed your tummy pain with anyone?**

Yes ☐ 1

No ☐ 2

D28 b. If YES, who did you discuss this with *(Please tick ALL that apply)*

General practitioner / local doctor	☐ 1
Public Health Nurse	☐ 2
GP Practice nurse	☐ 3
Midwife	☐ 4
Obstetrician/gynaecologist	☐ 5
Physiotherapist	☐ 6
Other health professional	☐ 7
Partner	☐ 8
Friend	☐ 9
Sister	☐ 10
Mother	☐ 11
Other *(please describe)*	☐ 12

_____

_____

D29a Thinking back to BEFORE you were pregnant, were you satisfied with your body image?

Always	Sometimes	Never
☐ 1	☐ 2	☐ 3

b. NOW, 3 months AFTER THE BIRTH of your baby, are you satisfied with your body image?

Always	Sometimes	Never
☐ 1	☐ 2	☐ 3

Please comment if you wish _____

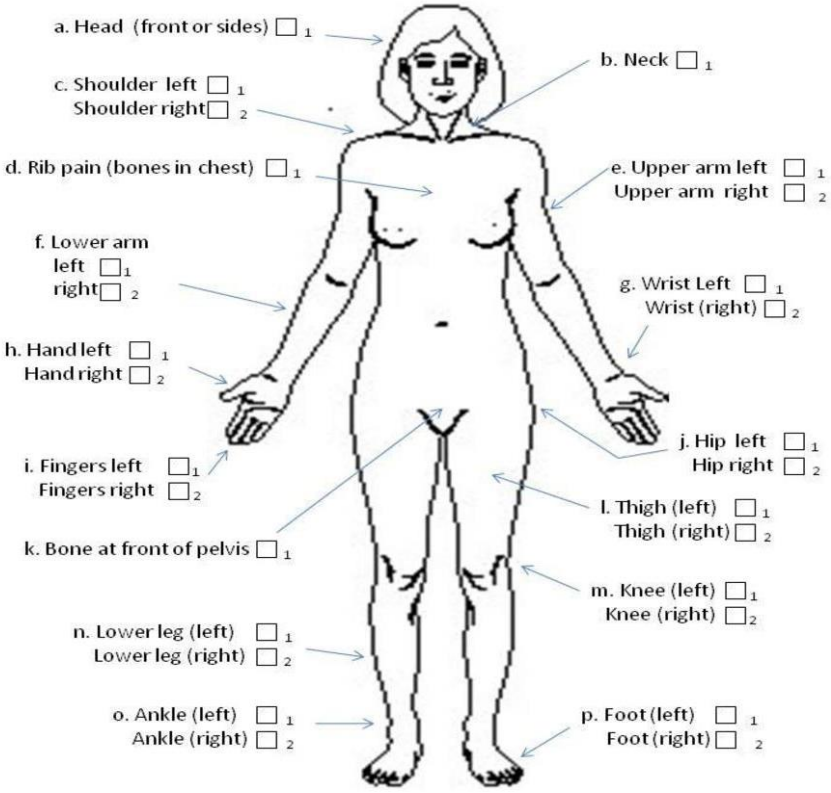
_____

D30 Please look at the two pictures below. Picture A is looking at the body from the front. Picture B is looking at the body from the back.
In the last month of your pregnancy and <u>BEFORE</u> you gave birth, did you experience pain in any of these parts of your body?

Yes ☐ 1 No ☐ 2

A. IF yes, please tick the boxes if you experienced pain in any of the parts of the body named in the last month of your pregnancy and BEFORE you gave birth.

Picture A
Front of Body



If you experienced pain in any other parts not named here, please tick here ☐

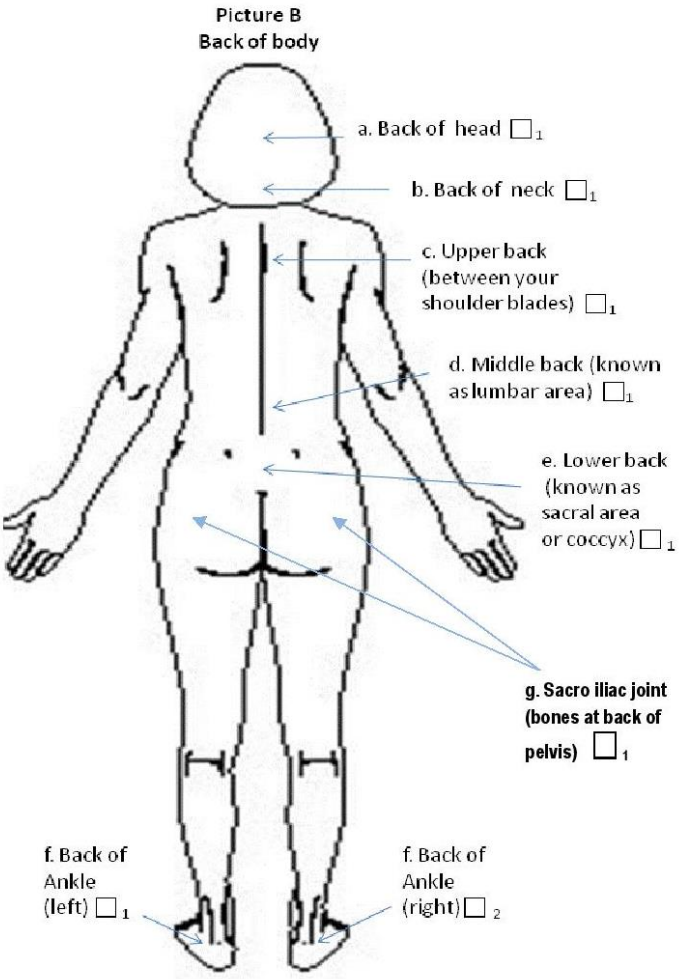
Please give details _____

_____

D 30 B Please tick the boxes if you experienced pain in any of the parts of the body named in the last month of your pregnancy and BEFORE you gave birth

Picture B

Back of Body



If you experienced pain in any other parts not named here, please tick here ☐

Please give details _____

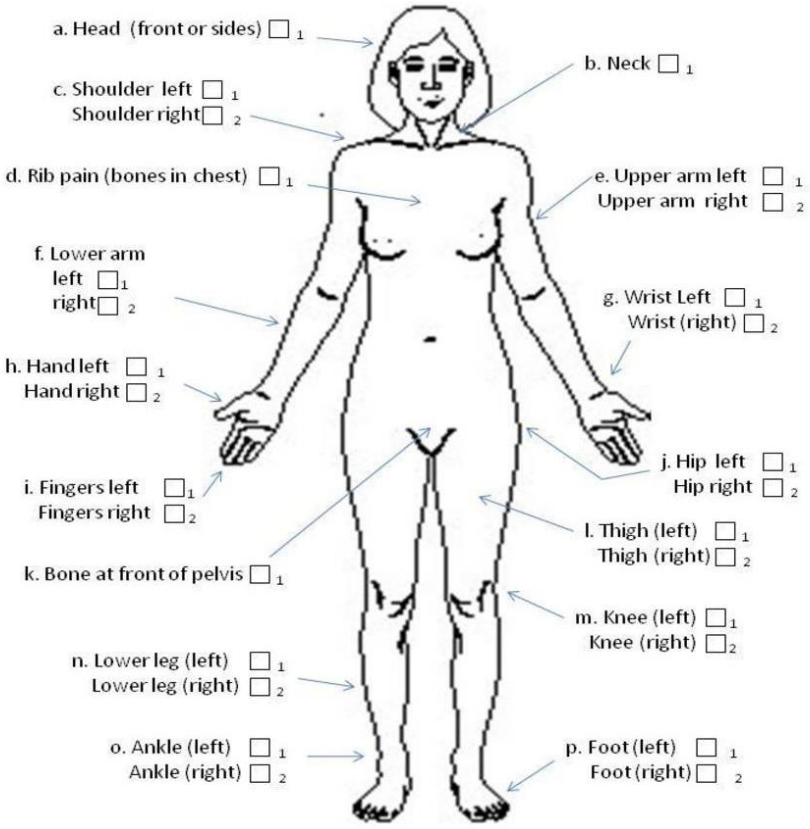
_____

Please look at the two pictures below. Again, picture A is looking at the body from the front. Picture B is looking at the body from the back. SINCE YOU GAVE BIRTH, have you experienced pain in any parts of the body named?

Yes ☐ 1 No ☐ 2

\. If yes, *please tick the boxes if you experienced pain in any of the parts of the body named in the last 3 months SINCE YOU GAVE BIRTH.*

PICTURE A
Front of Body



If you experienced pain in any other parts not named here, please tick here ☐

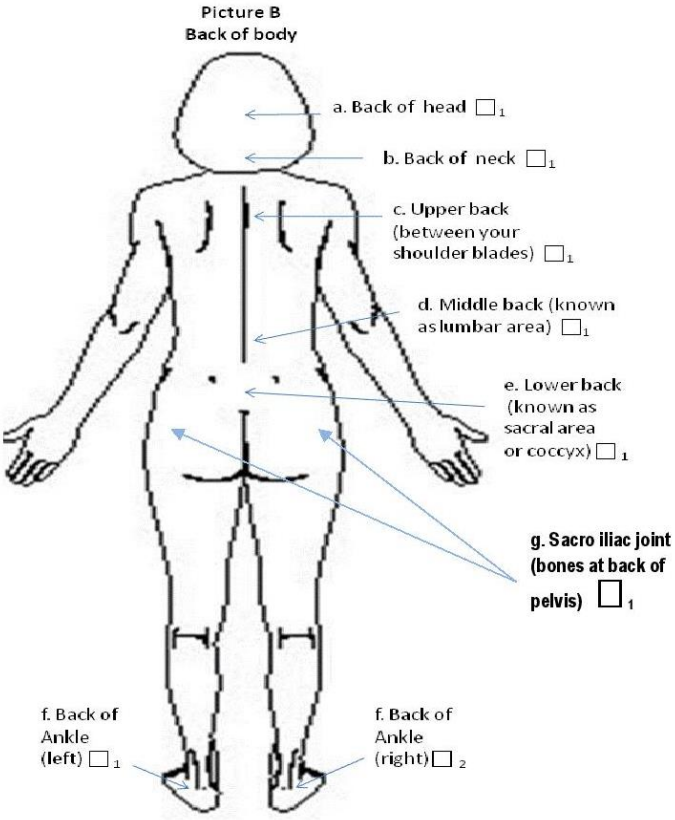
Please give details _____

_____

D31 B Please tick the boxes if you have experienced pain in any of the parts of the body named in the last 3 months SINCE YOU GAVE BIRTH.

Picture B

Back of Body



If you experienced pain in any other bones not named or shown here, please tick here ☐

Please give details _____

_____

Most pain can be treated successfully. If you are worried or concerned about pain and wish to get help, you should discuss it with your doctor or another health professional.

Section E: Sex after childbirth

The next few questions are about your sexuality and sexual health since the birth of your baby. Again, if you feel uncomfortable answering any of these questions or they are too personal, you do not have to answer them. However, if you have experienced any of the symptoms or issues asked about, if would help us to understand them and it might help other women to know they are not alone in their experiences when the findings are published. Again, we would like to reassure you that all the information that you provide is **strictly confidential** and all the findings from this survey will be presented and published in a way that does not identify **you** or **any** individual woman.

E1 a. When did you first have sexual or intimate contact again after you had your baby: ***(Please include all forms of sexual contact, i.e. do not restrict your answer to vaginal intercourse)***

I have not had sexual or intimate contact since the birth ☐ 1 *(Please go to E2)*

During the first 4 weeks ☐ 2

5-8 weeks after the birth ☐ 3

9-12 weeks after the birth ☐ 4

E1 b. Did you feel that this was

Too soon after the birth ☐ 1

Would have liked to start sooner ☐ 2

About the right time after the birth ☐ 3

E2 a. If you have not had any sexual or intimate contact since the birth is this because?

Because I do not have a partner ☐ 1 *(Please go to Section F)*

Other reasons ☐ 2

b. If you have a partner, but have not had any sexual or intimate contact since the birth, please tell me why *(Please tick ALL that apply)*

Too tired / exhausted	☐ 1
Relationship problems	☐ 2
Scared it will be painful	☐ 3
Fear of getting pregnant	☐ 4
Baby waking up	☐ 5
Still experiencing pain from perineal wound	☐ 6
Still experiencing pain from caesarean section	☐ 7
Don't feel interested	☐ 8
Other reason (P*lease describe)*	☐ 9

_____

_____

If you have not had any sexual or intimate contact since the birth, please go to question E12

E3a. Have you had vaginal intercourse since your baby was born?

Yes ☐ 1

Tried on one or more occasions, but it was too painful each time I tried ☐ 2

No ☐ 3 *(Please go to question E12)*

E3b. When did you first have VAGINAL intercourse again *(or attempt vaginal intercourse again)* after you had your baby?

During the first 4 weeks	☐ 1
5-8 weeks after the birth	☐ 2
9-12 weeks after the birth	☐ 3

E3c. **Did you feel that this was**

- Too soon after the birth ☐ 1
- Would have liked to start sooner ☐ 2
- About the right time after the birth ☐ 3

E4 **How much pain or discomfort, if any, did you feel the first time you attempted to have vaginal intercourse after your baby was born?**

- No pain ☐ 1
- Mild ☐ 2
- Discomforting ☐ 3
- Distressing ☐ 4
- Horrible ☐ 5
- Excruciating ☐ 6

E5a. **Other than the first time you tried having vaginal intercourse after your baby's birth, have you experienced pain or discomfort during vaginal intercourse in the past three months?**

- Yes ☐ 1
- No ☐ 2
- Haven't tried again ☐ 3

E5b. **If YES, how would you describe the worst pain or discomfort you have experienced? Would you say it was**

- Mild ☐ 1
- Discomforting ☐ 2
- Distressing ☐ 3
- Horrible ☐ 4
- Excruciating ☐ 5

E6a. Are you still experiencing pain or tenderness during vaginal intercourse?

Yes ☐ 1 *(Please go to E7)*

No ☐ 2

E6b. If NO, how many weeks after your baby's birth was it when vaginal intercourse stopped being painful?

☐☐ Number of weeks after the birth

E7 How often would you say intercourse is painful for you NOW?

Always painful ☐ 1

Painful most of the time ☐ 2

Occasionally painful ☐ 3

Rarely painful ☐ 4

E8a. How would you describe the pain or discomfort you are experiencing during vaginal intercourse NOW?

No pain ☐ 1

Mild ☐ 2

Discomforting ☐ 3

Distressing ☐ 4

Horrible ☐ 5

Excruciating ☐ 6

E8b. Looking at the following list, please tick any or all the words that apply to the pain or discomfort you are experiencing during vaginal intercourse NOW.

- Aching ☐ 1
- Throbbing ☐ 2
- Shooting ☐ 3
- Stabbing ☐ 4
- Gnawing ☐ 5
- Sharp ☐ 6
- Tender ☐ 7
- Burning ☐ 8
- Exhausting ☐ 9
- Tiring ☐ 10
- Penetrating ☐ 11
- Nagging ☐ 12
- Miserable ☐ 13
- Unbearable ☐ 14

E9a. Have you discussed the pain or discomfort you are experiencing with anyone?

- Yes ☐ 1
- No ☐ 2

b. If YES, who have you discussed this with *(Please tick ALL that apply)*

- General practitioner / local doctor ☐ 1
- Public Health Nurse ☐ 2
- GP Practice nurse ☐ 3

Midwife	☐ 4
Obstetrician/gynaecologist	☐ 5
Physiotherapist	☐ 6
Other health professional	☐ 7
Partner	☐ 8
Friend	☐ 9
Sister	☐ 10
Mother	☐ 11
Other *(please describe)*	☐ 12

_____

_____

E10 In the last month, how physically pleasurable have you found your sexual relationship?

Extremely pleasurable	☐ 1
Very pleasurable	☐ 2
Moderately pleasurable	☐ 3
Sometimes pleasurable, sometimes not	☐ 4
Not at all pleasurable	☐ 5
Not sure	☐ 6

E11 In the last month, have you had

		Yes	No	Prefer not to answer
a	Oral sex	☐ 1	☐ 2	☐ 3
b	Anal sex	☐ 1	☐ 2	☐ 3
c	Other sexual contact *(i.e. forms of contact with the genital area not leading to intercourse but intended to achieve orgasm)*	☐ 1	☐ 2	☐ 3

Please comment if you wish _____

_____

E12 How emotionally satisfying have you found your relationship with your partner since the birth?

Extremely emotionally satisfying	☐ 1
Very emotionally satisfying	☐ 2
Moderately emotionally satisfying	☐ 3
Slightly emotionally satisfying	☐ 4
Not at all emotionally satisfying	☐ 5
Not sure	☐ 6

E13 SINCE THE BIRTH have you experienced any of the following:
(Please tick one response on each line.)

	Yes	No	Prefer not to answer
a. Lack of vaginal lubrication	☐ 1	☐ 2	☐ 3
b. Painful penetration	☐ 1	☐ 2	☐ 3
c. Pain during sexual intercourse	☐ 1	☐ 2	☐ 3
d. Pain on orgasm	☐ 1	☐ 2	☐ 3
e. Difficulty reaching orgasm	☐ 1	☐ 2	☐ 3

	Yes	No	Prefer not to answer
f. Unable to reach orgasm	☐ 1	☐ 2	☐ 3
g. Vaginal tightness	☐ 1	☐ 2	☐ 3
h. Vaginal looseness / lack of muscle tone	☐ 1	☐ 2	☐ 3
i. Bleeding or physical irritation after sex	☐ 1	☐ 2	☐ 3
j. Loss of interest in sex compared with before your pregnancy	☐ 1	☐ 2	☐ 3
k. More interest in sex compared with before your pregnancy	☐ 1	☐ 2	☐ 3
l. Being pressured to take part in unwanted sexual activity	☐ 1	☐ 2	☐ 3
m. Being forced to take part in unwanted sexual activity	☐ 1	☐ 2	☐ 3
n. Other *(Please describe)*	☐ 1	☐ 2	☐ 3

_____

E14 a. Have you ever discussed any of the above issues with anyone?

Yes ☐ 1

No ☐ 2 *(Please go to E15)*

b. If YES, who did you discuss this with? *(Please tick ALL that apply)*

General practitioner / local doctor ☐ 1

Public Health Nurse ☐ 2

GP Practice nurse ☐ 3

Midwife ☐ 4

Obstetrician/gynaecologist ☐ 5

Physiotherapist ☐ 6

Other health professional	☐ 7
Partner	☐ 8
Friend	☐ 9
Sister	☐ 10
Mother	☐ 11
Other *(Please describe)*	☐

---

c. What issues did you discuss? *(Please tick all that apply)*

Lack of vaginal lubrication	☐ 1
Painful penetration	☐ 2
Pain on orgasm	☐ 3
Difficulty reaching orgasm	☐ 4
Vaginal tightness	☐ 5
Vaginal looseness / lack of muscle tone	☐ 6
Bleeding or physical irritation after sex	☐ 7
Loss of interest in sex compared with before your pregnancy	☐ 8
More interest in sex compared with before your pregnancy	☐ 9
Being pressured to take part in unwanted sexual activity	☐ 10
Being forced to take part in unwanted sexual activity	☐ 11
Other *(Please describe)*	☐ 12

E15 Compared with before your pregnancy, would you say that sex is now

- More frequent ☐ 1
- About the same ☐ 2
- Less frequent ☐ 3
- Not sure ☐ 4

E16 Overall, would you say that your sex life has changed since the birth

- It has improved ☐ 1
- It's about the same ☐ 2
- Not as good ☐ 3
- Not sure ☐ 4

E17 How often have the following issues affected your sex life since the birth?

		Very often	Often	Sometimes	Rarely	Never
a.	Tiredness / exhaustion	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
b.	Feeling depressed low or blue	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
c.	Relationship problems	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
d.	Pain / tenderness	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
e.	Lack of time	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
f.	Baby waking up / interrupting you	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
g.	Other (please describe)	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5

_____

_____

E18 Is there anything else you would like to tell me about your sexual and intimate relationships since having your baby?

Please comment if you wish _____

_____

If you are worried or concerned about pain when having sex and wish to get help, you can discuss it with your doctor.

If you are worried or concerned about unwanted or forced sexual activity and wish to get help, you can call the **Sexual Assault Treatment Unit (SATU)** based in the Rotunda hospital.

SATU telephone number:	01 8171736
SATU e-mail:	SATU@ROTUNDA.IE
Web:	http://www.rotunda.ie/
Opening hours:	9.00am to 4.30pm Mon – Fri
	Outside of these hours please contact the Rotunda Hospital at 01 8171700

Or you can call the **national** Dublin Rape Crisis Centre. The Dublin Rape Crisis Centre was established in 1979 and is a national organisation offering a wide range of services to women and men who are affected by rape, sexual assault, sexual harassment or childhood sexual abuse.

The services include a national **24-hour helpline**, one to one counselling, court accompaniment, outreach services, training, awareness raising and lobbying.

Dublin Rape Crisis Centre telephone number: HELPLINE 1800 778888

Section F: Your emotional health and well-being now

The next few questions are about your emotional health and well-being now. Again, if you feel uncomfortable answering any of these questions or they are too personal, you do not have to answer them. However, if you have experienced any of the symptoms or issues asked about, it would help us to understand them and it might help other women to know they are not alone in their experiences when the findings are published. Again, we would like to reassure you that all the information that you provide is **strictly confidential** and all the findings from this survey will be presented and published in a way that does not identify **you** or **any** individual woman.

Please look at the following statements and for each one think about how you have been feeling IN THE LAST WEEK

F1 a. During the last week I have been able to laugh and see the funny side of things

- As much as I always could ☐ 1
- Not quite as much now ☐ 2
- Definitely not as much now ☐ 3
- Not at all ☐ 4

F1 b. During the last week I have looked forward with enjoyment to things

- As much as I ever did ☐ 1
- Rather less than I used to ☐ 2
- Definitely less than I used to ☐ 3
- Hardly at all ☐ 4

F1 c. During the last week I have blamed myself unnecessarily when things went wrong

- Yes, most of the time ☐ 1
- Yes, some of the time ☐ 2
- Not very often ☐ 3
- No, never ☐ 4

F1 d. During the last week I have felt worried and anxious for no very good reason

No, not at all ☐ 1

Hardly ever ☐ 2

Yes, sometimes ☐ 3

Yes, very often ☐ 4

F1 e. During the last week I have felt scared or panicky for no very good reason

Yes, quite a lot ☐ 1

Yes, sometimes ☐ 2

No, not much ☐ 3

No, not at all ☐ 4

F1 f. During the last week things have been getting on top of me

Yes, most of the time I haven't been able to cope at all ☐ 1

Yes, sometimes I haven't been coping as well as usual ☐ 2

No, most of the time I have coped quite well ☐ 3

No, I have been coping as well as ever ☐ 4

F1 g. During the last week I have been so unhappy that I have had difficulty sleeping

Yes, most of the time ☐ 1

Yes, sometimes ☐ 2

Not very often ☐ 3

No, not at all ☐ 4

F1 h. During the last week I have felt sad or miserable

Yes, most of the time ☐ 1

Yes, quite often ☐ 2

Not very often ☐ 3

No, not at all ☐ 4

F1 i. During the last week I have been so unhappy that I have been crying

Yes, most of the time ☐ 1

Yes, quite often ☐ 2

Only occasionally ☐ 3

No, never ☐ 4

F1 j. During the last week the thought of harming myself has occurred to me

Yes, quite often ☐ 1

Sometimes ☐ 2

Hardly ever ☐ 3

Never ☐ 4

F2 Is there anyone you can talk to about how you are feeling? *(Please tick ALL that apply)*

Yes, but I am not sure they understand ☐ 1

Yes, and they are very supportive ☐ 2

No, there isn't anyone I can really talk to ☐ 3

I don't particularly want to talk about how I feel ☐ 4

There isn't anything I feel I need to talk about ☐ 5

*Please comment if you wish*_____

_____

F3 Looking back over the time since the birth of your baby, would you like to have had more emotional support (e.g. someone who regularly asked how you were, someone happy to listen to how you were feeling)?

Yes, definitely ☐ 1

Yes, probably ☐ 2

No, not really ☐ 3

Please comment if you wish _____

_____

_____

F4. Please read each statement and circle a number 0, 1, 2 or 3 which indicates how much the statement applied to you *OVER THE PAST WEEK*. There are no right or wrong answers. Do not spend too much time on any statement.

		Not at all	Some of the time	A good part of the time	Most of the time
1	I found it hard to wind down	0	1	2	3
2	I was aware of dryness of my mouth	0	1	2	3
3	I couldn't seem to experience any positive feeling at all	0	1	2	3
4	I experienced breathing difficulty (eg, excessively rapid breathing, breathlessness in the absence of physical exertion)	0	1	2	3
5	I found it difficult to work up the initiative to do things	0	1	2	3
6	I tended to over-react to situations	0	1	2	3
7	I experienced trembling (e.g. in the hands)	0	1	2	3
8	I felt that I was using a lot of nervous energy	0	1	2	3
9	I was worried about situations in which I might panic and make a fool of myself	0	1	2	3

		Not at all	Some of the time	A good part of the time	Most of the time
10	I felt that I had nothing to look forward to	0	1	2	3
11	I found myself getting agitated	0	1	2	3
12	I found it difficult to relax	0	1	2	3
13	I felt down-hearted and blue	0	1	2	3
14	I was intolerant of anything that kept me from getting on with what I was doing	0	1	2	3
15	I felt I was close to panic	0	1	2	3
16	I was unable to become enthusiastic about anything	0	1	2	3
17	I felt I wasn't worth much as a person	0	1	2	3
18	I felt that I was rather touchy	0	1	2	3
19	I was aware of the action of my heart in the absence of physical exertion (e.g. sense of heart rate increase, heart missing a beat)	0	1	2	3
20	I felt scared without any good reason	0	1	2	3
21	I felt that life was meaningless	0	1	2	3

If you are experiencing any problems with your emotional health and wellbeing and wish to talk to someone, you can telephone the **mental health midwife/nurse** Brid Shine and Elaine McGoldrick at the Coombe Hospital.

Telephone: 01- 4085200

Or you can call the Aware (Depression) Helpline on 1890 303 302

TEXT MESSAGING

Information on where to go for help in a crisis is now available through your mobile phone. Text the word HeadsUp to 50424. The HeadsUp text service is run by RehabCare and sponsored by Meteor.

ONLINE information and support

A number of support services are now using the internet to reach out to people.

For example, www.yourmentalhealth.ie

Section G: Contacts with health services

The next few questions are about your contacts with health services. Again, if you feel uncomfortable answering any of these questions or they are too personal, you do not have to answer them. However, if you have experienced any of the symptoms or issues asked about, it would help us to understand them and it might help other women to know they are not alone in their experiences when the findings are published. Again, we would like to reassure you that all the information that you provide is **strictly confidential** and all the findings from this survey will be presented and published in a way that does not identify **you** or **any** individual woman.

G1 SINCE THE BIRTH, how many times have you visited a local doctor or GP (General Practitioner) *(Please do NOT include visits to a specialist)*

a. About your health?		**b. About your baby's health?**	
Never	☐ 1	Never	☐ 1
Once	☐ 2	Once	☐ 2
Twice	☐ 3	Twice	☐ 3
3 times	☐ 4	3 times	☐ 4
4 times	☐ 5	4 times	☐ 5
5-6 times	☐ 6	5-6 times	☐ 6
7 or more times	☐ 7	7 or more times	☐ 7

Please comment if you wish _____

_____

_____

_____

If you have not visited a local doctor or GP since the birth, please go to question G3.

G2 If you have visited a local doctor GP more than once in the past three months

		Always	Mostly	Sometimes	Rarely/ Never
a.	Did you go to the same place for each visit	☐ 1	☐ 2	☐ 3	☐ 4
b.	Did you see the same doctor on each occasion?	☐ 1	☐ 2	☐ 3	☐ 4

c. If you did not see the same doctor on each occasion, was this your own personal choice?

Yes ☐ 1 **No** ☐ 2

G3 SINCE THE BIRTH, has any of the following happened to you?
(Please tick ONE response on EACH line.)

		Yes	No	Not sure
a.	Postpartum haemorrhage	☐ 1	☐ 2	☐ 3
b.	D & C (dilatation and curettage)	☐ 1	☐ 2	☐ 3
c.	Wound breakdown – perineal tear or episiotomy	☐ 1	☐ 2	☐ 3
d.	Wound breakdown – caesarean section	☐ 1	☐ 2	☐ 3
e.	Repeat repair of perineal tear or episiotomy	☐ 1	☐ 2	☐ 3
f.	Repeat repair of caesarean section wound	☐ 1	☐ 2	☐ 3

G4 SINCE THE BIRTH, how many times have you visited a hospital emergency room/department about

a. your health?		**b. your baby's health?**	
Never	☐ 1	Never	☐ 1
Once	☐ 2	Once	☐ 2
Twice	☐ 3	Twice	☐ 3
3 times	☐ 4	3 times	☐ 4
4 times	☐ 5	4 times	☐ 5

a. your health?

5-6 times	☐ 6
7 or more times	☐ 7

b. your baby's health?

5-6 times	☐ 6
7 or more times	☐ 7

Please give reasons if you wish

_____

_____

_____

_____

G5 SINCE THE BIRTH, how many times have you or your baby been re-admitted to a hospital?

a. you?

Never	☐ 1
Once	☐ 2
Twice	☐ 3
3 times	☐ 4
4 times	☐ 5
5-6 times	☐ 6
7 or more times	☐ 7

b. your baby?

Never	☐ 1
Once	☐ 2
Twice	☐ 3
3 times	☐ 4
4 times	☐ 5
5-6 times	☐ 6
7 or more times	☐ 7

Please give reasons if you wish

_____

_____

_____

_____

G6 SINCE THE BIRTH, when you go to the doctor do you feel able to talk about things that are troubling you concerning <u>your own health and well-being</u>? *(Please tick ALL statements with which you agree. Leave the statements that you do not agree with blank.)*

- Yes, my doctor makes it easy for me to talk about anything that is concerning me ☐ 1
- Yes, but he/she is often busy and doesn't seem to have time to listen ☐ 2
- Yes, I can talk to my doctor and he/she is very supportive and reassuring ☐ 3
- I can talk about some issues, but there are other things I do not feel comfortable talking about with my GP ☐ 4
- There's no point in talking to the doctor about my health because he/she cannot fix any of my problems ☐ 5
- No, I go to see the doctor about my baby not myself ☐ 6
- I don't talk to my doctor because I am worried he/she will think I am not coping ☐ 7
- I don't talk to the doctor because I am concerned he/she might want me to do something that will make the situation worse ☐ 8
- There are some issues I don't talk about because I am concerned the doctor might tell someone else ☐ 9

G7 SINCE THE BIRTH, has your local doctor or GP asked you directly whether or not you are experiencing any of the following *(please tick one response on each line)*

	Yes	No	Not sure
a. Tiredness or exhaustion	☐ 1	☐ 2	☐ 3
b. Leakage or involuntary loss of urine	☐ 1	☐ 2	☐ 3
c. Leakage or involuntary loss of bowel motion	☐ 1	☐ 2	☐ 3
d. Perineal pain	☐ 1	☐ 2	☐ 3
e. Sexual problems	☐ 1	☐ 2	☐ 3
f. Haemorrhoids	☐ 1	☐ 2	☐ 3
g. Feeling depressed or low	☐ 1	☐ 2	☐ 3
h. Relationship problems	☐ 1	☐ 2	☐ 3

a. SINCE THE BIRTH, how many times have you visited or been visited at home by a midwife (who is <u>not</u> a Public Health Nurse as well)?

Unsure	☐ 1
Never	☐ 2
Once	☐ 3
Twice	☐ 4
3 times	☐ 5
4 times	☐ 6
5-6 times	☐ 7
7 or more times	☐ 8

b. SINCE THE BIRTH, how many times have you visited or been visited at home by a Public Health Nurse?

Never	☐ 1
Once	☐ 2
Twice	☐ 3
3 times	☐ 4
4 times	☐ 5
5-6 times	☐ 6
7 or more times	☐ 7

G9 How many times have you discussed an issue related to <u>your own health and well-being</u> with your midwife or public health nurse in the past three months?

Never	☐ 1
Once	☐ 2
Twice	☐ 3
3 times	☐ 4
4 times	☐ 5
5-6 times	☐ 6
7 or more times	☐ 7

G10 Are you able to talk to your midwife or public health nurse about things that are troubling you concerning <u>your own health and well-being</u>? *(Please tick ALL statements that you agree with. Leave the statements that you do not agree with blank.)*

Yes, she/he makes it easy for me to talk about anything that is concerning me	☐ 1
Yes, but she/he is often busy and doesn't seem to have time to listen	☐ 2
Yes, I can talk to her/him and she/he is very supportive and reassuring	☐ 3
I can talk to her/him about some issues, but there are other things I do not feel comfortable talking about	☐ 4
There's no point in talking to her/him about my health because she/he cannot fix any of my problems	☐ 5
No, I go to see her/him about my baby not myself	☐ 6
I don't talk to her/him because I am worried she/he will think I am not coping	☐ 7
I don't talk to her/him because I am concerned she/he might want me to do something that will make the situation worse	☐ 8
There are some issues I don't talk about because I am concerned she/he might tell someone else	☐ 9

G11 SINCE THE BIRTH, has your midwife or public health nurse asked you directly whether or not you are experiencing any of the following *(Please tick one response on each line)*

		Yes	No	Not sure
a.	Tiredness or exhaustion	☐ 1	☐ 2	☐ 3
b.	Leakage or involuntary loss of urine	☐ 1	☐ 2	☐ 3
c.	Leakage or involuntary loss of bowel motion	☐ 1	☐ 2	☐ 3
d.	Perineal pain	☐ 1	☐ 2	☐ 3
e.	Sexual problems	☐ 1	☐ 2	☐ 3
f.	Haemorrhoids	☐ 1	☐ 2	☐ 3
g.	Feeling depressed or low	☐ 1	☐ 2	☐ 3
h.	Relationship problems	☐ 1	☐ 2	☐ 3

G12 Please feel free to comment on any other aspect of your own or your baby's health in the last 3 months

_____

_____

_____

_____

_____

_____

Section H: About you and your household

Thank you for taking the time to complete the survey so far. The next few questions ask for personal details about your household and social factors. Sometimes social factors can affect women's health in pregnancy and this is why these questions have been included here.

All the information that you provide is **confidential** and cannot be linked to you as an individual or your household and there is no possibility that any of this information will be passed on to any other agency or department, government or otherwise.

H1 Are you currently: *(Please tick ONE only)*

- Married ☐ 1
- Living with a partner ☐ 2
- Divorced or separated ☐ 3
- In a relationship - not living together ☐ 4
- Widowed ☐ 5
- Single ☐ 6
- Other *(Please describe)* ☐ 7

_____

H2 Who else lives together with you in your household? *(Please tick ALL that apply.)*

- Your child ☐ 1
- Your partner/husband ☐ 2
- Your mother ☐ 3
- Your father ☐ 4
- Your partner's mother ☐ 5
- Your partner's father ☐ 6
- Partner's child/children from previous relationship ☐ 7
- Your sister(s) and/or brother(s) ☐ 8

A friend/friends	☐ 9
Nanny/au pair	☐ 10
No one	☐ 11
Other *(please describe)*	☐ 12

_____

I3 How would you describe your current living accommodation?

House *(with a mortgage)*	☐ 1
House *(with no mortgage)*	☐ 2
Apartment *(with a mortgage)*	☐ 3
Apartment *(with no mortgage)*	☐ 4
Rented house *(rented privately)*	☐ 5
Rented house *(rented from local authority)*	☐ 6
Rented apartment *(rented privately)*	☐ 7
Rented apartment *(rented from local authority)*	☐ 8
Caravan / Mobile Home	☐ 9
Bed and breakfast accommodation	☐ 10
Hostel accommodation	☐ 11
No fixed accommodation *(homeless)*	☐ 12
Other *(Please give details)*	☐ 13

_____

_____

H4 a. Since having your baby have you gone back to work or study?

- Yes, gone back to paid work ☐ 1
- Yes, returned to study ☐ 2
- Am on paid maternity leave ☐ 3
- Am on unpaid maternity leave ☐ 4
- No, not in paid work or studying at the present time ☐ 5

b. How old was your baby when you returned to paid work or study?

- Less than seven weeks old ☐ 1
- Between seven weeks old and three months old ☐ 2
- More than three months old ☐ 3

c. How many hours did you spend at work or studying last week?

- Less than 10 hours ☐ 1
- Between 10 and 20 hours ☐ 2
- More than 20 hours ☐ 3

H5 How would you describe your current employment status *(please tick one response)*

- I gave up my job when my baby was born ☐ 1
- Full time paid work ☐ 2
- Part-time paid work ☐ 3
- Casual paid-work ☐ 4
- Looking for first job ☐ 5
- Unemployed ☐ 6
- Student or pupil ☐ 7
- Looking after home/family ☐ 8

Unable to work due to sickness / disability ☐ 9

Unpaid voluntary work ☐ 10

Other *(Please describe)* ☐ 11

_____

_____

H6 Which of the following best describes your medical cover/health insurance when you gave birth to your baby? *(Please tick one response)*

I had private health insurance for private care ☐ 1

I had private health insurance for semi-private care ☐ 2

I had private health insurance but chose not to use it for my pregnancy and birth ☐ 3

I had public care ☐ 4

Other *(Please describe)* ☐ 5

_____

H7 a. Are you hoping to have another baby?

Yes ☐ 1

No ☐ 2

Not sure ☐ 3

H7 b. If YES, would you prefer to have?

A vaginal birth ☐ 1

A caesarean section ☐ 2

No particular preference ☐ 3

Section I: you and your relationships

The next few questions are about you and your relationships and ask about your experiences in adult intimate relationships (for example, husband, partner, girlfriend or boyfriend of longer than one month.)

Again, if you feel uncomfortable answering any of these questions or they are too personal, you do not have to answer them. However, if you have experienced any of the symptoms or issues asked about, it would be help us to understand them and it might help other women to know they are not alone in their experiences when the findings are published. Again, we would like to reassure you that all the information that you provide is **strictly confidential** and all the findings from this survey will be presented and published in a way that does not identify you or **any** individual women.

I1 Are you currently in a relationship?

Yes ☐ 1 No ☐ 2

I2 Are you afraid of your current partner?

Yes ☐ 1 No ☐ 2

I3 Have you ever been afraid of any partner?

Yes ☐ 1 No ☐ 2

Please comment if you wish _____

_____

_____

_____

I4 I would like to know if you have experienced any of the actions listed below and how often they happened during the last THREE months, since you had your baby. Please answer, even if you are not with a partner at present. *(Please indicate how often it happened OVER THE LAST 3-MONTH PERIOD, by ticking one box on each line)*

My Partner…	Never	Only once	Several times	Once a month	Once a week	Daily
Told me I wasn't good enough	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6
Tried to turn my family, friends and children against me	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6
Slapped me	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6
Told me I was ugly	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6
Tried to keep me from seeing or talking to my family	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6
Threw me	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6
Blamed me for causing their violent behaviour	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6
Shook me	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6
Pushed, grabbed or shoved me	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6
Became upset if dinner/housework wasn't done when they thought it should be	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6
Told me I was crazy	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6
Told me no-one would ever want me	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6
Hit or tried to hit me with something	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6
Did not want me to socialise with my female friends	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6
Kicked me, bit me or hit me with a fist	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6
Tried to convince my friends, family or children that I was crazy	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6
Told me I was stupid	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6
Beat me up	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6

Please comment if you wish _____

_____

_____

_____

I5 Have you told anyone about the above experiences? *(Please tick ALL that apply.)*

I have not had any of the above experiences	☐	1
I have not told anyone	☐	2
I have told my Public Health Nurse	☐	3
I have told my regular GP/family doctor	☐	4
I told someone else *(Please say who)*	☐	5

_____

If you would like to tell us more about your experiences please use the space below.

_____

_____

_____

_____

_____

Women's Aid - working to end violence against women

If you need help, phone them on:

National Freephone Helpline

1800 341 900 - 10am to 10pm

http://www.womensaid.ie/

Email: info@womensaid.ie

Everton House
47 Old Cabra Road
Dublin 7
Tel: +353 1 868 4721
Fax: +353 1 868 4722

If you or someone you know is experiencing domestic violence, Women's Aid can help:

- **Women's Aid** operate the National Freephone Helpline 1800 341 900 (10am to 10pm, 7 days a week except Christmas Day)
- **Women's Aid** provide one to one support in six locations throughout Dublin including Cabra, Coolock, Swords, Dublin City Centre, Amiens and Ballymun.
- **Women's Aid** provide a court accompaniment service in the Greater Dublin Area.
- **Women's Aid** refer women to local domestic violence support services and refuges.

All of **Women's Aid** services offer **free**, confidential support to women and their children who are experiencing domestic violence in the Republic of Ireland.

Section J: Comments on the survey

J1 Now that you have got to the end of this part of the survey I am interested in knowing how you found it? *(Please tick ALL that apply.)*

I managed to finish it but it took ages	☐ 1
I was pleased to be asked about my experiences	☐ 2
It was OK	☐ 3
It was interesting	☐ 4
I didn't understand some of the terms or language used	☐ 5
Other (*please say what*)	☐ 6

_____

_____

_____

_____

J2 About the MAMMI Study website http://www.mammi.ie

a. Have you had an opportunity to look at the MAMMI Study website?

Yes ☐ 1 No ☐ 2

b. Did you recommend the website to others?

Yes ☐ 1 No ☐ 2

c. If you have looked at the website, please comment on how you found it and/or what other information **you** would have liked to see on it.

_____

_____

_____

_____

Comments

If you wish to write any further comments please do so on this page. Thank you.

Please help us to keep in touch.

If your address or other contact details have changed (or you are about to move), please fill in the details below:

Your NEW address:	Your NEW phone number(s):

Thank you for taking the time to complete this survey.

Again, we want to reassure you that no names will be used in any publication and it will not be possible to identify any individual woman or her responses.

Please use the reply paid envelope to send it back to us. If no envelope was enclosed with this survey or you have mislaid it, please call **us on 087 2290989** and we will send you out another one.

The third (S2: three months postnatal) survey results will not be available until all of the women taking part in the study have given birth. As soon as the third survey results are available, we will let you know via the website www.mammi.ie and the study newsletter for participants.

Please call us if you have any questions about the study. We look forward to contacting you again when your baby is six months old and wish you well.

Best wishes.

The MAMMI study team

087 2290989

www.mammi.ie

My sincerest thanks to Professor Stephanie Brown, Murdock Children's Research Institute, Melbourne, Australia for granting permission to amend and use this survey in an Irish setting.

Appendix 19 Interview Guide for clinicians - Phase 2

Interview guide for clinicians		Contemporaneous notes and post interview notes
1. Decision made by obstetric registrar on-call/senior obstetrician on call. **1.a.Seeking second opinion** **1.b.Discussed with obstetric consultant** **1.c.women's view taken into account, or asked for**	How do you classify Caesarean section? What do you think are the most common reasons for CS in nulliparous women What is the decision-making process for CS? Who makes the decision for a CS in the institution you are employed in?	
2. Clinical reasons such as **2.a. foetal distress** **2.b. failure to progress** **3. Non-clinical reasons such as** **2.a. Organisational factors (hospital policy and protocols)** **2.b. staffing issues** **2.c. lack of skill among clinicians** **2.d. lack of resources** **2.e. social issues (fear of litigation)** **2.f. maternal request** **2.g. time of the day or night (shift issues)** **2.h. health care coverage (insurance status of women)**	What is your role in the decision-making for a CS in nulliparous women? Are there any other factors which may have an influence in decision-making for a CS in nulliparous women? How do you feel about the way decision to perform CS are made? Anything else you would like to say?	

Appendix 20 Interview Guide for women - Phase 2

Interview guide for women **Introduction -** – I'd really like to hear your thoughts on your labour and birth, and giving birth by CS, how everything went for you, what it was like, what you had hoped for, how you felt about it then and now, how you are feeling now…		**Contemporaneous notes and post interview notes**
1. Can you tell me about your labour and birth – what are your recollections and memories of what happened (in your labour) in the few hours (or time) leading up to your CS? OR Could you tell me a bit about your CS? 2. What was it like to give birth by CS?	*If in labour, was it spontaneous onset of labour or induction of labour, pre labour or how far in labour (dilatation of cervix), type of analgesia, if any?* *Did you want to have a CS?*	
3. Tell me about what happened around the time the decision was made for your CS? OR Why do you think that you had a CS? was/were the reason(s) for the decision	*Main factors leading to the need for CS. Tell me about when and how the decision was made*	
4. Please can you describe your role in the decision-making for the birth of your baby? 5. How did you feel about the way the decision was made?	*Discussions with clinicians (midwife, doctor, GP etc.) – before and in labour (if it wasn't an elective CS)* *Tell me about how the decision was made (Were you given time to think about the decision (if applicable)* *Did you feel involved in the decision-making process)?*	
6. How have you been since the birth of your baby? OR what is it like since you had your CS, then and now? 7. Could you please tell me, in your opinion, if there is anything that could be done to improve women's health after child birth? 8. Is there anything else you would like to say?	*In terms of recovery from CS.* Changed over time? *Feelings, emotional, physical, expectations etc., pain, no pain, wound/pain, sickness, infections, attending for healthcare, antibiotics, medications, pain medication,* *Bonding with baby (feeding).* *Self caring and taking care of the baby.* *Day to day life and social life since birth*	

Appendix 21 Member checking form for clinicians – Phase 2

Summary of key findings and member checking questionnaire

Study title: Factors influencing decision-making for caesarean section for first-time mothers

This study aims to explore clinicians' views of factors influencing decision-making for caesarean section (CS) for first-time mothers. Five main themes emerged from the interviews with 35 clinicians (12 consultant obstetricians, eight senior obstetric registrars and 15 midwives). This is a synopsis of the key findings/themes that have emerged from the 35 interviews, and each theme has several sub-themes. I have presented a brief explanation of each subtheme with anonymised quotes from the interviews to illustrate the particular theme/subtheme.

For each theme, I would like to know the extent to which you can relate to it, based on your views of factors influencing decision-making for CS for first-time mothers. Please put an 'X' in the box under the comment that best represents your view.

Theme 1 A fear factor

Subtheme 1.1. Fear of litigation and/or adverse outcome
Most clinicians said that fear of adverse outcomes following vaginal birth, and possible legal consequences/litigation were a major factor influencing the decision to perform a CS. While litigation was viewed as an inevitable part of practice, some clinicians felt it did not influence their own personal decision-making
Example quote: *"I certainly think the threshold for you know, allowing certain things to kind of come to a more natural conclusion has changed because of people's fear of…the legal implications. And certainly, you know, more and more you're hearing women say to you, you know if something happens I will hold you accountable."*
Subtheme 1.2. Ever present - influence of past experience
Clinicians' past experience of an adverse outcome or litigation stayed with them forever, and this played a vital role in their short and long-term decision-

making processes, and often for the rest of their professional life.
Example quote: *"Obstetricians are humans like everybody else …they might be influenced by their own personal experiences of giving birth or their partner giving birth and they might be heavily influenced by a small number of very tragic cases that have influenced their career from that point forward."*
Subtheme 1.3. Influence of media - personal and professional consequences
Clinicians had a general perception that Ireland had become a litigious country and negative attention from the media influenced clinicians' practice and day-to-day decision-making.
Example quote: *"I think our society, we have become more litigious.… Nobody wants to stand in the court and defend themselves. So definitely one of the reasons why the rate of caesarean section is going over the board is the fear of litigation."*

Do you recognise any of your views in the above descriptions on 'factors influencing decision-making for CS'?

Yes, very true	Yes, fairly true	No, not really true	Not true at all
☐	☐	☐	☐

Do you recognise views of others that you may have heard of, in this description, even if you don't view like that, or don't agree with it?

Yes, very true	Yes, fairly true	No, not really true	Not true at all
☐	☐	☐	☐

Theme 2: Personal preferences versus a threshold - Clinician driven factor

Subtheme 2.1. A variation in interpretation and practice pattern
Individual clinicians' interpretation of the overall clinical picture, whether it was related to progress of labour or making a diagnosis of fetal distress varied with an obvious variation in their management of the situation, and these variations influenced the decision to perform a CS.
Example quote: *"there is a variation in the threshold to intervene so I think there are clinicians who are better at thinking from an etiological perspective... and ... looking at measures that will correct the cause of the fetal heart rate abnormality. If your threshold is to intervene very quickly... they may make a decision to do a caesarean section ...very quickly."*
Subtheme 2.2 Consultant obstetricians - a decision-maker versus approver of the decision
Consultant obstetricians' availability on site influenced the decision-making and outcome. Gaining approval for a decision over phone was dependent on individual obstetric registrar's interpretation of the clinical scenario and their predetermined view of the possible outcome.
Example quote: *"The consultant would be heavily involved* [in the decision-making process] *if they were on site. If it's after hours, generally it's … a discussion over the telephone. Like I mean it's very difficult, they can't see the CTG, so they're going through how the CMM2 or the registrar is interpreting the CTG. And generally, if they hear that we've done three FBSs …, they agree with going for a caesarean section."*
Subtheme 2.3. Perceived clinical indications - considering the bigger picture
Fetal distress, failed induction and failure to progress in labour were considered to be the three most common reasons to perform a CS for a first-time mother. However, clinicians' personal beliefs in the ambiguous situations,

capacity and overcrowding were viewed, by some obstetricians, as influencing the decision-making process. A belief system within the organisation was perceived to have some influence in the decision-making process, which was further influenced by infrastructural limitations.
Example quote: *"I feel hospitals should have a policy and they should stand over it. If there's any deviation from that policy then definitely it has to be a consultant decision and documented. What I find is very difficult is there's no documentation sometimes why a decision has been made, who made it and what the reason was."*
Subtheme 3.2. Influence of staffing
There were different perspectives to levels of staffing, lack of availability of midwives to provide one-to-one care and lack of an appropriate skill mix influencing the decision-making to perform CS.
Example quote: *"it's the lack of human resources… If you have a woman who's been there on the labour ward all day and is making very slow progress, I think for right or wrong you do make decisions based on the other external influences which are … too many patients and …too few staff."*
Subtheme 3.3. Midwife – an advocate in the shared process of decision-making
Decision-making for CS was viewed as a shared process, with obstetricians as the final decision-maker. The midwife's role in most occasions was viewed as an 'advocate' for the women. Although obstetricians were the final decision-makers for all CSs, they viewed the midwives' role as being vital to the decision-making process.
Example quote: *"Well, I mean they* [midwives] *are the first-line people that are really in the room and with the patient all the time, so they are getting worried first and then they would call the registrar or whoever is on call, quite often if it's a junior midwife she would discuss with the senior midwife manager. So I think*

it's really a team decision in the end."
Subtheme 3.4. Women - where do they stand in the process of decision-making
In general, maternal request for CS was not regarded as being a major factor influencing the decision to perform a CS. Some obstetricians were open about accepting and approving maternal request for CS. However, professionals' role was regarded as being crucial in ensuring that the woman was aware of all the risks, long term and short term, associated with birth by CS.
Example quote: *"I think probably, I mean it's their choice, it's their body I suppose. But I think we as professionals have a duty to make them fully aware of what is involved and the long-term consequence of having a caesarean, that it is a major operation, that things can go wrong."*

Do you recognise any of your views in the above descriptions on 'factors influencing decision-making for CS'?

Yes, very true	Yes, fairly true	No, not really true	Not true at all
☐	☐	☐	☐

Do you recognise views of others that you may have heard of, in this description, even if you don't view like that, or don't agree with it?

Yes, very true	Yes, fairly true	No, not really true	Not true at all
☐	☐	☐	☐

Theme 4: Private versus public - A possible difference in practice

Subtheme 4.1. An obvious difference in practice
Clinicians felt women's health insurance status, private or public, influenced the decision to perform a CS. There was an obvious difference in decision-

making processes for women booking for care under public care compared to those under private care. It was mostly dependent on the individual consultant obstetrician and their practice pattern. Some maternal factors such as history of IVF, maternal age, etc., also influence the decision-making for women attending under private care.
Example quote: *"Well I know that private caesarean section rate is higher than the public caesarean section rate …and I think there are a lot more primary caesarean sections in private practice than in public practice. I suppose …patients who attend privately have probably more money, might have had IVF…"*
Subtheme 4.2 Individualised practice versus a judgment call
Obstetricians' own preferences and individualised practices were perceived to be more evident when caring for women booked privately than for those in the public category, and this influenced their decision-making, the rate for the individual consultant obstetrician and the institution as a whole.
Example quote: *"We're all aware of colleagues who among their clinics, or their private patients have higher caesarean section rates than other colleagues. And it's not necessarily that one caesarean section rate is right, and one caesarean section rate is wrong. But I think it does show that there are differences in practice which can impact on caesarean section rates."*
Subtheme 4.3. Convenience - a possible factor
'Convenience' was perceived as a factor that influenced the decision-making for induction and management of labour and ultimately, a decision to perform a CS.
Example quote: *"You know that they* [consultant obstetricians] *are on a time limit...If it's a public woman there's not the same pressure on them to jump in and do a caesarean section, 'cos at the end of the day they're not going to do the caesarean section. They're going to get the registrar to do it … But if it's a private lady and they need to be somewhere...You would see them jump in*

quicker."

Do you recognise any of your views in the above descriptions on 'factors influencing decision-making for CS'?

Yes, very true	Yes, fairly true	No, not really true	Not true at all
☐	☐	☐	☐

Do you recognise views of others that you may have heard of, in this description, even if you don't view like that, or don't agree with it?

Yes, very true	Yes, fairly true	No, not really true	Not true at all
☐	☐	☐	☐

Theme 5: Lack of experience or loss of skills and confidence

Subtheme 5.1. Individual interpretation - role of experience
Clinicians' level of experience influenced their interpretation and management of the situation, which ultimately determined the outcome of the decision.
Example quote: *"Yea it can go two ways. You can either have the very experienced obstetrician who knows their skills and knows what they can do and what they can't do very clearly. … and then you can have the very under skilled, or less experienced obstetrician who over estimates their abilities…they're more likely to be the ones who will end up with failed instrumental and proceed to caesarean section birth."*
Subtheme 5.2 Lack of confidence or loss of skills - a judgment call
Clinicians' level of confidence and skill in managing a clinical situation had a major influence on the decision-making process. Clinicians mostly interpreted it as a judgement call for a given clinical scenario; however it was influenced

by their experience, skill and confidence in managing the situation, and this was evident, mostly, in decision-making for failure to progress in second stage of labour.
"People's confidence does influence it [decision-making]*…I am sure for the registrars that are on call you know if you have done the difficult instrumental and you have got someone else who is making slow progress with a biggish baby and you are kind of thinking oh god here I go again. You are much more likely to look for a reason … to think about doing a section."*
Subtheme 5.3. Practice pattern – junior versus senior
The way clinicians practised varied widely according to their level of experience. Some clinicians perceived that juniors [doctors] had a tendency to be quick to intervene compared to the seniors, whereas others thought it was the other way around.
Example quote: *"Very, very senior consultants they would be less inclined to section women straight away without a very hard indication, whereas for younger consultants would be sectioning women for softer indications."* *"...the older consultants would tend to bail out quicker than the… younger consultants. So if there is, you know … any signs of deceleration at all, and if say for instance … there is meconium …some of the consultants would think straight away you know 'this lady needs to be sectioned."*

Do you recognise any of your views in the above description on 'factors influencing decision-making for CS'?

Yes, very true	Yes, fairly true	No, not really true	Not true at all
☐	☐	☐	☐

Any further comments you may have:

Thank you very much for participating in this study.

Appendix 22 Member checking form for women – Phase 2

Summary of key findings and member checking questionnaire

Study title: Women's views of factors influencing birth by caesarean section and women's involvement in the decision-making for their birth

This study aimed to explore women's views of factors influencing birth by caesarean section (CS) and women's involvement in the decision-making for their birth. I conducted 20 interviews, and three main themes emerged. This is a summary of the three themes and each theme has several sub-themes. I have explained each subtheme briefly and used anonymised direct quotes from the interviews to illustrate the particular point(s).

For each theme, I would like to know the extent to which you can relate to it, based on your views of factors influencing birth by caesarean section and women's involvement in the decision-making for their birth. Please put an 'X' in the box under the comment that best represents your view.

Theme 1 I wanted a natural birth but…

1.1. Subtheme 1.1. I had a CS because…
Women's views on being involved in the decision-making process were influenced by whether labour onset was spontaneous or induced, and the progress of labour. Women who had a CS as a result of failed induction described not being involved in the decision-making. For these women, having to have a CS was inextricably linked with induction of labour. Many women felt that, despite all their attempts to experience a normal and natural birth, they still had to have a CS, and perceived that the circumstances and decision-making around their mode of birth were beyond their control.
Example quote: *"It was an emergency section…It wasn't really something that I did consider. So it was a bit of shock because I didn't really factor it into one of my options. Even though I knew it was there, I never thought that I would end up with one…There were a couple of reasons [for my CS], mostly meconium in the fluid [and] he [baby] was…stressed …It [The decision for CS] happened very fast…I felt like definitely out of control. Because there was nothing they could do about it."*

"So [in] the last week of my pregnancy… they decided [for] induction. And [it] failed. And…they had to do…C section."
1.2. Subtheme 1.2. Quick and unexpected
Childbirth was regarded as an important event in a woman's life, but the decision to birth by CS and not having enough time to experience and reflect back on this event was described as overwhelming.
Example quote: *"Loads of things [were]…happening in very short span of time. But…when you're giving birth…vaginally you probably have more time to realise that it's really happening. It was…like I was pregnant, pregnant…pregnant…and then within fifteen minutes we had a baby…it was overwhelming."* *"A natural birth is probably a bit easier…This [CS] was now done within…minutes and the little one was there...It's such an important event in a woman's life... And it was over so quick."*
Subtheme 1.3. Being listened to
In their very personal moment of labour and birth, some women felt that, at times, they were not listened to. Women who had emergency CS described their experiences mostly around the process of arriving at the decision to birth by CS.
Example quote: *"I didn't feel very…empowered…to question things…I had to go along with…what I was being told to do. I didn't ask as much as I would have liked to."* *"They kept me informed…They knew that I didn't want a C section. So they really were very good about letting me try to get there on my own."*

Do you recognise any of your views in the above descriptions?

Yes, very true	Yes, fairly true	No, not really true	Not true at all
☐	☐	☐	☐

Do you recognise views of others that you may have heard of, in this description, even if you don't view like that, or don't agree with it?

Yes, very true	Yes, fairly true	No, not really true	Not true at all
☐	☐	☐	☐

Theme 2: Involvement in decision-making

Subtheme 2.1. A personal experience
Most women whose CS was planned felt that they were actively involved in the decision and described it as a positive experience. This was different for women who had an emergency or unplanned CS. Having an emergency CS was the end point of a cascade of events. Few women described not being involved in the decision-making process, with feelings of disappointment on how their induction and labour were managed.
Example quote: *I don't think [I was involved in the decision-making process]…I was going on medical advice and taking…the advice of professionals…I was just told that this is what's going to happen…I don't feel like I was given a choice or that it was my decision to kind of change my mind."* *"I didn't feel like I had an active say in anything really, we were just kind of told baby's heart rate is dipping so we need to do this, and when you're told that…your baby's heart rate is dipping you think Oh God, okay...Now, I'm not medically trained so I don't know, you know, but it certainly didn't seem like right there and then that was our only option that we had to do, but yet that's what they did, you know."*
Subtheme 2.2 A silent acquiescence and going with the flow
Many women described 'accepting' the clinicians' decision without question. Some women did not feel empowered enough to question the professional decision, while others believed that 'going with the flow' and accepting the recommendation of professionals was the right decision for themselves and their baby.

Example quote: *"I felt very involved…these guys [clinicians] are experts, they deliver babies all the time, they know what they're doing, I'm sure there are standards and policies in place. I feel like I'm being listened to but at the same time I, I would never have argued with them either because I myself personally felt that my baby wasn't going to be delivered via my vagina."* *"Not really [involved in the decision-making process]…I just went with their decision. I didn't kind of fight it too much, I mean I did say, oh I don't really want to have a C section. But I wasn't going to say, oh no I think we should wait. Because I mean they're the professionals and…the whole time I said to myself, no just trust them and go with whatever they think is professionally needed."*
Subtheme 2.3. I was well informed
Women described being well informed during the decision-making process, and equated this with being actively involved, when events and procedures, or the reasons for these, were well explained to them.
Example quote: *"The midwife and the doctors…leading towards a C section… explained…everything. I didn't decide [the] C section. But I was aware and happy with the decision that the doctor made [and] I agreed…It was a medical decision…[and] I was happy with what was happening."* *"It happened very fast, so I was very scared. And I felt like definitely out of control. Because there was nothing they could do about it. But it was explained to me why and why they were doing it. And they were constantly keeping me up to date when it was time for it, it just was very rapid. It was quite scary."*

Do you recognise any of your views in the above descriptions?

Yes, very true	Yes, fairly true	No, not really true	Not true at all
☐	☐	☐	☐

"Initially…I was opting…for vaginal birth. But as the time went I could see…little more weight onto the risk…I was a little bit disappointed that…I couldn't give birth vaginally. On the other hand, if anything would happen [to baby] I would be just… blaming myself until the end of my life."

Do you recognise any of your views in the above descriptions?

Yes, very true	Yes, fairly true	No, not really true	Not true at all
☐	☐	☐	☐

Do you recognise views of others that you may have heard of, in this description, even if you don't view like that, or don't agree with it?

Yes, very true	Yes, fairly true	No, not really true	Not true at all
☐	☐	☐	☐

What aspects of your views have I omitted?

What aspects of your views have I exaggerated, if any?

What aspects of your views have I misunderstood or misrepresented, if any?

Any further comments you may have:

Thank you very much for participating in this study.

Appendix 23 Letter of approval from TCD and the three study sites for MAMMI study and CS strand

Letter of Approval from Faculty of Health Sciences, TCD for MAMMI Study

THE UNIVERSITY OF DUBLIN
TRINITY COLLEGE

SCHOOL OF MEDICINE
FACULTY OF HEALTH SCIENCES

Trinity College, Dublin 2, Ireland
Tel: +353 1 896 1476
Fax: +353 1 671 3956
email: medicine@tcd.ie

Professor Dermot Kelleher, MD, FRCPI, FRCP, F Med Sci
Head of School of Medicine
Vice Provost for Medical Affairs

Ms Fedelma McNamara
School Administrator
email: medschadmin@tcd.ie

Ms Deirdre Daly
School of Nursing and Midwifery,
Trinity College Dublin,
24 D'Olier Street,
Dublin 2.

Monday, 16th May, 2011

Study: Maternal health and Maternal Morbidity in Ireland (The MAMMI study)

Dear Applicant (s),

Further to a meeting of the Faculty of Health Sciences Ethics Committee held in September 2010, we are pleased to inform you that the above project has been approved without further audit.

Yours sincerely

Prof. Orla Sheils
Chairperson
Faculty of Health Sciences Ethics Committee

Cc Professor Cecily Begley, Professor Mike Clarke
School of Nursing and Midwifery,
Trinity College Dublin,
24 D'Olier Street,
Dublin 2.

Schools of the Faculty: Medicine, Dental Science, Nursing and Midwifery, Pharmacy and Pharmaceutical Sciences

Letter of Approval from Rotunda Hospital, Dublin for MAMMI Study

ROTUNDA HOSPITAL
Parnell St • Dublin 1
Tel: 01 - 817 1700 • www.rotunda.ie

DR SAM COULTER-SMITH
MASTER

3rd October, 2011.

Ms. Deirdre Daly,
Lecturer in Midwifery/Research Fellow,
School of Nursing & Midwifery,
24 D'Olier Street,
Dublin 2.

Re: The MAMMI Study (Maternal health And Maternal Morbidity in Ireland)

Dear Deirdre,

Just a note to confirm that the Research Ethics Committee of the Hospital are now happy for you to commence the above study. We wish you well with this work.

Kind regards.

Yours sincerely,

Dr. Michael Geary.
Chairman.
Research Ethics Committee.

Not for prescription purposes
• Tel: 01 - 817 1731 • Fax: 01 - 873 0932
• email: masterssecretary@rotunda.ie

Letter of Approval from Galway University Hospital for MAMMI Study

Feidhmeannacht na Seirbhíse Sláinte
Health Service Executive

Merlin Park University Hospital
Ospidéal na h-Ollscoile, Páirc Mheirlinne
GALWAY UNIVERSITY HOSPITALS

Clinical Research Ethics Committee
Main Administration Building
Merlin Park Hospital
Galway.

31st May, 2013.

Professor Declan Devane
Chair of Midwifery
Aras Moyola
School of Nursing & Midwifery
National University of Ireland
University Road
Galway.

Ref: C.A. 900 – Maternal Health and Maternal Morbidity Ireland (MAMMI)

Dear Professor Devane,

I have considered the above project, and I am happy to grant Chairman's approval to proceed.

Yours sincerely,

p.p. Colette Collins

Dr. Shaun T. O'Keeffe
Chairman Clinical Research Ethics Committee.

c.c. Professor Cecily Begley, Chair of Nursing & Midwifery, Trinity College Dublin, 24 D'Olier Street, Dublin 2.

Profess John Morrison, Chair of Obstetrics, National University of Ireland, Galway.

Merlin Park University Hospital, Ospidéal na h-Ollscoile, Páirc Mheirlinne,
Galway, Ireland. Tel: 00 353 (0)91 757631

Letter of Approval from Coombe Women and Infants University Hospital, Dublin for MAMMI Study

Coombe Women & Infants University Hospital

Excellence in the Care of Women and Babies
Fairfeacht i gCúram Ban agus Naíonán

Cork Street
Dublin 8
telephone +353-1-408 5200
fax +353-1-453 6033
www.coombe.ie

MC/MJ

02 April 2014

Ms Sunita Panda
Staff Nurse Neonatology Unit
CW&IUH

Re.: ***Study No. 9 – 2014 – The MAMMI Study (Maternal health and Maternal Morbidity in Ireland)- Caesarean section strand.***

Dear Ms Panda

This application was considered at the recent research ethics committee meeting held on 19th March 2014. Approval was given to the MAMMI study with the exception of the caesarean section strand as there was no information regarding the format of interviews of clinical staff and selection of same. The study can go ahead with the inclusion of appropriate logos and references to the Coombe Women & Infants University Hospital.

The second part of the study cannot go ahead until receipt of more information regarding methodology of clinical staff selection and interview.

Yours sincerely

Dr Michael Carey
Chairman

Copy: Prof. Cecily Begley, School of Nursing & Midwifery, TCD, 24 D'Olier Street, Dublin 2

Sunita Panda
School of Nursing & Midwifery
University of Dublin, Trinity College
24 D'Olier Street
Dublin 2

Ref: 140905

Title of Study: Maternal Health and Maternal Morbidity in Ireland (MAMMI): Caesarean Section Strand

Dear Sunita,

Further to a meeting of the Faculty of Health Sciences Ethics Committee held in February 2015, we are pleased to inform you that the above project has been approved without further audit.

Yours sincerely,

pp Gloria Brown
Dr. Ruth Pilkington
Chairperson
Faculty Research Ethics Committee

Coombe Women & Infants University Hospital

Excellence in the Care of Women and Babies
Sáfaracht i gCúram Ban agus Naíonán

Cork Street
Dublin 8
telephone +353-1-408 5200
fax +353-1-453 6033
www.coombe.ie

JM/MJ

07 January 2015

Ms Sunita Panda
CMM Delivery Suite
CW&IUH

Re.: ***Study No. 36 – 2014 – The MAMMI Study: Caesarean Section (CS) Strand – factors influencing the decision-making process and outcomes for women***

Dear Ms Panda

I am very happy to inform you that your study was approved by the research ethics committee in the Coombe Women & Infants University Hospital.

Yours sincerely

Dr Jan Miletin
Chairman

Copy: Prof. Cecily Begley, School of Nursing & Midwifery, TCD, Dublin 2

Feidhmeannacht na Seirbhíse Sláinte
Health Service Executive

Merlin Park University Hospital
Ospidéal na h-Ollscoile, Páirc Mheirlinne
GALWAY UNIVERSITY HOSPITALS

Clinical Research Ethics Committee
Main Administration Building
Merlin Park Hospital
Galway.

15th January, 2015.

Professor Declan Devane
Professor of Midwifery
School of Nursing and Midwifery
National University of Ireland
Galway.

Ref: C.A. 900 – ***Amendment 2 - Maternal Health and Maternal Morbidity Ireland (MAMMI)***

Dear Professor Devane,

I have considered the above amendment, and I am happy to grant Chairman's approval to proceed.

Yours sincerely,

p.p. Colette Collins

Dr. Shaun T. O'Keeffe
Chairman Clinical Research Ethics Committee.

c.c. Ms. Sunita Panda, School of Nursing & Midwifery, Trinity College Dublin, 24 D'Olier Street, Dublin 2.

Professor Cecily Begley, Chair of Nursing & Midwifery, Trinity College Dublin, 24 D'Olier Street, Dublin 2.

Merlin Park University Hospital, Ospidéal na h-Ollscoile, Páirc Mheirlinne,
Galway, Ireland. Tel: 00 353 (0)91 757633

Ospidéal an Rotunda
Ceannóg Parnell, Baile Átha Cliath 1, Éire.
The Rotunda Hospital
Parnell Square, Dublin 1, Ireland.
T: +353 1 817 1700 / F: +353 1 872 6523
www.rotunda.ie

29th September, 2015

Ms. Sunita Panda,
PhD Student,
School of Midwifery & Nursing,
Trinity College Dublin,
24 D'Olier Street,
Dublin 2

Our ref: **REC-2015-010** *(please quote this reference on all correspondence)*
Re: **The MAMMI Study: Caesarean section strand**

Dear Sunita,

Many thanks for your recent correspondence in relation to the above study, in which you confirmed that the changes to your proposal which had been requested by the Committee have now been made. This being the case, your research has been approved and may now commence.

You are requested to submit a progress report to the Committee in twelve months, and annually thereafter as applicable. We would also like to know when and where you publish or present your results. Please be aware of your responsibilities with respect to the Hospital's good research practice policies and guidelines, copies of which are enclosed here.

Kind regards.

Yours sincerely,

Dr. Peter McKenna,
Chairman,
Research Ethics Committee

cc. Prof. Cecily Begley, School of Midwifery & Nursing, Trinity College Dublin, 24 D'Olier Street, Dublin 2

CARING FOR GENERATIONS
SINCE 1745

Sunita Panda
School of Nursing & Midwifery
University of Dublin, Trinity College
24 D'Olier Street
Dublin 2

Ref: 140905

Title of Study: Maternal Health and Maternal Morbidity in Ireland (MAMMI): Caesarean Section Strand

Dear Sunita,

Further to a meeting of the Faculty of Health Sciences Ethics Committee held in February 2015, we are pleased to inform you that the above project has been approved without further audit.

Yours sincerely,

pp Gloria Brown
Dr. Ruth Pilkington
Chairperson
Faculty Research Ethics Committee

Appendix 24 Letter of invitation for women's participation in postpartum surveys – Phase 1

COLÁISTE NA TRÍONÓIDE, BAILE ÁTHA CLIATH | TRINITY COLLEGE DUBLIN
Ollscoil Átha Cliath | The University of Dublin

School of Nursing and Midwifery
Trinity College Dublin
24 D'Olier Street
Dublin 2

Dear

The MAMMI Study

We do hope you and your family are healthy and well since the birth of your baby.

Once again, many thanks for agreeing to take part in the MAMMI study; we really do appreciate your participation.

We are now enclosing the MAMMI study survey two which should be completed now, 3 months after you gave birth. We are also enclosing a FREEPOST addressed envelope for returning the survey.

If you do not wish to continue in the study, you know you are free to withdraw without giving a reason. If you do decide to withdraw from the study, perhaps you can let us know and we will respect your wishes and ensure that you receive no further correspondence.

We do hope you will take the time to complete the survey, which takes about 30-45 minutes to complete depending on how much detail you want to write.

Please feel free to call us on 087 2290989, or text us and we will call you back, if you have any questions or queries.

We really do hope you are healthy and well and we wish you and your family good health and happiness. We look forward to receiving your survey.

Yours sincerely,

The MAMMI Study Team

Telephone: 087 2290989
Email: contact@mammi.ie

The MAMMI Study team members are:
Professor Cecily Begley & Professor Mike Clarke, Principal Investigators
Deirdre Daly, Sunita Panda, PhD student and HRb Research Fellow, Jamile Marchi, PhD Student, Deirdre O Malley, PhD student, HRB Research Fellow, Francesca Wuytack, PhD student

Appendix 25 Lone-Worker-Guidelines

The University of Dublin Trinity College FACULTY of Health Sciences

Lone Worker Guidelines

The following pages are **guidance** for researchers (staff and students) who are working alone or in small teams. They are intended to provide guidance to researchers in the field, irrespective of whether they are working on independent research projects or externally funded ones.

Who is this guidance for?
Members of staff or students who:

- work by themselves without close or direct supervision,
- or in small teams
- who may be vulnerable to the physical environment,
- lone travelling either by public transport or on foot and
- in particular for unaccompanied home visits.
- Researchers are expected to follow these guidelines and to use their professional judgement at all times.

Safe working arrangements for staff who work alone

Lone working on campus should also be considered to have a reasonable element of risk, particularly when working in the evening, after dark and early in the morning.
You should have permission from your Head of Department or Supervisor and notify security to let them know when you are working late or any other time where you feel vulnerable.
Ensure that you have a telephone close to you at all times and the Campus security number to hand.
It is **your** responsibility to ensure that you alert a named co-ordinator/colleague, when your work involves you working alone, in vulnerable situations or undertaking home visits, so that an effective process is put in place to ensure your safety.

This includes:-

Basics –

Good common sense should prevail and all researchers should carry the following items each time they conduct research away from the University:

- Carry an official **identity card** (with photograph).
- Carry a **comprehensive map** of the area.
- Carry a **torch** (and spare batteries).
- Carry a **mobile telephone** and **phone cards** (for areas with poor mobile reception).
- Carry a **personal alarm** (to be kept in an accessible place).

Adapted from Keele University Lone Worker Guidelines

In addition, **each researcher** should:

- Maintain a **visit proforma** (Appendix 1) as well as their personal diary as a means of logging visits. The visit proforma must be easily accessible by colleagues who are monitoring your visit.
- Never carry large amounts of **money or valuables**.
- Always have familiarisation sessions on home visits with an experienced member of staff during their induction period and only complete a home visit on their own when they, and their more experienced colleague, agree that they are ready. A formal risk assessment should be undertaken prior to new staff undertaking lone working.
- Ask a colleague to accompany you if you feel at all uneasy about conducting a home visit on your own.
- Obtain information about where you are visiting before the visit. Ask how many people will be at the visit.

Risk assessment – ensure that there is opportunity to feedback relevant information from a lone visit – e.g. if you felt at risk or if there was an incident. This should be formally recorded and reviewed with your Supervisor/ Head of Department and other members of your team to ensure appropriate follow up action is taken and to minimise any risk in subsequent visits.

Use of private cars

- Researchers or staff using their own cars for travel:
- Should where possible become a **member of a national breakdown service**.
- Ensure that car users have the appropriate level of insurance cover.
- Drivers should travel with **doors locked and windows closed**. If windows are open, handbags and briefcases should be kept out of sight.
- At night, the car should be **parked in a well-lit and busy place.** Multi-storey parks, or car parks where the car and the user will not be easily visible, should be avoided.
- If a driver thinks they are being followed, they should keep driving until they reach a busy area - Garda station or a garage, etc.
- Staff should avoid taking research participants as passengers unless they know them.

Pre visits

- Make and keep pre-arranged appointments, and notify the participant if you cannot keep them.
- Try to arrange home visits during daylight hours whenever possible. During winter months, weekend visits may be more suitable than evening appointments.
- Consider the purpose of the visit. Does it pose a higher than usual potential of bringing about a violent response e.g. an interview in connection with emotional matters? If so, consider asking a colleague to accompany you or arrange to interview the person at the workplace.
- Ensure that an appropriate room is available and there is financial support to cover participants' travel expenses if necessary.

During a visit

1. **Do not** enter someone's home, if you don't feel comfortable or safe.
2. **Do not** enter a house if the person you have arranged to see is not there. Be aware of, and maintain, personal safety at all times during visits.
3. Always explain your research role clearly and the conditions of confidentiality.
4. If the participant is anxious, consider encouraging them to have a carer/friend within sight/hearing.
5. Never meet aggression with aggression.
6. Your safety is the primary concern, which should be placed above completion of research tasks.

Home visits

- If you are late arriving for your appointment, advise your nominated colleague who will record the revised time on the visit proforma.
- When visiting people's homes, try to let the tenant lead the way. Avoid being the first to go into any room. Be extra careful when alone with participants e.g. fetching something from a handbag, comforting participants. You should always make sure that the exit from the room is clear.
- Animals in the home: if you are in any doubt about the behaviour of animals in the home, ask for it/them to be locked away while you are visiting.
- Never undertake an interview or assessment in the bedroom.
- Do not give your personal telephone number or address to clients.
- You should not interview anyone who is under the influence of alcohol or drugs.
- If you feel uncomfortable while in a person's home, you should take steps to leave immediately.
- A professional and friendly attitude should be adopted but over familiarity must be avoided.
- Remember that the interviewee may also feel anxious about the interview and your visit.
- You should bear this in mind whilst also ensuring your own safety.

Be alert for signs of DANGER

- Raised voice, rapid speech and babbling indicate rising tension.
- Changes in tone and pitch as the conversation progresses may suggest anger, frustration or impending violent behaviour.
- Keep your distance. Each of us has a personal space, which we defend when we feel it is being invaded.
- Be alert for body language that may indicate developing anger – e.g. flushed face, fidgeting, pointing, folded arms.

Awkward or potentially threatening situations

If an awkward or potentially threatening situation arises, this should be reported to a colleague as soon as possible. The facts should also be recorded in a specific "untoward incident" file. Formal arrangements should be in place for staff to be accompanied by a colleague for subsequent visits if there have been any incidents giving cause for concern on the first occasion. If, for any reason, you are concerned for your personal safety once you arrive at your appointment venue, then do feel able to cancel your appointment. On return to the office, make alternative arrangements when another member of staff experienced in working on their own undertaking home visits can accompany you.

Process for monitoring researcher visits

When visiting the home of a participant, you should leave the following details with a nominated colleague (complete a visit proforma) who **has formally agreed to monitor the duration of your visit** .The onus is on you, the researcher, to ensure that a colleague is aware of the details of your visit and has agreed to monitor during the visit and when the visit is completed. Ensure that your nominated colleague is available on the phone and contactable by you for the duration of your visit. Keep your nominated colleague adequately informed by leaving the following details:-

- Sign/make colleagues aware that you are leaving the office and make sure that a named colleague is aware of your visit and details provided on your visit proforma sheet.
- State clearly the name and address and telephone contact for where the interview will take place (and where the interviewee lives, if different) – take care about interviewee confidentiality.
- State the time of the appointment, when you expect the visit to be completed and when to expect you back in the office or the time you expect to contact your nominated colleague to let them know that your visit is safely completed.
- State the make, model, colour and registration of the car you will be driving and the route you will be taking.
- Contact your nominated colleague if you are late for your appointment who will note this on the visit proforma.
- If an appointment or the deadline for contact is after 5pm, the researcher must make other arrangements for someone (colleague/partner/friend/family) to undertake the departmental role in monitoring the researcher's whereabouts. These details should be noted on the pro forma. Your nominated person should also be briefed on these procedures and given details of who to contact in the unit (Head of Department or nominated Deputy), in the case of your failure to return on time.
- Leave your mobile telephone switched on during the interview.
- It is the responsibility of the researcher to ensure that he/she has stated clearly the details about the visit. Where appropriate, a nominated colleague will monitor who is out of the office and when they can be expected to return. It is important that the office are aware of the whereabouts of the researchers, including, wherever it may be practicably possible, the travelling time between the visited site and the office.
- Prepare yourself for difficult meetings by finding out everything you need to know before arriving and planning in your mind how you are going to deal with the situation.
- It is the responsibility of the nominated colleague to ensure s/he is available to receive a call and monitor the time when the visit should be over. If circumstances change, s/he should arrange for another colleague to monitor the visit.
- If the interview is still in progress as the deadline for contacting the department approaches, the researcher should excuse him/herself and call their nominated colleague to inform them.
- If the deadline passes and the researcher has not contacted the nominated colleague, the nominated colleague should ring the mobile telephone number of the researcher.
- If there is no answer, the nominated colleague should inform the Head of Department (or Deputy) immediately and ensure the police are informed immediately.
- If researchers decide that they are not going to return to the office after their last visit, they should ensure that the appropriate person in the office knows about that by telephoning in. The visit pro-forma can then be completed accordingly.

Additional useful guidance

DCU Health and Safety – Out of Hours http://www.dcu.ie/safety/out_of_hours.shtml
Risk Assessment for lone/ out of hours work:
http://www.dit.ie/media/documents/healthsafety/policiesprocedures/Risk%20Assessment%20for%20Lone%20Out%20of%20Hours%20Work%202009.pdf
Health and Safety Executive. Working Alone in Safety. Controlling the risks of solitary work.
http://www.hse.gov.uk/pubns/indg73.pdf
Health and Safety Executive. Violence at Work. A guide for employers.
http://www.hse.gov.uk/pubns/indg69.pdf
Paterson BL, Gregory D and Thorne S (1999). A protocol for researcher safety. Qualitative Health Research, 9(2): 259-269
The Suzy Lamplugh Trust. http://www.suzylamplugh.org/home/index.shtml

Appendix 26 Summary of variables included in analysis - Original and new codes and categories - Phase 1 analysis

Variable	Original categories	Recoded categories	Ref category
Age (in years)	1 = up to 24 2 = 25 – 29 3 = 30 – 34 4 = 35 – 39 5 = 40 & over	0 = 25-29 1 = up to 24 2 = 30 – 34 3 = 35 – 39 4 = ≥40 years	25-29 years
BMI (Early pregnancy)	1 = Underweight 2 = Ideal 3 = Over weight 4 = Obese 5 = Very obese	0 = Ideal weight 2 = Overweight 3 = Obese/very obese 9 = Missing	Ideal weight
Treatment for infertility	1 = No 2 = Fertility drugs 3 = IVF/ICSI 4 = Other	0 = No treatment for infertility 1 = Yes	No treatment for infertility
Relationship	1 = Married 2 = Divorced or separated 3 = widowed 4 = single 5 = living with partner 6 = in relation, not living with partner 7 = other	0 = Married 1 = Single 2 = In a relationship, living with or without a partner 3 = Other (divorced, widowed, separated)	Married
Accommodation status	1 = House (with a mortgage) 2 = House (with no mortgage) 3 = Apartment (with a mortgage) 4 = Apartment (with no mortgage) 5 = Rented house (rented privately) 6 = Rented house (rented from local authority) 7 = Rented apartment (rented privately) 8 = Rented apartment (rented from local authority) 9 = Caravan/Mobile Home 10 = Bed and breakfast accommodation 11 = Hostel accommodation 12 = No fixed accommodation (homeless) 13 = Other	1 = owns house/apt 2 = rented house/apt 3 = other	Own house/Apt
Employment	1 = Full time paid work 2 = Part time paid work	0 = Employed 1 = Unemployed	Employed

	3 = Casual paid work 4 = Looking for first job 5 = Unemployed 6 = Student/Pupil 7 = Looking after home/family 8 = Unable to work due to sickness/disability 9 = Unpaid voluntary work 10 = Other	2 = Others (Including students)	
Ethnicity	1 = Irish 2 = Irish traveler 3 = African 4 = Chinese 5 = Any other white background 6 = Any other black background 7 = Any other Asian background 8 = Other including mixed background	0 = Irish 1 = Irish traveler 2 = African 3 = Chinese 4 = Any other white background 5 = Any other black background 6 = Any other Asian background 7 = Other including mixed background	Irish
Country of birth	Free text	0 = Irish 1 = Europe (Excluding Ireland and UK) 2 = UK 3 = America 4 = Asia 5 = Africa 6 = Australia 7 = New Zealand and other Oceania	Irish
Educational qualification	1 = No formal qualifications 2 = Primary or first school 3 = Lower secondary 4 = Junior/Inter/Group Cert/ O levels/ GCSE, NCVA Foundation cert etc 5 = Upper secondary Leaving Cert - applied and vocation progs., A Levels, NCVA level 1 etc 6 = Completed apprenticeship, NCVA level 2/3,	0 = Degree/Post graduate Degree 1 = Diploma/Cert or Equivalent	Degree/post graduate

	Teagasc cert, dip or equivalent 7 = Both upper secondary and technical or vocational qualification 8 = National cert, diploma NCEA/ Institute of Technology or equivalent, Nursing Diploma 9 = Primary degree Third Level Bachelor Degree 10 = Professional qualification of degree status 11 = Postgraduate cert or diploma 12 = Postgraduate degree Masters 13 = Doctorate PhD		
Preexisting medical conditions Asthma	1 = Up to 17 years 2 = 18 and over 3 = No 4 = Not sure 5 = Both as a child and as an adult	0 = No 1 = Yes	No
Diabetes	1 = Up to 17 years 2 = 18 and over 3 = No 4 = Not sure 5 = Both as a child and as an adult	0 = No 1 = Yes	No
High Blood Pressure	1 = Up to 17 years 2 = 18 and over 3 = No 4 = Not sure 5 = Both as a child and as an adult	0 = No 1 = Yes	No
Type of maternity care	1 = Public 2 = Semiprivate 3 = Private 4 = Other	0 = Public 1 = Semiprivate 2 = Private	Public
Number of babies	1 – Singleton 2 = Multiple	0 = Singleton 1 = Multiple	Singleton
Spontaneous onset of labour	1 = Yes 2 = No	0 = No 1 = Yes	SOL
IOL	1 = Yes 2 = No	0 = No 1 = Yes	No IOL
Use of IV oxytocin in labour	1 = Yes 2 = No	0 = No 1 = Yes	No IV oxytocin in labour

Epidural for pain management in labour	1 = Yes 2 = No	0 = No 1 = Yes	No epidural in labour
Baby's position for birth	Free text	0 = Cephalic 1 = Breech and other malpresentations	Cephalic
Length of stay in hospital	1 – 1-2 days 2 = 3-4 days 3 = 5-6 days 4 = 7-8 days 5 = 9-10 days 6 = 11 days and over	0 = ≤4 days 1 = >4 days	≤4 days
Baby's admission to NICU	1 = Yes immediately after birth(within 2 hours) 2 = Yes more than 2 hours after birth 3 = no	0 = No admission to NICU 1 = Admission to NICU	No admission to NICU
Amount of blood loss at birth	Free text	0 = up to 499mls 1 = ≥500mls	Up to 499mls
PPH	1 = Yes 2 = No 3 = Not sure	0 = No 1 = Yes	No PPH
Perineal wound infection – in hospital (immediate postpartum)	1 = Yes 2 = No 3 = Not sure	0 = No wound infection 1 = Wound infection	No wound infection
Caesarean section wound infection – in hospital (immediate postpartum)	1 = Yes 2 = No 3 = Not sure	0 = No wound infection 1 = Wound infection	No wound infection
Breast problems (immediate postpartum) (e.g., sore nipples, mastitis) (during hospital stay)	1 = Yes 2 = No 3 = Not sure	0 = No breast problems 1 = Breast problems	No breast problems

Administration of antibiotics postpartum	1 = Yes 2 = No 3 = Not sure	0 = No antibiotics 1 = Yes	0 = No antibiotics
Readmission to the hospital following discharge for mother's health	1 = Yes 2 = No	0 = No readmission 1 = Readmission	
Perineal wound infection (up to 3 months postpartum)	1 = Never 2 = Rarely 3 = Occasionally 4 = Often	0 = No wound infection 1 = Wound infection	No wound infection
Caesarean section wound infection (up to 3 months postpartum)	1 = Never 2 = Rarely 3 = Occasionally 4 = Often	0 = No wound infection 1 = Wound infection	No CS wound infection
Self-reported breast problems (Mastitis) up to 3 months postpartum	1 = Never 2 = Rarely 3 = Occasionally 4 = Often	0 = No breast problems 1 = Breast problems	No breast problems
Visit to local doctor or GP since birth of the baby for mother's health (up to 3 months postpartum)	1 = Never 2 = once 3 = twice 4 = three times 5 = 4 times 6 = 5-6 times 7 = 7 or more times	0 = Up to two visits 1 = ≥three visits	Up to two visits
Visits to hospital emergency department since birth of the baby for mother's health (3 months)	1 = Never 2 = once 3 = twice 4 = three times 5 = 4 times 6 = 5-6 times 7 = 7 or more times	0 = Never 1 = once 2 = twice 3 = three or more	No visit to emergency department

List of variables created for analysis

Variable	Description	Categories	Reference category
Gestational age	Gestational age was calculated by computing the difference between the expected date of birth and baby's actual date of birth and converting it into weeks.	0 = term (≥37 weeks) 1 = preterm including very preterm	Term
Mode of birth	The mode birth variable was created by computing individual variables on type of birth from hospital records	0 = SVB 1 = AVB 2 = Planned CS 4 = Unplanned CS	SVB
SVB	This variable was created by computing all SVBs into two categories	0 = SVB 1 = No SVB	SVB
AVB	This variable was created by computing all forceps, vacuum, forceps and vacuum births into two categories	0 = No AVB 1 = AVB	No AVB
Planned CS	This variable was created by computing all planned (elective) CSs into two categories; Other modes of birth (which included SVBs, AVBs and Unplanned CSs) and Planned CS.	0 = Other modes of birth 1 = Planned CS	Other modes of birth
Unplanned CS	This variable was created by computing all unplanned CSs (such as CS before or in labour, CS after attempts with forceps/vacuum, emergency CSs, CSs following failed IOL, etc) into two categories; Vaginal births (all vaginal births including SVBs and AVBs) and Unplanned CS	0 = Vaginal births 1 = Unplanned CS	Vaginal births
Clinical scenarios	Eight most common clinical scenarios were created by computing three main events such as IOL, Epidural for management of pain relief and use of IV oxytocin i. No IOL, no epidural, no oxytocin ii. No IOL, no epidural, oxytocin iii. No IOL, epidural, no oxytocin iv. No IOL, epidural, oxytocin v. IOL, no epidural, no oxytocin vi. IOL, no epidural, oxytocin vii. IOL, epidural, no oxytocin viii. IOL, epidural, oxytocin	0 = No IOL, no epidural, no oxytocin 1 = No IOL, no epidural, oxytocin 2 = No IOL, epidural, no oxytocin 3 = No IOL, epidural, oxytocin 4 = IOL, no epidural, no oxytocin 5 = IOL, no epidural, oxytocin 6 = IOL, epidural, no	No IOL, no epidural, no oxytocin

		oxytocin 7 = IOL, epidural, oxytocin	
Three case scenarios	This variable was created by computing the above eight into three distinct categories; i. No IOL, and induction with no epidural (with or without oxytocin), ii. IOL, epidural, no oxytocin, and iii. IOL, epidural, oxytocin	0 = No IOL, and induction with no epidural (with or without oxytocin) 1 = IOL, epidural, no oxytocin 2 = IOL, epidural, oxytocin	No IOL, and induction with no epidural (with or without oxytocin)
Wound infection in immediate postpartum period	The information for self-reported wound infection (perineal and CS) was obtained from women's self completed three months postpartum survey. This variable was created by computing perineal and CS wound infection variables in the immediate postpartum period, during hospital stay after birth and categorised into 'No wound infection' and 'Wound infection'.	0 = No wound infection 1 = Wound infection	No wound infection
Wound infection up to three months postpartum period	The information for self-reported wound infection (perineal and CS) was obtained from women's self completed three months postpartum survey. This variable was created by computing perineal and CS wound infection variables up to three months postpartum period, and categorised into 'No wound infection' and 'Wound infection'.	0 = No wound infection 1 = Wound infection	No wound infection

Appendix 27 Clinicians' views - Coding and categories using NVivo – Phase 2 analysis

Clinicians' views of factors influencing decision-making for CS – Codes and description using NVivo

Codes	Description
Defensive practice as a result of fear of adverse outcomes and litigation • Uncertainties associated with vaginal birth • Protect self • Protecting the women • Learned behaviour from senior colleagues	This code described clinicians' fear in relation to adverse outcomes associated with uncertainties from vaginal births and subsequent litigation. This was attributed to lack of support when things go wrong resulting in a more defensive practice for self protection as well as for protecting the women from any unexpected adverse outcomes. This also described fear as a learned behaviour from other colleagues and clinical environment. This ultimately influenced clinicians' decision-making.
Past experience and its influence • Own experience of dealing with adverse outcomes in past • Witnessed colleagues' bad experience of going through bad outcomes and legal issues	A clinician's personal experience of dealing with an adverse outcome or subsequent litigation, as well as knowing someone who had to go through a bad outcome and resulting litigation influenced his/her practice forever.
Cultural and societal influence • Social media and its influence • Maternity service being discussed in Irish media • A blaming culture	This code included descriptions about how media and a 'blaming' culture of practice in Ireland influenced clinicians' decision-making.
Clinicians' experience • Junior versus senior • Role of experience	This category includes codes relating to difference in decision-making based on obstetricians' experience.
Skills and confidence • Midwives' experience and confidence • Obstetricians' experience and confidence	Midwives' experience and confidence in supporting a woman in labour and an obstetricians' skill in managing a difficult vaginal birth in second stage of labour was described in this category.
Preference and practice pattern • Personal preference of obstetricinas and midwives • Obstetricians' practice pattern	Clinicians' own way of managing a situation based on their preference and practice pattern was described in this category.
Who makes the final decision – the consultant obstetrician or the senior registrar on call? • Obstetricians relying on the information received • On-call obstetricians interpretation of the situation when the consultant is not in the hospital	Obstetricians described the consultant's decision mostly based on the communication between the consultant and senior registrar over phone when the consultant was not present in the hospital. This category also included the discussion around importance of the presence of consultant obstetrician in the hospital round the clock.
Low threshold to intervene • Clinicians less tolerant of any deviation from normal • Clinicians' personal interpretation • Low threshold to intervene early	Some obstetricians had a low threshold to intervene early, for example in case of early signs of fetal distress, doing an FBS to check fetal oxygenation status, while others were good at managing conservatively through

	changing the women's position, close observation, and allowing the women to progress in labour, etc.
Perception of the reason to perform a CS • Maternal demographics such as age, BMI and treatment for infertility • Management of breech presentation	Increased maternal age, high BMI, treatment for infertility were some reasons perceived by most clinicians as clinical reasons to induce labour and subsequent CS, when the IOL failed.
Induction of labour • High rates of IOL in Irish maternity units • Failed IOL – major reason for CS • Flexible criteria to induce laboue	This category includes codes related to IOL being one of the major reasons for unnecessary and avoidable CSs. Most clinicians raised concerns related to the reasons for inducing labour and the existing flexibility in criteria for IOL.
Difference in practice for women in public versus private care. Obstetricians' convenience • Lack of auditing of private practice • Women with more choices in private care • Obstetric consultants' convenience – a major factor	This category included codes related to private consultants doing their own practice for women in their care, women with more choices in private care, obstetric consultants' convenience, etc.
Institutional disclosure • Hospital infrastructural facilities • Getting blended into the system and culture of practice within the organisation • Hospital policies and guidelines	This was a broad category which included limitations related to hospital guidelines and management policy with in a system perspective of clinicians' blending into the system of practice.
Women's role is crucial in decision-making process • Different views on women's role • Maternal request – not a major factor	This described the codes related to different views from clinicians' on women's role. Some viewed women's role as vital and other believed women having a limited role in the process of decision-making. Maternal request was not viewed as a major factor.

Appendix 28 Women's views - Coding and categories using NVivo - Phase 2 analysis

Women's views of factors influencing CS and their involvement in the decision-making process – Codes and description using NVivo

Categories and codes	Description
A timely decision • Baby was the priority • A planned birth was better than an emergency • Added concerns • CS was the only option	This category described codes related to concerns about baby's safety as a priority, thus, CS was viewed was a timely decision. Having a planned and controlled Cs was viewed as a better option than going through uncertainties and an emergency CS.
Desire for natural birth, but… • Not being listened to • Taken by surprise • Overwhelming • Negative experience with the decision-making process • It was very quick • Despite all the attempts for a natural birth	Although all women desired for a natural birth, this category included codes on women's negative feelings and experience with the decision for their CS.
Going with the flow • I had to stand my ground • I wasn't given a choice • It was recommended and I agreed • I was well explained, so I felt involved	This category mostly included women's views of their involvement/lack of involvement in the decision-making process. Most women described as going along with the professionals' recommendation, some described as not having a choice, and others equated 'being explained' as 'being involved' in the process of decision-making.

Appendix 29 Dissemination to-date

List of publications

1. Panda S & Begley C. (2014) 'Not in established labour': Outcomes of women cared for in an Irish antenatal ward, *British Journal of Midwifery* **22**(4), 264-268. https://pdfs.semanticscholar.org/2123/2897bace6ccf44dc46bb83b2e1f12961e4d2.pdf

2. Panda S., D'Sa J. & Rao A. (2016) Support needs of Indian women in early labour. *Journal of Women's Reproductive Health* **1** (2), 15-24. https://openaccesspub.org/article/249/jwrh-15-672.pdf
3. Panda S., Begley C. & Daly D. (2016) Readmission following caesarean section: Reasons for readmission and outcomes for women in one large Irish Maternity hospital. *British Journal of Midwifery* **24** (5), 322-328. https://www.magonlinelibrary.com/doi/abs/10.12968/bjom.2016.24.5.322
4. Curran N., Panda S. & Begley C. (2017) Living with intimate partner violence- A literature review of pregnant women's experiences. *The Practising Midwife* **20**(7), 1-4. https://www.all4maternity.com/living-intimate-partner-violence-literature-review-pregnant-womens-experiences/
5. Panda S., Begley C. & Daly D. (2018) Clinicians' views of factors influencing decision-making for caesarean section: A systematic review and metasynthesis of qualitative, quantitative and mixed methods studies. *PLOS ONE* **13**(7), e0200941. https://doi.org/10.1371/journal.pone.0200941
6. Panda S., Begley C., Daly D., Karlstrom A., Back L., Larson B. & Hildingsson I. (2018) Factors influencing decision-making for caesarean section in Sweden – a qualitative study. *BMC Pregnancy and Childbirth* **18**, 377. https://doi.org/10.1186/s12884-018-2007-7
7. McClafferty C & Panda S. (2019) The benefits of yoga during pregnancy: a literature review. *The Practising Midwife* **22**(1).

https://www.all4maternity.com/the-benefits-of-yoga-during-pregnancy-a-literature-review/

8. Sunita Panda, Manjubala Dash, Jomi John, Kalyani Rath, Anuradha Debata, Dharitri Swain, Krutideepa Mohanty, Jessica Eustace-Cook. Challenges faced by student nurses and student midwives in clinical practice: a systematic review and meta-synthesis of qualitative evidence. *PROSPERO* 2019 CRD42019119690. http://www.crd.york.ac.uk/PROSPERO/display_record.php?ID=CRD42019119690
9. Begley K., Daly D., Panda S. & Begley C. (2019) Shared decision-making in maternity care: Acknowledging and overcoming epistemic defeaters. *Journal of Evaluation of Clinical Practice,* 1– 8. https://doi.org/10.1111/jep.13243ical
10. Panda S., Begley C & Daly D. (2019) Factors influencing decision-making for caesarean section: An Irish perspective. The Practising Midwife, **22**(9), 27-28.

List of conference presentations

Oral

1. Panda S., Begley C. & Daly D. (2016) Readmission following caesarean section: Reasons for readmission and outcomes for women. Oral presentation at the 17th Healthcare Interdisciplinary Research Conference, Trinity College Dublin, Ireland, 10th November 2016.
2. Panda S., Begley C., Daly D., Karlstrom A., Back L., Larson B. & Hildingsson I. (2017) Factors influencing decision-making for caesarean section – A Swedish perspective'. Oral presentation at the International Confederation of Midwives (ICM) Triennial Congress, Toronto, 22nd June 2017.
3. Panda S., Begley C. & Daly D. (2018) Factors influencing decision-making for caesarean section - An Irish perspective. Oral presentation at COST Conference: From Birth to Health - Towards Sustainable Childbirth, Lisbon, Portugal, 17th September 2018.
4. Panda S., Begley C. & Daly D. (2019) 'Clinicians' views of strategies to reduce caesarean section'. Oral presentation at Trinity Health and

Education International Research Conference (TheConf2019), School of nursing and Midwifery, Trinity College Dublin, 7th March 2019.

5. Panda S., Begley C. & Daly D. (2019) Clinicians' views of factors influencing decision-making for CS'. Oral presentations at the 21st Congress of the Nordic Federation of Midwives, Iceland, 4th May 2019.
6. Panda S., Begley C. & Daly D. (2019) 'Women's views of factors influencing and their involvement in decision-making for CS'. Oral presentations at the 21st Congress of the Nordic Federation of Midwives, Iceland, 4th May 2019.
7. Panda S., Begley C. & Daly D. (2019) 'Involvement in decision-making to birth by caesarean section - women's perspectives'. Oral presentation at Normal Labour and Birth Conference, UK, 17th June 2019.

Poster

1. Panda S & Begley C. (2015) Not in established labour: Outcomes of women cared for in an Irish antenatal ward. Poster presentation at the 16th Healthcare Interdisciplinary Research Conference, Trinity College Dublin, Ireland, November 2015.
2. Panda S., Begley C. & Daly D. (2016) Clinicians' perspectives of factors influencing decision-making for CS: a systematic review and metasynthesis. Poster presentation at the 17th Healthcare Interdisciplinary Research Conference, Trinity College Dublin, Ireland, 9th November 2016.
3. Panda S., Begley C. & Daly D. (2017) Clinicians' views of factors influencing decision-making for CS: a systematic review and metasynthesis of quantitative, qualitative and mixed methods studies'. Poster presentation at the International Confederation of Midwives (ICM) Triennial Congress, Toronto, 19th to 22nd June 2017.
4. Panda S., Begley C. & Daly D. (2018) Clinicians' views of the factors that influence decision-making for caesarean section - a systematic review and metasynthesis of qualitative, quantitative and mixed methods studies. Poster presentation at COST Conference: From Birth to Health - Towards Sustainable Childbirth, Lisbon, Portugal, 17th-18th September 2018.

5. Panda S., Begley C. & Daly D. (2019) 'Clinicians' views of strategies to reduce caesarean sections'. Poster presentation at Normal Labour and Birth Conference, UK, 17th June 2019.
6. Panda S., Begley C. & Daly D. (2019) 'Clinicians' views of strategies to reduce caesarean sections'. Poster presentation at European Academy of Nursing Sciences (EANS) Summer School, Lisbon, 12th July 2019.