

Maternal Morbidity in Northern Nigeria:
Perceptions, Care-seeking and Measurement
within Community Settings

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Declaration

I, Judith Yargawa, confirm that the work presented in this thesis is my own. Where information has been derived from other sources, I confirm that this has been indicated in the thesis.

Signed:

Date:

Abstract

Background: Maternal mortality is often described as the ‘tip of the iceberg’ with maternal morbidity as its base. However, little is known about how women perceive, seek care or are impacted by maternal morbidities, or about the prevalence of morbidities at community levels.

Aim: To explore maternal morbidity within communities in Yola, Northern Nigeria in order to understand perceptions, care-seeking and measurement.

Methods: Focus group discussions, in-depth interviews, family interviews, cognitive interviews and a household-based survey were conducted with married women who had delivered within the past two years.

Results: In the qualitative studies, perceived morbidity status was the most dominant factor used to label a pregnancy as normal or difficult. Perceptions of morbidities were varied. While women acknowledged the severity of life-threatening conditions such as excessive bleeding, they also reported the impacts of less severe ones such as backache and vomiting. Morbidities were managed at home and/or through the formal system. The key drivers of care-seeking were mainly individual-level factors, with perceptions of severity and familiarity prominent. Women’s lay networks also influenced care-seeking positively or negatively. In the survey, high levels of health problems were reported. Spontaneous reporting of any health problem was 69.5%, 30.6% and 24.3% during pregnancy, delivery and postpartum respectively although few women reported that the health problems had been severe; on prompting, prevalence increased even more. The qualitative methods helped identify issues that could have affected the survey’s validity; however, reporting issues were also found.

Conclusion: Maternal morbidity is a significant issue in the setting. Health problems that are important to women may not necessarily be the ones prioritised by public health. Exploring maternal morbidity in communities provides valuable insights that could have been missed in facility studies, but also has challenges. Measurement efforts would greatly benefit from using qualitative methods.

Impact Statement

As maternal mortality declines globally, attention is now shifting towards the burden of maternal morbidity in low income settings. Beyond surviving pregnancy and childbirth, many women and their families suffer negative consequences from ill-health; however these are under-researched or mainly limited to severe outcomes. My PhD study highlights the impacts of maternal morbidities in Northern Nigeria, a region bearing a high burden of maternal health issues. My focus on conditions occurring across the severity spectrum (mild, moderate and severe from a biomedical perspective) helps to show that even less severe (non-life threatening) conditions are capable of inhibiting and disrupting the lives of women and their families. Traditionally, these less severe conditions have not been prioritised by public health due to the enormity of more pressing issues in the region. My PhD findings will thus contribute towards directing attention to these neglected issues so that women's health and quality of life can be improved.

The PhD findings also have implications for clinical practice. These include: highlighting specific areas that should be targeted in health promotion messages with respect to women's perceptions and care-seeking for morbidities; emphasising the need to sensitise health professionals about anthropological perspectives relating to morbidities to encourage less medicalised viewpoints and promote patient-centred care; and indicating how low educational level could potentially contribute to inequities. The latter point is particularly important because only 8.8% of women in my study sites have post-secondary education and more than half are not literate in any language.

This is also the first study, to my best knowledge, to measure self-reported maternal morbidity from the community in Nigeria. While previous studies have measured morbidities in the country, these were facility-based and therefore may not be representative. In Adamawa state where the study setting is located, for example, only 36.3% of births are delivered by a skilled provider. My population-level study thereby attempts to capture health problems that do not make it to the facility.

In academia, the PhD findings will complement global research efforts aimed at improving the measurement of maternal morbidities. One of its specific contributions comes from using a bottom-up approach to measurement: the usage of qualitative methods to inform the survey instrument. This involved discussing with women, understanding how they conceptualise morbidities, unpicking indicators that best capture their experiences and refining the instrument based on what works.

These ensured that the instrument used was context-specific, but at the same time, generic enough so that future studies could adapt it.

I have already disseminated part of my PhD work¹ and plan to submit manuscripts for publication in 4-5 peer-reviewed journals, as well as deliver oral presentations in relevant fora in the coming months. I have also shared practical fieldwork experiences from the PhD in tutorial and lecture sessions across three MSc research methods modules in my department. This served as a channel towards preparing the next generation to undertake research, which aligns with UCL's 2034 strategy of integrating research into education.

¹ Yargawa, J., Fottrell, E., Hill, Z. (2018). Care-seeking for maternal morbidity in Northern Nigeria: A qualitative study. *BJOG: An International Journal of Obstetrics and Gynaecology*, 125 (S1), pp. 145 (poster presented at the RCOG World Congress, Singapore, 22nd- 24th March, 2018)

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List of Abbreviations

ANC	Antenatal care
CI	Confidence interval
DHS	Demographic and Health Surveys
FAS	Facial affective scale
FGD(s)	Focus group discussion(s)
IDI(s)	In-depth interview(s)
IQR	Interquartile range
LGAs	Local Government Areas
MAR	Missing at random
MCAR	Missing completely at random
MDGs	Millennium Development Goals
MICS	Multiple Indicator Cluster Survey
MMM	Maternal Morbidity Matrix
MMWG	Maternal Morbidity Working Group
MNAR	Missing not at random
OR	Odds ratio
PID	Pregnancy-induced diabetes
PIH	Pregnancy-induced hypertension
PNC	Postnatal care
PPH	Postpartum haemorrhage
PPS	Probability proportional to size
s.d.	Standard deviation
SDGs	Sustainable Development Goals
SOPs	Standard Operating Procedures
TBA(s)	Traditional Birth Attendant(s)
UNICEF	United Nations Children's Fund
WHO	World Health Organisation

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Thesis Outline

This thesis reports the research that I undertook towards my Doctor of Philosophy degree at the UCL Institute for Global Health. The PhD was a two-part study consisting of a qualitative phase (to explore perceptions and care-seeking for reported maternal morbidity) and then a quantitative phase (to measure self-reported maternal morbidity). Chapter 1 provides background information relating to my research topic, the rationale for conducting the research and the aim and objectives of the PhD study. Chapter 2 presents the scoping review conducted to assess and synthesise the evidence on maternal morbidity within community settings in Sub-Saharan Africa. Chapter 3 provides a description of the study area and general procedures relating to the research (eligibility criteria of respondents, ethical approval and procedures for obtaining informed consent).

The next five chapters report the methodologies utilised and results obtained from the PhD: Chapters 4-6 cover the qualitative phase (the focus group discussions, interviews and family interviews), with each chapter reporting specific aspects of the qualitative phase. Chapter 4 describes the qualitative methodology and the results on perceptions of morbidities. A detailed exploration of morbidities was not possible within the timeframe of my PhD therefore I selected three morbidities *a priori* (vomiting, prolonged labour and haemorrhage during delivery and within the first 24 hours after delivery) for more detailed exploration; these are reported in Chapter 5. Chapter 6 focuses on care-seeking for reported morbidities. A preliminary validation study (cognitive interviews) was also conducted to investigate appropriate ways to measure self-reported maternal morbidity in community settings; this is reported in Chapter 7. Chapter 8 covers the quantitative phase (household-based survey).

Chapter 9 discusses the results from the PhD research, relates them to existing literature and reports the strengths and weaknesses of the research. It also provides implications for future research and for policy and practice. Lastly, Chapter 10 provides the conclusion of the PhD research.

Chapter 1: Introduction

1.1 Maternal Health in Developing Countries

Every day, about 830 women die from preventable pregnancy and childbirth-related causes worldwide, with 99% of these deaths occurring in developing countries [1]. In 2015 alone, approximately 303,000 women died during pregnancy and delivery [2]. The major direct causes of these deaths include haemorrhage, sepsis, hypertensive disorders, abortion, delivery complications, embolism as well as indirect causes such as HIV/AIDS and malaria [1, 3]. Maternal deaths also result from or are exacerbated by non-clinical and social determinants of health such as poverty, poor access to health services, harmful cultural/social practices, and lack of information on useful interventions [1].

In 2000, world leaders pledged to improve the well-being and lives of billions across the world by adopting the Millennium Development Goals (MDGs). Maternal health, the health of women during pregnancy, delivery and the postnatal period [4], was one of the eight priority areas included in the MDGs and is now one of the sub-targets of the Sustainable Development Goals (SDGs). Former United Nations Secretary General Ban Ki-moon also launched the Global Strategy for Women's, Children's and Adolescents' Health (2016-2030) with the three objectives of *Survive* (end preventable deaths), *Thrive* (ensure health and wellbeing) and *Transform* (expand enabling environments) [5].

So far, the global maternal mortality ratio (MMR) has been reduced by about 44% between 1990 and 2015, hence some progress has been achieved [6]. It is important to note, however, that the 44% does not apply universally as there are regional and country differences, as seen in the Global Burden of Disease studies on maternal mortality [2, 7]. In addition, the reduction estimates are sometimes modelled and based on assumptions such as equating increased skilled birth attendance to lower maternal mortality ratio; therefore the 'accurate' burden of maternal mortality is not known. The decrease fell below the 75% target reduction aimed by the MDG

commitment. Maternal mortality thus remains a huge challenge such that Dr. Richard Horton, *Lancet's* Editor-in-Chief, remarks that “the great conundrum of global health is the apparent resistance of maternal mortality to over two decades of vigorous campaigning and commitment by the safe-motherhood movement” [8].

Additional maternal health indicators besides mortality data also show the need for continued progress beyond the MDG era. Only half of pregnant women in developing regions receive the minimum antenatal care (ANC) recommendation of four visits during pregnancy, with coverage lowest in Sub-Saharan Africa (49%) and Southern Asia (39%) (2014 statistics) [9]. In addition, only 52% of births in Southern Asia and Sub-Saharan Africa are assisted by skilled health personnel (2014 data) [9]. While some progress has been made in contraceptive usage among women aged 15-49 years globally, with usage doubling from 13% to 28% between 1990 and 2015 in Sub-Saharan Africa for instance, there is still an unmet need for family planning in several developing regions with proportions ranging from 11%- 25% (2015 data) [9]. Global early childbearing amongst girls aged 15-19 years has also reduced slowly from 59 to 51 births per 1,000 girls between 1990 and 2015, with Sub-Saharan Africa having the highest rates at 116 births per 1,000 girls [9].

1.2 Maternal Health in Nigeria and Northern Nigeria

Nigeria has made some progress in maternal health over the last few decades. The maternal mortality ratio in the country declined from 1,350 per 100,000 live births in 1990 to 814 per 100,000 live births in 2015 [6]. There has also been increasing political commitment to maternal health in recent years. For example, in 2009, the Midwives Service Scheme was established to address the shortages of skilled birth attendants in rural and underserved areas. The midwives, consisting of retired, unemployed or newly graduated midwives, are posted to primary health care centres in target areas. On a broad level, the Scheme has shown an overall improvement in maternal health indicators compared to baseline data [10]. In addition, the federal government initiated a free maternal healthcare programme in 2012, although it does not appear to have been implemented widely across the country [11].

In spite of this progress, however, Nigeria is lagging behind in numerous maternal health indices. The country is the world's highest contributor of maternal mortality, accounting for 19% of global maternal death² [6]. Life-saving maternal interventions are largely non-existent in certain areas, unequally distributed or inaccessible to many women. For instance, the Demographic and Health Survey conducted in 2013 shows that only 38% of births are assisted by skilled birth attendants and although 85% of women in the country report knowing about a contraceptive method, only 15% of currently married women use contraception [12]. Official maternal morbidity statistics are not readily available for the country; however, one comprehensive survey across forty-two public tertiary hospitals found a maternal near-miss ratio of 15.8 per 1,000 live births (1.6%) [13]. Many of these were from preventable causes: obstetric haemorrhage (accounting for 49.0% of cases); hypertensive disorders (20.5%); abortive outcome (18.2%); non-obstetric complications, that is, indirect conditions such as anaemia and malaria (6.5%); dystocia (3.1%); pregnancy-related infection (2.5%); and other direct obstetric complications (0.1%) [13].

Although maternal health issues abound in all parts of Nigeria, Northern Nigeria is disproportionately disadvantaged compared to its southern counterpart in many aspects. Northern Nigerian women have poorer access to and utilisation of maternal health services. The proportion of women receiving ANC from a skilled provider is 41.0%, 49.3% and 67.0% in the the North-west, North-east and North-central zones compared to 73.0%, 90.4% and 90.6% in the South-south, South-west and South-east zones respectively [12]. Skilled birth attendance (SBA) is 5.4% in the northern state with the least SBA utilisation, and under 20% in most North-western and North-eastern states, compared to 96.5% in the southern state with the highest [12]. While 81.0%, 82.0% and 84.2% of women in the three Southern Nigeria geopolitical zones are literate (South-south, South-west and South-east respectively), only 25.8%, 28.3% and 54.3% of women in the three Northern Nigeria zones are literate (North-west, North-east and North-central respectively) [12]. Median age at first marriage for women is also lower in Northern compared to Southern Nigeria, for example, 15.3 years in the North-west and 22.7 years in the South-east [12]. In addition, total

² The country's big population size of 185 million partly explains this poor statistic.

fertility rates are higher in the North: 6.7, 6.3 and 5.3 in the North-west, North-east and North-central compared to 4.7, 4.6 and 4.3 in the South-east, South-west and South-south respectively [12].

1.3 Maternal Morbidity: An Overview

The Safe Motherhood Initiative of 1987 was instrumental in highlighting the burden of maternal mortality in developing countries as well as in putting the issue on the global agenda. Prevention of maternal mortality thus became a major subject and policy item for many national governments, international organisations, donor agencies, civil society organisations and research institutions. Over time, maternal mortality statistics primarily became the indicators for tracking progress in maternal health programmes.

Maternal mortality data, however, do not present a complete picture [14]. In recent years, experts and scholars have challenged this focus on maternal mortality and have highlighted a somewhat neglected area - maternal morbidity [15-17]. Experts describe maternal deaths as only ‘the tip of the iceberg’ and maternal morbidity as the base of the iceberg [18]. It has been reported that for every maternal death, approximately 20 women suffer infection, disease or injury [19] such that the UK All Party Parliamentary Group on Population, Development and Reproductive Health posed a rhetorical question asking whether women suffering from maternal morbidities in developing countries were “better off dead?” [16].

Prioritising maternal morbidity in research and policy has many important implications for Safe Motherhood Initiatives, which include: improving the health of women and their families; reducing maternal mortality [15, 20]; designing appropriate health promotion campaigns for target groups; estimating the number of women more likely to require necessary obstetric care so that informed decisions can be made [21]; serving as an indicator for the quality and coverage of obstetric care [22-25]; and serving as a proxy measure, since maternal morbidity occurs more frequently than maternal mortality, a ‘rare’ event [15, 26]. Prioritising maternal morbidity thus appears to be a worthwhile investment for improving maternal health.

1.4 Identified Gaps in Maternal Morbidity Knowledge and Justification of Current Research

In 2013, more than 800 maternal health experts convened in Tanzania for a conference. Drawing upon experiences from the Safe Motherhood Movement and the MDGs, they wrote a 12-point manifesto for maternal health post-2015 [27]. The third point on this manifesto prioritised maternal morbidity stating that “as maternal mortality declines, the world must now focus on both prevention and treatment of maternal morbidities...” [27]. This prioritisation does not only apply to the policy and practice aspect of maternal morbidity but also to its research. Overall, studies on maternal mortality outweigh those on maternal morbidity. For example, a keyword MEDLINE search on “maternal morbidity” and variants of Sub-Saharan Africa yields only 374 papers while a similar search on “maternal mortality” yields 2,397 papers, six times the number of the former (search as of 11 July 2018). There is, thus, a need to improve the evidence base on maternal morbidity.

Specific gaps exist within the maternal morbidity domain which need to be filled. Firstly, little is known, to date, about how communities perceive maternal morbidities, about care seeking, or about the impacts of morbidities. Perceptions of problems and beliefs about maternal morbidity and health are very important determinants of care-seeking and pregnancy outcomes [28-30]. There is a need to not only consider clinical causes of morbidities, but to also understand the social and behavioural factors underpinning them [31]. Biomedicine tends to uphold a disease model whereby diseases, as Winkelman (2009) asserts, are seen as “a biological problem” [32] or, as Bowling (2005) further explains, a “pathological abnormality ... indicated by signs and symptoms” [33]. This differs from the anthropological concept of ill-health which “refers to a patient’s experience of something wrong, a sense of disruption in well-being that may be the result of disease or caused by cultural beliefs” [32]. Looking at things from an anthropological perspective enables us to understand people’s experiences of health problems, as “illness- the personal experience of a problem in wellbeing- involves much more than disease” [32]. Perceptions of morbidities can also vary with cultures and individuals [34]. What is normal to some may be abnormal to others and vice versa; some morbidities may be

recognised as an illness while others may not be acknowledged [35]. This understanding of perceptions, particularly at the community level where people reside, is important for improving maternal health.

There is also a gap with respect to study populations and outcomes considered in maternal morbidity research. Many studies on maternal morbidity in developing countries have been conducted within facility settings and these may not be representative of the general population. Many of these studies have also focused on maternal near-miss, which are just on one end of the maternal morbidity severity spectrum [15, 22, 36-41]. While facility deliveries have improved in many developing countries over the years, non-institutional deliveries are still commonly practiced in many communities [14, 42, 43]. Studies conducted within communities are generally thought to be more representative of women in low income countries than facility-based ones. In addition, facility-based studies tend to focus only on acute complications, which potentially limits their usefulness [14, 44]. Community studies were generally conducted in the 1980s and 1990s and they largely focused on gynaecological/ reproductive morbidities such as irregular periods, dysmennorrhoea, vaginal discharge and STIs as opposed to maternal morbidities [31, 45-47]; hence there is a need for newer studies to focus on the latter. In the 2000s, sporadic community studies have been conducted on prevalence based on initial literature assessment.

Furthermore, little is known about the prevalence of maternal morbidities, partly due to concerns about the validity of self-reports [48, 49]. Community studies tend to be cross-sectional; hence they generally have validity issues such as recall bias, reporting bias, and also sensitivity and specificity issues related to self-reported events. Two large global research efforts- the Maternal Morbidity Working Group (MMWG) and the Alliance for Maternal and Newborn Health Improvement (AMANHI) are working to address some of these issues relating to maternal morbidity measurement. The MMWG is a technical working group of maternal health experts and practitioners from low, middle and high income countries initiated by the World Health Organisation (WHO) and other sister United Nations (UN) organisations [50]. The Group developed a tool for measuring maternal morbidity at

the facility level using a combination of physical examination, self-reports and facility records review [51, 52], which has been piloted in three countries [52]. While this is important moving forwards, it does not address the representation issues inherent in facility studies and it will also not capture maternal morbidity cases that do not make it to the hospital. The AMANHI study is an ongoing large population-based cohort study on the burden of maternal morbidity across eight countries in South Asia and Sub-Saharan Africa, which was also initiated by WHO and includes both self reports and clinical measures [53]. While this study will help fill important gaps, its focus on severe maternal morbidities potentially limits its reach. In addition, the tool being used for measurement appears to have been designed based on consensus from researchers, and not based on an understanding of the lived experiences of women and their families [53].

In view of the aforementioned points, it is paramount to conduct research studies which: seek to address the important yet neglected maternal morbidity domain of Safe Motherhood; contribute to the global research agenda; focus on investigating maternal morbidity at the community level; seek to understand morbidities from women's perspectives; and work towards improving validity of survey tools. It is perhaps more helpful to carry out morbidity studies in areas with high burdens of maternal health issues such as Nigeria. A scoping exercise conducted showed that few maternal morbidity studies have been conducted in Nigeria and these studies were generally facility-based. There is minimal knowledge about the prevalence of maternal morbidities in Nigeria. The country partly relies on estimates from statistical modelling conducted by international organisations, as population-based data on maternal outcomes are not readily available [13]. The 'real' burden of maternal morbidity is, hence, not known. This dearth in measurement jeopardises informed decision-making and effective channelling of resources to improve maternal outcomes. Maternal morbidity studies are thus warranted in the country. It is paramount, however, to focus on Northern Nigeria since it is significantly disadvantaged compared to its southern counterpart.

1.5 Aim and Objectives

Aim

To explore maternal morbidity within communities in Yola, Adamawa State, Northern Nigeria in order to understand perceptions, care-seeking and measurement

Objectives

1. To find out perceptions and care-seeking for maternal morbidity

Sub-objectives:

- a. To find out respondents' perceptions of maternal morbidity relating to normal vs. abnormal conditions, causes of morbidities and impacts of morbidities
- b. To identify morbidities that are important to women and families
- c. To identify care-seeking behaviours with respect to reported morbidities
- d. To find out lay networks that women consult and how they influence care-seeking

2. To investigate appropriate ways to measure self-reported maternal morbidity in community settings

Sub-objectives:

- a. To adapt existing surveys into a draft questionnaire for use in the community
- b. To use cognitive interviews to improve the validity of survey questions

3. To measure self-reported maternal morbidities

Sub-objectives:

- a. To estimate the prevalence of self-reported morbidities
- b. To measure the severity and consequences of the self-reported morbidities
- c. To obtain more detailed quantitative measures on three selected morbidities (vomiting, prolonged labour, and haemorrhage during and after delivery)

1.6 Overview of Methods Used to Address Research Objectives

Table 1.1 shows an overview of the methods used to address the research objectives. This PhD was a two-phased study. In the first phase- the qualitative phase- focus group discussions (FGDs), in-depth interviews (IDIs) and family interviews were conducted to answer Research Objective 1. This was then followed by an intermediary study (cognitive interviews) which used qualitative methods to answer Research Objective 2. In the second phase- the quantitative phase- a survey was carried out to answer Research Objective 3. The methodology for the qualitative phase is described in Chapter 4, that of the cognitive interviews in Chapter 7 and the methodology for the survey in Chapter 8.

Table 1.1: Research objectives and the methods used to address them

Objective	Sub-objective	Method(s)
1. To find out perceptions and care-seeking for maternal morbidity	a. To find out respondents' perceptions of maternal morbidity relating to normal vs. abnormal conditions, causes of morbidities and impacts of morbidities	FGDs
	b. To identify morbidities that are important to women and families	IDIs
	c. To identify care-seeking behaviours with respect to reported morbidities	Family interviews
	d. To find out lay networks that women consult and how they influence care-seeking	
2. To investigate appropriate ways to measure self-reported maternal morbidity in community settings	a. To adapt existing surveys into a draft questionnaire for use in the community	Cognitive interviews
	b. To use cognitive interviews to improve the validity of survey questions	
3. To measure self-reported maternal morbidities	a. To estimate the prevalence of self-reported morbidities	Survey
	b. To measure the severity and consequences of the self-reported morbidities	
	c. To obtain more detailed quantitative measures on three selected morbidities (vomiting, prolonged labour, and haemorrhage during and after delivery)	

1.7 Definition of Terms

In conceptualising health, several terms are often used such as disease, self-reported morbidity, quality of life, functioning, wellbeing and so on. Researchers/professionals have used some of these terms interchangeably or defined them in diverse ways. Below I clarify the terms relevant to my study:

Maternal morbidity: In 1990, a WHO Technical Working Group provided a definition for reproductive morbidity and divided it into three categories - obstetric morbidity, gynaecologic morbidity and contraceptive morbidity [54]. Over the years, however, the term “maternal morbidity” has been defined in numerous ways in literature and practice, making comparison and measurement across settings problematic. In 2016, the MMWG identified and standardised the definition of maternal morbidity: *“any health condition attributed to and/or complicating pregnancy and childbirth that has a negative impact on the woman’s well-being and/or functioning”* [51]. Unlike previous definitions, this definition went beyond the conditions themselves (such as haemorrhage, postpartum depression and incontinence) and included their consequences. The MMWG has also developed a tool for measuring maternal morbidity (more information in Section 2.7.3.2).

Self-reported maternal morbidity: Self-reported maternal morbidities are morbidities that women report to have experienced. They may be self-perceived (through the woman’s own experience of illness, its impacts or social influence rather than merely due to biological changes [55]) or could be reports of diagnosed conditions. Self-reported maternal morbidities are often measured using questionnaire-based interviews, as seen in Bhatia and Cleland 1996 [46], Fortney and Smith, 1996 [18] and Fikree et al., 2004 [28].

Near miss morbidity: A maternal near miss is defined as “a woman who nearly died but survived a complication that occurred during pregnancy, childbirth or within 42 days of termination of pregnancy” [23]. Hence near-miss morbidities, or near-miss

events, are “complications that immediately threaten the woman’s survival but do not lead to her death” [22]. A WHO working group has established three criteria for identifying near-misses [23] and has also developed a tool for measuring it [25] (more information in Section 2.7.3.2).

Direct causes of maternal morbidity: This is sometimes known as direct obstetric morbidity and it “results from obstetric complications of the pregnant states (pregnancy, labour and the puerperium), from interventions, omissions, incorrect treatment, or from a chain of events resulting from any of the above” [54]. Examples of direct causes of maternal morbidity include eclampsia, postpartum haemorrhage, vesico-vaginal fistula and sepsis. They are usually diagnosed by trained health personnel and could be measured using a range of tools, for example, retrieval of data from medical records into pre-specified forms.

Indirect causes of maternal morbidity: These are “conditions resulting from pre-existing or newly developed disease during pregnancy, and not caused by direct obstetric conditions” [56]; examples of these include HIV/AIDS, pre-existing hypertension, tuberculosis, pre-existing diabetes mellitus and malaria [51]. They could be measured in similar ways to direct causes of maternal morbidity (for instance, from medical records). Field tests could also be conducted and data recorded.

Comorbidity: This is “the presence of more than one distinct condition in an individual” [57], for example, an infectious disease with a non-communicable disease. Multiple morbidities are becoming quite common in low and middle income countries due to socioeconomic, demographic and environmental changes, although the burden and impacts are not well-known [58]. Comorbidities are often measured using indices, such as the Charlson Comorbidity Index [59] and the Maternal Comorbidity Index [60].

Disease: This relates to the clinical/ aetiological aspects and covers diseases, injuries and disorders. WHO International Classification of Diseases 10 (ICD-10) captures diseases and provides a standardised way of coding, classifying and recording diseases so that results can be compared across countries [61]. Estimates of levels of disease are often reported to capture the burden using measures such as prevalence and incidence.

Functioning: This is reflected in the WHO International Classification of Functioning, Disability and Health (ICF), which encompasses both functioning and disability. According to the ICF, functioning “refers to all body functions, activities and participation” and disability is an “umbrella term for impairments, activity limitations and participation restrictions” [62]. The ICF further describes it thus: “functioning and disability are results of the interaction between the health conditions of the person and their environment” [63]. Functioning can be measured in three main ways: by conducting direct physical tests (for example, time taken to walk a distance, grip strength); by observing behaviour directly; and by interviewing the individual concerned or another party (self-reports)- the latter method is mostly used [33]. Through the ICD and ICF, measurement and classification of health and disease can be standardised across various regions of the globe. The WHO Disability Assessment Schedule 2.0 (WHODAS 2.0) serves as the WHO’s practical measurement tool for functionality and disability and measures six domains (cognition, mobility, self-care, getting along, life activities and participation) using a 12-item or 36-item tool [64, 65]. A recent validation exercise of the 12-item version against the 36-item tool for maternal morbidity found agreement between the two and that the 12-item tool is a good alternative to the 36-item one [66, 67].

Quality of life: This deals with the “goodness of life” and can be considered in both macro terms (covering aspects such as employment, education, income, housing, etc) and micro terms (covering people’s experiences and their perceptions about their general quality of life) [33]. The WHO Quality of Life tools (WHOQOL-100 and WHOQOL-BREF) are popular instruments for measuring quality of life [68-70].

Broader health status: This deals with people's subjective perceptions about their health [33]. The Short Form 36 and 12 are widely used instruments for measuring broader or generic health status [71, 72].

Care-seeking: Researchers sometimes use the terms “health-seeking” and “care-seeking” interchangeably while others distinguish between the two terms. The current research will use the term “care-seeking,” since it focuses on people's perceived recognition of a health problem and the subsequent actions that follow in seeking a remedy, as opposed to “health-seeking” which broadly focuses on actions taken to ensure/maintain general health and well-being. Health-seeking appears to be embedded within a scholarly domain known as health behaviour, which broadly covers well-known theories such as the Health Belief Model [73] and Transtheoretical Model [74]. Care-seeking, on the other hand, resonates with Mechanic's (1962) concept of illness behaviour: “the ways in which given symptoms may be differentially perceived, evaluated and acted upon (or not acted upon) by different kinds of people” [75]. Care-seeking is often explored using qualitative studies and measured using questionnaires. While referring to different kinds of care-seeking treatments/regimens in the thesis, I have sometimes used the term ‘conventional’ to mean formal biomedical treatments and ‘unconventional’ to mean non-biomedical treatments. I acknowledge that these may not have been the most appropriate terms to use and I am solely using these terms for practical purposes only; I do not intend to suggest the ‘worth’ or ‘typicality’ of treatments.

Chapter 2: Scoping Review

2.1 Aim and Objectives of the Scoping Review

I conducted the scoping review to assess and synthesise the evidence on maternal morbidity within community settings in Sub-Saharan Africa. Maternal morbidity is an extremely broad topic and it would have been unfeasible to conduct an exhaustive literature review within the timeframe of my PhD; therefore I have carried out a scoping review to provide an overview of this broad topic. Its specific objectives included: i) to find out perceptions of maternal morbidity relating to causes, normal vs. abnormal conditions and impacts; ii) to investigate care-seeking for reported maternal morbidity; iii) to determine how lay networks influence care-seeking; iv) to identify issues (conceptual or practical problems) relating to measuring maternal morbidity; v) to find out the levels (prevalence or incidence) of maternal morbidity. These five objectives fall under three broad groups which I have referred to as ‘domains’ throughout the scoping review: perceptions domain (objective i); care-seeking domain (objectives ii and iii); and measurement domain (objectives iv and v). The scoping review objectives have been answered using narrative syntheses in headed sections in subsequent results sections in this chapter; data have also been summarised in flowcharts and tables occasionally.

2.2 Inclusion and Exclusion Criteria

The inclusion and exclusion criteria for the scoping review have been provided below³:

2.2.1 Inclusion Criteria

- Studies focused on the topics reflected in the scoping review objectives (perceptions of maternal morbidity relating to causes, normal vs. abnormal conditions and impacts; care-seeking for reported maternal morbidities; lay networks and care-seeking; issues related to measuring maternal morbidity; and levels of maternal morbidity)
- Conducted in Sub-Saharan Africa

³ I have merged the inclusion and exclusion criteria into one central section in this thesis, but they were separated according to their respective domains while I carried out the review.

- Study respondents should have been recruited from community settings
- Data from primary research
- Qualitative data (for the perceptions and care-seeking domains)
- Quantitative data (for the measurement domain)

2.2.2 Exclusion Criteria

- Studies that reported perceptions of maternal services, care or other related topics (for the perceptions domain)
- Studies on determinants of or barriers to utilisation of maternal health services (for the care-seeking domain)
- Studies on reproductive or gynaecologic morbidities
- Studies on comorbidities, pre-existing conditions or indirect causes of maternal ill-health (e.g. asthma, diabetes, tuberculosis, HIV/AIDS)
- Study respondents recruited from health facility settings
- Studies that reported only quantitative data (for the perceptions and care-seeking domains)

2.3 Literature Sources Searched

Seven ‘conventional’ databases and three grey literature sources in total were systematically searched for journal papers, reports, conference proceedings and theses (listed below). All databases were searched from inception up to June 2015 at the initial stages of my PhD, and then re-searched from 2015 to June 2018 at the later stages of my PhD.

A. ‘Conventional’ databases

- MEDLINE
- EMBASE
- PsycINFO
- CINAHL Plus
- SCOPUS
- Web of Science Core Collections
- CENTRAL (for the measurement domain only)

B. Grey literature

- OpenGrey⁴
- Electronic Theses Online Service, EThOS
- WHO African Index Medicus

Additional literature sources and seminal research work which did not meet the inclusion criteria of the scoping review but which provided valuable contextual information on issues relating to measuring maternal morbidity from community settings were included in the measurement domain. These contextual sources- 34 in total⁵- were generally obtained through random searches, journals, books from relevant sections of the UCL Institute for Child Health Library, referral from my supervisors/colleagues and also via contacts with maternal morbidity experts. The content of these contextual sources, which have mainly been reported in Section 2.7.3.2, include: the conceptual, categorization and standardization issues related with measuring maternal morbidity; global efforts on maternal morbidity measurement (for example, the work of the MMWG and the WHO near-miss tool); and alternative measurement methods to self-reports. While they are cited in Section 2.7.3.2, I did not include them in the flow-chart of the search results for the measurement domain (Figure 2.3) since they were retrieved from multiple sources.

2.4 The Search Process

Three different searches were conducted in each conventional database based on the three domains of the review (perceptions, care-seeking and measurement). Searches were carried out using variants of maternal morbidity in combination with variants for each domain, that is, “maternal morbidity” and “perceptions,” “maternal morbidity” and “care-seeking,” “maternal morbidity” and “measurement.” The search terms for “maternal morbidity” included synonyms of the phrase (e.g. maternal complication, maternal disease, maternal disorder), phase-specific terms (e.g. pregnancy complication, delivery complication, postpartum disorder), the three morbidities selected for detailed exploration (e.g. vomiting, prolonged labour, intrapartum haemorrhage) and other general maternal morbidity terms (e.g. obstetric

⁴ Only searched until 2015 as no paper appears to have been indexed in the database since 2015.

⁵ Six papers retrieved from the measurement domain on levels of maternal morbidity also contributed, but they are not included in this total.

near-miss). Examples of search terms for the three domains include: synonyms of perceptions (belief, perspective, view, practice, experience, tradition, attitude); key terms for care-seeking (e.g. health-seeking, illness behaviour, health utilisation, lay network, lay referral system); and key terms for measurement (e.g. prevalence, incidence, cross-sectional, community survey, self-report, severity measure, pain quantification, risk factor, indicator). The search terms run in EMBASE have been included in Appendix 2.1 as an example. For the grey literature sources, broad search terms such as “maternal health” and “maternal morbidity” were used since these databases are not as robust as the conventional ones. Searches were conducted using both free texts and medical subject headings (MESHs) in all three domains. To ascertain comprehensiveness, the MESHs were exploded. The search terms were piloted several times to maximize both sensitivity and precision before being run. Restrictions were not imposed with respect to language or time.

2.5 Screening and Analytical Approach

Using the inclusion and exclusion criteria, I screened the papers first by titles, then abstracts and then by full-text. A rigorous quality assessment protocol was not followed since the review was not a systematic review; however only peer-reviewed articles, reputable books and policy documents were included in the review. The retrieved literature sources were read and attention was paid to areas including the populations studied, outcomes considered, methods used, similarities and heterogeneity in studies, gaps in the evidence and findings relating to the five scoping review questions. To extract and synthesise the evidence, I used highlighted PDF documents and annotated bibliographies in Microsoft Word, and then mainly used annotated printed articles for the update in 2018.

2.6 Results of the Search Hits

Figures 2.1- 2.3 show the literature search results for all three domains. 19, 25 and 20 papers were finally included in the review for the perceptions, care-seeking and

measurement domains respectively⁶. The full-texts of two papers from the perceptions domain (published in the 1990s) [76, 77] and four papers from the measurement domain (two published in the 1990s and two in 2013) were not available [78-81]. However I was able to retrieve relevant information from the abstract of one of the perceptions paper [77]. Retrieved papers were managed using Endnote X7.1 and X8 [82].

⁶ As seen in Figures 2.1 and 2.2, a few studies focused on both perceptions of and care-seeking for maternal morbidity. As previously stated, the final result for the measurement domain does not include the literature sources relating to measurement issues.

Figure 2.1: Flow-chart of Literature Search Results for the Perceptions Domain

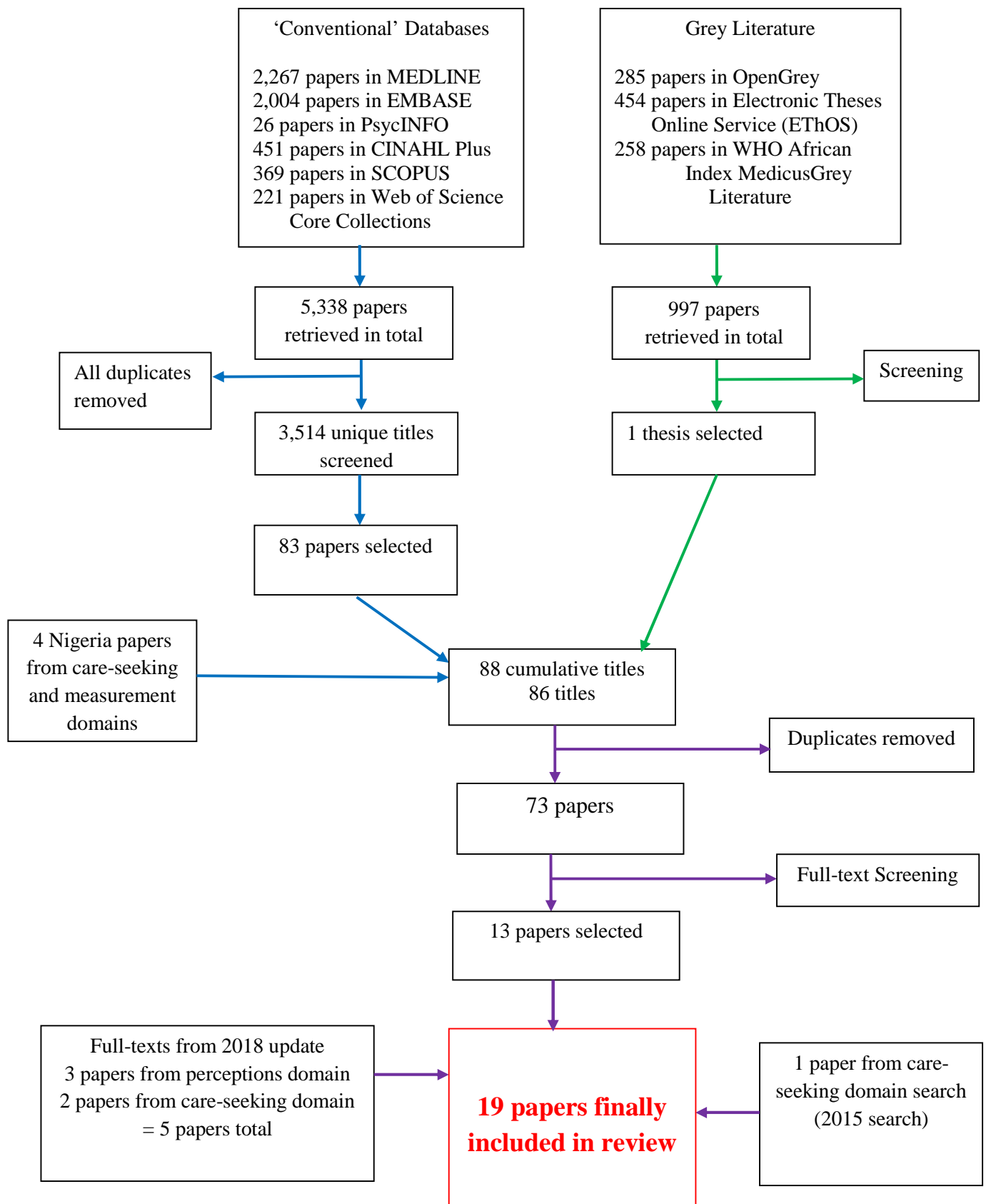


Figure 2.2: Flow-chart of Literature Search Results for the Care-seeking Domain

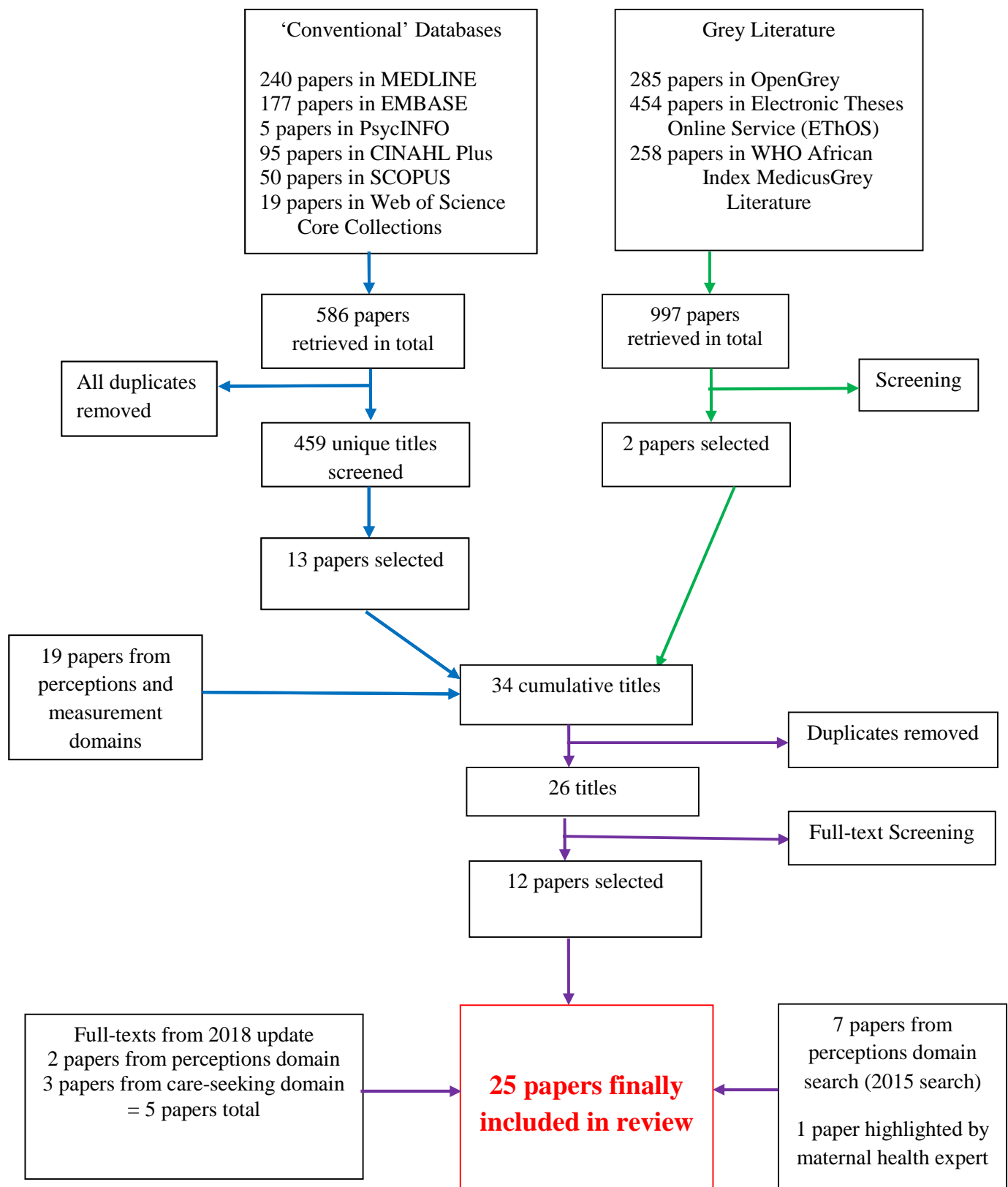
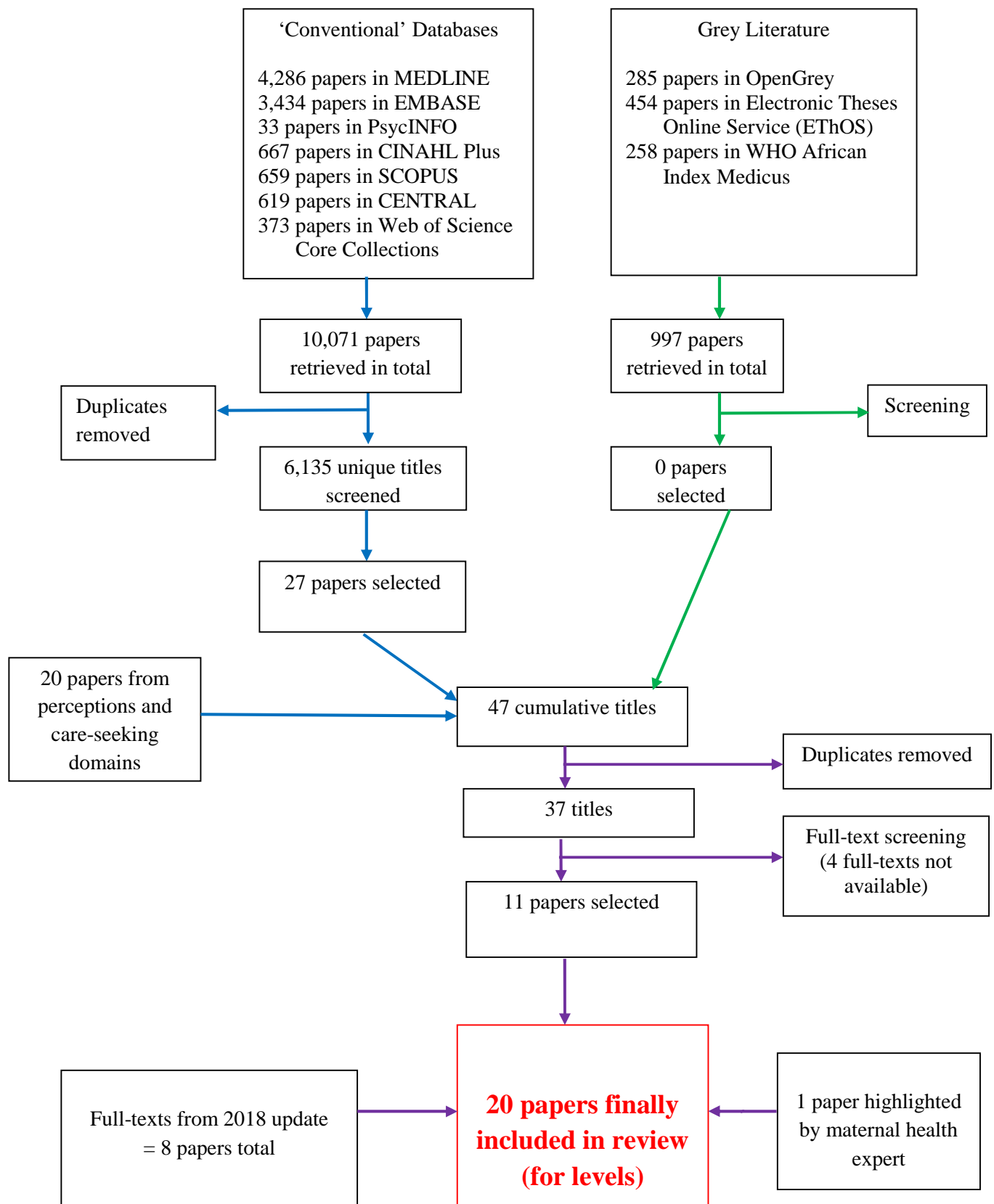


Figure 2.3: Flow-chart of Literature Search Results for the Measurement Domain



2.7 Assessment and Synthesis of the Evidence

2.7.1 Perceptions Domain

2.7.1.1 Assessment of the evidence

The distribution of the population and outcomes considered in the 19 included papers on perceptions show certain gaps. The studies were conducted in only nine Sub-Saharan African countries in total- eight in Nigeria [77, 83-89], four in Uganda [90-93], and one each in Tanzania [94], Mozambique [95], Ghana [96], Malawi [97], Ethiopia [98], Madagascar [99] and Burkina Faso [100]. Of the eight Nigerian studies, only two were conducted in Northern Nigeria [77, 88]⁷, the most deprived bloc of the country. Most of the studies in this domain were conducted in rural communities. While many Africans live in rural areas, it is also important to reflect perspectives from urban and peri-urban parts of the continent to ensure representation. Urban areas may also face unique health and social challenges and these have been captured in a limited capacity in Africa. Due to these population gaps, the perceptions reported in this review may not be transferrable across the continent. Four studies were published in the 1990s [77, 83-85] and one study in 2000 [86] (all carried out in Nigeria). All other studies were published in 2010 and beyond, except three studies between 2006 and 2009 [89, 98, 100].

Only a limited number of outcomes were considered in the studies- five on a broad range of issues or general complications of pregnancy and/or delivery [84-86, 96, 99], three on pre-eclampsia and/or eclampsia [77, 87, 95], three on mental disorders [94, 97, 98], three primarily focused on care-seeking but included data on perceptions [88, 89, 93], two on haemorrhage [83, 90], two on obstetric fistula [91, 92] and one on mastitis [100]. Most of these studies explored perceptions relating to causes of maternal morbidities; there were only five studies on perceptions of “normal vs. abnormal” conditions and one study reported impacts of maternal morbidities briefly.

⁷ I could not access the full-text of the El-Nafaty and Omotara (1998) study; however I was able to retrieve relevant information from the abstract.

2.7.1.2 Perceived causes of morbidities

Table 2.1 shows a summary of the perceptions of causes of morbidities in Sub-Saharan Africa. Perceived causes of morbidities were related to behavioural/lifestyle, spiritual/ superstitious, biological/ natural, medical/ birth-attendant and demographic/socio-cultural factors. Behavioural/ lifestyle factors and spiritual/ superstitious beliefs were linked to almost all the morbidities considered in the papers. Biological/ natural factors were also associated with several morbidities except mental disorders and some delivery complications [84, 87, 88, 93, 99, 100]. Medical factors and those related to birth attendants were mainly linked to delivery complications (such as excessive bleeding and retained placenta) and obstetric fistula [91-93, 96]. Demographic/ socio-cultural factors- early marriage, grandmultiparity, young age, primigravidity and early pregnancy- were also related to morbidities [92, 93, 96]. Two morbidities- excessive bleeding and obstetric fistula- were linked to all five categories of perceived causes [83, 84, 88, 91-94, 96, 99].

Within the five broad perceived causes, there were some specific causes for particular morbidities. Under behavioural/lifestyle factors, hypertension in pregnancy was perceived as stemming from stress, diet and depressive thoughts arising from marital or financial challenges, while convulsion was associated with diet-related factors (consuming cold drinks/ foods and poor nutrition). Young maternal age and primigravidity were associated with obstructed labour, delivery complications and obstetric fistula while grandmultiparity was linked to excessive bleeding. For excessive bleeding, the association between a woman's transgressions and complications was particularly prevalent in Esan communities in southern Nigeria. Thus women who commit adultery or incest are believed to suffer punishments manifested as delivery complications (retained placenta, prolonged labour and haemorrhage), which could eventually lead to their deaths, unless they make confessions [84-86]. A similar perception of infidelity resulting in delivery complications was also reported in a Tanzanian study [94].

It is worth pointing that some of the studies found recognition issues relating to hypertensive disorders. Akeju et al. (2016) and Boene et al. (2016) found that the

terms “pre-eclampsia” and “eclampsia” were not recognised [87, 95]; there were also no specific local terminologies for pre-eclampsia [87]. However, convulsions and hypertension were known in communities, although one of the studies found that these were not connected to the pregnancy [87].

2.7.1.3 Perceptions of ‘normal’ vs. ‘abnormal’ conditions

A few studies explored women’s perceptions of normal vs abnormal conditions. In Nigeria, paleness, fever, severe nausea and vomiting, fatigue, spotting and leg swelling were regarded as common and normal aspects of pregnancy [89] while haemorrhage, obstructed labour and placental abruption were perceived as severe morbidities that could cause death if prompt remedy is not taken [84]. Chiwuzie et al. (1997) found that haemorrhage was induced after birth in southern Nigeria in order to cleanse the womb from “bad blood,” a practice which health professionals tend to discourage [83]. Similar findings were also reported in a study conducted in rural Uganda with women and TBAs: postpartum bleeding was seen as a normal process which helps to cleanse, and that blood clots remaining in the womb could cause pains, blockage of the fallopian tubes that could prevent future conception, womb rot, infection or just complications [90]. Hanlon et al. (2009) found that while postpartum depressive symptoms were recognised in Ethiopia, they were not considered as illness in a pathological sense [98].

2.7.1.4 Perceptions of impacts of morbidities

Only one study [97] reported on the impacts of perceived morbidities. In an attempt to widen the scope of the literature search, I included broad terms on perceptions and did not include specific words such as “impacts;” therefore I may have missed some studies. It is also plausible that the facility studies which I excluded may have considered impacts of morbidities. For example, the impacts of obstetric fistula are well-known in literature and these are usually reported from fistula repair centres. However, a recent comprehensive systematic review on the impacts of maternal morbidity on health-related functioning, which included facility-based studies, also found gaps relating to outcomes [101]. Many maternal morbidities were not considered and there was a predominant focus on a few morbidities in Africa-

obstetric fistula, depression and near-miss morbidities. The evidence base on perceptions of morbidities therefore needs to be improved in general.

Stewart et al. (2015) briefly reported the impacts of perinatal stressors on mental health in Malawi [97]. They found that pregnancy was viewed as a time bringing about uncertainty. A number of factors were outlined as causing worry (lack of support, poverty, HIV, witchcraft, child illness) and stress (abuse, infidelity and abandonment). Exposure to these stressors were perceived as capable of altering one's behavior, leading to outcomes such as severe mental disturbance (for example poor concentration, collapsing and talking to oneself, rejecting the baby and suicide) [97].

2.7.1.5 Perceptions of morbidities over time

It is difficult to decipher from this review whether perceptions have changed over time in Sub-Saharan Africa since the same outcomes were not studied in the same countries across the different time periods to allow for observing trends. Considering the studies at a broad level however, it appears that a few perceptions may have persisted. Postpartum bleeding is still seen as a normal cleansing process in a 2016 Ugandan study [90], as reported in a Nigerian study in the 1990s [83]. Infidelity resulting in delivery complications has similarly been reported in studies in the 1990s [84, 85] as well as in 2010 [94]. There appears to be changes in a few perceptions over time however. The perceived causes of convulsion in a 1998 Nigerian study [77] were mainly spiritual/superstitious beliefs (witches, wizards, evil spirits, malevolence from co-wives, destiny from God) in addition to a few other factors, but these were mainly linked to behavioural/lifestyle factors (depressive thoughts, diet, stress) and biological/natural causes (heredity, cold) in a 2016 study in Nigeria [87]; different regions of the country were studied in the two studies however.

Table 2.1: Summary of perceived causes of maternal morbidity in Sub-Saharan Africa

Morbidity	Perceived causes				
	Behaviour/lifestyle	Spiritual/superstitious	Biological/ natural	Medical/related to birth-attendant	Demographic/ socio-cultural
Hypertension in pregnancy [87, 95]	Stress, diet, depressive thoughts from marital or financial challenges		Heredity, cold		
Convulsions [77, 87, 95]	Ingesting cold drinks and food during pregnancy, poor nutrition	A snake living inside a woman's body, witches/wizards/evil spirits, malevolence from co-wives, destiny from God	Heredity, exposure to cold weather		Early marriage
Excessive bleeding/ haemorrhage [83, 84, 88, 94, 96, 99]	Too much consumption of alcohol, hard work during pregnancy, consuming sweet foods, abortion, committing taboos such as adultery, incest, having sex before circumcision, disobedience to one's husband	God's will, enemies, evil forces, poisoning, being cursed	Retained placenta, separation of the placenta, having tears from delivering a big baby, the delivery process, excess blood sugar	Poor obstetric care, home-births	Grandmultiparity
Prolonged labour [86, 97, 99]	Consumption of certain foods during pregnancy, infidelity, husband's failure to do a customary ceremony, having unresolved misunderstandings with others (mainly partners or parents)	Witchcraft from someone the woman is at bad terms with or from an initiated child			
Obstructed labour [93]		Failure to take traditional herbs to weaken pelvis	Having small pelvis, anaemia, genetic history of complicated deliveries		Being young, primigravidity
Retained placenta [96]				Homebirths	
Delivery complications [84-86, 94, 96, 98, 99]	Adultery/infidelity or incest, having unresolved misunderstandings with others (mainly partners or parents)	Witchcraft from someone the woman is at bad terms with or from an initiated child		TBAs, home-births	Young maternal age
Complications and severe pains [96]	Strenuous livelihood activities (e.g. climbing trees to get firewood, farming, preparing local wine, charcoal burning)				

Morbidity	Perceived causes				
	Behaviour/lifestyle	Spiritual/superstitious	Biological/ natural	Medical/related to birth-attendant	Demographic/ socio-cultural
Mental disorders (perinatal depression, distress, postpartum depression) [97-99]	Lack of support from husband, abandonment or infidelity from husband, being gossiped about by friends and acquaintances for reasons such as getting pregnant soon after delivery, comparing oneself to others and being envious, hunger/poverty, out-of-wedlock/unwanted pregnancies	Spiritual forces, possession by evil spirits			
A local illness consistent with infection [99]			Cold air and the wind		
Postpartum contractions [99]			'Dirty'/blocked blood remaining inside the uterus		
Mastitis [100]	Improper breastfeeding practices	Two bubbles in the breasts not bursting after delivery, sorcery/ envy and jealousy from others	Parasitic infections		
Obstetric fistula [91-93]	Gender-based violence, delays in accessing care, induced abortions, having sex during menstrual period, family planning misuse	Being cursed by the gods or paternal aunts	STIs, difficult labours and C-section, having the bladder full during labour, having big babies	Accidental puncture by doctors during C-sections, having long nails, not wearing gloves, TBA birthing procedures, medical staff errors which burst the bladder, usage of urinary catheter, giving birth in health facilities	Early marriage/pregnancy

2.7.2 Care-seeking Domain

2.7.2.1 Assessment of the evidence

As also observed with the evidence from the perceptions domain, there were also gaps relating to populations considered in the 25 studies on care-seeking. Excluding the ten studies already reported in the perceptions domain [77, 83-85, 87-89, 93, 99, 100]⁸, only ten Sub-Saharan African countries in total were reflected in the studies: three in Ghana [102-104], two each in Nigeria [105, 106], Mozambique [107, 108], and Ethiopia [109, 110], and one each in South Africa [111], Mali [112], Tanzania [113], Malawi [114], Uganda [115] and Kenya [116]. Many were also conducted in rural communities. In a few cases, the authors did not specify the geographical make-up (urban or rural) of the study setting. As the focus was on care-seeking, the studies tended to consider a broad range of outcomes. During the screening process, I observed that the literature was dominated with quantitative studies relating to determinants/ barriers to utilisation of maternal health services, and also about knowledge of danger signs. Very few studies explored care-seeking for maternal morbidities using qualitative methods.

2.7.2.2 Care-seeking for reported maternal morbidity

Medical care is pluralistic in Sub-Saharan Africa. Perceptions of aetiology of maternal morbidities determine where care-seeking is sought [107]. There is a general agreement in many settings that formal health systems are more suited to treat certain conditions- usually perceived as arising from natural, biological or physical causes- while traditional systems are better able to manage other kinds of morbidities- usually perceived as stemming from traditional/ spiritual origins. In Nigeria, Osubor et al. (2006) found that health problems such as convulsions, which were classed in the spiritual causal group, were believed to be best managed by spiritualists and traditional healers while morbidities in the physical/ natural/ biological causal group were thought to be treated by conventional medicines [89]. Similarly, Aborigo et al. (2015) reported that communities in rural Ghana believe that certain maternal complications are not recognisable to formal health

⁸ The ten studies were conducted in the following countries: 7 in Nigeria, 1 in Uganda, 1 in Madagascar and 1 in Burkina Faso.

professionals but can only be treated by traditional healers, as they are perceived to be caused by witchcraft [103]. This distinction was also applied within a morbidity. For instance, breast problems and haemorrhage were perceived as having either spiritual or natural causes in a Burkina Faso [100] and a Nigerian study [85] respectively and the cause ascribed influenced care-seeking. Thus in the Nigerian study, haemorrhage caused by biological factors such as retained placenta and grandmultiparity were perceived as being amenable to orthodox treatment and haemorrhage resulting from evil spirit or committing taboos as not manageable by the formal health sector [85].

In Madagascar, women exhibiting symptoms/ behaviours consistent with postpartum depression were thought to be possessed by evil spirits and taken to spiritual healers for exorcism or treated with herbs [99]. In Northern Nigeria, remedy for eclampsia included local concoctions that are drunk or inhaled, and also talisman that is worn on the neck [77]. A study conducted in Southern Nigeria also reported similar local remedies for convulsions- incisions, herbs, concoctions and topical usage of black soap; no traditional remedies were reported for hypertension however [87]. In South Africa, *Kgaba* (traditional medicine) is used to protect from harm, and as a remedy for prolonged labour and overdue delivery [111].

Usage patterns of these pluralistic systems for morbidities were varied within and across studies. Some groups of women gravitate to one system, others use care-seeking options concurrently [84, 104, 106, 107], other women patronise these options in succession. For instance, they may first resort to prayers, then use traditional remedies, and finally consult the health facility as a last option if all else fails [109]. In one South-west Nigerian study, however, the order for care-seeking in the preceding sentence was reversed such that the spiritual route was the last resort used when conventional medicine was perceived to have failed [106]. Usage of options in succession can also be seen in a Ugandan study on obstructed labour where the authors reported a ‘pathway’ to care-seeking [115]. Here, women would often conceal the onset of labour to “protect their own integrity” and to take “control of own birth process.” When they “reach the limit” and are unable to give birth, then

they call close friends and family members who assist with diverse traditional regimens (such as herbs, hot strong tea and finger insertion in vagina); a traditional birth attendant may also be summoned. When most of these options fail, then the partners are involved, who take over the situation by looking for funds and “mobilizing the community” to facilitate care-seeking at the health facility (further challenges are then experienced at the community and health system level) [115].

In Ethiopia, decisions-making was influenced by severity ranking in which certain complications were considered ‘referral-worthy’ for some respondents while others were perceived as normal in spite of degrees of severity [109]. Thus a woman would go to hospital for breech presentation and not haemorrhage in spite of losing considerable blood [109]. Similarly, Aborigo et al. (2014) found that rural women in Ghana do not seek care at health facilities for bleeding but use herbs for it [102]. In a Mozambiquan study, health facilities were seen as being the most appropriate option to seek care although several barriers to accessing formal care were also reported (for example, fear of being mistreated by health professionals and transportation constraints) [108]. In their study conducted in Uganda, Keri et al. (2010) found that TBAs had a list of problems and circumstances for which they would refer women to the health facility [93]. These included labour-related problems (delayed labour, malpresentation, contractions occurring without the water breaking, too close or too far apart contractions, baby’s head too big) and other situations such as the pregnant woman having a small pelvis, being very young, having twins, being primigravida, having had many deliveries, having had C-section previously, having high blood pressure, and having specific conditions (epilepsy, lameness and being ‘mad’) [93].

2.7.2.3 How lay networks influence care-seeking

Lay networks play a huge role in care-seeking for maternal morbidities. The key people that constituted women’s lay networks in the literature were mothers-in-law, grandmothers, mothers, TBAs, husbands, neighbours, older sisters-in-law and the wider community [102, 103, 107-110, 112, 113, 115]. Lay networks, however, sometimes extended beyond women’s immediate family members to the community at large. In rural Ghana, for instance, women also shared information on obstetric

danger signs with other women while traveling to fetch water, in market places, in women's group meetings and while conducting communal labour [102].

Members of women's lay networks play varied roles. In her study in Ethiopia, Warren (2010) found that older women and TBAs were the most likely to recognise implications of complications and then suggest an appropriate cause of action [109]. Husbands' influence on care-seeking, on the other hand, appeared to be related to finances. In other words, men's ability or inability to source money for maternal complications would determine the women's care-seeking options [112-114]. Husbands also served as decision-makers, with varying levels of autonomy for women across communities. In their study in South-western Nigeria, Odimegwu et al. (2005) found that although men in the area were acknowledged as decision-makers, women were at liberty to make decisions in obstetric emergencies, especially in the absence of their husbands; this deviates from the widely cited finding that women need prior permission from their husbands to access care [105]. Sharma et al. (2017) reported that while husbands were the key decision-makers in care-seeking for maternal death cases, female relatives and TBAs took on this role for PPH [88].

Lay networks play both positive and negative roles with respect to care-seeking for maternal morbidities. The Kabakyenga et al. (2011) study reported above shows how lay networks can facilitate care-seeking (by contributing money or transportation) or delay care-seeking (by trying out a range of traditional options first before seeking formal care) [115]. In Ethiopia, TBAs sometimes gave referral letters to families, making it less difficult for them to access emergency care at hospital [109]. TBAs also reported that they recognised that certain conditions, such as dehydration, excessive bleeding and caesarean sections, were beyond their expertise and they usually referred women to the formal health sector for such needs [103]. In contrast in Southern Nigeria, some TBAs believed that every obstetric complication was within their sphere of competence [83]. Other members of the lay network could also delay care-seeking for morbidities. Soud (2005) found that while some women

preferred to first consult biomedical services for maternal morbidities, their lay networks, particularly older females, preferred that these women first try home or traditional regimens before consulting health professionals [116].

2.7.3 Measurement Domain

2.7.3.1 Assessment of the evidence

The similar trend of a focus on a limited number of Sub-Saharan African countries and outcomes was also observed in the measurement domain. Of the 19 community⁹ studies included, data from only 17 Sub-Saharan African countries were reflected. About one-third of these studies (seven) were conducted in Ethiopia [35, 49, 110, 117-120]. Others included: two each in Ghana [121, 122] and Malawi [123, 124], and then one each in Zimbabwe [125], Nigeria [126], South Africa [127], Niger [128], Rwanda [129], Mozambique [130], Uganda [131] and Kenya/Zambia [132]. One study [21] was conducted across a number of sites in six West African countries: Cote d'Ivoire, Burkina Faso, Mauritania, Mali, Niger and Senegal. This study- the MOMA study- was a large population-based study conducted in the 1990s where 20,326 women were followed from pregnancy up to 60 days postpartum [21]. A series of papers were published from the study, including a full report [133]. However I was unable to find the full report, although I may not have been able to read the study in-depth due to its publication in French. I have only included one of the MOMA studies in the review [21]. The Nigeria study [126] investigated the association between male responsibility and maternal morbidity, and was therefore, not primarily focused on reporting levels of morbidities.

In terms of outcomes considered, five studies focused on maternal mental health disorders (including antenatal and postnatal depression) [118, 119, 121, 122, 127], five studies on pelvic floor disorders (obstetric fistula and/or pelvic organ prolapse) [49, 110, 120, 124, 130], five studies on a group of complications on more severe

⁹ In this context, a “community study” means recruitment and data collection took place outside a facility setting. These were usually in household settings.

ends of the spectrum from a biomedical perspective (such as haemorrhage, severe headache, pre-eclampsia, dystocia, malaria, eclampsia, sepsis etc) [21, 35, 117, 125, 126], two studies on numerous morbidities of differing severities [123, 129] and one study each on postpartum cardiac failure [128], on a combined group labelled as “prolonged labour/ obstructed labour/ failure to progress” [132] and maternal near-miss [131].

All but six of the studies used a cross-sectional design; the other six studies used cohort designs [21, 119, 121, 122, 130, 132]. A good number were not stand-alone studies on maternal morbidity but parts of larger projects or trials assessing other outcomes including maternal mortality, quality of care, access to services and interventions for improving health. While information about the type of instruments used for measurement were reported in many studies (for example, adapted version of tools or questionnaires developed by the authors), the case definitions for morbidities (how morbidities were ‘diagnosed’) were sometimes not supplied.

During the screening process I conducted in 2015, I found 581 facility-based studies in Sub-Saharan Africa on maternal morbidity (relating to levels, prevalence, incidence and risk factors); 262 of these studies or 45% were conducted in Nigeria alone. Most of these studies were conducted in tertiary institutions and university teaching hospitals, with very minimal representation from primary health centres. A significant proportion of these studies focused on hypertensive disorders (pre-eclampsia and eclampsia), uterine rupture, caesarean section, obstetric fistula and hysterectomies. Few other outcomes studied included obstructed labour, infection, maternal depression, episiotomy and maternal near misses. These facility-based studies were not included in the review; however many of them have improved our understanding of maternal morbidities, and hence, advanced the evidence base (please see examples of such facility-based studies conducted in Sub-Saharan Africa and across the globe here [22, 134]).

2.7.3.2 Issues relating to measuring maternal morbidity

Measuring maternal morbidity is not a straightforward process and many factors could potentially affect the validity as well as introduce misclassification to measurement efforts. These include:

I. Definition, categorisation and standardisation issues

Morbidity is difficult to interpret and define [135]. Maternal morbidity is a complex, multi-faceted concept with multiple causes (medical, social and otherwise), varying times of onset, differential severity, varying duration (chronic or acute), and a wide range of diagnoses and treatment possibilities [17, 46, 136-138]. Unlike outcomes such as mortality or pregnancy, maternal morbidity is not a binary entity but it rather occurs on a continuum [34]; it can thus be ambiguous [135]. It is also challenging to definitively establish the cause of a specific morbidity, since there could be several contributing factors.

As reported earlier, the definition and identification criteria of maternal morbidity were only recently standardized. Many researchers have been using different case definitions, standards and tools for measurement. For example, in defining prolonged labour, some researchers use labour occurring for >12 hours as the cut-off while others use >24 hours. A scoping exercise found that surveyed experts and the literature identified and classified maternal morbidities using non-uniform and diverse ways; the timeframe and severity of morbidities were some of the key areas with discrepancies [50, 136]. Such wide ranges of possibilities result in underestimation or overestimation of parameters, introduce sensitivity and specificity issues and also make comparisons across settings difficult.

More recently, maternal health authorities have made efforts to standardise the definition and measurement of maternal morbidities. One of these global efforts related to the measurement of maternal near-misses. A WHO working group harmonised the definition (provided in Section 1.7) as well as established three

criteria for identifying near-misses: clinical/disease-specific criteria (such as uncontrollable fits); management-based/ intervention-based criteria (such as hysterectomy following blood loss); and organ-system dysfunction-based/ laboratory-based criteria (such as oxygen saturation levels within a specified time) [23]. The WHO group also developed a tool for identifying near misses, which has been validated and is widely used across the globe [25]. This tool, however, is only applicable in facility settings and its focus on only severe outcomes potentially excludes morbidities occurring at less severe levels. Furthermore, in as much as it is a measurement tool, it appears to be primarily used for evaluating quality of care, which potentially shifts its focus from quantifying the burden of morbidities in terms of prevalence and incidence.

The most recent effort is the work carried out by the MMWG, which was tasked with improving “the scientific basis for defining, measuring and monitoring maternal morbidity” [51]. Its definition of maternal morbidity as “*any health condition attributed to and/or complicating pregnancy and childbirth that has a negative impact on the woman’s wellbeing and/or functioning*” [51] is arguably the most comprehensive and uniform definition so far because it goes beyond biomedical connotations of ill-health and includes the consequences of morbidities on wellbeing and different aspects of life. It also “allows for conditions to be understood from a woman’s point of view and assessed in terms of how they affect her life” [139]. The MMWG also developed a conceptual framework for conceptualising maternal morbidity (which takes on a life cycle approach to women’s health) [140], as well as a tool for measuring morbidities- the Maternal Morbidity Matrix (MMM). The MMM is designed for use in primary care settings and has three dimensions:

- Dimension 1: Consists of a list of signs, symptoms, investigations and management procedures for direct (obstetric) morbidities and indirect (medical) morbidities; the classification was made to align with ICD-MM, the WHO application of ICD-10 to pregnancy, delivery and postpartum deaths [141].

- Dimension 2: Encompasses functional impact, which assesses the ability to perform bodily functions and activities such as self-care, household activities, work/economic activities, mobility, communication and so on.
- Dimension 3: Covers maternal history and includes socio-economic, demographic, obstetric history, and also care-seeking during pregnancy.

The MMM fills in the gap left by the WHO near-miss tool by measuring less severe morbidities as opposed to focusing on severe morbidities. Recently, the MMM was translated into an ANC and a postpartum maternal morbidity questionnaire, with the incorporation of existing tools such as PHQ-9- a depression measure- and the WHO Disability Assessment Schedule 2.0 12-item tool; these were then piloted in Kenya, Malawi and Jamaica [52]. One potential drawback of the MMM tool is its design for use in facility (primary care) settings. A near-universal ANC or PNC attendance will be required for the data generated from the tool to be population-based. While ANC has improved significantly across many developing countries, PNC utilization is still quite low. In addition, some primary care facilities in low income settings may lack the resources to carry out the diagnostic tests included in the tool.

II. Recall and reporting issues

Surveys depend on people's recognition of a symptom/illness as something worth remembering/reporting. They also rely on people's memory/recall and their willingness to report the required information to interviewers [142]. Validation studies have, however, found discrepancies between women's self-reports and corresponding medical examinations [48, 49], raising validity questions. Self-reports may deviate from the 'truth' because of numerous reasons including:

- Women without morbidities in reality sometimes report signs and symptoms in surveys, leading to specificity and overestimation issues [48, 143, 144]. This appears to be a key reason why researchers may not be keen to collect or use self-reported data. Misclassification could occur, especially when diagnoses are not confirmed with more objective measures (such as laboratory tests and physical examination). There could also be specificity

issues relating to questions asked, which may lead to this overestimation. For example, asking about experience of bleeding after delivery is a non-specific question and women may legitimately report bleeding, but the question itself does not enable the researcher to identify if this was haemorrhage or not.

- Women may only recall morbidities they sought care for at health facilities, as Nilses et al. (2002) found in their study in rural Zimbabwe [125].
- Sometimes only severe events are remembered; milder ones are discounted.
- Morbidities without symptoms (such as hypertension) may not be perceived, hence may not be reported [145].
- Socio-economic status also influences self-reports. Andersson et al. (2011) found that the women from less deprived backgrounds reported more obstetric complications compared to women from more deprived backgrounds. They asserted that the more deprived women may have perceived the complications as normal and also discounted the problems since they survived [126].
- Impediments to the ‘salient principle,’ which states that “accurate reporting occurs when the illness in question is salient, and social and psychological barriers to reporting are absent” [146].

A number of community-based studies were conducted in the 1980s and 1990s, but these were largely abandoned due to these issues around validity of self-reports. In spite of their recall and reporting issues, the usefulness of self-reports have been acknowledged, although some of these were documented in papers published in the 1990s. Stewart et al. (1996) concluded that “interview-based diagnosis may be the only way of obtaining even a rough idea of how common some problems are among women within a given population” [147]. Similarly, Fortney et al. (1996) assert that “asking people is still the only method we have for collecting information on many subjects. In the case of maternal morbidity, alternatives to simply asking women are quite limited” [18]. They also “provide evidence of women’s experience of health and morbidity during pregnancy” [55]. Self-reports may also be the primary method, and perhaps, the only way of collecting morbidity data in areas where health service utilisation is low or where good records are non-existent [35, 125, 145, 148, 149]. It has also been highlighted that women’s self-reports could sometimes be more

reliable than hospital records. For example in telling the duration of labour, health professionals may start counting from the time a woman was admitted while the woman may start counting from the time she started experiencing labour pains [43].

Arguments have also been made counteracting the recognition and recall issues associated with self-reports. In their large population-based study in four developing countries, which used self-reports with prior qualitative validation, Fortney et al. (1996) communicated that most maternal morbidities are obvious/ apparent to women and their families, unlike gynaecologic morbidities [18]. Some research findings also suggest that recall may be less problematic than anticipated, since women are able to accurately recall maternal events up to four years post-delivery [18] and even as long as thirty or more years later [150].

III. Financial, feasibility and representativeness issues associated with more reliable measurement methods

Facility-based data provide the major source of information on reproductive health in Sub-Saharan Africa [123]. These data are usually collected from medical records and/or through physical examinations, laboratory tests or interviews with service users. On one hand, facility-based measurement use more objective and reliable methods to measure maternal morbidity. For example, blood collection drape estimation and the alkaline haematin method could be used in a hospital to measure intrapartum and postpartum haemorrhage [151-154]. Hospital records, when kept consistently, can show morbidity levels and trends over time.

On the other hand, facility-based measurements pose certain challenges. Firstly, facility-based records may not be representative. While institutional delivery rates have improved in several developing countries, home-births are still practiced widely in some communities. While ANC rates are also quite high in many low income settings, PNC rates are yet to achieve such high rates. Thus many morbidity cases

remain undetected in communities where home-births are widespread and PNC utilisation is low. A study which estimated the prevalence of obstetric fistula in Malawi from both community and hospital settings found that only 532 cases out of a total of 1,107 were identified from hospital records; the remaining 575 cases were identified from the community survey [124] (further information on this study has been provided in Section 2.7.3.3). Secondly, hospital records do not provide a ‘true’ picture. The worst cases may never make it to the health facility, especially if such women are marginalised/deprived. Alternatively, it could also be that only the worst cases reach the hospital when all other remedy options fail. Thirdly, not all facility records are reliable for numerous reasons including: missing data; failure to keep certain records; inaccessibility to non-staff due to confidentiality issues; and residents in catchment areas of hospitals may use other facilities [142].

Alternatives to facility-based measurement will be to conduct cohort studies or population-based health examination surveys (that is, surveys with clinical/laboratory components) [140, 142] as conducted in the 1980s and 1990s in low income settings [31, 42, 45-47]. These alternatives are, however, very expensive and time-consuming. For cohort studies, the researcher will also have to intervene in cases where women experience complications, potentially altering results [18]. There are also availability issues with reliable diagnostic tests that can be used seamlessly in the field [43], although some tests (for example blood pressure measures) are quite simple and could be easily administered. Probabilistic methods, which have been utilised in verbal autopsies, hold promising results for maternal morbidity measurement [149]. They measure the burden of maternal morbidities by estimating their likelihoods from self-reported symptoms [149]. These methods are however still in the developmental stages.

2.7.3.3 Levels of Maternal Morbidity

Nineteen studies reported prevalence and/or incidence of maternal morbidity in the community. Many studies used self-reports only, which could be prone to the recall and reporting issues highlighted in Section 2.7.3.2 although they may have been the feasible or low-cost measurement option for these settings. The instruments used for

measuring morbidities were sometimes validated tools (such as the Edinburgh Postnatal Depression Scale and the Patient Health Questionnaire-9 for measuring mental health disorders) [118, 121, 122, 127], adapted or partially adapted tools from different sources (such as the Demographic and Health Surveys, WHO or other authors) [35, 117, 130], appeared to be the authors' own tools [110, 123, 125, 126, 129, 132] or a mix of these approaches [119]. A few of the studies used questionnaires with confirmatory physical/clinical examinations [21, 49, 120] and one study used clinical examination only [128]. A few other studies used some approaches worth pointing. Kalilani-Phiri et al. (2010) measured the prevalence of obstetric fistula in Malawi using two approaches: review of hospital records and a community survey using the sibling-based approach [124]. While the sibling-based method may have likely increased coverage by providing data for ostracised women or those absent [155], it may have also overestimated the condition due to misclassification with urinary incontinence, as the authors rightly acknowledged; repeat measurements can also not be ruled out. Nansubuga et al. (2016) measured maternal near miss from the community by reviewing participants' responses and matching them against the WHO near miss criteria [131]. While rigorous methodologies appeared to have been followed in the study, the subjective nature of the case identification could have led to overestimation of cases; misclassification and reporting bias can also not be ruled out.

The proportion of women who reported at least one morbidity ranged from 17.8% to 43.9% [35, 117, 123, 126]. It is important to note, however, that the 17.8% reported in the Andersson et al. (2011) study may be an underestimation, as the women in that part of Nigeria hailed from deprived backgrounds and may have under-reported [126]. The most common health issues reported included malaria, nausea/vomiting, severe headache, severe lower abdominal pain, high fever, high blood pressure during pregnancy, excessive bleeding, prolonged labour, and pain in the head, stomach, back, legs or the body in general [35, 117, 123, 125]. Semasaka et al. (2016) reported the prevalence of a range of morbidities during pregnancy in Rwanda. The morbidities with prevalences above 10% (range 12.7%- 19.2%) were vomiting, dimness/blurring vision, anaemia, abdominal pain and severe bleeding, and lastly abdominal pain [129].

Prevalence of individual morbidities tended to vary across studies, which may reflect actual differences in morbidity levels or case definitions. The prevalence of antenatal depression in a rural Ghanaian population was as low as 9.9% [121] and as high as 39% in two Cape Town settlements [127]. In two different Ethiopian studies, prevalence of antenatal depression was 11.8% [118] and 28.7% [119]. Prevalence of postnatal depression, on the other hand, was as low as 3.5% in a rural Ghanaian population [122]. Four studies reported estimates of obstetric fistula which only showed slight differences: 1.1, 1.6 and 2.2 per 1,000 women in rural southern Mozambique [130], Malawi [124] and Ethiopia [110] respectively. The prevalence was 0.06% in another Ethiopian study [120].

The levels of other morbidities reported in literature in different Sub-Saharan African countries include: 4% for hyperemesis gravidarum [123]; 7% for high blood pressure [123]; 40 per 1,000 women of child-bearing age for postpartum cardiac failure [128]; 0.2% and 7.8% for faecal and urinary incontinence respectively [49]; 1% for symptomatic pelvic organ prolapse [120] and 6.3% for pelvic organ prolapse [49]. Harrison et al. (2015) conducted a prospective community-based study on obstructed labour, prolonged labour and failure to progress (OL/PL/FTP) across a number of low and middle income countries; they found the rate to be 41.6 per 1,000 births in Lusaka Zambia and a little over 100 per 1,000 births in western Kenya (the exact estimate wasn't clear from the graph for Kenya) [132]. The maternal near-miss rate was 287.7 per 1,000 pregnancies in Rakai, Uganda [131]. In their large cohort study conducted in six West African countries, Prual et al. (2000) found the incidence of severe maternal morbidity from direct obstetric causes to be 6.17 cases per 100 live births, with variations across the study sites (ranging from 3.01 to 9.05 per 100 live births); severe haemorrhage accounted for almost half of these direct causes (46%) [21].

2.7.3.4 Risk factors for maternal morbidity

I also reviewed the literature on risk factors for maternal morbidity in Sub-Saharan Africa, although this was not a major objective of the review (the studies were retrieved from the 2015 literature search only). Risk factors for maternal morbidity

extend beyond pathogenic causes to include the wider social determinants of health, as seen in Table 2.2. In addition to the risk factors in Table 2.2, age, tribe, early marriage, prolonged labour and occupation were found to be associated with obstetric fistula [110, 124]. Partner support (OR 0.88, 95% CI 0.8-0.97) [127] and endorsement of socio-cultural perinatal practices (OR 0.66, 95% CI 0.45–0.95) [156] were found to be protective against antenatal depression and other mental disorders in pregnancy. Interestingly, home deliveries were associated with reduced risk of obstetric complications (OR 0.70 95% CI 0.50- 0.98) while facility-based delivery was associated with increased risk of obstetric complications (OR 1.43 95% CI 1.02- 2.01) in Western Kenya [157], highlighting major issues relating to quality of care or the fact that sicker women deliver in facilities.

Table 2. 2: Majors risk factors for maternal morbidity in literature retrieved (Only adjusted odds ratios are presented for multivariate analyses.
Where multiple correlates are provided, I only included the main associations highlighted by the authors)

Risk factor group	Morbidity								
	Antenatal depression	Prolonged labour	Non-vaginal delivery	Postnatal depression	Pelvic organ prolapse	Non-fatal maternal morbidity	Severe peripartum complications	Obstetric complications	Postpartum complications
Socio-demographic	Maternal age 30+ years (RR 1.16, 95% CI 1.06-1.27) [121] Never married (RR 1.34, 95% CI 1.14- 1.58) [121]			Non-indigenous ethnicity (RR 1.50, 95% CI 1.23- 1.83) [122]	Highland rural residence (OR 2.30, 95% CI 1.14- 4.62) [49]				
Socio-economic	Household income < R2000 per month (OR 1.52, 95% CI 1.15-2.01) [127] Lower wealth quintile (RR 1.30, 95% CI 1.13-1.50) [121]								
Relational and socio-cultural	Violence in relationship in the previous year (OR 1.49, 95% CI 1.13-1.96) [127]			Endorsement but incompletion of socio-cultural perinatal practices (OR 2.16, 95% CI 1.11–4.23) [156]-related to persistent postnatal common mental disorders		Spousal factors: intimate partner violence in the last year, intimate partner violence during pregnancy and not having discussed the pregnancy with their husbands or partners (OR 2.39, 95% CI 1.96- 2.92) [126]			
Obstetric history	Previous loss of pregnancy (RR 1.30 95% CI 1.18-1.43) [121]			Previous stillbirth (RR 1.40, 95% CI 1.04- 1.88) [122]	History of prolonged labour (OR 1.78, 95% CI 1.10-2.88) [49]				

Risk factor group	Morbidity								
	Antenatal depression	Prolonged labour	Non-vaginal delivery	Postnatal depression	Pelvic organ prolapse	Non-fatal maternal morbidity	Severe peripartum complications	Obstetric complications	Postpartum complications
Neonatal outcomes				<p>Stillbirth (RR 1.93, 95% CI 1.23- 3.02) [122]</p> <p>Death occurring before depression assessment (RR 2.52, 95% CI 1.77- 3.58) [122]</p> <p>New-born severe illness (RR 3.06, 95% CI 2.13- 4.39) [122]</p>					
Other morbidities		Antenatal depression (RR 1.25, 95% CI 1.02- 1.53) [158]	Antenatal depression (RR 1.19 95% CI 1.02- 1.40) [158]	<p>Antenatal depression (RR 4.42, 3.66- 5.32) [122]</p> <p>Postpartum complications (RR 1.35, 95% CI 1.12- 1.62) [122]</p>			Antenatal depression (RR 1.11, 95% CI 1.07- 1.15) [158]		Antenatal depression (RR 1.27, 95% CI 1.21- 1.34) [158]
Other factors	Unplanned pregnancy (RR 1.55 95% CI 1.43- 1.69) [121]			Season of birth- dry season (RR 1.31, 95% CI 1.09- 1.56) [122]	Carrying heavy objects (OR 2.13, 95% CI 1.12- 4.07) [49]			Facility-based deliveries (OR 1.43 95% CI 1.02- 2.01) [157]	

2.8 Summary of Review Findings and Conclusion

There were gaps relating to the population and outcomes considered in all three domains of the scoping review (perceptions, care-seeking and measurement). Studies were conducted in only a limited number of Sub-Saharan African countries and most of these were carried out in rural areas. A limited range of outcomes were considered, with studies on mental disorders, obstetric fistula and conditions on more severe end of the maternal morbidity spectrum considered. Summary of findings relating to the five review objectives are provided below:

Review Objective 1: To find out perceptions of maternal morbidity relating to causes, normal vs. abnormal conditions and impacts

- Perceived causes of morbidities were related to behavioural/lifestyle, spiritual/ superstitious, biological/ natural, medical/ birth-attendant and demographic/socio-cultural factors.
- A number of conditions such as spotting, fever, paleness and leg swelling were regarded as common and normal aspects of pregnancy while some problems such as haemorrhage and obstructed labour were seen as severe morbidities. A few studies reported a tendency for postpartum bleeding to be seen as a cleansing process.
- One study which reported on the impacts of perinatal stressors on mental health found that it was linked to negative consequences (severe mental disturbance, rejecting the baby and suicide).

Review Objective 2: To investigate care-seeking for reported maternal morbidity

- Medical care is pluralistic in Sub-Saharan Africa, with perceptions of aetiology determining which care-seeking is sought. There is a general agreement in many settings that formal health systems are more suited to treat certain conditions (usually perceived as arising from natural, biological or physical causes) while traditional systems are better able to manage other

kinds of morbidities (usually perceived as stemming from traditional/spiritual origins). This distinction in care-seeking routes based on perceived aetiology was also applied within a morbidity.

- Usage patterns of these pluralistic systems for morbidities were varied within and across studies. Some groups of women gravitate to one system, others use care-seeking options concurrently, and other women patronise these options in succession.

Review Objective 3: To determine how lay networks influence care-seeking

- Lay networks play a huge role in care-seeking for maternal morbidities. Older women, female relatives and TBAs were the most likely to recognise implications of complications and then suggest an appropriate cause of action. Husbands' influence on care-seeking appeared to be related to finances and decision-making, with varying levels of autonomy for women across communities.
- Lay networks play both positive and negative roles with respect to care-seeking for maternal morbidities; they can facilitate or delay care-seeking.

Review Objective 4: To identify issues (conceptual or practical problems) relating to measuring maternal morbidity

- Maternal morbidity is a complex, multi-faceted concept which occurs on a continuum and could be caused by several contributing factors. These characteristics make maternal morbidity difficult to interpret and define.
- Many researchers have been using different case definitions, standards and tools for measurement, which make comparisons across settings difficult, underestimate or overestimate parameters and also introduce sensitivity and specificity issues.

- Maternal health authorities have made efforts to standardise the definition and measurement of maternal morbidities by establishing/refining definitions and developing tools that could be used across diverse settings.
- Self-reports are sometimes used to measure maternal morbidity and may be the only way of collecting morbidity data in areas with low service utilisation, non-existent records or limited resources. However, they could be prone to recall and reporting issues as well as question-specificity issues; these are key reasons why researchers are less likely to use them.
- Ideally, more reliable facility-based measurement methods such as physical examinations, laboratory tests and/or medical records reviews should be used but these methods are often associated with financial, feasibility and representativeness issues.

Review Objective 5: To find out the levels (prevalence or incidence) of maternal morbidity

- The proportion of women who reported at least one health problem ranged from 17.8% to 43.9%. The most common health issues reported included malaria, nausea/vomiting, severe headache, severe lower abdominal pain, high fever, high blood pressure during pregnancy, excessive bleeding, prolonged labour, and pain in the head, stomach, back, legs or the body in general.
- Prevalence of individual self-reported morbidities tended to vary across studies, which may reflect actual differences in morbidity levels or case definitions.

Conclusion

Maternal morbidity research will benefit from both qualitative and quantitative approaches. Qualitative studies in the scoping review suggest that understanding women's perceptions of morbidities yields great insights into their care-seeking behaviours. The review also showed that care seeking varies widely between and within countries in Sub-Saharan Africa; hence it is difficult to generalise about

maternal morbidity. This calls for local and context-specific studies. The influence of lay networks on women's care-seeking also needs to be explored further by researchers.

Quantitative studies focused on measuring maternal morbidity will provide useful information on the burden of the issue so that informed decisions can be made and maternal health improved. Measuring maternal morbidity is generally difficult. Ideally, more objective and reliable studies (such as cohort studies or large population-based health examinations) should be conducted; however, they are very resource-intensive. Facility-based measurements may not be representative and also have other inherent issues. Probabilistic methods are still undergoing further developments. Self-reports have some advantages, but are also not without challenges, as highlighted in the review. The goal, however, is to not to discard the method because of its flaws, but to minimise its methodological weaknesses and maximise its strengths. The scoping review found limited papers on maternal morbidity in community settings from Sub-Saharan Africa. There is a need to improve the evidence base in terms of populations and outcomes considered.

Chapter 3: Contextual Information and General Procedures

3.1 Chapter Structure

In this chapter, I will provide a description of the study area and the general procedures relating to the research: eligibility criteria of respondents; ethical approvals obtained; and the procedures for obtaining informed consent. The general procedures were the same across all studies; therefore I will present them in this chapter as opposed to the methodology sections of their respective chapters.

3.2 The Study Area

Nigeria is a West-African country bordered on the north by Niger and Chad, on the west by Benin Republic, on the east by Cameroon and on the south by the Atlantic Ocean. It is the most populous country in Africa, with an estimated population of 185 million (2016 statistics) [159]. It is also Sub-Saharan Africa's biggest economy although more than 62% of its population live in extreme poverty [160]. Nigeria gained independence from the British in 1960, had military rule predominantly in the decades that followed, transitioned into democracy in 1999 and has since been governed by civilians. Nigeria is divided into 36 states with a state capital in Abuja. The country is very diverse and has over 500 languages; English is the official language.

As practiced in many countries, Nigeria's health system is three-tiered and consists of the primary, secondary and tertiary levels of care; healthcare responsibilities are shared between the three levels of government (the local, state and federal governments). The Nigerian health system is ranked among the five worst in the world and is chronically underfunded [161]. The country only spends 3.7% of its GDP on health (2014 statistics) and uses a mixed method of health financing, with out-of-pocket payments accounting for around two-thirds of the total health expenditure [159, 162]. The National Health Insurance Scheme was established over

a decade ago; however only about 3% of Nigerians (mainly civil servants) are covered under the scheme [163]. While the government has initiated a free maternity care programme in public facilities, private healthcare usage is high in some states and utilisation of formal care is low in the northern part of the country [164]. Life expectancy at birth is 55 and 56 years for males and females respectively (2016 statistics) [159].

My PhD research was conducted in Adamawa, one of the northeastern states of Nigeria (Figure 3.1). Adamawa state has 21 Local Government Areas (LGAs) and each LGA is further divided into wards, the smallest administrative unit in Nigeria. Yola North and Yola South are two LGAs in Adamawa, collectively referred to as “Yola” the capital of Adamawa (Figure 3.2). The two LGAs have 11 wards each. Yola North is the administrative and commercial capital of the state while Yola South is the traditional headquarters where the Lamido of Adamawa lives (the highest traditional ruler of the state). Yola North is urban (although some of its communities have more developed infrastructure than others) while Yola South has both urban, rural and mixed areas. Figure 3.3 shows pictures taken in Yola to further portray the study area.

Figure 3. 1: Map of Nigeria showing location of Adamawa State (in red) [165]

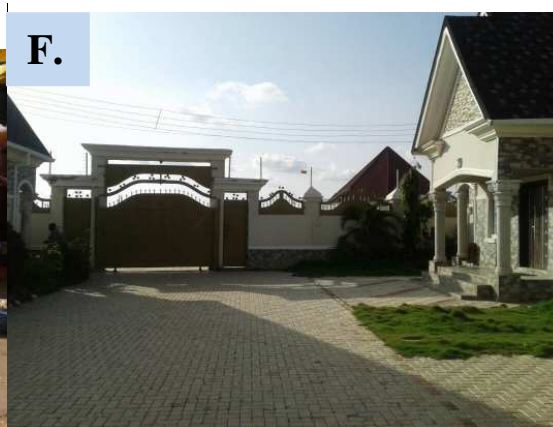


Figure 3. 2: Map of Adamawa State showing Yola North and Yola South (in red)
[166]



Figure 3.3: Yola in pictures. A- a rural residence in Yola South; B- a busy commercial street around Bekaji Roundabout, Yola North; C- a community water supply source in Malamre, Yola North; D- an urban residence in Yola North; E- market area in Shopping Complex, Yola North; F- an urban residence; G- group of houses in an urban area, Yola South; H- rural households in Yola South; I- an urban residence; J- a subsistence farmland; K- Malamre Clinic, Yola North; L- shops in Karewa, Yola North (Photo credits: Mrs. Deborah Mathias and Mr. God'sWill Yisboh)





Yola has a total population of 823,220 people while Adamawa's is around 4 million¹⁰ (2014 figures) [167]. Residents of Yola are primarily civil servants, traders, fishermen, entrepreneurs, farmers, academics and cattle rearers; they mainly practice Christianity or Islam (with a near 50-50 split in Yola North and some communities in Yola South being predominantly Muslim). Hausa, English and Fulfulde are widely spoken in Yola, although there are several other languages in the area. In recent years, Adamawa experienced massive security challenges from the Islamic terrorist group Boko Haram, particularly in parts of the State which share border with Borno, the epicentre of the terrorist group. Yola has generally enjoyed peace, although there has been security tension at different points in time necessitating curfews in the area, as well as deadly attacks in 2012 and 2015. Currently, Yola is home to thousands of internally displaced people who fled towns and villages terrorised by Boko Haram. They are housed in camps supported by the Nigerian government, international organisations (governmental and UN-sister organisations), faith-based institutions, local non-governmental organisations and academic institutions, but they also live within host communities (religious centres, informal spaces and homes) [168, 169].

The formal health system in Yola has both public and private health facilities. The public health system consists of one tertiary hospital (the Federal Medical Centre), one state hospital and numerous primary health care facilities (health posts, primary health clinics and primary health centres) spread across the 22 wards in Yola. Data for the distribution of primary health care facilities and resources in Yola are not readily available; however Table 3.1 shows the recommended distribution from the guidelines of the National Primary Health Care Development Agency (the federal agency that oversees primary health care in Nigeria) [170]. As seen in Table 3.1, the primary care health workforce consists of not only health workers but also members of the community (such as the Village Development Committees). The health posts are the most basic health facilities and are usually located in rural areas. Primary health clinics and primary health centres, on the other hand, can be found in both rural and urban areas. There are about 18 primary health care facilities per 100,000 people in Nigeria [171]. In addition to these cadres of public health facilities, Yola

¹⁰ The 4 million is a projected figure while the 823,220 was obtained via head counts.

also has numerous private hospitals and clinics, although these are mainly located in the urban areas.

In terms of demographic and health indicators for women of child-bearing age, specific data are also not readily available for Yola. However, Table 3.2 shows key maternal indicators for Adamawa State. A third of women aged 15-49 years have no education and only 14.6% have completed secondary school [12]. The proportion of women who receive ANC is quite high at 85.1%; however skilled birth attendance is very low at 36.3% which, according to studies exploring the issue in Northern Nigeria, stems from a combination of factors including deprivation, disrespectful/abusive care, socio-cultural reasons, ethnicity, not having a perceived need for facility delivery and poor accessibility [172-178]. Table 3.2 also shows that Adamawa data are fairly comparable with Nigeria data in many indicators including proportion of women aged 15-49 years who are literate (53.2% vs 53.1% respectively), proportion of women who were delivered by a skilled provider (36.3% vs 38.1%), proportions of women delivered by C-section (2.3% vs. 2.0%) and proportion of home-births (65.3% vs 63.1%). The proportion of women who receive ANC from a skilled personnel however are significantly higher in Adamawa compared to the national average (85.1% vs. 60.6%); the reasons for this high disparity are not particularly clear. For some other indicators, proportions are lower in Adamawa compared to the national average, with the highest discrepancy seen in the proportion of married women aged 15-49 years who currently use contraception: 4.4% vs 15.1% respectively[12].

Table 3. 1: Recommended distribution of primary care facilities in Nigeria (Source: National Primary Health Care Development Agency) [170]. It is not clear in literature whether Adamawa has met this recommendation, although proxy data (distribution of primary health facilities per 100,000 people) suggest that the state has a higher number (24.7) compared to the national (16.6) and North-east averages (17.9) [179].

Type of primary health facility	Catchment area	Catchment population	Health manpower
Health post	Village/ community level	500 or less	- 1 village health worker - 1 community resource person - Functional Community/ Village Development Committees
Primary health clinic	Not specified, but usually group of villages or neighbourhoods [171]	2,000- 5,000	- 2 Community Health Extension Workers (CHEWs) - 4 Junior Community Health Extension Workers (JCHEWs)
Primary health centre (Ward health centre)	Ward level	10,000- 30,000	- 1 Community Health Officer ¹¹ - 1 public health nurse - 4 nurses/ midwives - 3 CHEWs - 6 JCHEWs - Functional Ward Dev. Committees - Ward Councilor

Table 3. 2: Key maternal indicators in Adamawa State and Nigeria (Source: Demographic and Health Surveys, 2013) [12]

Indicator	Adamawa	Nigeria
Proportion of women aged 15-49 with no education	34.5%	37.8%
Proportion of women aged 15-49 who have completed secondary school	14.6%	18.3%
Proportion of women aged 15-49 who are literate	53.2%	53.1%
Median age at first marriage for women aged 20-49	17.5 years	18.3 years
Proportion of women who received ANC from a skilled provider	85.1%	60.6%
Proportion of women who were delivered by a skilled provider	36.3%	38.1%
Proportion delivered by C-section	2.3%	2.0%
Proportion of home-births	65.3%	63.1%
Total fertility rate	5.8	5.5
Proportion of married women aged 15-49 who currently use any contraception method	4.4%	15.1%

¹¹ Serves as the head. A “well-orientated” National Youth Service Corps (NYSC) doctor could also head the team where available. The NYSC is a mandatory one-year national assignment for Nigerian graduates.

3.3 Eligibility Criteria for Respondents

The eligibility criteria for primary and secondary respondents are shown below:

Primary respondents: Women

- Of child-bearing age (aged 15-49 years): Constitutionally, adulthood is attained at age 18 in Nigeria. The Child's Rights Act also stipulates that the minimum marriageable age is 18 years, although not every state in the country has ratified this Act. Three different sets of laws (civil, Islamic and customary) run concurrently in the country. Hence some states with Islamic and customary laws allow girls below age 18 to marry, in addition to prevailing cultural norms that support the practice. Therefore, I included women aged 15-17 years since it is not uncommon for women in that age bracket to be married and have children. In addition, they are a particularly vulnerable group with respect to maternal morbidities, hence it was important to include them. Furthermore, at a global policy level, the starting point for women of child-bearing age is considered to be 15 years, which also justifies including the 15-17 years demographic group.
- Married: This could be either religious, legal or traditional unions. In the study area, out-of-wedlock pregnancies tend to occur amongst adolescents and these are often characterised by difficult circumstances (for example, stigma and neglect). Therefore I limited eligibility to married women to allow for appropriate comparisons. It would have also been difficult to recruit unmarried adolescent mothers. Out-of-wedlock pregnancies are extremely rare in the study area and I do not anticipate that this would have introduced significant selection bias.
- Residents of Yola (Yola North and Yola South): As reported in Section 3.2, Adamawa has experienced massive security challenges from the Islamic terrorist group Boko Haram in recent years. Therefore I restricted the study area to Yola, which has been relatively safe, for security reasons. In addition, this research study was not part of a bigger project with well-established research links and resources; thus I decided to conduct the study in a familiar

area for feasibility reasons. Eligible respondents should not have migrated newly to the area, for example, being internally displaced persons due to Boko Haram terrorist activities).

- Given birth within the past two years preceding study: A relatively short duration period of two years was imposed to maximise recall.

Secondary respondents

These were all people in the primary respondents' familial/social circles including co-wives, husbands, female neighbours, mother, mother-in-law and other female relatives. The secondary respondents were recruited in the qualitative phase only for the family interviews (further information in Section 4.2.2). While health care providers and traditional birth attendants would have provided useful information on the topic, I focused on community respondents to ensure collection of more in-depth, rich data and to also reach data saturation.

3.4 Ethical Approval and Informed Consent

Written ethical approval was obtained from the Adamawa State Ministry of Health and the University College London Research Ethics Committee (Project ID number: 6846/003) (Appendix 3.1). Verbal approval was obtained from appropriate community leaders. Informed consents were sought from respondents prior to the studies. Informed consent was not obtained from parents of married 15-17 year old participants, since they are technically considered adults amongst relevant circles in the study area.

Once identified, respondents were approached face-to-face. After identifying and approaching potential participants, the study was explained to the respondents face-to-face in clear terms in either English or Hausa using information sheets (Appendix 3.2). Any questions were answered and participants were invited to participate and written informed consent was taken (verbal consent in the survey) (Appendix 3.3).

It is culturally courteous to appreciate people for taking part in a project in the study area; therefore thank-you tokens were provided to participants (dustpans). The dustpans were provided at the end of sessions as opposed to the beginning in order not to influence consent and their judgments, and hence, validity of the data. Information about giving these tokens were not provided during recruitment. Transportation payments were also given to some FGD respondents when they had to travel from their residences. Refreshments were provided after FGD sessions.

Chapter 4: Perceptions of Maternal Morbidity

“If there is no pregnancy, there is no illness”- IDI 14

4.1 Chapter Structure

In this chapter, I will address the first and the second sub-objectives of the first research objective (1a and 1b): “to find out respondents’ perceptions of maternal morbidity relating to normal vs abnormal conditions, causes of morbidities and impacts of morbidities” and “to identify morbidities that are important to women.”

I will start by reporting the methods of the qualitative phase of my research, which were planned and written up as a protocol to ensure that data were collected in a rigorous and transparent manner. I will then proceed to report the results- my participant population and six themes: understanding perceptions of maternal morbidity; normal vs abnormal morbidities; comparisons to self and other women; morbidities that are important to women; perceived causes of morbidities; and lastly, impacts of morbidities. The methods component of the qualitative phase is first reported in this chapter; it will therefore not be repeated in Chapters 5 and 6.

4.2 Methods

4.2.1 Theoretical Positions

My research adopted the interpretative approach, a paradigm which, according to Ulin et al. (2005), acknowledges that “reality is subjective and multiple as seen from different perspectives” [180] and aims to understand the world from participants’ point of view [181]. My research also took its premise broadly from sociology of health and illness, a perspective which looks beyond biomedical viewpoints and takes on a more holistic view of health and illness. It differentiates between medicine’s concept of disease and lay people’s subjective feelings and perceptions of disease [182]. Three aspects of sociology of health and illness particularly resonate with my research’s objectives:

- Cultural models of disease/illness.
- Illness behaviour- which Mechanic (1962) conceptualises as “the ways in which given symptoms may be differentially perceived, evaluated and acted upon (or not acted upon) by different kinds of people” [75].
- Lay referral systems/networks- which are important sources of health knowledge and influencers of illness behaviour.

4.2.2 Study Designs

My first objective seeks to explore perceptions, subjective meanings and experiences of research participants in relation to maternal morbidity. Thus it necessitated utilising a qualitative approach, which is generally concerned with answering questions about the ‘how,’ ‘what,’ and ‘why’ of a phenomenon as opposed to the ‘how much’ and ‘how many’ [181].

Focus group discussions (FGDs), in-depth interviews (IDIs) and family interviews were identified as appropriate methods to meet the qualitative research objectives. FGDs enable one to access ‘rich’ data but also have the added advantage of providing insights into group norms, cultural values and group meanings [183, 184]. The interaction between FGD participants also offers numerous advantages: the sharing and comparison of experiences help to “advance the conversation;” generation of data that may not emerge otherwise; elicitation of candid responses; and enablement of a safe space to share sensitive information [185-188]. I therefore conducted FGDs to find out how perceptions of maternal morbidity and health may be shaped within social contexts, and also to understand how group dynamics could influence perceptions. IDIs are useful in understanding meanings and lived experiences and were carried out to elicit detailed, in-depth information on the research topic [189]. Family interviews entailed having discussions with a sub set of IDI women and member(s) of their family who witnessed and/or managed the respondent’s morbidity, or who supported her maternal health. These were conducted because a household is a crucial strata of social organisation that has implications for health and care seeking; interviewing household members together can provide key information on household-level decision making [181]. The use of

multiple methods also allowed for method triangulation, which was used to validate the findings [190, 191].

4.2.3 Sampling

4.2.3.1 Sampling Approach and Criteria

Sampling was purposive, an approach in which Bryman (2012) explains thus: “sample units are chosen because they have particular features or characteristics which will enable detailed exploration and understanding of the central themes and questions which the researcher wishes to study” [192]. The aim of the sampling strategy was to obtain diversity with respect to participant characteristics that may influence how women perceive and experience morbidities. Sampling women from various backgrounds was also done to ensure data source triangulation [190, 191]. The eligibility criteria for respondents have been provided in Section 3.3.

The FGDs were stratified by age and place of residence (urban/rural) to ensure that respondents feel comfortable to discuss in the group [193] and to also compare and contrast viewpoints across the different groups. FGDs were not stratified by educational level, and within an FGD respondents had a range of educational levels. However, one FGD was conducted with women who had completed at least a bachelor’s degree, who are uncommon in some parts of the area, in order to obtain a different perspective from the women who had lower educational levels. Education has generally been linked to improved cognition [194-196] and it was important to investigate how educational level may or may not influence their perceptions. Women were recruited from the same area or within the same relational circles- friends invited friends or neighbours invited neighbours (more information in Section 4.2.3.3). Each FGD consisted of between 5- 8 women.

For the IDIs, respondents were sampled based on primary and secondary sampling criteria [197]. The primary criteria had set quotas to ensure the recruitment of sufficient respondents in each category. Secondary criteria, as they were considered

less important, did not have quotas, but I ensured variation in all characteristics by keeping a tally during data collection and modifying recruitment as needed. I identified the sampling criteria a priori, but modified them based on my initial findings of the characteristics that influenced perceptions and behaviours. The final primary criteria were: educational level (none/minimal; educated- post-secondary), morbidity status (had or did not have a health problem during the last pregnancy, delivery or postpartum) and age (15-19, 20-34 and 35-49 years). The secondary criteria were place of residence (urban, rural) and parity (primipara, multipara). While morbidity status was a primary criteria, I found that it was difficult, in practice, to ascertain whether a woman had a morbidity prior to the interview; therefore fixing clear-cut quotas was not practical. Using the women's perceptions of their morbidities (diagnosed or self-reported), my own judgements and what is considered of public health importance, I was able to sample women to reflect varying morbidity severities. Towards the end of the fieldwork, women were purposively selected by morbidities on the more severe spectrum (excessive bleeding, eclampsia, uterine prolapse and anaemia).

4.2.3.2 Sample Size and Strategies

At the initial design stages, sampling grids with subgroups and possible sample sizes were drawn for the IDIs and FGDs. Previous research has shown varied conclusions about the number of interviews needed to reach data saturation, with numbers as low as 12 [198] and as high as 30 [199]; many researchers generally agree that 15-20 interviews are robust enough for validity purposes. I used a conservative size of 20 as a guide for the IDI sample size, but my focus was also on collecting data until no new information was being provided (saturation was reached earlier but I continued sampling until 21 to see whether any further perspectives may be obtained). The FGD sample size was determined by the groupings of my sampling characteristics¹².

¹² In FGDs 1 and 2, I collected respondents' socio-demographic details at the end of the interview as opposed to the beginning (recommended by a literature source) and I discovered that two women were slightly above and slightly below their respective age-groups. I changed my approach and started collecting these details before the start of the discussion to ascertain eligibility. One respondent in the 15-19 rural FGD said she was 14 years, but this may have been an underestimation as she looked around 16-17 years. Her data did not contribute to the findings since she was below the age requirement (she only spoke in four instances during the FGD. In two instances, she mentioned something that was also echoed by other respondents, hence this contributed to the data. In the other

I used my judgement to determine what an appropriate sample size would be for the family interviews - roughly half of the IDI sample size (based on when I observed that saturation had been reached for many categories in the IDIs).

As described above, the sampling grid for the IDIs was modified using information learnt during the fieldwork on sampling and morbidity classification. In addition, a new category was introduced in the quotas- “special interest.” This comprised of women from any demographic group which had specific characteristics or particular morbidities (for example, experienced a morbidity that I was coming across for the first time in the fieldwork or a morbidity of public health importance). Another change made is that a general quota of three was used for the 15-19 demographic group because it was very difficult to find eligible educated women who are between 15-19 years. This is because educated 15-19 year olds are generally unmarried, hence ineligible. Therefore I sampled anyone who met the eligibility criteria in this demographic group regardless of educational level. At the beginning of the IDIs, I sampled whoever was eligible, keeping track of who was being interviewed. After 11 IDIs, I formally checked the sub-groups of women interviewed. The completed IDI and FGD sampling grids are shown in Tables 4.1 and 4.2 below.

Table 4. 1: Completed IDI sampling grid¹³

	15-19 years	20-34 years	35- 49 years
Educated	3	3	2
Minimal or no education		3	3
Special interest (primarily by morbidity status)	7		
	Total number of IDIs: 21		

two instances, she spoke in Fulfulde and it is not clear whether the information was relevant to the research’s focus or not).

¹³ Morbidity status was a primary criterion even though it is not explicitly shown in this completed version of the sampling grid. I also kept a tally for morbidities and made modifications using information learnt during the fieldwork.

Table 4. 2: Completed FGD sampling grid

	Aged 15-19yrs	Aged 20-34 yrs	Aged 35+ yrs
Urban	1	1	1
Rural	1	1	1
	Additional FGD with educated women in the 20-34 age bracket: 1 Total number of FGDs: 7 Total number of respondents: 44		

The family interviews were comprised of a subset of IDI respondents and relevant members of their families who played key roles in their maternal experiences, including co-wives, husbands or other females in their social circles. I used the interviews with primary respondents to determine whether a family interview was necessary (based on the women's morbidity experiences and/or household factors) and which secondary respondents to include. For example, one respondent's co-wife usually serves as her birth attendant (she delivered her last baby) and also advised her during pregnancy on treatment regimen; it was therefore important to conduct a family interview here and explore care-seeking in this household. In another case, the respondent had eclampsia around delivery and was unconscious; therefore I included her mother in the family interview as she witnessed these morbidity events and could therefore provide reports. Ten family interviews were conducted in total, with a range of 1-5 individuals participating (excluding the primary respondent).

4.2.3.3 Identification of Respondents and Recruitment

Respondents were recruited through four main community entry points: the Women's Development Centre; community liaisons; snowball sampling; and my own networks (see Table 4.3). The Women's Development Centre is a community centre which aims to empower women in Yola by teaching them craft skills. Women who attend these sessions generally have minimal or no education and lived in Yola

South. The Head of the Centre introduced me to the women on one of their meeting days. I informed all the women at the Centre about the study, described the eligibility criteria and invited eligible women to participate. The community liaisons, on the other hand, were knowledgeable residents who had been living in their respective communities, knew the communities well and were known and trusted by community members. They included community elders and an NGO worker. They were asked to identify and recruit eligible women for FGDs and IDIs; where possible I visited the respondents' houses with the community liaisons. Snowball sampling was used to recruit women who had experienced morbidities. Sometimes respondents spontaneously suggested their friends who they believed had very relevant experiences to the study's focus; other times I inquired if they knew any eligible women. I grew up and lived in the study area for many years; hence I also recruited some respondents through my own social networks. Using these methods, I ended up sampling respondents from 11 out of the 22 wards in Yola.

Table 4. 3: Break-down of respondent recruitment

	Recruitment route	Number of respondents
FGDs	Women's Development Centre	2 FGDs
	Community liaisons	4 FGDs
	My networks and snowball sampling	1 FGD
IDIs	Women's Development Centre	1 woman (respondent originally recruited for an FGD but could not attend)
	Community liaisons	9 women
	Snowball sampling	6 women
	My networks	5 women

4.2.4 Data Collection

4.2.4.1 Data Collection Schedule

The FGDs were conducted between December 2015 and January 2016 and the IDIs and family interviews between February to June 2016. On average, the FGDs lasted one hour, the IDIs 45 minutes and the family interviews 30 minutes. The IDIs ranged from 17 minutes to about an hour. The short IDIs were because the respondent had no or few morbidities to describe, and in one case because the respondent had been unconscious due to eclampsia and could not provide a detailed account. One FGD or 1-2 IDIs were conducted per day. Where possible family interviews were carried out at later dates from the date of the primary IDI to enable me to perform preliminary analysis on the primary respondent's data. This was not possible in two cases because of distance to the respondent's house and the availability of the husband for interview.

4.2.4.2 Data Collection Setting

Four FGDs were conducted in one of the respondents' homes, two at the Women's Development Centre and one in a community liaison's home. All the IDIs and family interviews were conducted in the respondents' home, except one IDI which was carried out at the respondent's workplace – a school. In eight out of 10 of the family interviews, the primary respondents were present; in two cases the respondents had child care or domestic chores to attend to. I conducted all the interviews and moderated all the FGDs. A note-taker was used in the initial FGDs, but was away when later ones were conducted and I felt experienced enough to handle the FGDs alone.

4.2.4.3 Languages Used and Translation

All sessions were conducted in English or Hausa (the conventional and most widely spoken language in Northern Nigeria). To ascertain colloquial coherence and completeness, I translated the qualitative topic guides into Hausa and discussed key words and synonyms with other bilingual individuals, including medical professionals, to reach consensus on the best terminologies to use. I did not use translators since I am bilingual, except in three IDIs where a respondent's relative or

a community liaison served as Fulfulde translators for all or part of the interview. While translating during transcription, I tried as much as possible to maintain the respondent's verbatim words, discussion style and speech.

4.2.4.4 The Topic Guides

In all interviews, semi-structured topic guides were utilised (Appendix 4.1). The content of the topic guides was devised based on my research questions and through consultation with relevant literature and my supervisors. The topic guides were structured in a chronologic fashion- questions on pregnancy then delivery and finally postpartum questions. Pre-specified probes were included, but spontaneous probes were also used. The questions in the FGD and IDI topic guides can be divided into seven parts:

- 'Mapping' questions [200]: These were broad overarching questions that gave a 'snap-shot' or 'scope' of the respondents' perspectives (FGDs) or experiences (IDIs). For example, *"In general, how was your health after you gave birth?"*
- Questions exploring 'normal' vs difficult' pregnancy: Respondents were asked what they thought a normal and a difficult pregnancy were.
- Questions that required spontaneous listing of morbidities: In the FGDs, women were asked to list all the illnesses or health problems that can affect a woman during pregnancy, delivery and postpartum. In the IDIs, they were asked whether they experienced any illnesses or health problems in these periods and to report them.
- Follow-up questions based on the spontaneous listing above: In the FGDs, these included what the women thought were the most common ones, the most serious, the causes, consequences and treatments for the morbidities listed. Follow-up questions in the IDIs included how the woman discovered the morbidity, whether or not she thought it was normal, what she thought

caused it, whether or not she sought a treatment or solution (if she did- what and why), and how the morbidity impacted her.

- Specific questions on the three morbidities of interest: These explored perceptions of vomiting, prolonged labour and bleeding. Most questions here were very specific to each morbidity but general questions were also asked.
- Questions on lay networks: The respondents were asked about useful sources of advice (FGDs) or people they consulted during a morbidity episode (IDIs) and why.
- Questions exploring morbidities that are important to women: These included the ranking exercise in the FGDs and the ‘worst morbidities that can happen’ question in the IDIs (more information in Section 4.3.6).

The family interview topic guide included follow-up questions on issues that arose from the primary respondent’s interview. It also contained pre-specified questions on care-seeking, that is, on illnesses or health problems that the family would manage at home and the ones they would seek care for outside the home during pregnancy, delivery and postpartum (follow-up questions included why these morbidities and how they were managed). A shorter topic guide was used for the family interviews compared to the ones for IDIs and FGDs, since the former only explored some aspects of the research focus.

Prior to my fieldwork in Nigeria, I conducted a pre-pilot study to pretest the interview topic guide for comprehension and length with Nigerian women residing in the UK who had given birth within the past one year; further information can be found in Appendix 4.2. When I travelled to Nigeria for the fieldwork, I also had informal interviews with five health professionals (three doctors, one midwife and one nurse) working in public and/or private hospitals in Yola before commencing data collection. These interviews were conducted to obtain important exploratory information and did not contribute to the ‘main’ data of the PhD. In addition, I do not have formal medical training and these interviews were a necessary extension of

my prior readings on obstetrics from medical literature. The areas covered and lessons learnt from these preliminary interviews have been summarised in Appendix 4.3.

4.2.4.5 Data Collection Facilitation Techniques

Probes, verbal and non-verbal, were used to elicit more information from participants [200, 201]. Enabling techniques, which refer “to a number of techniques for stimulating thinking and self-expression, and thus ‘enabling’ participants to reflect and discuss the research topic further and more deeply,” were also used to help access views that are difficult to verbalise [202]. The following enabling techniques were used:

- **Visual representations of phenomena:** 500mL and 1,000mL bottles were carried to enable respondents to estimate the amount of blood they lost during and after delivery.
- **Vignette:** This was used to explore perceptions of and care-seeking for prolonged labour in the FGDs. A prolonged labour scenario was given and then respondents were asked what the fictitious woman will most likely do in that situation.
- **Free listing:** Respondents were asked to list illnesses and health problems (as described in Section 4.2.4.4).
- **Ranking exercise:** To find out the morbidities that are important to FGD respondents, the women were asked to rank a list of seven morbidities in order of decreasing severity (more information in Section 4.3.6).
- **Specific examples:** Respondents were also sometimes asked to give specific examples when they reported certain experiences.

4.2.4.6 Changes Made to Data Collection Methods

The topic guides (for FGDs and IDIs) and data collection methods were modified during the course of the study to reflect new lessons learnt in previous sessions and to also optimise responses. Examples of changes made during the FGDs include:

- The vignette was removed and replaced with a set of direct questions. This was because the women generally ignored the fictitious story and then reported their own or others' experiences. Hence direct questions on prolonged labour were deemed more appropriate.
- In the ranking exercise, I discovered that the women had limited knowledge of postpartum depression and sepsis. Thus I provided more descriptions/symptoms of these morbidities when explaining the exercise.
- In the topic guide section on lay networks, respondents kept mentioning "doctor" and "hospital" as the appropriate/ useful source of advice. In subsequent FGDs, I included "... *apart from the doctor, nurse and other hospital staff*" to the question.
- Hausa words that conveyed 'better' meanings for certain words on the topic guides were discovered after the first few sessions and were used.

Examples of changes made during the IDIs include:

- Initially, I planned to only probe on morbidities of "public health importance." However, after conducting the FGDs and few IDIs and finding out that some morbidities which women consider important may not necessarily be of public health importance, I removed this initial clause.
- The 500mL and 1,000mL bottles shown (for estimating haemorrhage) during the FGDs and in some IDIs were not shown in subsequent IDIs. Some women were not very sure of their bottle estimations and instead voluntarily provided other methods they used to quantify/discern their blood loss.

- At the later stages of the IDIs (up to the quantitative phase of the PhD), the eligibility criteria for marital union was changed from “married (that is, currently married)” to “currently married, or married before baby was born even though not currently married.” In one of the last IDIs conducted, I saw how maternal morbidity could break marriages and destabilise social structures. Hence I decided to include this demographic group in order not to lose ‘good’ data on such experiences.

4.2.4.7 Recording

All sessions were audio-recorded. Data, including observations, were also recorded using field notes. Detailed field notes were taken shortly after the sessions to maximise recall; they were not taken during data collection in order to maintain focus and flow of the discussion. Areas addressed in the field notes included key points from the session, themes emerging, changes made to the methods, dynamics observed, the atmosphere, comparison and contrast between respondents, limitations, reflexivity, areas needing more clarity, and miscellaneous thoughts [201-204]. Follow-up calls or sessions were carried out with a quarter of the respondents at later days to clarify unclear areas or to acquire further information.

4.2.5 Data Analysis and Management

4.2.5.1 Transcription

All FGD and IDI data were transcribed verbatim in English; the family interview data were analysed directly from the audio-recordings (more information in Section 4.2.5.5). I transcribed all the FGD data and more than half of the IDIs; I hired transcriptionists for the remaining IDIs to maximize time. However, I double-checked each outsourced transcript line-by-line against the audio-recording to ascertain completeness and validity. The transcription was done in tandem with the data collection. The audio-recordings were stored on my personal computer and dictaphone, except when I gave them to the transcriptionists.

Certain strategies were employed to facilitate the transcription process. At the beginning of FGDs, respondents were asked to say their names, their favourite food and the reason why they like it to make recognition of their voices easier during transcription. I also wrote down their names according to their sitting arrangement so as “to-put-a-face-to-the-voice.” In addition, I used Express Scribe (NCH Software) [205] and a foot-pedal to facilitate the transcription process.

Non-verbal communication (such as laughs and gestures) and incomplete sentences/ words were included in the transcripts as much as possible. Words that respondents stressed were also emphasised using capital letters, italics, repetitions and exclamation marks depending on the context. Hausa expressions that “added value” to the context or deepened meanings were retained in the transcripts as much as possible. For incomprehensible areas in the audio recording, I made several attempts to decipher what was said. If I was able to understand what was said to a reasonable degree, but without 100% certainty, I enclosed the data segment within brackets and put a question mark at the end of the probable statement. If I was unsuccessful in deciphering what was said after several attempts, I put “(incomprehensible)” at the point where it occurred.

The transcription was conducted in such a way that it went beyond generation of verbatim accounts to interpretation, that is, sometimes I would pause and write notes on themes/observations from the data while transcribing. Thus I used the transcription process as part of my analysis. For the outsourced transcripts, going through each one line-by-line against the audio-recording ensured that I also sustained the transcription process as part of the analysis.

4.2.5.2 Method of Analysis

Data were analysed using thematic analysis, a method which “involves discovering, interpreting and reporting patterns and clusters of meaning within the data” [206]. The thematic analysis was primarily informed by Braun and Clarke (2006) [207]. The analysis commenced as soon as the data collection began, where I started to

observe patterns/themes and recorded them in field notes. This process continued throughout data collection and transcription. As I was the person who collected the data and did most of the transcription, I was fully immersed in the data prior to analysis.

Analysis was conducted at both a semantic and latent level [207]. At the semantic level, I identified codes/categories/themes from the surface or explicit level without going beyond what a respondent had said. At the latent level, I looked beyond the surface content of the data in order to unpick underlying assumptions, conceptualisations and ideas.

4.2.5.3 Coding Process and Structure

Braun and Clarke (2006) [207] outline two approaches to coding: *deductive/theoretical* ('top-down way') where coding tends "to be driven by the researcher's theoretical or analytic interest in the area, and is thus more explicitly analyst-driven;" and *inductive* ('bottom-up way'), "a process of coding the data without trying to fit it into a pre-existing coding frame, or the researcher's analytic preconceptions ...[and] is data-driven" [207]. I adopted both approaches. A deductive approach was necessary because it allowed me to code for "a quite specific research question" as opposed to letting the "specific research question ... [to] evolve through the coding process" [207], making it an efficient option. I also used an inductive approach because I was interested in exploring unanticipated themes.

During the analysis of the pre-pilot study (Appendix 4.2), I used inductive codes to develop a coding tree in NVivo 10 (QSR International) [208]. This coding tree was used as a base for the FGD coding tree, with the addition of inductive codes that emerged from the data. I developed another coding tree for the IDI data using the FGD tree as reference. Each tree had two hierarchical levels at the onset but these eventually became five because of the inductive codes. An excerpt of codes showing all five levels- relating to the perceived causes of high blood pressure during

pregnancy- can be seen in Appendix 4.4 (the data from both FGDs and IDIs have been combined, hence there are some repetitions of codes).

Each transcript was printed out and then semantic and latent codes were generated; the semantic codes reflected the NVivo coding trees. The entire data set was coded line-by-line to maximise completeness. The codes were then transferred from the hard-copy transcripts into NVivo (I found that I coded more comprehensively, thoughtfully and within context when I used pen and paper, but I also wanted the flexibility and organisation that NVivo provides). Annotations and observations were also documented during the analysis.

4.2.5.4 Identification of Categories and Themes

The codes generated were collapsed into categories (Appendix 4.5). The categories were then collapsed into themes, or occasionally, they were retained as categories if sufficiently small. Patterns were searched for within and between categories.

4.2.5.5 Analysis of Family Interviews

Qualitative research analysis is labour-intensive and time-consuming. Researchers have explored different ways to make the process more efficient without compromising validity. Some researchers have argued that transcribing qualitative data may not always be necessary and have proposed alternative ways to manage qualitative data [204, 209, 210]. I explored more efficient ways to analyse the family interviews without transcription [203, 204, 209-211] and I then modified some aspects of these methods. This entailed analysing the data directly from the audio recording and also writing detailed notes where necessary. I used one central Microsoft Word document to compile all findings from the family interviews. The analysis was conducted in tandem with the data collection. The method is described below:

- A coding outline, consisting of pre-specified categories/sub-categories, was designed in Microsoft Word.

- The audio recording was listened to from the beginning to the end, pausing every few seconds or 1-2 minutes intervals (depending on the density of the information spoken) to take notes. Sometimes, the recording was rewound or forwarded to get the context of the data. Sometimes, segments were listened to several times to increase validity. Hard-copy notes were made for each family interview.
- The notes from the recordings were then transferred into the coding outline in Microsoft Word. Additional coding categories were formed as the data increased.
- The audio-recording was then listened to a second-time from the beginning to the end while double-checking the coding outline in Microsoft Word. The recording was paused and modifications were made where necessary.
- The processes above were repeated for the next family interview until all family interviews were analysed.
- The central document was then printed out and further analysis conducted.

4.2.6 Reflexivity and Positionality

Throughout my fieldwork, I was conscious of my position as both a researcher and a Yola native. My status as a local had numerous benefits: I had tremendous access to communities; I enjoyed a ‘natural’ acceptance due to my fluency in Hausa and conservative attire; and the respondents were also very open and spoke freely with me. I like to assume that these benefits had positive rather than negative impacts on the fieldwork and data in ways that I may not easily quantify.

In spite of being a native, however, I experienced some difficulties in expressing certain words/phrases in Hausa. English has always been the language of instruction throughout my education and I have used Hausa for academic and professional purposes in a limited capacity. Vetting key terms with other bilingual individuals, spontaneous filling-in-the-blanks or provision of alternative explanations by the respondents or community liaisons were helpful in these few instances.

While respondents may have been aware of my roots in Yola, I wonder if a few of them may have also viewed me as a healthcare professional, perhaps, due to the medical focus of the topic. I remember two specific instances where respondents posed medical questions to me: a respondent's mother-in-law (who participated in the family interviews) asked about diabetes and another respondent asked about family planning. I was faced with a dilemma: meet my respondents' need for knowledge and perhaps 'overstep' my boundaries as a researcher, or hold back to maintain 'neutrality' and then turn down an opportunity to help. While I may have tried to give general information, I also reasoned that it was not in my place to give professional advice; hence I referred them to local services. These incidences made me to realise that consciously or unconsciously, respondents could make assumptions about our positions as researchers. While it may be difficult to gauge the extent to which their assumptions could have impacted their interview responses, the data they provided do not suggest bias.

Maternal morbidity is a topic with substantial grounding in the medical field and I was aware of my position as a researcher with non-medical training. I tried to compensate for this limitation by reading medical literature on maternal health in the earlier and middle stages of my PhD, as well as conducting preliminary interviews with healthcare professionals before commencing data collection. While these efforts paid off, I acknowledge that they do not completely address the medical training limitation. On the other hand, however, my position as an 'outsider' in the medical field may have enabled me to hear and view respondents' perspectives from an anthropological rather than a 'medicalised' angle. One aspect of the PhD involved exploring perceptions and this 'medical neutrality' may have been a valuable advantage.

In general, qualitative research acknowledges that it is impossible for researchers to detach themselves completely from the research process or product [212-218]. One particular interview- with a respondent who had become blind following maternal

complications- was very difficult for me. It felt as though my position as a human being with feelings superseded my role as a researcher. The sight of the respondent as soon as I entered her compound evoked emotions in me and I felt somewhat nervous and inexperienced to handle the interview. I was also worried that I may ask insensitive questions mistakenly; hence I was very conscious of my words during the interview. I ended up skipping some of the questions on the topic guide. However, after analysing her transcript, I saw the gaps and areas that needed clarification. I eventually conducted a follow-up interview with this respondent. This time around, I felt quite confident and comfortable and I successfully obtained the necessary information.

4.3 Results

4.3.1 Structure of the Results Section

I will start by describing the participant population and then proceed to report the findings within six themes: understanding perceptions of maternal morbidity (foundational perspectives); normal vs abnormal morbidities; comparisons to self and other women; morbidities that are important to women; perceived causes of morbidities; and lastly, impacts of morbidities. The sub-themes will be presented at the beginning of each theme. In general, I left quotes in their raw unedited forms but I did light editing occasionally to aid comprehension. I used pseudonyms in respondents' quotes.

4.3.2 Participant Population

Seven FGDs (with a cumulative total of 44 women), 21 IDIs and 10 family interviews were conducted. Tables 4.4, 4.5 and 4.6 summarise the socio-demographic characteristics and basic obstetric history of the respondents. The FGD respondents' ages ranged from 15- 48 years, 34 out of 44 had no/primary education, and 41 out of 44 respondents delivered vaginally in their last births. Place of delivery was varied, with some respondents giving birth in health facilities and others at home (Table 4.4).

The IDI respondents' ages ranged from 16- 40 years. 11 out of 21 IDI respondents lived in rural areas, 14 had minimal or no education, 16 had vaginal deliveries in their last births and eight had home deliveries (Table 4.5). The family interviews were conducted with co-wives, husbands or other females in the women's social circles who played significant roles in their maternal health phase. Six households were located in rural areas and four households were in urban areas (Table 4.6). The households were mainly of low socio-economic status; one household was middle-class and another household was upper middle-class (based on visual examination of the type of accommodation, household assets seen around, the area where the house was situated, and the socio-demographic data of the respondent).

Table 4. 4: Summary of FGD respondents' socio-demographic details and obstetric history (total number of FGDs= 7; range of participants in FGDs= 5-8; total number of participants in all FGDs= 44)

S/N	Age-group	Total number of respondents	Residence	Highest educational level ¹⁴	Occupation ¹⁵	Religion	Number of living children (range)	Mode of delivery	Place of delivery
FGD 1	20-34 years	8	Urban	No education: 4 Primary: 2 Secondary: 1 Post-secondary diploma: 1	House-wife: 4 Petty business (tailoring, trading, knitting): 4	All Islam	3-7	All vaginal	Not collected
FGD 2	35-49 years	6	Urban	No education: 3 Primary: 3	All petty business (trading and/or knitting)	All Islam	4-9	All vaginal	Home: 1 Health facility: 5
FGD 3	15-19 years	5	Urban	No education: 2 Primary: 1 Post-secondary diploma: 2	House-wife: 1 Petty business (trading): 2 Student: 2	All Islam	1-3	All vaginal	Home: 1 Health facility: 4
FGD 4	20-34 years	5	Urban	Bachelors: 4 Masters: 1	Applicants: 2 Civil servants: 3	All Christianity	1-2	Vaginal: 2 C-section: 3	All health facility
FGD 5	20-34 years	7	Rural	No education: 2 Primary: 4 Secondary: 1	House-wife: 5 Animal farmer: 2	Islam: 6 Christianity: 1	1-9	All vaginal	Home: 2 Health facility: 5
FGD 6	35-49 years	8	Rural	No education: 4 Primary: 4	House-wife: 1 Traditional healer (also a hair-dresser): 1 Petty business (threshing, trading): 2 Farmer: 4	Islam: 4 Christianity: 4	6-10	All vaginal	Home: 4 Health facility: 4
FGD 7	15-19 years	5	Rural	All had no education	House-wife: 4 Petty business (trading): 1	All Islam	1 child each	All vaginal	Home: 3 Health facility: 2

¹⁴ This includes women who only had some years of education in the respective category and those who completed it.

¹⁵ House-wife or unemployed

Table 4. 5: Summary of IDI respondents' socio-demographic details and obstetric history (total number of IDIs= 21)

Socio-demographic or obstetric detail	Number of respondents
Age (years)¹⁶	
15-19	3
20-34	12
35-49	6
Residence	
Rural	11
Urban	10
Highest educational level	
None	8
Primary	2
Secondary	4
Post-secondary diploma	2
Bachelors and above	5
Occupation	
House-wife	11
Petty business (poultry, trading, tailoring, knitting, parboiling rice)	4
Private school staff	1
Civil servant	3
Professional (lawyer, int'l NGO worker)	2
Religion	
Islam	12
Christianity	9
Type of marital union	
Monogamous	16
Polygamous	5
Number of living children	
1	4
2	6
3	3
4	4
5 and above	4
Gestational age at last pregnancy discovery	
≤1 month	10
>1 month but <3 months	4
≥3 months	4
Others ¹⁷	3
Place of last delivery	
Health facility	13
Home	8
Mode of last delivery	
Vaginal	17
C-section	4

¹⁶ Three respondents didn't know their ages and gave an approximation, but I think they underestimated their ages by about 5-9 years (based on their obstetric history and physical features).

¹⁷ This includes gestational ages that do not fit into the three categories- "*before two months*", "*after 1 month*" and "*don't know*."

Table 4. 6: Description of family interview respondents' household (total number of family interviews= 10; range of individuals in the family interviews excluding the primary respondent= 1-5)

Socio-demographic detail	Number of households
Primary respondent's age group (years)	
15-19	2
20-34	4
35-49	4
Residence	
Rural	6
Urban	4
Socio-economic status of household	
Low	8
Middle	1
Upper-middle	1
Family members present (excluding the primary respondent)	
Mother	1
Neighbour	1
Step mother-in-law	1
Husband's younger brother's wife	1
Co-wife ¹⁸	1
Co-wives and other females ¹⁹	2
Husband	3

4.3.3 Understanding Perceptions of Maternal Morbidity: Foundational Perspectives

To explore women's perceptions of morbidities, it was first of all important to find out how they define a 'normal pregnancy' and a 'difficult pregnancy.' I asked respondents what they thought these two terms mean in order to obtain contextual information and to also see whether morbidity was salient in their perceptions. This foundational question ended up generating significant information about how women view, define, describe and label morbidities and their severities. Four sub-themes emerged with respect to definitions of normal vs difficult pregnancy: morbidity status; extent of disruption to normal everyday life and/or functions; extent of

¹⁸ In this interview, two neighbours stopped by briefly, contributed a little but eventually left.

¹⁹ In one family interview, the "other females" included the mother-in-law and also the two wives of the primary respondent's brother-in-law. In the other interview, this included the primary respondent's step-daughter. In the latter interview, a neighbour stopped by briefly, contributed a little but eventually left.

satisfaction/contentment with the pregnancy; and reports received from authoritative sources.

A. Morbidity status

This was by far the most dominant sub-theme on this topic; all FGD groups and 20 out of the 21 IDI respondents used morbidity status to label a pregnancy as normal or difficult. Normal pregnancies were viewed as being pregnancies that were morbidity free. The most frequently reported conditions that the women used to classify a pregnancy as difficult included vomiting, inability to eat, insufficient blood, spitting, malaria, headaches and body pains. For some women, single morbidity episodes were considered normal but multiple or long-lasting ones were seen as difficult. Thus a difficult pregnancy is one in which “*you’re not well today, you’re not well tomorrow...every day is like that.*” Pregnancies requiring hospitalisation, frequent visits to a caregiver, or necessitating receipt of medical interventions like injections and drips “*right from the beginning [of the pregnancy] to the end of it*” were also always considered difficult. The following quotes demonstrate these perceptions:

Respondent: *Difficult pregnancy is like the [one] I laid in the hospital for about 3 weeks, sincerely some [pregnancies] are stressful (IDI 7).*

Interviewer: *Now baby boy’s pregnancy, do you think it was a normal pregnancy or a difficult pregnancy?*

Translator: *It came with difficulty.*

Interviewer: *OK, why does she think it came with difficulty, like why did she say it was difficult?*

Translator: *It’s not normal. The first time she went to the hospital, she was transfused with 3 pints of blood. That is why she is saying that this pregnancy is not normal (IDI 21).*

Respondent:... *[My friend] said whenever she was pregnant, for three months, she would not eat. So such persons will have to be on hospital bed, they will be giving them infusions and what a view. That person will come out to say it was a difficult pregnancy because you have to stay- and there are some people, for the whole of the 8-9 months, they are in the hospital (IDI 18).*

Although women defined normal and difficult in relation to morbidities, a few women articulated that normal pregnancies do come with some health challenges.

One respondent asserted that pregnancy is not quite “*glossy as people term it*” and defined difficult as being different from others: “*normal pregnancy doesn’t mean there was absence of morning sickness and other little, little inconveniences here and there. But it just meant that it’s what is common across board for many people*” (IDI 16). Another respondent put it nicely by saying, “*normally when you are pregnant, you are not your normal self*” (IDI 18). The definition of normal vs difficult pregnancy was also seen as something that is fluid *over time*, as a woman could have a morbidity at an early stage but become normal later; and also fluid *at one point in time*, as a woman could have it easy/normal in one area but have it difficult in another area. A few women felt that it was not possible to define pregnancies as normal nor difficult as every woman and pregnancy is “*unique in its own way*” hence “*you won’t, compare your first experience and your second experience to be the same thing*” (IDI 8) because “*no two are the same*” (IDI 6).

B. Extent of disruption to normal everyday life, activities and/or functions

A number of respondents considered how the pregnancy impacted their normal, everyday lives or how it affected their abilities to perform routine activities and functions. If minimal or no disruption was experienced, then the pregnancy is termed normal. Six areas of life emerged from their reports, and in many cases, morbidity was still an underlying factor influencing whether or not these areas of life were disrupted:

- Physical life- covered the extent of being active, whether the woman could carry out chores and whether she was dependent on others to perform tasks for her. This was prominently considered.
- Nutritional life- was also another prominent area and it had to do with a pregnant woman’s ability to eat, that is, not vomiting after eating, having a good appetite, not having cravings and being well-nourished.
- Social life- pertained to whether or not the woman was able to mingle with others and stay comfortable within social settings.
- Emotional life- had to do with emotions expressed by the woman during the pregnancy and whether or not she had a change in behaviour; it was mentioned in relation to difficult pregnancy.

- Marital life- had to do with whether she received any negative comments from her husband because of the pregnancy.
- Professional life- covered whether the pregnancy had a negative impact on her job.

The following quotes demonstrate women's perceptions of normal vs difficult pregnancies with respect to these six areas of life:

Physical life

Interviewer: ... So you feel his pregnancy was normal or difficult?

Respondent: Normal. Normal. Not difficult.

Interviewer: Okay. And why did you say it's normal?

Respondent: Because I do almost everything myself (IDI 17).

Respondent:...In fact I was up and doing, not until when I was even six months that it was very obvious I was pregnant (IDI 8).

Respondent:... You're able to do every work in your house and you don't need someone to do it for you (IDI 15).

Nutritional

Fatima: Normal pregnancy, everything is normal, you can eat everything

Unidentified: Yes

Fatima: You can eat whatever you find, you just have peace of mind.

Isatu: No vomiting, nothing, (not being disgusted by food?)

Fatima: That's the normal one ...

Interviewer: And then the difficult one is the one you talked about-

Amina: Yes. It's not every food one can eat. Today you're not well, tomorrow you're not well-

Fatima: You just have to be selective; it's not just any type you can eat

Amina: You see, someone just has to say it's difficult (FGD 3).

Asabe: They'll cook kuka soup and then you'll say you don't want kuka soup, only yakuwa soup. They'll cook yakuwa soup and then you'll say you don't want the one cooked with palm oil, only the one cooked with potash (FGD 7).

Social

Respondent: ...Like I didn't have issues with all these spitting... Like I didn't have so many issues with it. It didn't make me uncomfortable to the

extent that I couldn't stay in the midst of people...Yes, interaction, it didn't affect me too. And a lot of things that I used to do, I still did them (IDI 6).

Emotional

Respondent:...*There are some who couldn't stand their home, they could not stand their normal environment, their own homes. I had a friend, when she was pregnant, she hated her home, that her home stank to her...It was stinking. So, the place she could stay was her sister-in-law's house. So the husband had to take her to her sister-in-law's place ... She didn't even really like her daughter, her second pregnancy, she didn't like her first daughter, the first baby they had, she was pregnant with the second daughter. So you could hear all manner of things (IDI 6).*

Marital

Rachel: *Not feeling well, not feeling well. You're just there until your husband comes and says "I'm even tired of treating you and this pregnancy. You're always having issues, always having issues" (laughs) (FGD 6).*

Professional

Respondent:...*I was not actually fine during the pregnancy. And there was something that usually occur throughout that pregnancy- needing to go to the restroom frequently, especially in the mornings ... Sometimes you will finish preparing for work and then you'll have to just like, "please I'm sorry, I'm coming, I'm coming, I'm coming... You'll go to the washroom this time, you'll go again and all that. It really even affected my work because I kept coming late to work. I got a reprimand (IDI 18).*

C. Extent of satisfaction/contentment with the pregnancy

A normal pregnancy happens at the right time, which the women defined as *"the pregnancy came when you've already weaned your baby, then you become pregnant again"* (FGD 5). In the FGD where this was mentioned, women said becoming pregnant while having a suckling child is difficult because it can become overwhelming for a woman when lumped with other issues in her life during pregnancy. In addition to happening at the right time, some FGD groups and IDI respondents' views demonstrated that a normal pregnancy also has a happy ending; this means having a quick labour or having an easy, short or non-problematic delivery. Positive phrases were also used to describe a normal pregnancy. These included having cause to say *"praise be to God," "usually feel very fine," "usually*

happy,” “didn’t give me tough time,” “[you] have peace of mind,” “was easy,” “feeling my body safe” and “there was nothing...like suffering.” In contrast, a difficult pregnancy is described as *“[having] no peace of mind,” “wasn’t enjoyable,” “you will not enjoy your body,”* and *“you suffered.”*

D. Reports received from authoritative sources

Respondents used feedback from authoritative sources to gauge whether a pregnancy was normal or difficult. Thus in a normal pregnancy, medical professionals would confirm that both the woman and her baby are doing fine health-wise during antenatal check-ups.

4.3.4 Normal vs Abnormal Morbidities

The discourse on normal vs difficult pregnancy provided insightful information on women’s perceptions of morbidities. After gaining spontaneous responses to perceptions of normal and difficult pregnancies, I further explored how women labelled morbidities, particularly, whether they labelled certain morbidities as normal and others as abnormal. The results showed that abnormal morbidities are those which are: i) long lasting ii) not common iii) perceived as symptoms of more serious problems iv) remedied by ‘unnatural’ medical interventions (usually around delivery). These four factors were generally in line with the women’s perceptions of morbidities in the preceding section.

Firstly, morbidities characterised by extended time (prolonged labour and delayed placental expulsion) were perceived as abnormal. In general, a morbidity was perceived to have a length threshold for normality (which could vary from woman to woman) and once it exceeded this threshold, then it was abnormal. Secondly, there was a fairly general perception that what is common is normal. In other words, what is normal is *“something that happens to several people and when they experience the same-, when they’re under the same condition”* (FGD 4). To the respondents, the difference is just the fact that some women may experience these normal conditions

at more severe spectrums than others. Conditions that were listed as common in a free-listing exercise included vomiting, headache, leg pain, '*kasala*' (the tendency to not want to work, the body being too relaxed, body heaviness), body weakness, excessive sleeping, abdominal pain, fever, frequent urination, high blood pressure, spitting, inability to eat and malaria.

Morbidities perceived as symptoms of more serious problems were also thought to be abnormal. For example, bleeding during pregnancy is abnormal because it "*signals something very terrible*" and also "*a woman who is pregnant should not be bleeding.*" Although considered morbidities, symptoms of pain (e.g. headache, backache, abdominal pain) were generally seen as normal, but, if the pain was perceived as a potential symptom of 'more serious' morbidities, then they were considered abnormal. For example, headache is normal in pregnancy, but the headache accompanying high blood pressure is not.

Lastly, if a procedure is perceived as necessary or inevitable, then it is perceived as normal. But if the procedure is seen as something deviating from the norm or standard way, then it is abnormal. Therefore a C-section is not normal because delivery is supposed to be natural/vaginal. However, a procedure such as episiotomy is seen as normal because "*it's just necessary that it has to be done [sometimes]*" such as when "*you sight that the baby is too big.*" In addition, "*it's even better they cut you than for it to tear*" because "*if they don't do the addition and then it does the addition by itself (tears), it will bring problem that will be more than the one they should have done.*" Episiotomy was also perceived as the better option if someone is a primigravida, as supported by the respondent below when her birth attendant carried it out:

Respondent: *So normally they [maternity staff] don't waste time, I heard they don't waste time on primis like that, normally they know that- it's just maybe is it that they know that we would naturally need some tear or so. So they do it. They said it's better for them to insert it than to wait for the baby to come out forcefully make way, because that will tear us in different ways and then, but doing it themselves makes it easier or clean, because it's a directed something. They did it so (IDI 16).*

4.3.5 Comparisons to Self and Other Women

An important cross-cutting theme was that most judgements around morbidity, functioning and activity level were made by comparing an individual pregnancy with previous pregnancies or those of other women. The other pregnant women were either members of their social circles, fellow pregnant women attending antenatal care and/or ward-mates during hospitalisation episodes. If a woman has similar or better experiences compared to her previous pregnancies or compared to other pregnant women, then she has a normal pregnancy; a difficult pregnancy was the opposite of these observations. Respondents tended to use other women's extreme morbidities as comparators, thereby underplaying their own experiences to make themselves feel better. This tendency, however, did not prevent them from acknowledging that they also had issues. The following quotes demonstrate these observations:

Comparison to self

Respondent: *Well, his pregnancy, honestly, I've been delivering but I've never had an experience like I did for his own pregnancy, because I had leg problem and swollen legs, and I had never experienced it before... amongst all my children, he is the one who gave me tough time (IDI 15).*

Respondent: *Well, uhm, I would say that Elisa's pregnancy was very eventful, unlike that of John (her first child). My first pregnancy did not really give me much stress. But that of Elisa ... gave me more and I was not actually fine during the pregnancy (IDI 18).*

Comparison to others

Respondent: *But a difficult pregnancy could just mean, okay there were some things that were peculiar or unique to that pregnancy that is not common with other women (IDI 16).*

Respondent: *... [Mentioning an incident she saw while being hospitalised because of placenta praevia] One lady was just vomiting, vomiting, vomiting, she couldn't eat anything.*

Interviewer: *That's in the hospital?*

Respondent: *Yes, because in the gynae ward, all of them were pregnant, everyone. Then I said I thank God because I saw mine as different. Just vomiting and vomiting, no eating food, no drinking water, nothing, they just put drip on someone. Some people can stay until the pregnancy is about six months before they are able to eat food. So but in my own case I was eating everything. It was just the improper lie of the baby only, that was the problem and that was why they gave me bed rest to stay at one place. But*

apart from that, I would eat everything. Even when you see me with the people coming to greet, you might say they are the ones who are ill (both laugh) (IDI 7).

Taniyo: *Mine is, I feel my own is normal because there was no really much discomfort, only that urination aspect and the sleeping problem- I mean the sleeping posture problem. But- so I feel my own is better, at least it's normal, compared to other women. From what- compared to what I'm hearing from other women, you know, their own is discomfort of salivation, vomiting, some fainting and the rest. I feel mine is a bit normal (FGD 4).*

In addition, women who had 'weird morbidities' or 'weird experiences' tended to normalise them by reporting that they heard the same thing happened to such and such person or in such and such place, thereby making it evident that they were not the only ones. For example, one FGD respondent mentioned that she did not have any amniotic water at the time she was delivering and that "...I'm not the first person. Someone told me again that her sister had the same experience" (FDG 4). A teenage mother who had eclampsia even took this comparison tendency a big step further by comparing her experience to the wider, general population. Hence she reported that eclampsia is not normal "*because it doesn't happen to many people like that, it is only pregnant women that it sometimes occurs to*" (IDI 19).

4.3.6 Morbidities that are important to women

To find out about morbidities that are important to women, I used three avenues to explore their perceptions of severity of morbidities: a free-listing exercise; a ranking exercise; and a question on the 'worst morbidity that can happen' (all discussed in the next three sub-sections). In general, a similar set of morbidities was perceived as serious in all three methods (for example bleeding), which demonstrates triangulation. The free-listing exercise and 'worst morbidity' question generated additional serious morbidities that were not explored in the ranking exercise (such as high blood pressure, malaria and diabetes). The various techniques identified differences in perceptions between age and education/socio-demographic categories.

A. Free-listing exercise

In the FGDs, I asked respondents to list the most serious morbidities during pregnancy. Morbidities that were perceived as serious included abdominal pain,

bleeding, diabetes, fainting, headache, high blood pressure, inability to eat and malaria. Variations in responses were observed across socio-demographic groups. Educational level and age appeared to be the strongest factors that differentiated women with respect to perceptions of severity of morbidities. The educated women in FGD 4 were very knowledgeable about a broad range of morbidities and listed the most number amongst all FGD groups. The 35-49 year groups and the 20-34 year groups provided many perspectives that the 15-19 year olds did not. Only the educated women and also the women in the oldest age groups mentioned bleeding, high blood pressure, fainting and/or diabetes as the most serious morbidities. The teenage mothers reported morbidities associated with pain (abdominal pain and headache) as the most serious.

B. Ranking exercise

In the ranking exercise, I showed FGD respondents the pictures of seven postpartum morbidities (Appendix 4.6) and followed it up with explanations (that is, what they are and how they manifest). The seven morbidities were sepsis, perineal discomfort, mastitis, bleeding, backache, obstetric fistula and postpartum depression. Then I asked them to rank them in order of decreasing severity using whichever criteria they deemed fit. Table 4.7 shows the results of the ranking exercise, with #1 being the most severe morbidity and #7 being the least severe morbidity.

Table 4. 7: Results of the ranking exercise on severity of morbidities

	#1 Most severe	#2	#3	#4	#5	#6	#7 Least severe
FGD 1	Obstetric fistula	Mastitis	Backache	Bleeding	Perineal discomfort	Sepsis	Postpartum depression
FGD 2	Obstetric fistula	Bleeding	Mastitis	Postpartum depression	Sepsis	Backache	Perineal discomfort
FGD 3	Mastitis	Backache	Perineal discomfort	Bleeding	Obstetric fistula	Postpartum depression	Sepsis
FGD 4	Bleeding	Mastitis	Backache	Perineal discomfort	Postpartum depression	Obstetric fistula	Sepsis
FGD 5	Obstetric fistula	Bleeding	Mastitis	Perineal discomfort	Sepsis	Postpartum depression	Backache
FGD 6	Bleeding	Obstetric fistula	Mastitis	Postpartum depression	Perineal discomfort	Backache	Sepsis
FGD 7	Perineal discomfort	Mastitis	Backache	Postpartum depression	Obstetric fistula	Sepsis	Bleeding

Several criteria guided respondents' rankings including the morbidities' life-threatening potential, prevalence, whether or not they experienced it before, inhibition of chores, effects on the baby, social consequences, marital consequences and severity of pain. Variations were also observed in the criteria used across groups. For the two 15-19 year-old groups (FGDs 3 and 7) inhibition of chores appeared to be the factor considered the most important resulting in morbidities that caused discomfort such as mastitis and perineal discomfort being ranked highly. These two younger groups did not agree on the rank of bleeding, with group 7 ranking it last as they considered that "*blood usually comes out, no problem.*" The educated women's group (FGD 4) used prevalence as their criteria; therefore morbidities that occur frequently were given higher rank (e.g. bleeding and mastitis) while those which were very rare were given lesser rank (e.g. obstetric fistula and sepsis). Sepsis was perceived as uncommon as they felt many women are routinely given antibiotics after delivery. Overall knowledge about postpartum depression and sepsis was low amongst the young mothers and those with minimal or no education. The 15-19 year old urban respondents mentioned that they had never heard about postpartum depression or sepsis before. It is plausible that this may have influenced them to rank the morbidities low. Obstetric fistula was ranked as #1 or #2 in all the FGD groups, except those of the 15-19 year-olds and the educated women. The former groups perceived it as a serious morbidity since it has life-altering consequences. One respondent in FGD 6 nicely summarises the impact of obstetric fistula this way: "*The obstetric fistula. Ah, your vagina has no brake, is there health? (Laughter in group) There isn't!*"

C. 'Worst morbidity that can happen' question

In the IDIs, I asked respondents what they thought was the worst illness or health problem that can happen to a woman during: i pregnancy, ii delivery, iii after delivery, and why they mentioned them. Table 4.8 lists all the morbidities that were mentioned in all the IDIs.

Table 4. 8: Illnesses or health problems mentioned as the worst that can happen to a woman

Pregnancy	Delivery	Postpartum
<ul style="list-style-type: none"> - Malaria - Abdominal pain - Body pain - Inability to work - Vomiting - High blood pressure (or pregnancy-induced hypertension) - Insufficient blood/anaemia - Pregnancy-induced diabetes - Fever plus vomiting - <i>Kasala</i> (body heaviness) - Bleeding- threatened abortion - Jaundice - Bleeding 	<ul style="list-style-type: none"> - Bleeding - Prolonged labour - Labour pains/travails - Labour not progressing - Mal-presentation - Having an oversized foetus - High blood pressure - Vomiting - C-section - Insufficient blood - Unconsciousness - Eclampsia (high blood pressure also mentioned sometimes) - Abdominal pain characterising labour 	<ul style="list-style-type: none"> - Abdominal pain - Insufficient blood - Back pain - High blood pressure - Excessive bleeding - Vomiting - Malaria - Feeling cold - Breast problems

The table shows that five morbidities- bleeding, abdominal pain, high blood pressure, vomiting and insufficient blood/anaemia- were mentioned in all three phases. It also shows a wide range of morbidities from mild to moderate to severe morbidities using a biomedical viewpoint. It includes conditions that health professionals would not term as morbidities- such as *kasala*, inability to work and labour pains, but also does not include other conditions such as maternal depression. The reasons respondents provided for mentioning these morbidities included life-threatening potential, disruption of life, hospital care-seeking, nutritional impacts, prevalence, whether or not the women experienced it before or know someone who experienced it, persisting after the maternal health phase, mental health effects and so on. Additional reasons given included impacts on aesthetics ('affects appearance') and also the fact that the morbidity in question is very difficult to manage. Educational level was the main factor that differentiated women with respect to perceptions of severity of morbidities (and age occasionally); this was somewhat similar to the trend in the FGD exercises.

They were some deviant views. One respondent mentioned that “*you can’t say one [morbidity] is better than the other*” and also “*you can’t really say one [morbidity] is more dangerous than the other, and the other is more severe than the other, they are all severe in their own right*” (IDI 6). Two rural women responded with “don’t know;” one explained that this was because “*I don’t usually experience anything, so I wouldn’t know*” (IDI 3). Four rural women responded with “*nothing*” when asked about the worst morbidity in the postpartum period, illustrating the perception that pregnancy is more difficult compared to labour²⁰ which “*will just take one day and the child would come out and I rest*” (IDI 9), or the view that the postpartum period is usually ‘problem-free’: “*after delivery, there’s no problem afterwards. As long as you deliver safely, that’s all. You will be able to do all your work and all your activities, no problem* (IDI 3);” “*well there is no problem after delivery. It is just to take care of your baby...*” (IDI 14).

4.3.7 Perceived Causes of Morbidities

Perceived causes of morbidities across the entire maternal phase (each morbidity asked in turn) fell under three major and three minor themes: Biological factors or other morbidities (major); lifestyle and behaviours (major); ‘don’t know’ (major); ‘caused by the baby’ (minor); spiritual factors/superstitious beliefs (minor); and medical personnel errors or procedures (minor). The biological factors or other morbidities theme was the top causal reason, accounting for more than 25 morbidities. Some causes were morbidity-specific, while some causes cut across several morbidities. The respondents also sometimes provided multiple causes for one morbidity. Interestingly, broader social determinants of health (such as poverty) and a few attributes (such as high parity) were rarely reported as causes.

A. Biological factors or other morbidities

‘*The pregnancy*’, family history, someone’s biological attributes, and lastly, other morbidities and pre-existing conditions were thought to cause morbidities. Over half of the morbidities under this theme were attributed to “*it is just the pregnancy*” “*this*

²⁰ “Labour” is being used in an overarching sense to include both the delivery and postpartum periods.

only happens when I am pregnant” (in one case, *“it was just the delivery”*). Family history was given as a reason for high blood pressure during pregnancy, and two respondents reported that they had excessive bleeding because it ran in their family: *“it’s particular with my dad’s clan, that the women menstruate when they are pregnant”* (IDI 13). A woman’s biological attributes- particularly primigravidity and the size of one’s pelvis or vagina- were thought to predispose one to having tears during delivery. High parity was never reported as a cause and only one IDI respondent reported age as a factor explaining that younger women tend to bleed more during delivery than older women.

Other morbidities were also seen as bringing about ill-health. Abdominal pain was perceived as the cause of bleeding during pregnancy. Pregnancy-induced diabetes was seen as the reason why some women have an oversized foetus at delivery. Having congealed/ static blood inside was perceived as the cause of abdominal pain postpartum, which was usually remedied by bathing with or massaging the stomach with hot water. One respondent linked her iron deficiency to the excessive spitting she experienced during pregnancy.

B. Lifestyle and behaviours

These tended to be factors perceived as stemming from the woman’s decisions or negligence. During pregnancy, for example, folding one’s legs while sitting down was perceived to cause leg problems. Salt intake was seen as one cause of high blood pressure, eating some types of food was linked to vomiting, with the exact food specific to each woman. Failure to bath with hot water or care for oneself after delivery was linked to sepsis, and fear of the postpartum hot-bath was seen as a cause for postpartum depression. Leaving the facility early before all the observations had been done was also seen as causing illness.

Some behavioural causes were viewed as outside of the woman’s control such as husbands’ failure in carrying out nurturing and provision responsibilities. Inadequate access to food was perceived as one cause of anaemia, postpartum depression and

eclampsia; one FGD respondent went as far as saying that “*the husbands’ ears need to be pulled*” (FGD 1). This view was primarily mentioned during the FGDs. Quite a number of women, however, mentioned supportive roles that their husbands performed during the maternal health phase including helping out with household chores, escorting them for strolls during pregnancy or to the hospital for delivery, staying home with the woman when she was ill, providing food and looking for blood donors during an emergency.

Stress- including physical, psychological and professional- was also linked to morbidities. For example, stress from household chores and civil work was seen as the perceived cause of one respondent’s pre-term delivery in the past. While I was explaining postpartum depression during the ranking exercise, FGD respondents spontaneously reported the causes of postpartum depression as stemming from feeling helpless, being tired and weak after delivery, not having people present to help, not having enough sleep or lack of rest and being unhappy.

Samira: *Most times, if it’s not due to luck, you’ll see that most times when you go to the hospital, they’ll tell you that you have high blood pressure. Most times, that a woman needs to stop worrying, she should reduce her intake of what and what, they’ll tell you.*

Interviewer: *So it’s worry that brings high blood pressure during...-*

Samira: *Yes, when you combine worry with pregnancy, why wouldn’t high blood pressure result? (FGD 2).*

Respondent’s mother: *[Narrating her daughter’s eclampsia episode] At that time, her body was already slack, no strength. They took her to the hospital. When they took her to the hospital, hunger had already gotten into her body, her husband wasn’t feeding her. She’s pregnant but no food.*

[Continues narration in another section of the interview]

Respondent’s mother: *The problem, she wasn’t eating food to her satisfaction. She wasn’t getting enough food that would satisfy her, she wasn’t getting the kinds of food that pregnant women like and crave, she wasn’t getting it at all!*

Interviewer: *So it’s just the general food that is cooked in the house?*

Respondent’s mother: *Only the food- that’s right! Even the food that they cook at home, she doesn’t get satisfied with it. That is what brought this disease problem to her (Family interview #9).*

Respondent: *My first baby was pre-term, so- and we were thinking ... maybe stress because I was working.*

Interviewer: *What kind of work were you doing?*

Respondent: *I am a civil servant, I went to work*

Interviewer: *OK, just work?*

Respondent: *Yes. I did a lot of my house chores, I did almost everything.*

Interviewer: *By yourself?*

Respondent: *Even sweeping the front yard, I think I swept my front yard till... the frontage of my house. I swept the frontage till I put to bed... Yes. I was doing a lot of things. So when it came to this second pregnancy, I just streamlined it, even at my place of work (IDI 6).*

C. Don't know

Some respondents just acknowledged that they did not know the causes of the morbidities they experienced. In some cases, the respondents speculated on what may have caused the morbidities or reiterated what doctors told them but they still acknowledged that they did not know the causes. In some cases, they responded with, “*it is the doctors that know*” or “*we are not doctors*”. Educated women in this situation reported that they were still researching and looking for answers.

D. Caused by the baby

This covered issues perceived as resulting from the foetus' movements, growth in the uterus or its 'preferences.' Leg problems happen because “*the baby is resting on your legs,*” and shallow breathing because “*it's the baby that comes and pierces here [the chest] ...and blocks our chest*” (FGD 7). The size of the baby was also thought to cause tears. In addition, one respondent in FGD 5 mentioned a probable cause of bleeding during pregnancy: “*maybe the baby doesn't like dirt, some people say this... Then he keeps pushing out blood.*”

E. Spiritual factors/ superstitious beliefs

Perceptions of causes also stemmed from respondents' spiritual or superstitious beliefs. A few women reported that pregnancy generally makes a woman's body raw, exposed or open, making her vulnerable to becoming possessed by a spirit. A woman becomes possessed by this spirit when she goes out or loiters around in the night, when she fails to tie her head scarf or when she fails to say “*bismillahi* or

sallama” before squatting down to urinate. This spirit can cause illnesses, can make a woman to “*run mad*”, can “*eat her up*” or can cause a miscarriage. Morbidities were also seen as an act of God in few cases. In addition, one respondent reported that a woman will keep experiencing abdominal pain postpartum until her baby’s umbilical cord falls off.

F. Medical personnel errors/ procedures

Medical errors or oversight were also perceived as resulting in morbidities. Failure of the nurse/ midwife to scoop out blood or retained placenta during delivery was seen as a cause of postpartum bleeding. One respondent reported that in attempting to scoop out left-over delivery blood, a nurse and a doctor inserted their hands into her vagina at different points, loosening her suture and perhaps causing the internal tear she had; the nurse happened to be “*a tall, huge woman*” with “*big hands*” (IDI 16). Similarly, another respondent linked the tear she experienced to her midwife’s mistake, as seen below:

Taniyo:...*The midwife too can, they cause- This my second child, when I was delivering him, it was the fault of the midwife that I got a tear. Because she didn’t, she didn’t position the baby, the baby’s head. There’s a way she’s supposed to- she herself she confessed that it was her fault, because she said she didn’t position the baby well, I just- she told me to push. So when I pushed, the baby just gave me a tear.*

Aminchi: *Ah-ah ...*

Doris: *But someone told me that there’s one woman, one midwife, very experienced, that she doesn’t tear people. That she, she use olive oil*

Taniyo: *OK*

Doris: *That she- enooough that, but she will waste the olive oil but she will pour it enough and the place will be well lubricated*

Taniyo: *Wow!*

Doris: *It will be well lubricated and she will-*

Taniyo: *She will manipulate-*

Doris: *Yeah, manipulate and the baby will come out*

Aminchi: *It’s good like that.*

Doris: *I’m telling you that she, that that is what- is, is a, an ooold midwife*

Taniyo: *Wow*

Doris: *I don’t know whether she has retired now. But she, is olive oil she use. You know olive oil, will give very good lubrication. She will pour enough and the place will get so elastic that there’s no need for tear (FGD 4).*

Table 4.9 summarises the perceived causes of the morbidities explored in the research based on these six sub-themes. In few cases, some of these causes were seen as bringing about morbidities or health problems in general. An external factor- the heat or hot weather conditions- was also mentioned as a cause of one woman's pre-term delivery.

Table 4.9: Summary of the perceived causes of individual morbidities explored in the research

Perceived cause	Resultant Morbidity (Pregnancy)	Resultant Morbidity (Delivery)	Resultant Morbidity (Postpartum)
1. Biological factors or other morbidities	Lower abdominal pain, bleeding, headache, abdominal pain, vomiting blood, vomiting, inability to eat, spitting, PROM, swollen leg, swollen body, high blood pressure, dizziness, backache, fever, seeing things hazy, malaria, leg pain, blood transfusion plus anaemia, chest pain	Bleeding, having an oversized foetus, eclampsia	Perineal discomfort, sepsis, fainting, abdominal pain or hotness, cracked underfeet, dizziness, mastitis, C-section, high blood pressure, bleeding, swollen toe nail due to nail in-growth, fever
2. Lifestyle and behaviours	Vomiting, leg problems, high blood pressure, fainting, side pain, frequent stooling, backache, fever, bleeding, insufficient blood/ anaemia	Tears, prolonged labour, pre-term delivery, eclampsia	Backache, sepsis, infected tear, dizziness, sudden life-threatening problem, perineal discomfort, postpartum depression, weakness/fatigue, high blood pressure
3. 'Don't know'	Bleeding, peppery sensation in stomach, vomiting, inability to eat, premature labour, swollen leg, frequent stooling	Bleeding, delayed placental expulsion, pre-term delivery, failure to progress during labour, persistent CS delivery, uterine prolapse	Backache, abdominal pain, painful stretch marks, bleeding, blindness
4. Caused by the baby	Bleeding, leg problems, leg pain, shallow breathing, obstructed breathing	Tears, prolonged labour	-----
5. Spiritual factors/superstitious beliefs	High blood pressure, vomiting	-----	Blindness, abdominal pain, fever
6. Medical personnel errors/ procedures	-----	Tears	Abdominal pain, bleeding, tears

4.3.8 Impacts of morbidities

Women's perceptions of the impacts of morbidities were explored. In the FGDs, I asked about the consequences of morbidities generated from the free listing exercise. In the IDIs, I asked respondents whether they experienced any illnesses or health problems during pregnancy and the postpartum period. If they did, I then asked how the experience was for them and how it impacted their day-to-day lives. The findings demonstrate that different morbidities exert different consequences on women's lives. Some morbidities can affect several aspects of a woman's life (for example, physical, financial, social, mental, etc) while some morbidities only impact a specific aspect of the woman's life. The impacts of some morbidities only occur during the maternal health phase while others extend beyond this period. In most cases, the impacts of morbidities were negative; however, they were also positive in few cases. Three dominant sub-themes were evident on impacts of morbidities: positive impacts; negative impacts- during the maternal health phase; and negative impacts-beyond the maternal health phase.

A. Positive impacts

The data showed that morbidities could impact women positively by changing long-held traditions and encouraging good health behaviours. In other words, women's previous experiences with morbidities can have positive unintended consequences.

Firstly, morbidities in previous pregnancies can influence women accustomed to home births towards institutional delivery. One 30-year old mother of five children in a rural area reported that her previous experience with excessive intrapartum bleeding and delayed placental expulsion made her decide to give birth to her last child in a health facility: "what *actually scared me and made me to go to the hospital was my bleeding, and also the placenta doesn't fall out on time.*" The box below tells her story in more detail:

Respondent:... *When I give birth, the type of bleeding I experience and also the placenta doesn't usually come out early; that was why I decided that it is better I start giving birth in the hospital. I felt that they [hospital staff] will be able to help me in these areas. But- glory be to God, when I gave birth to this boy [last baby] in the hospital, ... things were better for me*

with respect to the placenta and the bleeding. Because when I went and explained to them the way I bleed when I give birth, then they gave me some drugs and I took. When I gave birth, they gave me some injections. Even though the blood still poured, but it was not as I used to experience in my deliveries... You will take two wrappers [big, rectangular piece of cloth that Nigerian women tie around the lower half of the body] and clean up the place but it is still not wiped off... And if you lift up the wrapper like this and stand it erect, you will see blood dripping from the wrapper. You see, it is much. Because if I deliver while lying down, when I raise my head up and squeeze it [holds her hair], it is just blood that you will be seeing dripping... It ran down and it even reached my head! (IDI 15).

In addition, morbidities can prompt care-seeking. For example, the below extract shows a woman who started to attend ANC because she experience bleeding, which led her to discover her gestational age:

Respondent: *So I had gotten back from the market. Then at night, I began to see bleeding. We went to the hospital and did a scan, then they discovered and said the pregnancy had reached 6 months or getting to 7*

Interviewer: *Kai*

Respondent: *Yes. So I didn't really do antenatal care very well.*

Interviewer: *Okay, so it was when you saw the blood that you people went to the hospital?*

Respondent: *Yes, yes, that time I hadn't even begun antenatal. It was at that time that I started antenatal care- I would say that I began antenatal care around 6 months to 7.*

Interviewer: *Okay, but it was the time the blood came that you discovered you were pregnant, you didn't know prior to that?*

Respondent: *No, I knew I was pregnant. But I thought it was a new pregnancy, small pregnancy Because it doesn't get big at the beginning [abdomen]. Normal like this, I could be 2, 3 months pregnant and my stomach would be like this normal, because I have a big body, it doesn't show (IDI 7).*

For some women, past morbidities made them alert their care-givers *a priori* so that they could be better prepared, avert possible problems in the current pregnancy and improve chances for better outcomes. For instance, one respondent who had given birth four times before alerted her birth attendant about her history with postpartum haemorrhage. Morbidities can also influence family planning decisions: “*I discovered that health-wise I wasn't really fine because of that pregnancy. And that actually made me- as soon as I had the baby, I went for family planning..... Uhm.*

Because it was a bit- I wouldn't want to say it was traumatic but it was somehow stressful. My health was dwindling between good and bad. I was just like looking forward to the day the baby will come out and then I will be myself again. That was how it went" (IDI 18).

B. Negative impacts- during the maternal health phase

Morbidities also impacted women and their families during the maternal health phase. Some morbidities were perceived as being life-threatening to the mother and/or baby. These included high blood pressure, labour onset with “menstrual blood,” prolonged labour, delayed placental expulsion and bleeding. Many respondents also reported how morbidities such as tears, perineal discomfort, abdominal pain, mastitis and premature labour caused them pain, discomfort and suffering. There were also morbidities thought to have negative impacts on the baby, either in utero or after birth, for example falling because of fainting during pregnancy could affect the baby if the woman falls on a rough surface and abdominal pain postpartum could affect a woman's ability to care for the baby.

Many respondents also provided accounts about how morbidities disrupted their normal, everyday lives, activities and functioning, and some women had to streamline their activities due to morbidities. These impacts sometimes led to changes in roles in the household and conferring additional burdens on family members: *“Kai, it affected me very much. Because there were some very simple things that I would usually do now-now, but it came and overwhelmed me. People had to do everything for me, people had to do everything for me, I was just sitting down and didn't have the opportunity to do it. You see? I thought that if I go to the hospital, they will give me drugs that will remove the dizziness totally, but it got to be that it couldn't remove it at that time. It was when the pregnancy became stronger [grew older] that I stopped feeling this dizziness” (IDI 5).* Spitting had a social consequence as it made women uncomfortable in social gatherings.

Morbidities had a mental impact on women and their families; this was not always a direct result of the morbidity. For example, hospitalised women formed communities with other women in the ward, and when a woman died, the others on the ward were affected:

Respondent: ...Even the time I was admitted in the hospital there were many challenges. You will see that someone will come alive and healthy, she will come and greet you and then both of you will chat. Then later on, you'll see that she has died.

Interviewer: That's the pregnant ones?

Respondent: The pregnant ones, yes. Like I will be lying down and see the ward filled to the brim, and then the next thing this person dies, this person dies, this one has delivered, all these things. One will definitely be afraid a little. But when I feel afraid, I just get a little courage and then say "It's alright, that's how life is." So that's how it is. You just put your trust in God, that's all (IDI 7).

C. Negative impacts- beyond the maternal health phase

A few women experienced consequences that extended beyond the maternal health phase, and in a few cases, were permanent. These consequences were related to their marital, physical, economic and social lives. In the most severe cases marital impacts included divorce, for example where a family blamed the husband for the eclampsia due to his negligent care; or the husband taking on another wife due to visual impairment that affected his first wife's ability to carry out her duties: "*it really changed my life. The thing I will do by myself has now overpowered me and they have to do it for me. You see, life has changed*" (IDI 10). This respondent reported that she is now house-bound and does not attend social activities. Morbidities were also thought to increase the financial burden on the women's household. The respondent above who became blind was forced to switch her occupation from a tailor to being a less profitable rice seller, as her former source of income required her sight.

Some respondents reported that they still experience or know women who still experience morbidities they had during the maternal health phase which can "*become a health problem forever. You'll never part ways with it*" (FGD 1) or that the morbidities in the maternal phase caused later morbidities. These morbidities included backache, ulcer (heart burn), high blood pressure, headache and pains resulting from C-section. One respondent also mentioned that when she gives birth, she "*can stay more than one year and not understand my body... it's when I'm almost weaning a child that I start to feel some strength in my body*" (FGD 2). There was also an acknowledgement that giving birth in general depletes one's strength and ability to do work. Some respondents also mentioned that morbidities they experienced also led to other morbidities later.

4.3.9 Summary of Findings

Research sub-objective 1a: To find out respondents' perceptions of maternal morbidity relating to normal vs. abnormal conditions, causes of morbidities and impacts of morbidities

- Abnormal morbidities are long lasting, uncommon, seen as symptoms of more serious problems, and remedied by 'unnatural' medical interventions. What is common is thought to be normal. A normal pregnancy was seen as having similar or better experiences compared to previous pregnancies or those of other women. Respondents tended to use other women's extreme morbidities as comparators, thereby underplaying their own experiences to make themselves feel better. This, however, did not prevent them from acknowledging that they also had issues.
- Perceived causes of morbidities fell under three major sub-themes (biological factors/other morbidities, lifestyle and behaviours, 'don't know') and three minor ones ('caused by the baby', spiritual factors/superstitious beliefs, medical personnel errors/procedures). Interestingly, broader social determinants of health (such as poverty) and a few individual attributes (such as high parity) were rarely reported as causes.
- Morbidity status was the most dominant factor used to label a pregnancy as normal or difficult. Pregnancy impacted several areas of life, with physical and nutritional the most prominent.
- Impacts of morbidities could be positive (changing long-held traditions and encouraging good health behaviours) or negative (bringing consequences during the maternal health phase or beyond).

Research sub-objective 1b: To identify morbidities that are important to women and families

- Morbidities that were important to women were varied, as seen in the free-listing exercise, ranking exercise and ‘worst morbidity that can happen’ question. Education and age appeared to be the strongest factors that differentiated women with respect to perceptions of severity.

Chapter 5: In-depth Exploration of Three Selected Morbidities

“Blood has this dilemma: It is problematic when it comes out and it is problematic when it doesn’t come out”- FGD 1

5.1 Chapter Overview

This chapter will address objectives relating to vomiting, prolonged labour and haemorrhage (during delivery and within the first 24 hours after delivery)²¹. Given the complexity of morbidities, a detailed exploration on each maternal morbidity reported in Chapter 4 is warranted, however this was not possible within the time frame of my PhD. Therefore I selected three morbidities *a priori*- occurring during pregnancy, delivery and postpartum- to allow for more detailed exploration. Two of the morbidities- prolonged labour and haemorrhage- were selected because of their recognised public health significance: prolonged labour is a risk factor for obstetric fistula and is also a major reason why women undergo caesarean section, while postpartum haemorrhage accounts for about a quarter of all maternal deaths in the developing world [219] and is also a key contributor to many maternal complications. Vomiting, on the other hand, was selected because it is rarely studied in low income settings and emerged as particularly important to women in the pre-pilot phase. In addition to these specific reasons, understanding these three very different morbidities in more detail may help inform measurement efforts.

I focused on specific elements of these three conditions and had unique objectives for each of them at the onset. For vomiting, they were: i) to find out whether vomiting during pregnancy is perceived as an illness or a normal part of pregnancy; ii) to find out the impacts of vomiting during pregnancy on women’s lives. For prolonged labour, they were: i) to investigate how women discerned the start of ‘true

²¹ My initial focus was bleeding after delivery. During the pre-pilot phase however, I found that women sometimes reported bleeding after delivery as bleeding during delivery and misclassification occurred. Therefore, I had to clearly define the two terms and also decided to explore both.

labour’; ii) to find out perceptions of normal/short labour²² vs. prolonged labour. For haemorrhage, they were: i) to find out general perceptions relating to blood loss during delivery and within the first 24 hours after delivery; ii) to find out perceptions of minimal/normal²³ vs much blood loss.

5.2 Methods

The methods are the same as those described in Chapter 4. I included specific questions on vomiting, prolonged labour and haemorrhage in the FGD and IDI topic guides to explore respondents’ perceptions about when these issues were considered normal or abnormal, and to also obtain additional information for each condition. For each condition I focused on specific questions that I felt were of particular importance given gaps in the literature; these are described in the respective morbidity sections.

5.3 Results

5.3.1 Structure of the Results Section

I will start by reporting the findings on vomiting, then prolonged labour and lastly haemorrhage. The vomiting section has two themes: how vomiting during pregnancy is perceived and the impacts of vomiting. The prolonged labour section also has two themes: discerning ‘true labour’ and perceptions of normal/short labour vs prolonged labour. The haemorrhage section, on the other hand, has four themes and yielded the most data in this chapter: the three ‘schools of thought’ on bleeding; perceptions of minimal/normal vs much blood loss; blood loss depends on context; and good blood vs diseased blood.

²² My priority was prolonged labour, but it was also important to explore perceptions of short/normal labour for comparison and contrast sake. I put normal and short labour in one group since this was not my primary focus.

²³ My priority was also to explore perceptions of much blood loss; hence I have also classified minimal and normal blood loss as one category.

5.3.2 Perceptions of Vomiting

5.3.2.1 Overview of the vomiting cases

I identified five cases that I classified as moderate (3 cases) or severe (2 cases) vomiting in the IDIs. Most of these women reported that they were unable to keep food and even water down. Women reported vomiting ‘several times’ up to 5 times in a day. The two women with the severe cases said they were vomiting from the first trimester until birth; they received drips, and one was hospitalized. Those with the moderate cases had shorter duration. All other IDI respondents reported mild or no vomiting. Although there were only five cases of moderate or severe vomiting, these offer important insights into what it is like to experience this morbidity in a low income setting. In the FGDs, I did not explore individual cases of vomiting but rather asked about general perceptions and beliefs.

5.3.2.2 How vomiting during pregnancy is perceived

In the FGDs, I asked women whether they thought vomiting is an illness or a normal part of pregnancy. In the IDIs, I asked whether the woman was vomiting at any point during her pregnancy, and if she was, what its frequency was, whether the vomiting was such that almost everything that goes into her mouth comes out, whether or not she thought this was normal or an illness and how the experience impacted her.

Vomiting was generally perceived as a normal part of pregnancy, unless a woman vomits after eating, has poor appetite and is not well-nourished as a result of the vomiting. Normal vomiting is also short, that is one feels uncomfortable for few hours a day, or just vomiting ‘*once in a while*’. It also does not prevent one from performing chores, or make one have to lie down; and has triggers that can be controlled, such as staying away from the place where food is being prepared to avoid food odours. On the other hand, vomiting is considered abnormal when a person vomits everything they eat or drink, is ‘*overwhelming*’, prolonged, or is bad enough to go to the hospital. Prolonged vomiting was defined as vomiting from ‘*the moment pregnancy sets in...until you give birth*’, vomiting beyond the first trimester, or vomiting for a significant duration of the pregnancy. A few women also

mentioned that vomiting “*varies from pregnancy to pregnancy*”, or “*depends on the individual; someone will experience it, another person will not.*” The women who experienced moderate or severe vomiting tended to perceive it as an illness or abnormality, as seen in this quote below:

Respondent: *Yeah some women think that all those nausea, vomiting is normal but to me it's not normal because I have seen so many pregnant women that from Day 1 they are eating like pig until they deliver... To me it's not normal when it [vomiting] can deprive you of eating what your body needs you know, or maybe eating what you are supposed to eat, to me it's not normal. But some people think that all those nausea, vomiting is normal...But I don't think I would call it normal even what they call normal symptom...I wouldn't call it normal because I [am]supposed to take those things I need them and I can't because once I take them I vomit so... (IDI 13).*

5.3.2.3 Impacts of moderate or severe vomiting

The data in this section came primarily from the five women who experienced moderate or severe vomiting; however, IDI women who experienced mild or no vomiting described the potential consequences of more severe vomiting, and the impact they had seen in others. The women provided accounts that showed how the vomiting impacted them nutritionally and physiologically. Some women could only keep certain foods down and went through months of their pregnancies restricted to specific foods and drinks such as tea, oranges, and *talge*, a pudding made with mainly maize or guinea-corn flour and water. The two women with severe vomiting were totally unable to retain food or water at some points and had to be put on drips. Most of the five women reported that they lost weight considerably: “*I was almost starving ... I lost appetite and I was getting underweight you know, and the baby was just growing*” (IDI 13). Others reported physiological consequences including fainting and almost needing a blood transfusion during delivery as a result of her nutritional status because what she was eating during pregnancy was “*just rubbish...they were not nutritious in any way.*” One respondent felt that the vomiting was so severe she may die:

Respondent: *...Well, I said “This illness that has really disturbed me. If I will survive, let me survive; if it is for death, I have forgiven everyone and people should also forgive me” (laughs really hard).*
...

Respondent's mother-in-law: *She thought she was going to die...That's why she said everyone should forgive her... That's how pregnancy is; it puts an individual into all sorts of things (IDI 5).*

As well as the nutritional and physiological consequences, severe or moderate vomiting had logistical implications for their families. These included cooking two separate meals because the woman could not tolerate the general meal; cooking in another house; and family members not wearing sprays or perfumes. The vomiting also inhibited the respondents from performing their chores, making them fully dependent on their family members. For the women who were given drips, their families had to pay out-of-pocket for their treatments. One respondent who reported that “every time- almost all the time they were coming to add more water [for me at home]... I consumed many bags” also provided the account below:

Respondent: *Sincerely we were spending money. Money, he [husband] was really spending a lot of money, honestly. Honestly, money was being spent... Some people even said that it was as if I was buying the children whenever I got pregnant (interviewer laughs). But I said, “No, it is not like that.” They said, “This kind of stress that you go through.” They said, “It is not everyone that can keep you with all this kind of dark suffering.” Did you see the way I used to change? It was likeeeeeee a rag when you come and see me lying down. You might even say it is an oooooold woman, I am just soooo folded, even to get up I can't (IDI 9).*

The vomiting also had an impact on family relationships with the husband of the respondent whose quote is directly above suggesting family planning so that she could rest from the stressful vomiting experience. He also complained about having to “scout around” for someone to cook for him:

Respondent: *My husband, the situation even affected him. He even said that if there was a way to do it, that after this pregnancy when I give birth, he would prefer that I go to the hospital and get an injection so that I can take this break and rest. Because for him, kai this thing is really stressful. I said, “No. What God has given you would you tell him it's not supposed to be so or how?” Then he said, “It is not like I am refusing it, it is the suffering that I want to prevent for you. When you get pregnant, to say that you cannot do anything, you're just lying down and then I have to go and scout around for a woman to come and cook for me?” (IDI 9).*

5.3.3 Perceptions of Prolonged Labour

I explored prolonged labour in both the FGDs and IDIs. In the first few FGDs, I used a vignette, but this was not effective so I changed to direct questions (Section 4.2.4.6). These direct questions included:

- How a woman would know that ‘true labour’ had started.
- How she could tell the difference between false and ‘true labour.’
- How long they would expect a normal labour to last, that is from the time the strong pains come up to delivery.
- What they would consider to be too long.

In the IDIs, I asked every woman about her labour and delivery, including how she knew her labour had started, what she did afterwards, what she thought about the length of her labour (from the time she started experiencing strong, regular pains up to the birth of her baby), whether she thought her labour was short, normal or long and why she thought so.

In both the FGDs and IDIs, I inquired about the start of labour (‘true labour’) because it would have been difficult to know how the respondents defined a prolonged labour without first knowing how they classified the start.

5.3.3.1 Discerning ‘true labour’

The IDI women could remember very specific details about their labour experiences and reported three methods that signalled ‘true labour’ had started, with many women using a combination of these methods. It is difficult to know whether women recognized these signs as ‘true labour’ at the time they occurred or assigned them with hindsight. Although these methods were seen as signs of ‘true labour,’ women acknowledged that labour was unpredictable and can vary from pregnancy to pregnancy and from woman to woman. The three sub-themes were:

- **Pain:** This was mainly back pain, abdominal pain and lower abdominal pain. Words used to describe this pain included “*no lenience*”, no lessening, pain that cannot be endured, prolonged pain that does not wane, feeling as if “*a bone [in the back and lower abdomen] ... is being broken with an axe*” (IDI 5), and pain that inhibits physical activities and mobility. The idea of contractions occurring every few minutes only emerged from educated

women. The quote below captures how false and true labour were differentiated by one educated respondent:

Respondent: *I was still feeling the contraction was not that serious since I can endure it. The thing is that the moment you can't endure, that means (both laugh) you're almost at the- but since I can endure it, I can still stand up and do one or two things, so I was like I just held on, till the next morning (IDI 8).*

- **Previous experiences:** Many respondents reported that a woman would know that labour had truly started from her previous labour experiences, but some women also mentioned that every child comes differently and no two labour experiences can be the same for a woman. A few women also reported they would recognise labour because of knowledge gained from reading pregnancy books or attending antenatal care sessions.

Maimuna: *...You've already given birth the first time, you already know labour occurs. When you're giving birth the second time, you should be able to know that labour has started. You should know from the symptoms [manifestations] that labour has started today (FGD 1).*

- **Physical symptoms:** Respondents reported that the start of 'true labour' was also signalled by specific symptoms, which were not related to pain. Universally mentioned was the water breaking. In addition, the respondents mentioned specific symptoms that varied from woman to woman and even from pregnancy to pregnancy including bleeding, feeling cold: *"I was feeling very cold as if it would kill me"* (FGD 5), sweating, feeling like pooing but the poo never comes out and falling into a very sweet sleep. Some women acknowledged that water breaking may not always be a good indicator since one may still be in labour without the water breaking.

In some cases the symptoms that signalled the start of labour were also reported as indicating whether the labour would be straightforward or problematic: *"if it's time for delivery, women will see that the menstrual blood will first come..... it's a problem. Because when it starts coming with this first, honestly, the woman will really have convulsions, it will give her*

tough time. But when it starts coming with water first, it will come easy” (FGD 2). Similarly, one rural multipara woman also mentioned that blood loss will be much if a woman’s labour starts with bleeding as opposed to commencing with back pain or the water breaking. But in other cases, the same symptoms were considered ‘just another type of labour’:

Laila: *I thought there are different kinds of labour. This one, my most recent delivery, it was blood that started coming out before I delivered.*

Interviewer: *But to you, the blood that started coming, do you think it is normal-*

Laila: *That time, I wasn’t seeing anything-*

Interviewer: *Or you think it is an illness?*

Laila: *It was just blood that poured and poured, then it stopped. Then I gave birth the next day.*

Interviewer: *You gave birth the next day?*

Laila: *Yes.*

Interviewer: *What did you do when the blood came, when it started coming?*

Laila: *I went to the hospital (FGD 5).*

5.3.3.2 Perceptions of normal/short labour vs prolonged labour

The length of labour theme yielded less data compared to the start of labour theme, as questions on the former generally yielded shorter answers. Views on the normal length of labour vs prolonged labour were varied, but, normal/easy/short labour tended to be expressed in terms of minutes and a few hours, while prolonged labour was expressed in terms of several hours (*‘15 hours’, ‘24 hours’*) or several days. Women often used daily markers to define prolonged labour such as being in labour from *‘morning till night,’ ‘night till morning,’ ‘12 midnight to around 12 noon,’ ‘morning up to mangariba’*-the sunset Islamic prayers. In addition, the length of one’s labour was perceived as something which could vary from pregnancy to pregnancy and from woman to woman, something unpredictable and also something that God determines.

I did not explore perceptions of ‘false labour’ in-depth; however some respondents alluded to it and these tended to be expressed in terms opposite to ‘true labour’ (for example, no lenience with ‘true labour’ but ‘false labour’ starts and wanes, starts and

wanes). Primigravidae were also seen as more likely to experience false labour. The following quotes demonstrate the findings on perceptions of length of labour:

Faiza: *Every child comes differently (FGD 1).*

Amina: *For one person, it could be 5-6 hours. For another person, it will be throughout the night up until the day breaks. Another person, it will be from morning to evening.*

Isatu: *It could even last up to 3 days for another person*

Amina: *Yes, very well.*

Isatu: *Even when you go to the hospital, you'll stay there overnight*

Fatima: *For me, I slept overnight and spent the next day before I could give birth (FGD 3).*

Farida: *You know everyone's one labour is in a particular way. One will sleep overnight with the pain but another person-*

Asraf: *Sleep overnight? One will even spend days!*

Farida: *(Incomprehensible)*

Asraf: *Like my own (laughs)*

Farida: *But another person, 30 minutes is too long, they've given birth. But other people, honestly, they suffer (FGD 7).*

Maimuna:... *Even the doctors say that you'll be in labour for 24 hours the first time you're giving birth. But it could be one hour, two hours for subsequent deliveries; this is what the doctors usually say. But when it comes to giving birth, it all depends on what God decides for you, that's how you give birth. Because for some people's first delivery, they are able to give birth within one hour. But for the second delivery, you could be in labour for 2-3 days (FGD 1).*

Doris: *But me I think this false labour, sometimes there's a difference between when you're first time. How do they call- pri- what?*

Aminchi: *Prima*

Doris: *A prima...Eh-eh, primigravida. And then the subsequent ones. Most times the people that are the very first ones, they experience- you know they are the ones that most times tend to have this false labour-... And you know that one it takes a longer time even before dilation and uhm-*

Taniyo: *Yeah*

Doris: *It takes actually a very long time*

Taniyo: *It takes a long time*

Doris: *Eh-eh. It may have some contractions which could not be the real labour contractions. Most times it is common with the very uhm first compared to the second one (FGD 4).*

Furthermore, women often compared the lengths of their labour with previous deliveries, or those of other women:

Comparison to previous labour experiences

Respondent:...Because for some- for some of my previous deliveries, there were some who lasted longer than his (last baby). Because for one, I'll be feeling the labour from morning, I'm feeling it and moving around with it until his delivery time reaches. For some, when it starts, it will not last long. But his own is the fastest (last baby) (IDI 12).

Respondent: I gave birth to her at home. Her labour came very easy.

Interviewer: Her labour came very easy?

Respondent: Uhmmm. You know my deliveries then, I used to suffer a lot. For this one, I didn't stay long undergoing the labour. That's why I said it came easy. This one, I didn't stay long undergoing the labour, but for my other deliveries I used to stay a bit long undergoing labour. But this now, I didn't stay long undergoing the labour (IDI 10).

Comparison to other women's labour experiences

Respondent: Well, some people use to stay long. But to me, I didn't stay long. Because some people, the ones I met there [at the maternity ward], I gave birth and left them (both laugh) (IDI 2).

Respondent: [Referring to the length of her last labour] It was prolonged...It was prolonged. It's not short labour. Because there are some people, they go in there, in 15 minutes they are out with their babies. So for you to be in labour from morning till night and then the baby isn't....It was a prolonged-

Interviewer: Prolonged labour, OK, alright (IDI 18).

5.3.4 Perceptions of Haemorrhage

This section covers both bleeding during delivery and bleeding within the first 24 hours after delivery and I will present the findings for both concurrently, but I will make distinctions where necessary.

In the FGDs, I asked respondents how much blood they would expect a woman to normally lose during delivery, how a woman would know if her blood loss is normal or if she has lost too much blood during delivery, and how she would quantify blood loss. This included showing a 500mL and a 1,000mL bottle, which are the cut-offs for postpartum haemorrhage and severe postpartum haemorrhage respectively [219].

I then asked a similar set of questions for the first 24 hours after delivery, starting from the time the placenta comes out.

In the IDIs, I asked the respondent what she could say about the blood she lost during delivery, how she would quantify it (with follow-up probes such as whether she thought the blood loss was small, normal or much), whether she thought the blood lost would fill the 500mL or 1,000mL bottle or a smaller or larger bottle, and whether she was worried or scared about the amount of blood she lost. I asked a similar set of questions for the first 24 hours after delivery (from the time the baby comes out up to 24 hours later²⁴), and also inquired about bleeding beyond the first 24 hours. In the first few IDIs, I asked about soaking of pads and how frequently she was changing pads, but I removed these as other methods for measuring blood loss had become apparent.

In addition to the direct responses on the issues described above, themes emerged spontaneously including the three ‘schools of thoughts’ on bleeding, blood loss depends on context and ‘good blood’ vs ‘diseased blood’.

5.3.4.1 The three ‘schools of thoughts’ on bleeding

Respondents typically fell into one of three groups with respect to how a woman *should* bleed during and/or after delivery:

- A. **The ‘flow proponents’:** These respondents believe that blood needs to come out of a woman, as it is better for blood to come out than stay inside. They would report something along the lines of “*if it does not come out a lot, it disturbs me in the stomach*” and also “*when it comes out, you feel a bit better.*”

- B. **The ‘precautioners’:** These respondents tended to stress the consequences of blood loss and generally do not support the blood-needs-to-come-out

²⁴ The start times for the postpartum period in the FGDs and IDIs were different. Please refer to the limitations section in Chapter 9 for more information.

perspective. Unsurprisingly, the flow proponents and precautioners sometimes had tensions, as seen in the quote below in a rural FGD (with respect to bleeding within the first 24 hours):

Lilian: *I think it is better for her to bring out the blood*

Interviewer: *OK. Why do you say so?*

Lilian: *Because of the dirt inside.*

Interviewer: *OK*

Hadiza: *But for some, don't you see that if the blood has snapped and comes out, that's a problem? If it hasn't snapped, it stays still. For some, it is usually the bleeding that causes them to transfuse the person*

Amal: *She'll just be feeling dizziness*

Hadiza: *She'll just be dizzy. It is the bleeding that causes them to add the blood (FGD 5).*

- C. **The 'middle-grounders':** These respondents were in-between the other two groups and acknowledged the complexity of blood loss, summarised nicely by one woman in FGD 1 as “*blood has this dilemma: it is problematic when it comes out and it is problematic when it doesn't come out.*” Some of these respondents also appeared to struggle with drawing a line between acceptable level of bleeding and excessive bleeding as illustrated by the discussions below from an FGD and a family interview:

Rakiya: *It is good that blood comes out a lot, but also not too much... Comes out normal, just normal*

Interviewer: *What is normal? What does normal mean? You said it's better it comes out normal.*

Rakiya: *Just small, small*

Amina: *Let it not be too small, let it not be too much.*

Rakiya: *Yes, very well (FGD 1).*

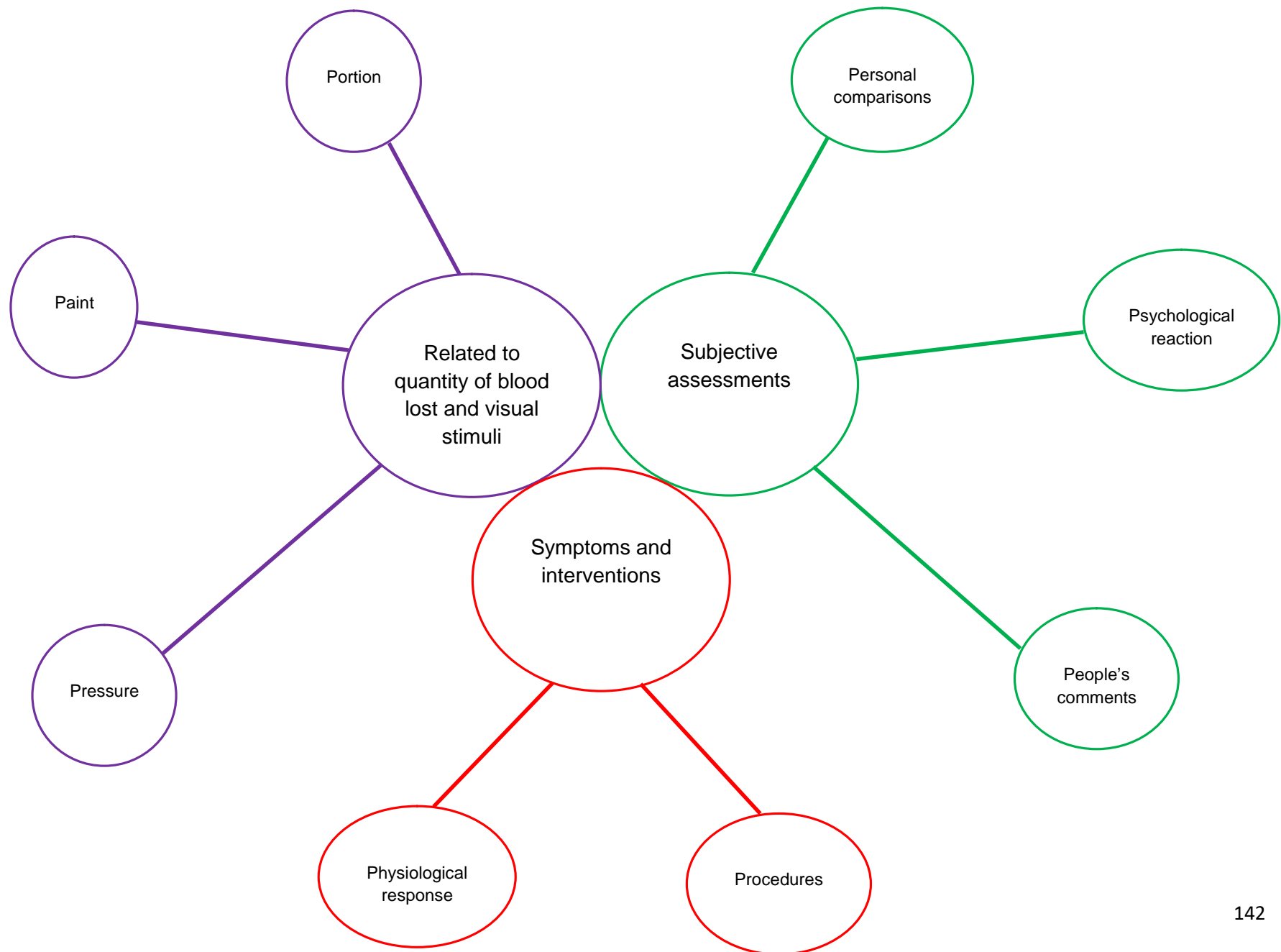
Wife: *Bleeding is not good. If blood doesn't flow, it is a problem. It needs to pour but it should not pour too much.*

Husband: *[When blood] pours little-little, it is removing some diseases, it is removing some diseases from a woman's body. But when it is over, well, it will affect the woman and you'll see her body become white like ash. Well, and when you go to the hospital, they'll say “add blood for her, add blood for her.” The blood has gone. And while trying to add blood, before you realise it, the doctor will forget something, (he'll go and fix this and that? OR he'll go here and there?), and then they'll come and say, “well, she's dead” (Family interview #7).*

5.3.4.2 Perceptions of minimal/normal vs. much blood loss

Perceptions of minimal/normal vs much blood loss generally fell under three sub-themes: related to quantity of blood lost and visual stimuli; symptoms and interventions; and subjective assessments (Figure 5.1). Some women used a combination of these methods when reporting their perceptions.

Figure 5.1: Methods used for describing levels of blood loss



A. Related to quantity of blood lost and visual stimuli

Respondents used the quantity and visual recollections of the blood they lost to classify bleeding as minimal or much. Three areas were apparent:

- Portion

This related to methods that women used to quantify bleeding. Phrases used to describe too much blood loss during delivery included “*up to 2 or 3 plastic bags....the plastic bag that they give water to someone [drips]*” and “*like that their bowl in the hospital [kidney dish]*.” In the educated FGD group women were more likely to use quantifiable measures such as, “*not more than 1 pint*” or “*not up to a litre*” for normal blood loss.

In describing minimal blood loss within the first 24 hours postpartum, some women compared their bleeding to their menstrual flow and reported that “*the menstrual flow was heavier than it*” and “*it was mild... [and] was just as if I was having my normal menstruation.*” Blood consistency was also used to describe minimal blood loss in the first 24 hours: “*it did not come out in chunks much, just very little came out in chunks.*”

The 15-19 year olds and a few of the rural women struggled to quantify blood loss at all, and used terms such as “*if it pours too much*” despite probing on quantities. They also had an assertion that a woman would just know if there was too much blood lost: “*you that have the blood will know..... the pouring is too much, that’s why you will know.*”

As mentioned earlier, I used 500mL and 1,000mL bottles to also explore respondents’ perceptions of blood loss. In the FGDs, much blood loss during delivery was generally seen as 1,000mL and above; blood loss of 500mL was generally not perceived as much with comments such as “*some blood is still left inside, it has not finished coming out*” and much blood loss “*will definitely be more than this bottle.*” Findings were similar for blood loss within the first 24 hours.

Responses from the IDIs were similar for blood loss during delivery, but varied for within the first 24 hours postpartum, with some women reporting 500mL, 1,000mL and anything in-between as too much.

Comparison of blood loss portions at two different time points was also reported. When I asked how to know whether to seek care for bleeding in a family interview, one educated husband mentioned that before a woman is discharged, the flow of blood should be at a minimal point, so if the flow of blood has increased beyond the level of her discharge, it is something to be concerned about.

As well as quantity, duration of bleeding was also used as an indicator. This method was usually used for bleeding beyond the first 24 hours postpartum. Some women felt that normal bleeding should stop a few days after delivery or in one week. Too much bleeding was generally thought to be bleeding that goes beyond an expected end-point such as the baby's naming ceremony (seven days postpartum) or the 40 days postpartum period.

- Paint

This related to the extent to which blood stained or soaked through clothing, pads or surfaces. This included messing up someone's wrapper when one lies down, staining the plastic sheet on one's bed, blood dripping from the wrapper used during delivery, a wrapper looking as if *"you're picking ...[it] from blood, as if you're washing it [the wrapper] in it"*, staining the surface one sat on, and blood splashing down and staining the floor when one gets up from the bed.

Taniyo: *Well, I thought I lost almost 50cL oh [500mL], because I, I stood up, it was dripping like water. ...Yes. I was having pad but it was coming out underneath like water, I'm telling you. The pad was soaked, my pant, everything, the ground, the- everywhere was just wet. Not bed oh, now I came down from the bed, everything on the ground was wet with water-with the blood. Yes. I believe then-... I lost almost 50cL or more than... (FGD 4).*

Changes in staining and soaking were also used as an indicator that bleeding has reduced, with prolonged heavy bleeding being seen as problematic as described below. Women reported being able to change from using a 'heavy-duty' blood absorber to a lesser one. For example, replacing the plastic sheet on one's bed that is often used to prevent staining with a napkin, or needing to change only pads as opposed to also changing pads and wrappers. The quote below demonstrates this:

***Amal:**... When a woman goes to deliver and she's back, from that day, a plastic sheet must be put on her mattress. When it happens that day, and she spends the whole day with it, it is good for them to remove the plastic sheet and put a napkin. When this (napkin) holds things for her, one can say ... the blood has not really poured. But a woman who stays up to 3-4 days and the plastic sheet is still under her mattress, blood is still pouring, I think there's a problem (FGD 5).*

Related to soaking as an indicator of too much blood loss, was the use of pads to determine the quantity of blood. This has to do with the extent to which a pad gets soaked, the number of times a woman changes pad within a given time postpartum, or how many pads she has to use at one time. Respondents thought that too much blood loss within the first 24 hours postpartum will be characterised by changing pads three or four times per day, and doubling or tripling pads, as seen below:

***Interviewer:**... How would a woman know if she has lost so much blood after delivery? How would she know?*

***Fatima:** She would know from her vaginal cloth or pad. It would be very soaked. It still gets soaked when she puts another one... But for some, it would not soak the pad or vaginal cloth no matter how it rushes.*

***Interviewer:** OK. But like how many pads would a woman use that you'll say, "Hmm, this one is-*

***Fatima:** Sometimes- they used to say that you should be doubling it. You should put on two until after it-, you should still put on two more. That's what they usually say (FGD 1).*

- Pressure

This related to the perceived force with which the woman's blood was coming out, and it was mostly used to describe bleeding within the first 24 hours postpartum. The perceptions of much blood loss here generally involved the word "*rushing*" and it

included subsequent descriptions such as “*like passing urine*” and “*like water, like tap.*”

B. Symptoms and interventions

Respondents also used their physiological response, and interventions done by medical staff, to categorise bleeding as minimal or too much.

- **Physiological response**

The most common symptoms mentioned as signalling too much bleeding were being unable to get up, feeling like falling down when one gets up, fainting, dizziness, headache and weakness. Other symptoms mentioned included “*body has no quality,*” “*[hearing] as if birds were chirping,*” paleness of the eyes, hands/palms and legs, “*body becomes white like ash,*” body pains and feeling as if one “*had been beaten,*” and “*your body will also be shaking. Just like that, you’ll see yourself shaking.*” Similar sets of symptoms were used for describing blood loss within the first 24 hours postpartum. The quote below provides a description of much blood loss using the physiological response method:

Maimuna: After delivery, the doctors usually ask someone to lie down for at least 6 hours. ...When [you] lie down and you need to pass urine or something, they say, “Stand up, go ahead and do it.” If you’ve lost too much blood, the moment you get up, you’ll faint. That way, they’ll know that you’ve lost too much blood...I experienced this with this baby [points to the baby she’s holding]. When I came up- I was lying on the bed. Then they told me, “you’ve been discharged.” Then they said, “Get up, let’s go.” I got up and I could see people, but later on I was on the ground. I fell down and fainted (FGD 1).

- **Procedures**

Respondents also used the management regimens provided/prescribed by maternity staff to make judgments about bleeding; no procedures were described for home births. The procedures that signalled too much blood loss included having blood transfusion, health staff asking your relatives to look for blood donors, being given bloodtonic tablets or blood supplements, being referred because the bleeding has overwhelmed the doctors, being given “*some injections to stop it and some tablets,*”

and maternity staff needing to manually scoop out blood from you. Among educated women, a drop in one's packed cell volume was also mentioned. Women who had a planned C-section had to have blood stored in the blood bank, and if this blood was not used up, bleeding was considered minimal/normal:

Respondent: *Since it was through CS, there wasn't any problem. They went ahead and checked the PCV [packed cell volume] and said there was no problem, and they had already kept blood in the bank and said if I lose blood, they will use it. But they didn't eventually get to use it (IDI 7).*

C. Subjective assessment

Respondents used subjective interpretations, markers and opinions to make judgements about levels of blood loss. These fell under three areas:

- Psychological reaction

I asked women whether their bleeding scared or made them worried. Women who reported that their bleeding was normal generally said that the bleeding did not scare them or make them worried. Too much bleeding, on the other hand, was described with statements such as “*will even scare your birth attendant,*” “*I was totally agitated*” and “*it shocked me you know...*” A few respondents also spontaneously reported themselves or the birth attendant being scared as a sign of too much blood loss. In one case, however, a respondent reported that it was her lay networks who were afraid as opposed to her:

Respondent: *...When I used to bleed during the delivery [at home], people used to be scared when they see it. But it didn't used to scare me because I was already used to it. Although one cannot get used to suffering, but since every time you're experiencing something, you're always finding yourself in it, you see one can say she's used to it (IDI 15).*

- Personal comparisons

The trend of comparing one's experiences to previous deliveries and to other women, as reported in other sections of this thesis, was also observed with respect to bleeding. About half of all the multipara IDI respondents compared their bleeding

during their last deliveries with previous one(s). Particularly, women made statements such as “*I lost more blood in that of Tim than Tony*” and “*it was for this one that it poured a lot, but it did not pour a lot for these ones.*” Women also gauged their bleeding by comparing their blood loss with other women’s. The two quotes below demonstrate these observations:

Comparison to self

Rachel: *For some, it depends on your delivery. From the 1st to the 2nd to the 3rd to the 4th to the 5th, all, you’ll be able to know the way blood pours for you. The delivery you first started, you’ll be able to mark the blood that poured previously and then the most recent one, the one you’re currently in. Yes, you’ll be able to differentiate it (FGD 6).*

Comparison to others

Respondent: *I didn’t bleed very much for this one [referring to last born]. But others bleed a lot. They keep soaking pad upon pad, but I didn’t really soak up mine. For some others, they even have to double the pads. But in my case just one was enough and when I wear that one, at about the time I go to take my bath I just change it and that’s all (IDI 7).*

- People’s comments

Some women used the comments made by birth attendants about their bleeding to also make judgements. Women who reported minimal/normal bleeding said the maternity staff “*didn’t say the blood is short in my body*” or that they expressed surprise that the woman did not bleed. In contrast, women who reported much blood loss said the maternity staff commented that their blood loss was too much or that they “*should be given food that will increase your blood.*” For home births, one respondent described her much bleeding during delivery as “*everyone who sees it must talk.*”

5.3.4.3 Blood loss depends on context

Although women could report ways of determining too much bleeding, they also felt that the level of bleeding depended on the individual woman, her birth attendant/place of delivery, and her mode of delivery.

Emerging mostly from the focus groups was a perception that the level of blood loss was dependent on individuals' blood levels, which were believed to vary: "*blood, it is body-by-body*" and "*everyone has a blood level that God has given her.*" This meant that women were expected to have different levels of bleeding, and that different women could tolerate different levels of blood loss:

Farida: *You know everyone-, it depends on how everyone's blood is. One can bleed a lot, no problem. But another person, when she bleeds, you must have problem. [she later likens this to how women's menstrual flow also differs] (FGD 7).*

Interviewer: *But if I say, here's this bottle (500mL), if I say a woman lost blood that filled up this bottle during delivery, do you think it is normal or problematic?*

Hadiza: *It could be problematic to one person, but it wouldn't be problematic for another person-*

Laila: *It wouldn't be problematic*

Interviewer: *It wouldn't be problematic if it doesn't surpass this?*

Laila: *I think so*

Interviewer: *Why do you say so?*

Hadiza: *It could be problematic to one person because it could be that there wasn't enough blood. If it pours and fills up a bottle like this, it would be problematic for her. But if another person has sufficient blood, even if it pours and fills up to 3 of this bottle, it wouldn't cause anything (FGD 5).*

One respondent explained that not bleeding much was a sign of insufficient blood: "*Because you know for someone the blood will pour very much. But for another person, she has insufficient blood it will not pour much. Well my own is like that, it did not pour a lot*" (IDI 14). One other respondent reported age as a factor that influences blood loss, with older women tending to bleed less than younger women during delivery.

There was also a perception that a woman will not bleed much postpartum if her birth attendant has 'scooped' out blood during delivery, as described in the quotes below. This scooping out was perceived as more likely in a facility birth, and consequently some women felt that women bled more when they delivered at home. A few respondents also reported that blood loss is less if a woman had a C-section compared to vaginal birth. This is because the blood is usually evacuated during the procedure, and they felt that blood flow is controlled during the C-section:

Doris: *There are some women, some midwives that after delivery, they will now use a glove very big like that and they put their hands-*

Taniyo: *Obstetric glove, right?*

Doris: *To scoop everything out to avoid that-*

Aminchi: *The retained placenta.*

Doris: *Yes. They will remove them all. And most times, you don't experience such bleeding. But it's not practiced everywhere. It's one lady that told me about this- that they did it for her somewhere and she didn't experience-*

Taniyo: *Yes. For this my second child, I didn't experience any bleeding because the midwife, she put that obstetric glove and she scooped out all the blood from the inside, yes. She scooped out everything.*

Jane: *Normally, mine was CS. So immediately when they evacuate all the blood (incomprehensible 2-3 words), it was only 2 days that I experienced the blood-*

Taniyo: *Bleeding?*

Jane: *Uhhmm. Two days (FGD 4).*

5.3.4.4 Good blood vs diseased blood

A theme that emerged mainly from the FGDs, was related to perceptions of blood as being good or diseased/bad/dirty. These were differentiated by colour and consistency. Good blood is reddish; bright; fresh “*coming out from a wound, so it's part of the blood in circulation, not what is outside.*” On the other hand, diseased/bad/dirty blood: is blackish or dark; comes out in clots; is “*useless;*” “*condemned;*” and comes out because “*disease is what is pouring;*” and it must be removed from a woman's system. Diseased blood was also generally perceived as a major cause of abdominal pain post-partum if not expelled. An educated respondent described good blood as being oxygenated and bad blood as having no oxygen.

Having diseased blood postpartum was normal, and respondents mentioned that diseased blood is what birth attendants usually scoop out manually during delivery, as seen in the quote below:

Farida: *Well, when you go to the hospital, they will scoop out the blood. They will scoop out this dirty blood...You know, if it is the hospital, they will scoop out all this dirty, dirty blood, and remove it....If it is at home, this one they've not scooped it out, blood must just come out (FGD 7).*

A traditional practice of encouraging the bad blood to come out after delivery by using hot water baths, massages and drinks was universally done to get rid of the blood, except in C-section deliveries. A few respondents reported negative health effects from the hot water baths such as ear blockage and swollen body; however, they did not report stopping the practice but only modified it by allowing the water to cool down a bit. The importance of the baths and removing the bad blood is illustrated in the following quote from a father, who knew hot baths were discouraged by health staff but still advocated for their importance:

Respondent's husband: *If it were just blood dripping (hisses briefly), I wouldn't have appreciated the practice. But to have seen CLOTTED BLOOD coming out, I think I appreciated it. And I encouraged her too. What it means is there was some bleeding inside and it got stuck there, which I think it will not be good afterwards. So those traditional practices, I think they are good (Family interview #8).*

Some respondents reported that it is detrimental to lose good blood but fine to lose diseased blood, that is, “*when one is giving birth, if the black one is pouring, no problem. But if someone sees that her blood has snapped, it means there's a problem*” (FGD 5). Similarly, the same quantity of blood loss is sometimes simultaneously perceived as minimal or much depending on the type of blood.

5.3.5 Summary of Findings

Research sub-objective 1a: To find out respondents' perceptions of maternal morbidity relating to normal vs. abnormal conditions, causes of morbidities and impacts of morbidities

* Note: As stated earlier, I had unique objectives for each of these three conditions at the onset, which I attempted to address during data collection. For vomiting, they were: i) to find out whether vomiting during pregnancy is perceived as an illness or a normal part of pregnancy; ii) to find out the impacts of vomiting during pregnancy on women's lives. For prolonged labour, they were: i) to investigate how women

discerned the start of ‘true labour’; ii) to find out perceptions of normal/short labour vs prolonged labour. For haemorrhage, they were: i) to find out general perceptions relating to blood loss during delivery and within the first 24 hours after delivery; ii) to find out perceptions of minimal/normal vs much blood loss. While these questions provided valuable insights on these three conditions as seen in the summary of results below, there were a few limitations. I only came across five cases of moderate/severe vomiting and it is plausible that additional perspectives on impacts may have been obtained with a larger sample size. For prolonged labour, I could have explored some aspects in-depth, for example, perceptions of ‘normal labour.’ For haemorrhage, it was somewhat difficult to identify women within the community who had experienced haemorrhage in reality, although a few women gave descriptions that suggested excessive bleeding. These have also been acknowledged in the limitations section of the discussion chapter.

- Vomiting was generally seen as a normal part of pregnancy, unless a woman vomits after eating, has poor appetite and isn’t well-nourished due to it. Normal vomiting is short, does not inhibit chores or make one to lie down, and has triggers that can be controlled; abnormal vomiting is prolonged, overwhelming, bad enough to go to hospital and brings out all one eats/drinks. Moderate or severe vomiting impacted women nutritionally, physiologically and mentally. It also impacted their families logistically, physically, financially and maritally.
- Three methods were generally used in discerning ‘true labour’: pain; previous experiences; and physical symptoms. Normal/easy/short labour tended to be expressed in terms of minutes and a few hours and prolonged labour in terms of several hours or several days.
- Three groups were apparent with respect to how a woman should bleed during and/or after delivery: ‘flow proponents’ (believe that blood needs to come out and not stay inside); ‘precautioners’ (tended to stress the consequences of blood loss); and ‘middle-grounders’ (in-between;

acknowledged the complexity of blood loss; sometimes struggled to draw a line between acceptable and excessive bleeding).

- Perceptions of minimal/normal vs. much blood loss generally fell under three sub-themes: related to quantity of blood lost and visual stimuli ('portion', 'paint' and 'pressure'); symptoms and interventions ('physiological response' and 'procedures'); and subjective assessment ('psychological reaction,' 'personal comparisons' and 'people's comments'). Some respondents also felt that the level of bleeding depended on the individual woman, her birth attendant/place of delivery and her mode of delivery.
- Blood was perceived as being good or diseased/bad/dirty, and colour and consistency were used to differentiate between these two 'types' of blood. Diseased blood was generally seen as a major cause of abdominal pain postpartum if not expelled.

Chapter 6: Care-seeking for Reported Maternal Morbidity

“...We don’t do quackery [for children and pregnant women]”- Family interview #8

6.1 Chapter Structure

In this chapter, I will address the third and fourth sub-objectives of the first research objective (1c and 1d): “to identify care-seeking behaviours with respect to reported morbidities” and “to find out lay networks that women consult and how they influence care-seeking.”

6.2 Methods

The methods are the same as those described in Chapter 4. I included questions about care-seeking and lay networks in the FGD and IDI topic guides. In the FGDs, I asked respondents about useful/appropriate sources of advice that pregnant women and those who recently delivered may consult for general questions about their health, their baby’s health, what to eat, what to wear, when to resume work/chores and so on. I also explored care-seeking for some of the pregnancy morbidities mentioned in the free-listing exercise as well as for haemorrhage, one of the three selected morbidities reported in Chapter 5. The questions on care seeking for haemorrhage focused on whether and when a woman needs to seek care at any point of her bleeding.

In the IDIs I asked about actual care seeking experiences. I asked IDI respondents whether they experienced any illnesses or health problems during pregnancy and the postpartum period. If they did, I then asked whether or not they consulted any source and how they decided to consult that source. These questions were integrated into the labour and delivery narratives (Section 5.3.3). I also asked the respondent whether or not she was worried at any point during the delivery, and whether anyone was with her during the labour and the role s/he played.

In the family interviews, I asked whether there were illnesses or health problems that the family would manage at home and those they would seek care for outside the home during pregnancy, delivery and postpartum, and how they would be managed. I mainly asked for examples, but also explored hypothetical situations. These discussions sometimes went beyond the delivery of the primary respondent to other deliveries in the household; this gave a more in-depth understanding of care-seeking and perceptions in the household.

6.3 Results

6.3.1 Structure of the Results Section

The first four themes I present were deductive based on the study aims: “care-seeking approaches” relates to how available treatment options were used; “care-seeking options” pertains to the treatment options available; “care-seeking drivers” relate to factors that determined which options were used to treat morbidities; “the identity, roles and care-seeking influence of lay networks” relate to the members of respondents’ social circles which they consult with respect to morbidities and health, and how these individuals impact care-seeking. One inductive theme emerged from the data: “care-seeking behaviours by socio-demographic characteristics” and it relates to individual-level factors which impact care-seeking.

6.3.2 Care-seeking Approaches

Care-seeking options are used in a variety of ways (Figure 6.1).

In some cases, care-seeking is **uni-dimensional**, that is only one option of treatment is used until the morbidity is remedied. This approach tended to be used for morbidities at the extreme ends of the severity spectrum, with mild morbidities entirely managed at home and severe morbidities usually taken to the hospital.

Sometimes, care-seeking is **step-wise**: one option is tried out first and if it does not work, another one is tried and so on until the morbidity is remedied. For example, in managing malaria, a family may first wait for a few days at home to see how the morbidity progresses. When it continues, they may buy drugs from the pharmacy, and if the malaria “*overpowers*” the medicine, then they go to the hospital. Similarly, the respondent who lost her sight (reported in Chapter 4) first went to the traditional healer but later visited the hospital.

Care-seeking can also be **simultaneous** where multiple options are tried in tandem. In treating abdominal pain postpartum, for instance, one respondent uses cassava, drinks honey in hot water and also buys ampiclox from the pharmacy. Another respondent also utilised both hospital and traditional regimens for backache, reporting that “*whichever one I find, I take.*” The quest for cure and hastened recovery appeared to initiate this simultaneous usage of multiple options.

Certain options tended to be used exclusively or predominantly in certain maternal phases (pregnancy, delivery and postpartum), hence care-seeking was sometimes **phase-specific**. For example, some families would use the hospital during pregnancy but would deliver at home and manage postpartum morbidities at home. In this context, several reasons- a recognition that ANC is important, concern for the baby and free ANC- appeared to encourage hospital usage during pregnancy.

Related to phase-specific care seeking was **opportunistic** use of antenatal care in pregnancy, where care-seeking for a morbidity is delayed until the next antenatal care, then the issue is either brought up spontaneously or mentioned when the care-giver inquires about any problems:

Interviewer: *But like, did you seek for help for the vomiting, did you look for treatment or something?*

Respondent: *When I go to the hospital, then I complain... When you go for antenatal care, they usually call you one after another. They'll ask you, “You're pregnant, do you have problems? Say it. Which problem and which problem is your own?” You*

know when they ask you like this, you'll say "I'm eating food but it is not staying in my stomach." ...

Interviewer: *OK... It's not as if the vomiting disturbed and then you went immediately-*

Respondent: *Yes, it was not-*

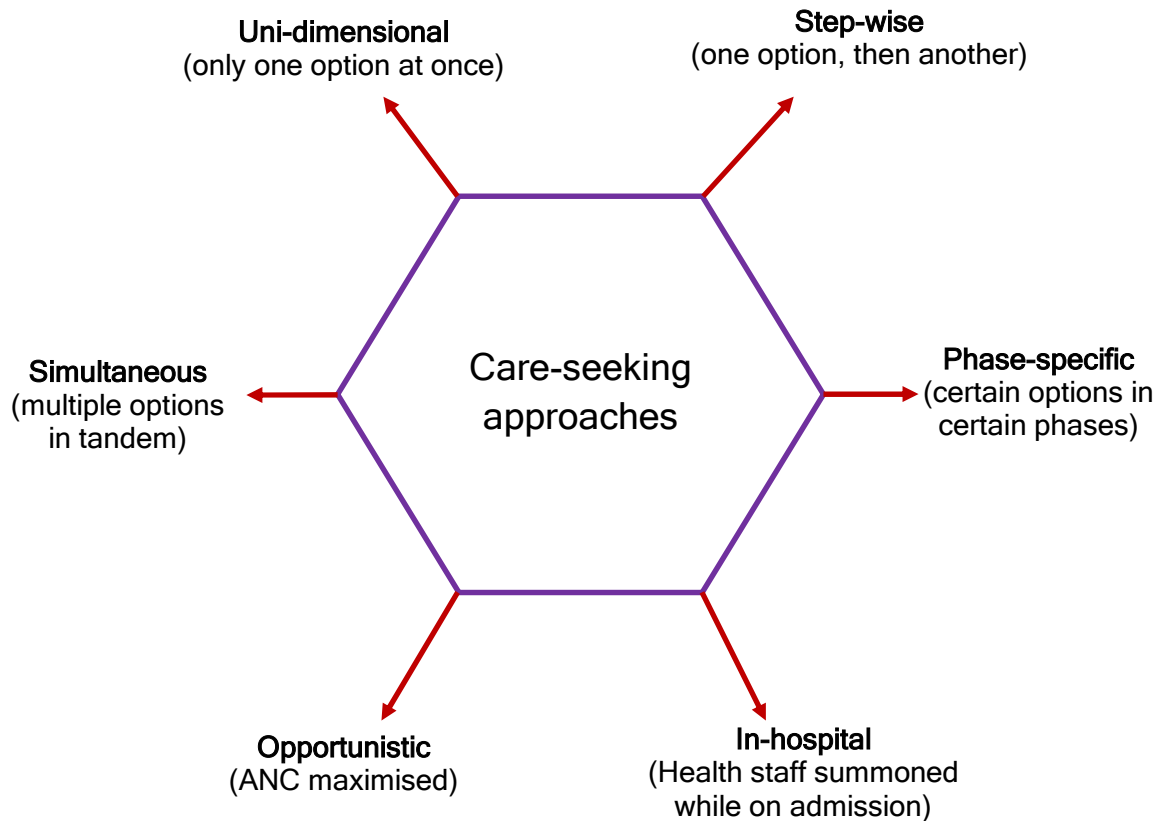
Interviewer: *It was just during the maternity*

Respondent: *Very well, very well. I went for maternity and then I complained. I did not stand up and go specifically because of the vomiting (IDI 1).*

Also related to phase-specific was care-seeking within the hospital while the woman is admitted for observation following delivery- **in-hospital care-seeking**. It entails summoning maternity staff specifically from their duty stations because of an issue. Most cases of in-hospital care-seeking were related to postpartum haemorrhage and were done by educated women, as seen in the example quote below:

Respondent: *... I just got up to tie my wrapper very well before I sat down, and that is when blood just splash down and poured on the floor. When I saw it I had to lie down back...Because you know standing, it will encourage the bleeding, so I had to lie down back... I now called the nurse, so the nurse came and attended to me. They cleaned me up and the bleeding stopped until I was discharged (IDI 6).*

Figure 6. 1: Care-seeking approaches



6.3.3 Care-seeking Options

As described above respondents and their families treated, prevented and/or managed morbidities at home or through the formal health system. These will be discussed in detail in the next two sub-sections.

6.3.3.1 Home management

This entailed managing morbidities with readily available regimens obtained at home or outside sources without consulting the formal health system. Morbidities were managed at home using three sources of regimens:

A. From lay knowledge

The knowledge about home regimens was obtained from previous generations and lay networks (relatives, friends, neighbours or colleagues), and in many cases these regimens were prepared or obtained locally by respondents and their families. Health

problems managed using this option included spitting, delayed placental expulsion during home-birth, postpartum abdominal pain, general body pain, *kasala* (body heaviness), stomach bloating, high blood pressure, and fever. Home care was also used to hasten delivery, remove “*zaki-zaki*” a “sweetness” fluid that has to ooze out before one can give birth, reducing labour pains, and to increase blood after excessive bleeding during delivery.

For women who had home deliveries, delayed placental expulsion came out strongly as a morbidity that families would initially manage at home; therefore I will be providing in-depth information about it. The length of time for placental delays varied from 10 minutes to two hours, and in most cases, the women’s lay networks- who also served as their birth attendants- tried to expel it using several strategies²⁵ including:

- Waist-jerk movement.
- Shaking the abdomen- the woman’s lower abdomen is held and then turned or shaken.
- The woman is raised and shaken.
- Pepper is put on hot coals so that the woman inhales and sneezes
- *Murciya*, a local kitchen utensil (Figure 6.2) is pushed into the woman’s mouth as if to induce vomiting.
- Water is poured into a bowl of ash (Figure 6.3) and then turned upside down.
- The bark of a wild paw-paw tree (Figure 6.4) is boiled and drunk.
- The woman is asked to push as if she is in labour.
- The woman is asked to blow into a bottle.

Some of these treatments (for example, shaking the abdomen and pushing a local kitchen utensil in the mouth as if to induce vomiting) were commonly mentioned while other treatments (for example, water being poured into a bowl of ash) appeared to be family-specific. While a rationale could be deduced for most of the treatments

²⁵ Some of these strategies may have also included ‘known-but-not-yet-tried’ ones.

(to mechanically expel the placenta), the water-being-poured-into-a-bowl-of-ash treatment appeared to be purely superstitious. The bark of wild paw-paw tree being boiled, on the other hand, appeared to serve a similar purpose as induction of labour. In some cases, the strategies were reported to have expelled the placenta, but in other cases, a health worker had to be summoned home or the woman was taken to the hospital.

Figure 6.2: *Murciya* (picture not taken from a respondent's home)



Figure 6.3: Bowl of ash



Figure 6. 4: Branch from wild paw-paw bark



B. From traditional healers

Some respondents managed morbidities at home using medicines obtained from traditional healers. These included medicines that could be swallowed, bathed with, or that were burnt because “*some of the spirits don’t like the smell of some medicines*” (FGD 3). Qur’anic writings and recitations were also used. Morbidities managed with this option included backache, mastitis, blindness, and morbidities with a spiritual cause. Possession by a spirit could be the cause of any morbidity, with spiritual cause identified when ‘doctors’ were unable to diagnose or treat the morbidity (more information in Section 6.3.4). “*Madness*” was always considered to have a spiritual cause as explained in the quote below:

Interviewer:...*You said the chewing-chewing illness [eclampsia] is an illness for the hospital. Which types of illnesses then are illnesses for traditional medicine?...*

Respondent’s mother : *For example, like spirit illness. If it happens to you, like you’ll go to the hospital and they’ll say no drugs for it. Go to the Mallam and he’ll scoop out some powder and give you. They’ll tell you it’s the one, it’s the spirit, or it’s like this, or it’s like this wicked people that possess someone. Isn’t that the traditional one? That’s it!*

Interviewer: *OK, but how do they know that it is the one? What will a woman do that people will know that this is an illness for traditional medicine?*

Respondent’s mother: *An illness for traditional medicine, the way one will know it is, for example, if someone is sitting down like this and then she is looking in an abnormal way. She’ll be looking in an abnormal way like madness [I think she demonstrated someone staring into space, or looking from left to right]. That is the one for traditional medicine (IDI 19).*

C. From pharmacies

Women and their families also consulted or visited pharmacies for health advice or to buy drugs; it was difficult to always decipher whether these pharmacies were drug stores or were run by trained pharmacists. Health problems for which pharmacies were visited included abdominal pain, headache, malaria, dizziness, and vomiting. In a few cases, drugs were obtained from pharmacies for prophylactic reasons. Some women who had home deliveries also obtained ampiclox- an antibiotic- from the pharmacy for postpartum abdominal pain:

Respondent: *It [abdominal pain] even stops you from eating, until you take something, ampiclox. But I stopped experiencing the abdominal pain after 3 days.*

Interviewer: *Ok, so you took ampiclox when you were having the abdominal pain?*

Respondent: *Yes.*

Interviewer: *Where did you go to and then you were given the ampiclox?*

Respondent: *From a nearby chemist here (IDI 3).*

6.3.3.2 The formal health system

This entailed consulting a health personnel or a health facility. Using this option, families either brought a health personnel home to manage a morbidity, or respondents visited or were taken to a health facility.

A. Health personnel summoned to home

Families sometimes called or brought a health personnel home to treat a woman. Sometimes women who had home-births also called a health personnel to check their health and baby's after the delivery. These health personnel lived and/or worked in the same communities as the women; one family referred to such a personnel as their "family doctor." Morbidities for which health personnel were summoned included vomiting, delayed placental expulsion during home-birth, prolonged labour and abdominal pain. One severe and one moderate case of vomiting that I reported in Chapter 5 were entirely managed at home by a health personnel with interventions including drugs, injections and drips. The quote below shows when a health personnel was summoned:

Respondent: *When the baby came out, like the baby came out, but the stomach was turning. Before the thing [placenta] will come out, until the doctor²⁶ came. They went and called the doctor and he came...*

Interviewer: *Who went and called the doctor?*

Respondent: *My neighbour here [in the family interview, the neighbour reported that it was the midwife she called] (IDI 4).*

B. Hospital

Here, 'hospital' is a generic term for health facility as respondents generally referred to any type of health facility as 'hospital.' This option also included consultations for morbidities during antenatal care. A range of illnesses that took respondents to the hospital, or which families reported that they would seek care for in a hospital should they occur, included infection, excessive bleeding, labour that comes with fever/malaria or fainting, expelling a stillborn, dysentery, body pains, diarrhoea, ulcer, labour that starts with bleeding, obstructed labour, headache, delayed placental

²⁶ It is not clear if this was a doctor, another health professional with formal medical training (such as a community health worker) or a non-medically trained person.

expulsion, frequent stooling, side pain, high blood pressure, malaria/fever, vomiting, prolonged labour, uterine prolapse, painful stretch marks post-delivery, leg pain, stitches loosening, abdominal pain and delivery complications during home-birth. In the family interviews, prolonged labour, excessive bleeding, and labour that starts with bleeding came out predominantly as the morbidities that they would seek care for at the hospital.

The morbidities managed by the different sources were wide ranging, and many morbidities were listed as being managed by several sources. Factors that influenced where care was sought are described in the next section.

6.3.4 Care-seeking Drivers

Different factors determined which care-seeking options were used including perceived severity of the morbidity, familiarity with the morbidity or treatment, perceived efficacy of treatment, previous experiences with the morbidity or treatment, perceived cause of the morbidity and affordability. Perceptions of severity and familiarity were major drivers of care-seeking.

A. Perceived severity

Some morbidities were first treated at home and care was only sought outside when they were perceived to have become severe- either because they were prolonged, impacted on normal activities or functioning, the pain was unbearable or causing severe discomfort; and when home remedies had failed. There weren't any particular patterns observed in terms of which care-seeking options were used next, as approaches differed (Section 6.3.2).

Hajara: ...But if there's a problem, from night to morning to evening, it means there's a problem inside. You can't understand this problem until you go to the doctor's (FGD 6).

Interviewer: OK. But at what point did she say, "kai, it is better for me to go to the hospital?" Why did she go to the hospital that time?

Translator: *She said it started/kicked in very seriously-*

Co-wife: *She was really vomiting-*

Translator: *She was really vomiting*

Co-wife: *Even to go outside, she couldn't go outside, that was why she went to the hospital (IDI 11).*

Some morbidities were perceived to be severe as soon as they occurred and the hospital was visited straightaway or respondents reported that it would be visited should the morbidity occur. This tended to happen when there was a perception that the morbidity could kill the baby and/or mother or lead to other serious negative impacts, or from witnessing the negative consequences it had on someone they knew. I found that respondents and their families were generally afraid of excessive bleeding and took it very seriously, as seen in the quote below. A few respondents reported specific incidences of women they knew who died from excessive bleeding. One respondent's remarks were indicative of the seriousness with which bleeding was taken: that only "*madness*" would make an individual not to rush a bleeding woman to the hospital, as once bleeding starts, it means the situation is "*bad*" and only the mother or child will survive unless due to "*luck*" (Family interview #3). In the IDIs, a little over one-third of respondents reported excessive bleeding (antepartum or postpartum) in the last delivery or previous ones, and all the women reported some form of care-seeking.

Husband: *[Mimicking how blood flows] But that one that will come down su su su su su*

Wife: *Very well!!!!*

Husband: *Tomorrow su su su su-*

Wife: *In one case, it can even run on the ground*

Husband: *This one must be taken to the hospital*

Wife: *This type will pour a lot, it is a problem*

Husband: *This one-*

Wife: *It must be taken to the hospital.*

Husband: *This one is an illness*

Wife: *Because if you leave it at home and it keeps pouring, at the end the woman who gave birth will lose her life*

Husband: *Yes, she will die*

Wife: *Because when this blood finishes, you know ... she will experience a big problem (Family interview #7).*

B. Familiarity

Home management was generally used when the morbidity was familiar or when there were known remedies for treatment. Morbidities that were unusual, which occurred out-of-the-blue or which had never been experienced were usually taken to the hospital. Families and women seemed to have to a repository of known issues that could happen during pregnancy, delivery and after-birth and which they have remedies. Morbidities that were unknown or for which home remedies were unknown were taken to a hospital. For example, in addition to being seen as severe, bleeding was also perceived as a morbidity that should be taken to the hospital because there are no known home remedies for it. Furthermore, while families knew about and have developed several strategies to manage delayed placental expulsion during home-births, this step was not extended to other morbidities such as uterine prolapse as these were considered rarer and families were afraid to handle it.

***Interviewer:** ... So the first time that you saw it [blood], you decided to go the hospital?*

***Respondent:** Yes*

***Interviewer:** ... But why did you decide to go the hospital at that time?*

***Respondent:** Because I had never seen- in fact I have never even heard of someone being pregnant and then blood is coming out (IDI 7).*

***Respondent's husband's step-mother:** No, no. To return it [prolapsed uterus]? We were afraid, my sister, we were afraid to return it... If you've never seen something, you must take it to a place where they surpass you [with knowledge]. In this world, it's certain that someone else surpasses someone, someone else surpasses someone. That's how it is done (Family Interview #10).*

C. Perceived efficacy

Related to familiarity was the perceived efficacy of options. Certain options and treatment regimens were seen as more effective. Many respondents acknowledged their lack of expertise and expressed a belief in the diagnostic, curative and preventive capabilities of health workers and hospitals; one educated husband sums it nicely by saying “we don't do quackery” for pregnant women and children (Family interview #8). Receiving hospital reassurance at some points that a perceived morbidity is normal negated care-seeking. The formal health system was also used when respondents reasoned that lay networks or non-hospital sources cannot handle

a morbidity. For instance, one rural family did not use traditional medicine for eclampsia because “*the illness is the type for hospital*” (Family interview #9). In one case however, traditional medicine was used when conventional medicine failed to treat a morbidity, as seen in the second quote below:

Interviewer: *When a woman has high blood pressure, what's its solution? How would one-*

Zulai: *The solution to this high blood pressure ... like when you're pregnant, you should be visiting the hospital every time. Because they'll check your blood. If it has gone up, they will know. If it has not gone up, they'll know. If it has gone up, there's an injection they'll give a woman. When they inject her, the blood pressure would go down. That's when you're pregnant. When she is about to delivery, it is preferred that she gives birth in the hospital. Why? Because they know what to give her so that this blood pressure doesn't go up (FGD 2).*

Asabe: *... I went to the hospital [for mastitis]-... They wrote drug for me, I took it but it didn't heal. And I usually go to the Mallams [Islamic healers]. They read and do this [demonstrates spitting] on the head (FGD 7).*

D. Previous experiences

Previous experiences of morbidities made women to be aware of danger signs and also served as reminders of negative consequences. These in turn influenced care-seeking in the future by making women and/or their families to: initiate care-seeking; upgrade to using the formal system; stop the usage of unorthodox regimens; alert health professionals about the probability of occurrence of a morbidity so that they could take appropriate measures upfront; negotiate care in facilities or do in-hospital care-seeking. The quote below demonstrates how a previous C-section influenced a respondent to demand the intervention a second time after being in prolonged labour, although other factors appeared to have also influenced this action- labour pains, education and witnessing her labour roommate die:

Respondent:... *[After being in pains for several hours] And when the doctor that was to check me checked and said I was 2cm. And I was like that till night, 2cm, 2cm.*

Interviewer: *You didn't progress*

Respondent: *So I said, "Excuse me please. I would like you to BRING OUT THIS BABY!!!..."*

Interviewer: *Why did you, why did you tell them that you want this baby out now?*

Respondent: *Because I was going through pains! And from morning till that night, 1-2cm, for how long will I stay on that? And, remember I had a CS before then. What if the pain impacts so much on the initial cut, besides, and then something else happens? So that was how I was like this baby should be brought out now. So my doctor was contacted, and eventually around 11 nothing was done. So I had to yell at the doctor there ...I said, "TAKE MY CASE AS AN EMERGENCY PLEASE!!!" So they rallied round and by 11:45pm they brought the baby out (IDI 18).*

E. Perceived cause

The cause of a morbidity also determined which care-seeking option was used. For instance, morbidities that were caused because actions had not been followed could be remedied by performing the action, so postpartum stomach bloating could be managed at home because the cause is that the abdomen had not been massaged adequately after delivery. Morbidities seen as being caused by the pregnancy, and which cease after delivery, or those perceived as conditions that will wane and only ceased at their own time were also managed at home:

Interviewer: *What's the step necessary to tackle this [leg numbness/inability to walk] when it occurs to a woman?*

Samira: *There's just no step to take-*

Zulai: *It's just until one gives birth.*

Samira: *This leaves you only when you give birth. Because even when you go to the hospital, they'll just tell you not to be sitting down in one place, you need to just be walking around, that's just the solution they'll ask you to do (FGD 2).*

Respondent: *...Well, from this time henceforth, I decided not to take paracetamol again since it was pregnancy. Until- (laughs)*

Interviewer: *Why did you say that? (laughs)*

Respondent: *I just left it*

Interviewer: *Why did you say you will not take paracetamol again?*

Respondent: *Well, because for malaria²⁷ during pregnancy, when you're taking paracetamol, it is not as if the malaria will leave, it will just wane and then come back again, it will wane and then come back again. Until its ceasing time reaches. That is, if it is for pregnancy, when it starts like this for me, until its ceasing time reaches. Otherwise, it will not stop (IDI 12).*

²⁷ She may have been referring to fever; colloquially, the Hausa words for malaria and fever are the same.

In addition, there was a perception that the hospital cannot treat morbidities originating from spiritual causes (Section 4.3.7). Pregnancy was perceived as making a woman's body raw, exposed or open, making her vulnerable to becoming possessed by a spirit which could cause a wide range of illnesses that the hospital cannot diagnose nor treat. In such cases, a traditional source would need to be consulted:

Interviewer: *But is a hospital able to help when this spirit enters someone? Are they able to give all-*

Many at once: *They are not able to-*

Many at once: *They don't give-*

Interviewer: *Please can we talk one at a time? OK*

Samira: *They don't see anything-*

Zakiya: *They are not able to see-*

Samira: *You just have to consult traditional sources. It [the spirit] can change your baby and then put an old person in you-*

Zakiya: *Very well. The hospital, they don't see this. When you go, they tell you it's ulcer, or typhoid- [many respond with "Uhhh"] (FGD 2).*

Isatu: *They wouldn't understand it at the hospital-*

Fatima: *They wouldn't know*

Amina: *They'll tell you that they didn't find anything wrong in someone's body-*

Hasiya: *Yes, them-*

Amina: *Only if-*

Hasiya: *They're only interested in your money-*

Amina: *When you return home, consult traditional sources. They'll then check and find out what's wrong with you*

Hasiya: *Hospitals can't provide remedy for spiritual issues, only traditional sources (FGD 3).*

F. Affordability

This was a minor sub-theme, hence the short length of the sub-section²⁸. The availability and lower cost of traditional medicine and home remedies drives care-seeking in some families. In a few cases, traditional medicine was used because respondents could not afford hospital treatment.

²⁸ Affordability emerged as one of the reasons for home-deliveries. I have summarised the reasons given for home-deliveries in Appendix 6.1.

Interviewer: *OK. And did she seek for any remedy or treatment or anything from anywhere?*

Translator: *They used traditional medicine the time that she get her abdominal pain with the watery stool. She is taking traditional medicine, she didn't go to hospital...They do the traditional medicine, when they get money then they go to hospital (IDI 21).*

Table 6.1 overleaf shows a summary of care-seeking for selected morbidities with respect to approaches, options and drivers using data from the IDIs, family interviews and FGDs.

Table 6.1: Care-seeking snapshot of selected morbidities

S/N	Morbidity	Care-seeking option(s)	Care-seeking approach(es)	Care-seeking driver(s)
1.	Vomiting	Health worker summoned home, hospital	Uni-dimensional, opportunistic, simultaneous	Perceived severity, perceived efficacy, familiarity (when it occurred out-of-the-blue)
2.	Spitting	Always managed at home with lay knowledge	Uni-dimensional	Familiarity (known remedies)
3.	Bleeding	Always hospital	Uni-dimensional	Perceived severity, familiarity (no known remedies), perceived cause (unknown), previous experiences, perceived efficacy
4.	Malaria/fever	Pharmacy, hospital	Stepwise, uni-dimensional	Perceived severity
5.	Backache	Traditional medicine, lay knowledge, hospital	Simultaneous	Perceived severity
6.	High blood pressure	Lay knowledge, pharmacy, hospital	Uni-dimensional, simultaneous	Perceived efficacy
7.	Prolonged labour	Lay knowledge (to hasten delivery in general), health worker summoned home, hospital	Uni-dimensional	Perceived efficacy, previous experience, perceived severity
8.	Delayed placental expulsion (during home-birth)	Lay knowledge, health worker summoned home	Stepwise	Familiarity (known home remedies), perceived severity (home remedies failed)
9.	Stomach bloating	Always managed at home with lay knowledge	Uni-dimensional	Perceived cause (known), familiarity (known remedies)
10.	Uterine prolapse	Hospital	Uni-dimensional	Familiarity (morbidity unknown), perceived efficacy
11.	Eclampsia	Hospital	Uni-dimensional	Perceived efficacy
12.	Abdominal pain (antepartum and postpartum)	All options (except health worker summoned)	Simultaneous, uni-dimensional,	Familiarity (known home remedies), affordability, perceived cause (known), perceived severity

6.3.5 The Identity, Roles and Care-seeking Influence of Lay Networks

As stated in Section 6.2, I asked FGD respondents about useful/appropriate sources of advice that pregnant women and those who recently delivered may consult for general questions about their health, their baby's health, what to eat, what to wear, when to resume work/chores and so on. In the IDIs, I asked respondents who had reported illnesses or health problems during pregnancy and the postpartum period whether or not they consulted any source and how they decided to consult that source. These questions were integrated into the labour and delivery narratives (Section 5.3.3), in addition to finding out whether anyone was with the woman during labour and the role s/he played.

I found out that respondents' lay networks consisted of individuals in their social circles including mothers, husbands, mothers-in-law, co-wives, sisters, other female relatives, friends and family friends, work colleagues, older women, neighbours, other people in the neighbourhood, women at ANC, and well-wishers who visited them after delivery. Lay networks were a key source of advice, practical help and support. They were considered to have knowledge and/or experience about morbidities because they are older- "*big people, those who are more than you*" (FGD 7), have undergone the same experiences, or happened to be health professionals themselves. They were able to answer questions, explain causes of morbidities, serve as birth attendants, shape perceptions about what is normal and abnormal, pass on knowledge about treatment options, and offer advice. Table 6.2 outlines their specific roles. Respondents felt emotionally close and free with them, which facilitated consultation. They were also consulted because they lived with or close to the respondents.

Zulai: ... Well, those ones who have surpassed you, you can go and ask them. Those ones who have given birth before, you who has just given birth newly, you have no idea about it, you just have to ask someone above you. They'll tell you this is what you're supposed to eat, this is what you're not supposed to eat (FGD 2).

Interviewer: How did you come about deciding to consult your aunt, like why did you consult her?

Respondent: Well, she is older. She is older than me, and I kind of, am free with her too. So I just spoke with her. At least some things you don't read in books, you learn from the experience, from someone. So some things you may not get them in the books but from the experience of an elderly person. You can learn a lot and it will help you and save you some inconveniences too (IDI 6).

Although all members of a lay network could give advice, share knowledge and answer questions, there were some differences by type of person in how they were used. Friends, and occasionally other women at ANC, tended to give specific advice about how to take treatments. For instance, one respondent reported that a doctor prescribed anti-malarial for her but because “*my friend had told me that at seven months I’m not supposed to take it and I was seven months already... I threw it away*” (IDI 16). Another respondent who ingested moringa seeds and leaves for high blood pressure, in addition to hospital prescriptions, reported that she learnt about this treatment from a woman while attending ANC.

Family members handled logistical-related issues such as buying drugs from the pharmacy, taking respondents to the hospital for care, looking for blood donors during emergencies and providing or arranging transportation around delivery. Husbands were particularly prominent in these areas (Table 6.2). In a few cases involving rural women, husbands and mothers-in-laws consulted each other about the woman’s care. In one case, the mother-in-law²⁹ noticed something was amiss with the woman’s health and raised the issue with her husband. Another husband consulted his mother when his wife notified him that she fell and felt the baby stop moving; the respondent reported that this was their first delivery and neither of them knew what was happening. In one other case not directly related to morbidities, the husband consulted his mother whether it was safe for him to give his wife a bike-ride to another rural area during her late pregnancy.

Neighbours also played important logistical roles. In the study area, it is very common for different families to share a compound, or for houses to be structured such that one house faces another house- a system informally known as “face-me-I-face-you” for urban residences. In some of these settings, families would share toilet and kitchen facilities. For solo houses, it is quite common to chat with one’s neighbour over the fence or visit them for casual chats. This close geographical proximity encourages a communal lifestyle such that one’s neighbours become more like family members. Thus neighbours sometimes performed logistical roles such as providing transportation during emergencies when respondents’ family members were not around or summoning a health worker home to provide care.

29 The respondent made reference to “*my in-law*”, which I assumed is her mother-in-law.

Support roles were also mainly carried out by family members including mothers, husbands, sisters, co-wives, children, aunts and other relatives, although other lay networks also helped out too. For example, elderly women gave postpartum hot baths. One respondent also mentioned that her neighbour gave her food when she could not tolerate the one cooked in her household due to vomiting.

Table 6.2: Various roles performed by lay networks

Thematic area	Specific roles	Lay networks involved
Knowledge	Giving advice, sharing knowledge and answering questions	Mothers, friends, husband, neighbour, co-wife, aunt, relatives, old people, family friend, parents, fellow women, and people in general
	Giving customised advice	Friends, ANC attendee
	Giving experiential advice	Women who have given birth before, older women (e.g. <i>“the mummies in my office”</i>), old people
Logistics	Providing or arranging transportation	Husband, aunt, older brothers, family members
	Providing transportation during emergencies when women’s family members were not around	Neighbours, co-workers in one instance
	Looking for blood donors during emergencies	Husband
	Buying drugs from pharmacy	Husband, mother
	Serving as intermediary between the woman and her mother-in-law	Husband
	Serving as intermediary between the woman and her husband	Mother-in-law
	Serving as birth attendants ³⁰	Co-wife, sister, mother-in-law, female relative. Two husbands also reported being in the delivery room in previous deliveries

30 “Birth attendant” here means the person who delivered the baby and carried out necessary delivery practices. All the home births that I came across during the qualitative phase were attended by family members or neighbours. Although this is not directly related to morbidities, it has implications for morbidities.

Support	Giving postpartum hot bath	Elderly women
	Offering prayers	Husband, children, people at church
	General support: keeping eye on woman, escorting her to hospital, carrying out domestic chores	Mother, husband, sister, co-wife/co-wives, aunt, relatives, neighbour

Although lay networks played significant roles and were extensively consulted, there were some cases when they were not consulted. This was usually because:

- There were no problems or the woman already knew what to expect.
- It was not logistically possible to do so, for instance, they were not home or it was too late in the night to call them.
- There was a perception that they would impact the woman negatively, for example, offer advice contrary to the hospital's.
- The woman did not want to agitate or cause them to worry.

Respondent: ... *I was never comfortable with the hot water [postpartum hot bath]. So even when they recommended that, okay, a little bit massage around the wound, the CS wound, I said no. It will just take time to go by itself... Because even in the hospital, they advise you not to use too much of hot water when you have your baby through CS, because it is not advisable. You're already swollen and the area around it is swollen. So the hot water will just make it more swollen so you don't do that. Unlike somebody that have a normal delivery you can use hot water to press your stomach and do all that (IDI 8).*

Interviewer: *Who was with you when the labour started?...*

Respondent: *It was just me alone. I was with my husband but I didn't show him as if I was experiencing something.*

Interviewer: *Oh I see. Why? (laughs)*

Respondent: *(Laughs). I didn't show him.*

Interviewer: *I see. Was there a reason or.....?*

Respondent: *No reason. You know, you know when it comes to delivery, everyone's patience is different. For one person, she can be patient and you wouldn't be able to discern very quickly (that she is in labour) from her face, another person cannot be patient. And also, when you're living with someone, you who is experiencing the delivery will not be agitated compared to the person staying by your side. That's why (IDI 15).*

By playing significant roles and occupying important positions in women's lives, lay networks are able to influence care-seeking either positively or negatively. Many respondents' care-seeking practices depended on what their families believed and practiced. I found that the biggest positive role that lay networks played was *initiating* care-seeking at a health facility. As a first step, they are able to recognise that something is amiss and then they raise the initial alarm. This recognition also extends to emergency situations. In other cases, they encouraged care-seeking: by explaining the cause of an abnormality which eventually results in hospital visit; referring one to the hospital when consulted; and 'nudging' women to revisit the hospital when a morbidity persisted, reoccurred or does not improve after an initial visit.

***Doris:** There's the story of one woman...She had a tear and she came back home quite OK. So the thing didn't heal well and she started, eh, sleeping with her husband. But she was now feeling pain like that. So as she now told her friend. Then her friend said let her take mirror and check. When she checked, she discovered that the thing was just something else... So she went back to the hospital...It had already formed abscess-...So they had to scrap it so that they can get the fresh tissue to re-stitch it again. This woman cried and cried till she fainted... She fainted in the process (FGD 4).*

When an abnormality has been recognised and the decision to visit a health facility made, lay networks facilitate access to health services by providing or arranging transportation, as reported in earlier paragraphs. In some situations, lay networks fill in the vacuum for absence of ambulances in communities during emergencies; this was informal and based on communality. For example, the neighbour of one woman drove her to the hospital when her labour started, as her husband had spent the night queuing for fuel at a petrol station. In other cases, they call or arrange for expert care at home, for instance, summoning a health worker home during a delayed placental expulsion episode. Other positive roles that lay networks perform include doing in-hospital care-seeking and discouraging women from using unorthodox remedies for morbidities, as seen below:

***Interviewer:** Ok, at that time that the bleeding like poured and stained the floor, who was the person who called the nurse?*

***Respondent:** My aunty that was with me-*

***Interviewer:** That was with you ok. She was the one?*

***Respondent:** Yes (IDI 6).*

Respondent: ... [After experiencing severe abdominal pain from drinking potash] One lady came and told me, “Kai, one should not drink kanwa, kanwa can cause a miscarriage and it will also disturb you in the stomach.”... I never drank it again from that time onwards (IDI 2).

In as much as lay networks facilitate appropriate care-seeking, sometimes they also serve as inhibitors by: normalising a morbidity and then reassuring women; making the wrong diagnosis; or failing to take appropriate steps as gate-keepers to healthcare. In other cases, they discourage or delay care-seeking by encouraging stoicism or refusing to act promptly. In a few instances, it was the women’s gate-keepers to care- husband and mother-in-law- that failed to initiate care. Lastly, lay networks also provide or suggest unorthodox regimens for health problems to women, or suggest diverse treatment options for one particular health problem; this was mainly done by friends. The following quotes demonstrate these observations:

Respondent: It was different people. Like my mother said that “When you’re pregnant, there’s nothing that wouldn’t happen to you. You just have to endure.” Hence when I see something disturbing me, then I keep quiet. That’s me, I’ll just keep quiet (IDI 1).

Respondent: Well, some others were saying- that is old people [in the neighbourhood]. They will say “there’s no problem.” ...

Interviewer: So they were telling you.....?

Respondent: That there was no problem.

Interviewer: No problem, when you saw the bleeding?...

Respondent: Yes. They used to say “no problem.”

Interviewer: Was it before- was it while you were in the hospital or...?

Respondent: No, it was for the time I didn’t go to the hospital.

Interviewer: Okay they told you there was no problem, the bleeding was going to cease?

Respondent: Yes, that it would cease (IDI 7).

Respondent: Honestly, abdominal pain, I experience abdominal pain. For Belem’s own, they will come and rub potash, nothing; They will come and tie something here, the traditional one, nothing; They said I should drink whisky, I will drink whisky and get drunk, nothing (Interviewer laughs). They said I should do this, nothing! The abdominal pain is here- ...

Interviewer: OK, how did you, did you come about that decision, and you said “perhaps I should try this or try that?” How did...?

Respondent: When I try this one and it does not work, then they will tell me “Since you tried this one and it didn’t work,” one woman will tell you, “For me, I use to drink this one.” They will bring it to you. When you drink it and it does not work,

then you'll try this one. Someone will then say, "Me, I use to do this one," that she use to do it like this. I will just be ingesting it-

Interviewer: *OK, are these like friends or some-*

Respondent: *Yes, like when they come. You know, women come after one delivers-*

Interviewer: *That's right*

Respondent: *They will come to celebrate with you. Thus when they come and meet you suffering like this, someone will say here's something like this, that she has ever experienced abdominal pain and this is what she drank (IDI 1).*

While care-seeking for bleeding was usually prompt in general, I observed a few differences in the way women's lay networks approached care-seeking for the morbidity, particularly with respect to urgency. In the first two cases, which involved educated women, their lay networks rushed them to the hospital. In the first case, the respondent's neighbour took her to the hospital around 4am after she suddenly woke up from sleep and found herself soaked in blood, as her husband had travelled. In the second case, the respondent's colleagues rushed her to the hospital when she started bleeding in the office:

Respondent: *Because the episode for the pre-term, the thing started in the office. I was in the office... I was just sitting down and I felt the urge to pee. So on getting up I wanted to go and ease myself, then I felt something big flowing down and I was sitting next to one of my friends in the office.... Upon lifting my shirt like this, I just saw blood. I now told her and said, "Ah, Hadiza, see blood!" I was cleaning it, I didn't know my boss saw it. He was sitting opposite me and now shouting "Hey!!! Blood!!!" And the office became confused. Before I knew what was happening, they had bundled me inside a vehicle- Seriously, before I knew what was happening, I just saw them, they had bundled me inside his- I didn't even know when he [boss] brought his car. Honestly before I knew it, they bundled me in the vehicle to the hospital, and I called my husband...So I spoke with my husband, they now collected the phone and told him to bring some cloths for me since I was bleeding I needed to change, he should bring- they just told him what to bring...what to take to the hospital (IDI 6).*

In contrast, the family members of another respondent who experienced postpartum haemorrhage few days after delivery- a woman without education- first of all took water for her to bath and waited a long time before taking her to the hospital. She eventually fainted in the hospital and was unconscious for several days:

Respondent: *I started here- ...was it from night the thing happened to me. When I slept and woke up, when I got up, blood had soaked my wrapper. They took water for me to bath. From here, the blood was just snapping and coming down. It was just pouring and pouring. Then I fetched water and washed, until the thing overpowered me, it overpowered me and just released like this. I couldn't do anything- even to raise my hand. My body was totally slack. Then I called my husband and then we went to the hospital.*

Interviewer: *Was it at that night you went to the hospital?*

Respondent: *In the morning- in the afternoon like this.*

Interviewer: *OK, in the afternoon?*

Respondent: *Yes, we went to the hospital. When we went to the hospital, they looked and said, ha!, my body has no blood. Then they tied water for me [incomprehensible], then they went and looked for- then they admitted me. They kept looking for blood [her husband was the one who looked for people- his relatives and her relatives- to donate blood]. I didn't even know where I was... Days after days, I didn't know where my mind was (IDI 10).*

6.3.6 Care-seeking Behaviours by Socio-demographic Characteristics

I found that educational level, age and parity influence care-seeking.

- **Educational level**

Educational level was the foremost factor that distinguished women with respect to care-seeking. Educated women- respondents with post-secondary education- were generally proactive. They read a lot and conducted in-depth research about pregnancy, delivery, their health and baby's. While seeing health professionals in facilities, they asked questions and also followed what the staff were doing step-by-step; uneducated women were generally passive. Educated women also came across as being able to take personal responsibility for ensuring better health outcomes.

Respondent...*Hardly I will go for antenatal [and] the doctors wouldn't know me by name. I ask so many questions ... They will be wondering...When you're writing, I would like to know what is my BP for that day, I would like to know what I am weighing, what my baby is weighing, how is my baby lying for that particular month. I ask questions and you must answer me! ... That is just it. So hardly I go for antenatal and a doctor does not say, "Mrs. Ati, any more? You are here today. How are you doing today?" ... And to me, it helps a lot. You don't just keep quiet. You might have..... don't wait for the doctor to tell your- or start making impressions that you are not okay or your baby is not okay. Ask questions. And I guess the doctor will be happy too to answer you (IDI 8).*

Respondent:...And I also surfed the net so much (both laugh). Because there are certain questions human beings around you might not be able to answer at all. Or sometimes you don't even want to wait. Sometimes I wake up in the night and "let me google this thing, this is how I feel." And then I google it, see, "Ah, it's nothing after all" (IDI 18).

In addition, educated women double-checked information from health professionals with internet sources or trusted lay networks. They were also more likely to 'sieve' health advice received from others because "if you follow people's views, you'll end up being confused, and in fact, sometimes even putting yourself in trouble" (IDI 8). They also tended to reject superstitious beliefs and relied on valid sources of health information. While in health facilities, educated women were able to voice out their preferences and negotiate their care with health professionals. In a few cases, just being in the hospital was not sufficient to ensure thorough care and educated respondents were usually the ones who practiced in-hospital care-seeking (Section 6.3.2):

Respondent: ...That bleeding something, I was skeptical that, "Kai, I hope these people [health professionals] will just check me." So when they covered me, after they sutured... I'm resting, I now called the nurse. I asked, I told her to check me, that midwife. So when she did, she just saw that the nightingale was soaked with blood, I was bleeding. She said, "Ahh, you are bleeding." Then she now said "Ahh ahh, didn't they pack your- pack the blood out?" So she now put gloves...

-----Continues narration-----

Respondent:... So after they covered me, I now- after some time, I now called her again. She came. I said, "Check me." When she checked me, she saw I was bleeding. And so she was like, "Ahh, I'm getting afraid, Pamela (respondent's pseudonym) is still bleeding and something, no, I'm getting afraid. This is too much...This is too much." So she went to call the doctor...

-----Continues narration-----

Respondent:... And, I think they came to the rescue- to remedy on time, it was timely, so... because if I had not been calling her consistently to come and checkup, she wouldn't have known, because the wrapper was covered on me, they thought they had finished their work but blood was gushing out.

Interviewer: Okay you were feeling it, that is why you called her?

Respondent: I wasn't feeling it; it's just that I just didn't want to take chances. I didn't want to take chances that are- because feeling it actually, you may not! (IDI 16).

- **Age**

Teenage mothers were generally unable to recognise appropriate moments to seek care, particularly around delivery time; this appeared to stem from their inexperience

and limited knowledge as reported in Chapter 4, making reliance on family for decision-making and advice more likely. In one case, a teenage respondent also appeared to lack power to influence her care:

Respondent's mother : *The thing [labour] started for her from Thursday. When it started on Thursday, she was just keeping quiet since she is not a big woman, this was just her first delivery. She didn't know and she just went into the room and laid down. She didn't know that it was delivery. Then she told-*

Interviewer: *OK she didn't know that time?*

Respondent's mother: *Yes. Then she told her husband. Her husband just went out and left. He wasn't even bothered about her*

Interviewer: *OK he is the very first person she told?*

Respondent's mother: *Very well!... Instead of her husband to bring her, he just went out and left. And he didn't even look for someone to tell, "Oh, this is what she is going through." He didn't look for. He just kept quiet and she slept with it. Even on that Friday, she spent the whole day until in the evening when her body got destabilised. You see, the body had already gotten fatigued by then... By that time, the illness had already gotten into her body. You see, they didn't help her on time... (IDI 19).*

- **Gravidity/parity**

Care-seeking tended to reduce as women had more children and became more experienced, as seen in the quote below. Primigravidas demonstrated an eagerness to seek care compared to multiparas. For example, one primigravida woman would visit the hospital the very day a morbidity started (malaria/fever in one incident, antepartum bleeding in another instance).

Respondent: *... Like for Nathan (her 5th delivery), I've- I did not ask. You know it wasn't my first time. Normally these questions come to those that- you know like primers (both laugh). So because it was your first time you will be asking so-so, you will be anxious and be saying, "Ah, what will happen," this and that (IDI 17).*

6.3.7 Summary of Findings

Research sub-objective 1c: To identify care-seeking behaviours with respect to reported morbidities

- Women and their families used a number of approaches in using available treatment options: uni-dimensional (only one option used until the morbidity

is remedied; usually for morbidities at the extreme severity ends); step-wise (one option, then another); simultaneous (multiple options tried in tandem); phase-specific (certain options in certain phases); opportunistic (care-seeking for a morbidity is delayed until the next ANC); and in-hospital (summoning maternity staff specifically from their duty stations while on admission).

- Respondents and their families managed and/or prevented morbidities at home (using regimens from lay knowledge, pharmacies or traditional sources) or through the formal health system (health personnel summoned home or health facility visitation). For home-births, delayed placental expulsion came out strongly as a morbidity that families would initially manage at home using improvised strategies. Women and their families were generally afraid of excessive bleeding and took it very seriously; hospital care-seeking was always used.
- Six factors determined which care-seeking options above were used: perceived severity of the morbidity; familiarity with the morbidity or treatment; perceived efficacy of treatment; previous experiences with the morbidity/treatment; perceived cause of the morbidity; and affordability. Perceptions of severity and familiarity were major drivers of care-seeking.
- Educational level, age and gravidity/parity influenced care-seeking, with educational level being the most distinguishing factor. Educated women were proactive and came across as being able to take personal responsibility for better health outcomes; uneducated women were generally passive. For age, teenage mothers were generally unable to recognise when to seek care, especially around delivery. For gravidity/parity, care-seeking tended to reduce as women had more children and experience.

Research sub-objective 1d: To find out lay networks that women consult and how they influence care-seeking

- Respondents' lay networks consisted of individuals in their social circles and they included mothers, husbands, mothers-in-law, co-wives, sisters, other female relatives, friends and family friends, work colleagues, older women, neighbours, other people in the neighbourhood, women at ANC, and well-wishers who visited them after delivery.
- Women consulted these lay networks and they influenced care-seeking either positively or negatively. Many respondents' care-seeking practices depended on what their families believed/practiced. There were some differences in how lay networks were used: friends tended to give specific advice about how to take treatments; family members handled logistical-related issues and support roles; and neighbours helped logistically, e.g. providing transportation during emergencies when family members were not around.

Chapter 7: Validating a Maternal Morbidity Measurement Tool in the Community

“You see the thing is, it wasn’t as if it [blood] was gathered and then put into a bottle so that you see, not to talk of measuring it...Hence you see you wouldn’t know”- IDI 9.

7.1 Chapter Overview

Measurement errors in surveys generally stem from three areas: those related to survey questions; those connected with data collectors; and those related to the question-and-answer process, including respondent errors [220, 221]. Researchers have traditionally focused on the first two aspects and it is only quite recently that attention has been drawn to the question-and-answer process [221, 222]. This chapter will focus on the methods and findings from the cognitive interviews conducted to improve validity of the survey tool for the quantitative phase (objectives 2a and 2b). The cognitive interviews were carried out to find out whether the survey tool was measuring what it intended to measure [223]; hence I explored how respondents were answering questions in order to identify potential sources of error.

I will start by reporting the methods and then the results. While the qualitative phase (Chapters 4-6) was primarily a stand-alone study and was not designed as a pretesting phase, it provided important formative insights for the survey serendipitously. This in turn reduced the problems needed to be identified during the cognitive interviews. I will report these insights from the qualitative phase in this chapter as well.

7.2 Methods

7.2.1 Overview of Cognitive Interviewing

Cognitive interviewing originated from a psychological research technique developed by Ericsson and Simon in the 1980s called protocol analysis, which “yield[s] insights into the thought processes involved in participants’ completion of certain tasks in a laboratory setting” [224]. As a formalised research procedure, however, it was birthed from the Cognitive Aspects of Survey Methodology movement and has only been in existence for approximately 30 years [225].

Cognitive interviewing combines cognitive psychology and survey methodology [226], which then enables researchers “to explore the processes by which respondents answer survey questions, and the factors which influence the answers they provide” [221]. The underlying question that it seeks to address is “will my respondents interpret my items in the manner that I intended?” [223]. Cognitive interviewing allows one to examine the questionnaire from the respondent’s point of view instead of the researcher’s [226] and it is able to detect both overt and covert issues [227]. Cognitive interviewing shares similarities with qualitative interviewing since both have an in-depth outlook, that is, they entail eliciting in-depth information [228]. It is not concerned with quantitative procedures such as sampling errors or consistency [225, 229]; it complements rather than replaces traditional piloting or field-pretesting [221, 225].

Cognitive interviewing also has weaknesses just as any other research method. In as much as it can help identify problems, Conrad and Blair (2009) point out that the method can also introduce measurement error in ways such as identifying problems that aren’t really there (“false alarm”) and flagging different issues depending on the person analysing the verbal data [230]. Cognitive interviewing has also been criticised for being artificial and subjective [226], and also, for its inability to provide useful quantitative information [221]. Some of these weaknesses can be minimised when cognitive interviews are designed robustly.

7.2.2 Study Design

Two paradigms or techniques are usually employed to carry out cognitive interviews: think-aloud and verbal probing. Think-aloud involves asking a respondent to 'think out loud' as he/she completes a questionnaire or answers a question, while verbal probing entails an interviewer asking a respondent specific questions to understand how he/she went about answering the question [221, 224].

The think-aloud paradigm has several advantages which include: being standardised, hence reducing chances of interviewer bias; no need for prior knowledge of questionnaire design or to know specific objectives of the study; ability not to change the content and flow of the discussion, a problem which typically characterises verbal probing; and provision of intrinsic 'purity' since data are collected during the response process as opposed to afterwards [224]. On the other hand, the think-aloud paradigm has disadvantages which include: placing a huge burden on respondents as they find it unnatural [221, 223]; providing room for significant divergence as respondents can go off on diverse tangents [223]; inability to tell what the problem is with a question even though it identifies that a question is problematic; and being difficult to analyse [223].

Similarly, verbal probing has both pros and cons. In terms of advantages, verbal probing is more efficient than think-aloud since it provides more focus by not allowing respondents to diverge to irrelevant areas [223, 224]. Other advantages include: it does not interfere with the actual process of responding (theoretically speaking), unlike think-aloud which does [224]; it gives a researcher useful information that he/she would not have accessed without specifically asking for it [224]; it is 'respondent-friendly' since it doesn't place much burden on them; and it is easier to analyse [223]. However, probing could introduce bias as subjects could provide answers that have been more carefully thought-out [223]. In addition, interviewers could potentially alter results by probing too much or too little.

I utilised the verbal probing technique since it appears to work better for interviewer-administered surveys compared to the think-aloud procedure which is better suited for self-administered questionnaires [221, 224]. It has also been recommended for use in multi-national settings [229].

7.2.3 Sampling

Respondents were selected purposively by educational level (none/minimal; educated- post-secondary) and place of residence (urban-rural) as it has been shown that socio-cultural factors influence the question-response process in surveys [231]. While a higher proportion of women in the study area are not educated, I decided to select educated women as half of the participant population because they are likely to give more insights or consider the questions more critically than uneducated women. In addition, I wanted to develop a questionnaire that works for both educated and uneducated women to increase its applicability in other settings. Respondents were selected by convenience across four wards that broadly reflected the diversity in the study area- two urban and two rural wards.

I recruited respondents face-to-face using two routes primarily: i) snowball sampling through respondents that participated in the qualitative phase (the FGDs and IDIs) and also through respondents that had already been interviewed in the cognitive interviews; ii) through my social networks. A community liaison also introduced me to two respondents. Information on informed consent and ethics have been provided in Chapter 3. Generally, the sample size for cognitive interviewing is small, ranging from 10 to 30 respondents [223]. I used this *a priori* range as a guide and conducted 16 cognitive interviews in total.

7.2.4 Data Collection

7.2.4.1 Data collection schedule, setting and languages used

The cognitive interviews were conducted between July and August 2016 at respondents' homes. All interviews lasted between ~one to one-and-a-half hours,

except in four cases where they ranged from 40-50 minutes. I conducted all the interviews in either English or Hausa depending on the respondent's language of communication; translators were not used.

7.2.4.2 The survey questionnaire

Prior to fieldwork in Nigeria, I developed a questionnaire using best practices. These included reviewing relevant literature to identify objective ways to ask questions and appropriate areas to focus on; consulting some members of the Maternal Morbidity Working Group and authors with significant experiences in measuring maternal morbidity and other health indicators, who in turn shared expertise and relevant resources; and adapting questions from well-established surveys (such as the Demographic and Health Surveys and the Multiple Indicator Cluster Survey; the original and adapted questions have been included in Appendix 7.1). In addition, significant time was spent brainstorming on appropriate ways to ask questions and in identifying indicators. My supervisors and I held discussions and carried out further detailed step-by-step appraisal and modification of the questionnaire. The pre-fieldwork draft of the questionnaire has been included in Appendix 7.2.

The questionnaire consisted of questions relating to: i) background information (socio-demographic details, obstetric history, care and support received during the last pregnancy, delivery and postpartum, and outcomes of the last delivery); and ii) morbidities (perceptions of general state of health, morbidities experienced during pregnancy, delivery and postpartum, the severity and consequences of these morbidities, and the three selected morbidities- vomiting, prolonged labour and haemorrhage). Certain sections from #ii above were repetitive but customised for pregnancy, delivery and postpartum:

- The morbidities- unprompted table: This was included to measure the prevalence of morbidities. It consisted of a list of morbidities and procedures (interventions given, used as proxies for morbidities) which were to be recorded when a woman self-reports them. Morbidity is a complex phenomenon and this table was an attempt towards simplification. This

section was structured tentatively and was modified once I understood how women classify problems.

- The severity and consequences of morbidities table: This table was designed to measure the severity of the morbidities listed in the preceding table using several factors including the duration, care-seeking done and its financial, physical, social, nurturing and marital impacts as well as its overall severity. The severity of only the top two most serious morbidities, as judged by the respondents, were recorded.
- The morbidities- prompted table: This table was included so that the frequency of morbidities reported here could be compared with that obtained from the “morbidities- unprompted table.” It consisted of a list of symptoms and procedures associated with severe morbidities and all respondents were asked whether they experienced them. The questions in this table were not tested during the cognitive interviews and were reserved for the survey only.
- The three selected morbidities: One morbidity per phase was selected for in-depth measurement as reported in preceding chapters- vomiting for pregnancy, prolonged labour for delivery and haemorrhage for postpartum.

7.2.4.3 The cognitive interview topic guide

Semi-structured topic guides (Appendix 7.3) were used during the cognitive interviews and only questionnaire sections relating to morbidities were tested:

- Perception of general state of health- during pregnancy (PP)
- Morbidities during pregnancy- unprompted (MP-U)
- Severity of morbidities- pregnancy (SP)
- Vomiting (VM)
- Morbidities during delivery- unprompted (MD-U)
- Severity of morbidities- delivery (SD)
- Prolonged labour (PL)
- Morbidities during postpartum- unprompted (MS-U)

- Severity of morbidities- postpartum (SS)
- Haemorrhage (HM)

As the questions were repetitive for each phase, I did not explore the severity measures for all three phases per respondent but selected one or two phases. One morbidity was then selected for each of the phases, from the list reported spontaneously by the respondent. In addition to the sections above, I also tested elements of two facial scales which were meant to measure the extent of agreement with a statement (Figure 7.1)³¹ [232] and the level of severity of morbidities³².

Standardised probes were prepared before hand (proactive probes), however, sufficient flexibility was allowed and additional probes were administered in response to a respondent's answers (reactive probes) [223]. Tourangeau (1984) provides a useful question-response model or 'pathway' that respondents go through to answer a question, which includes four areas: **comprehension** of the question; retrieval (**recall**) of the relevant information from memory; making a **judgement** about the information needed to respond to the question; and lastly, **response** to the question [233]. Probes designed to test each of these four areas were included in the topic guides [234], examples of which can be seen in Table 7.1.

³¹ The original scale has five faces, including a neutral face. The main author granted permission to use this modified scale without the neutral face in the survey. During the cognitive interviews, the word "mildly" was mistakenly omitted from Faces #2 and #3, although appropriate explanation on the scale was provided.

³² I tested a popular facial scale and made modifications during the cognitive interviews, but one of the authors of the scale declined permission to use the modified version. The original scale was non-emotive and I made some of the faces more expressive by including smiles, droops and tears. The author felt that these added a second dimension to the scale; he reasoned that it was not ideal to mix both pain and affect. He also brought up copyright. However, findings from the modifications helped to inform the choice of the scale used subsequently.

Figure 7.1: Facial scale to measure extent of agreement

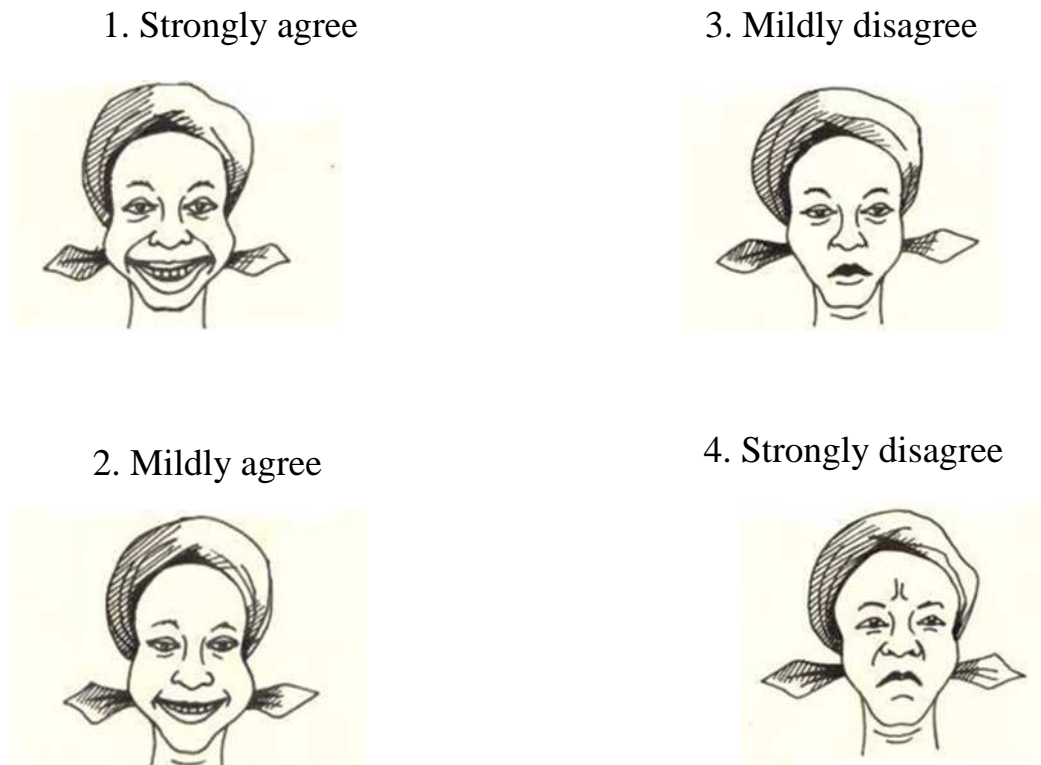


Table 7.1: Examples of probes used during the cognitive interviews

Category	Probes
Comprehension	What does the term “illness” mean to you?
	Can you repeat this question in your own words?
	What do you think this question is asking for?
Recall	How well do you remember that you experienced ----- during your last pregnancy?
	How sure are you that it started at -----?
	How easy or hard is it to remember this?
Judgement	How did you arrive at the answer of ---- days? (<i>can serve as a recall probe too</i>)
	Why did you select “moderate disruption?”
	How did they diagnose you with -----?
	How did you know that the drug you were given was meant to increase your blood level?
Response	How easy or difficult was it for you to choose an answer from this list?
	Does this face (<i>point the face that woman selected</i>) really depict your answer (<i>mention answer that she picked</i>)?

	Do “ <i>chatting with your family and others, going for church/Islamic-related activities or participating in important events like weddings, birthdays and naming ceremonies</i> ” exemplify your social life, or do you think there are other more important aspects of your social life which this question should have mentioned?
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7.2.4.4 The cognitive interview process and recording

Before commencing the discussion, the respondent and I role-played the cognitive interview process with practice questions. In other words, I posed a question, the respondent answered and then I asked a targeted probe. This process was used during the actual discussion and continued until all questions were exhausted. Such a back-and-forth process appears to work well for interviewer-administered surveys and poses little difficulty for many people [223].

To maximise problem identification, the interviews were conducted in rounds consisting of four respondents each. In each round, the interviews were tape-recorded and detailed notes were written under each respective question in the topic guides. Wide spaces were included for notes in the topic guides (versions in Appendix 7.3 shrunk to maximise space) and respondents’ verbatim or near-verbatim words were retained as much as possible. Field notes were also written after the interview.

The questions were then revised accordingly and another round was conducted. The changes that needed to be made kept reducing as the rounds increased. This process was repeated until no further problems warranting significant changes were identified. I also asked respondents for suggestions to improve questions at different points of the discussion and also asked for overall feedback at the end of the interview. Due to the scope of the research, it was not always possible to implement all suggestions given by respondents. In making changes to the questionnaire, I prioritised comprehension across educational levels. Therefore when I found that certain questions were unproblematic for educated women but did not work for uneducated women, I removed these from the questionnaire. Inclusivity (whether a

minority could understand the question), rather than the highest number of positive responses, guided the decisions.

In general, questions found to be unproblematic in initial rounds were not tested in further rounds, but in certain cases, were repeated for assurance purposes, for example, questions relating to the scales and severity of morbidities. I introduced and tested some new questions in Rounds 3 and 4. For example, I tested new severity measures: the number of times that conventional care-seeking was sought; whether the respondent was currently taking medication for the morbidity; and the consequences of delivery morbidities on bodily functions such as urinating and defecating. I also asked respondents whether it was appropriate to include “sleeping with husband” as an example under marital consequences of morbidities.

7.2.5 Analysis

The analysis was conducted using similar techniques as those utilised in the family interviews (Section 4.2.5.5), except that notes constituted the main data set analysed in this study as opposed to audio-recordings. A coding outline consisting of pre-specified categories/sub-categories was designed in Microsoft Word. The categories were the four rounds conducted and the sub-categories were aspects that worked well, issues identified (explained in the next paragraph), observations and other miscellaneous aspects (such as additions, deletions, notes on the data collection and suggestions provided by respondents but which should not be implemented). I had a list of questions that I followed but I analysed each question under these categories/sub-categories.

In each round, the notes written under each question were reviewed in-depth and issues were identified and categorised using Tourangeau’s (1984) four models [233]-comprehension, recall, judgement and response issues. These were then transferred into the coding outline in Microsoft Word. Analyses were conducted by considering individual data and also comparisons across respondents. These processes were

repeated in the next round until all rounds were analysed. This central document was then reviewed further and appropriate changes were made in the questionnaire.

7.3 Results

7.3.1 Structure of the Results Section

I will start by reporting the formative insights from the qualitative phase and then I will report the results of the cognitive interviews. For the latter, I will first describe the participant population and then report the results of the four aspects tested- comprehension, recall, judgement and response. I will tabulate the issues found relating to these four aspects but I will occasionally paraphrase, edit or summarise respondents' statements to fit responses into the limited spaces in the tables (Tables 7.3- 7.6). Lastly, I will highlight other ways that the cognitive interviews proved valuable.

7.3.2 Formative Insights from the Qualitative Phase

As stated in the chapter overview, the qualitative phase was not designed to test the survey questionnaire; it only provided the following valuable lessons serendipitously:

A. Provided colloquial insights

The qualitative research helped me to identify common expressions relating to health and morbidities in the study area and also enabled me to understand how women talk- information which I eventually included in the standard operating procedures (SOPs) for data collectors and also emphasised during their training. I found that women usually reported morbidities in terms of symptoms, although usage of specific biomedical terminologies was also not uncommon. I also learnt about relevant terms. For instance, women used the word "*mahaifa*" to refer to the placenta although this actually means "uterus" in Hausa; the correct word for placenta-

“*mabiyi*” is not used colloquially³³. I also discovered unique ways that women describe morbidities such as eclampsia being called the “*chewing-gum illness*” and described as “*you will just be chewing your mouth*” (IDI 19)³⁴. One respondent also referred to placenta praevia as “*low-lying placenta*” and provided clear, vivid descriptions:

Respondent: ...*They said it was because of a low-lying placenta, since you people in health know it. The unborn child and the placenta had switched positions. The placenta had come down, then the child had moved up. Any movement the child makes, it is just blood that begins to pour, so the child won't be able to move downwards until they perform an operation, because the placenta had blocked the passage where the child would come out from. Until the child comes out before the placenta can come out* (IDI 7).

Furthermore, I discovered that women were generally able to describe morbidities with sufficient clarity and details so that it was possible to unpick and categorise morbidities. For example, while hyperemesis gravidarum and malaria both have vomiting as a core symptom, women who had symptoms that matched the former tended to stress the vomiting and its resulting consequences such as being given drips while women with malaria focused on aspects such as body hotness and loss of appetite. Women were also very open and willing to discuss morbidities; it was not a taboo subject.

It is common knowledge that direct translations from English to Hausa do not always work. The qualitative research further emphasized this fact and helped me to prioritise translation within context as opposed to translating in order to achieve academic rigour (direct translation and back translation). For instance, a woman would say “*na haifu da kaina*” and I would translate this as “I gave birth vaginally,” which is the correct meaning in colloquial Hausa as no one would actually say the word “vaginally” to convey the message. Doing a direct translation in this context- “*I gave birth by myself*”- would have meant she gave birth without assistance, which would have altered the meaning.

³³ One doctor whom I interviewed in the preliminary study (mentioned in Chapter 4) first highlighted these two terms.

³⁴ In these cases, I did not refine questions based on such nuanced findings but highlighted them in the SOPs for data collectors.

B. Highlighted women's recall tendencies

I also discovered areas where women could recall events easily or with difficulty. While women could easily recall the lengths of their labour (as seen in the block quote below where a respondent in FGD 5 recalled the start and end points of her labour for different children), some uneducated women struggled to recall the exact duration of morbidities, number of morbidity episodes across several months or precise quantifications. For example, one respondent found it difficult to approximate the number of times she was vomiting per day because “*I was not counting it sincerely,*” although she was eventually able to give an approximate number with further probing. For the uneducated women, their limited numeracy and literacy skills appeared to have affected their recall. Some women who had C-section could also not provide information about their blood loss during delivery because they were not conscious during the procedure and doctors did not provide this specific information.

Hadiza: *It [labour] occurs in different ways to me. There was a time it started from 4am, but before 5, the baby had come.*

Interviewer: *5am or 5pm?*

Hadiza: *5am. This one here, it took 24 hours for me, it even surpassed it (Many laughs in group)*

Hadiza: *This other one here, from 6pm to 12, 12:30, it took for me. Another one, from 6:30 to 8:00 clock-*

Interviewer: *All these occurred to you*

Hadiza: *Uhhmm*

Interviewer: *Which of these do you think took too long, to you?*

Hadiza: *The one that took very long, that's the- the 24 hours one (FGD 5).*

Furthermore, I found that respondents used a number of recall strategies. Women sometimes used land-mark times to remember events around their morbidities or to indicate frequencies, for example, using the Muslim prayer times to mark the length of labour or how frequently they changed pads, or using the six-week postnatal check-up to decipher onset of a morbidity. In a few situations, I also devised strategies to help respondents to recall information. I found that one way to stimulate or maximise recall is to break extended time periods into smaller ones. For instance, it is better to inquire about postpartum health experiences in chunks of time- within the first 24 hours post-delivery, within one week and beyond one week post-birth- as

opposed to saying “after delivery” without any indication of time. When I asked respondents about their postpartum health in general and whether they experienced any illnesses, some of them said “no, I didn’t,” but when I asked within these time chunks, then they suddenly remembered.

C. Identified difficulties unique to certain demographic groups

It was generally difficult to have in-depth interviews with respondents aged 15-19 years. They were not very talkative, therefore the interviews felt strained and not very fluid compared to those with older women. For some questions, they tended to respond with monosyllabic responses or few words. While it was valuable to unpick these tendencies, I did not anticipate that this would pose a problem for the survey since the study design does not require in-depth explanations. On the other hand, it could also be that I happened to sample reserved 15-19 year olds by chance, as an interview with one 19 year old woman³⁵ flowed well. Interestingly, FGDs with this demographic group were not problematic.

In addition, as highlighted in Section 5.3.4.2, quantification of blood loss sometimes appeared problematic for a few rural woman and the 15-19 year olds, as seen in the quote below:

Respondent: *You see the thing is, it wasn’t as if it was gathered (laughs briefly) and then put into a bottle so that you see, not to talk of measuring it. It just poured to the ground, and even as it poured to the ground it wasn’t like it was so much. It was afterwards that when I stood up and went to the bathroom and had my bath then it began to flow. Hence you see you wouldn’t know (IDI 9).*

³⁵ Unfortunately, this interview does not contribute to the data because I found out at the very end of the discussion that she was ineligible due to residency outside Yola. She had only come to live with her mother temporarily so that she could take care of her and the baby during the maternal health phase.

D. Provided additional questions and improved existing ones

The qualitative research helped identify additional questions to be included in the questionnaire and also showed ways to improve the sensitivity of some questions. The free-listing exercise (Section 4.3.6) was useful for populating the morbidities tables. Additional questions were also generated for the vomiting section of the survey, for example, “*did you vomit so much that you were afraid*” and “*the vomiting made me fully dependent on others to do my day-to-day activities like cooking, sweeping and going to the shop (strongly agree, mildly agree, mildly disagree and strongly disagree).*”

7.3.3 Participant Population for the Cognitive Interviews

Of the 16 respondents in the cognitive interviews, 10 lived in urban areas and six in rural areas. The women’s ages ranged from 18-40 years. A quarter of the women had home deliveries and the remaining delivered in health facilities. A little over half of the respondents were multigravidas. Half of the respondents had earned post-secondary degrees while the remaining half had minimal or no education (Table 7.2).

Table 7.2: Summary of respondents' socio-demographic details and obstetric history
(total number of participants= 16)

Socio-demographic or obstetric detail	Number of respondents
Residence	
Urban	10
Rural	6
Age (years)	
15-19	2
20-34	12
35-49	1
Occupation	
House-wife	6
Unemployed	1
Petty business	3
Student/National Youth Service Corps member	3
Teacher	1
Civil servant	2
Highest educational level	
None	3
Primary	2
Secondary	3
Post-secondary diploma	1
Bachelors and above	7
Religion	
Christianity	6
Islam	10
Type of marital union	
Monogamous	13
Polygamous	3
Number of living children	
1	7
2	3
3	2
4	0
5 and above	4
Gestational age at last pregnancy discovery	
≤1 month	7
>1 month but <3 months	2
≥3 months	2
Others ³⁶	5
Date of last delivery	
<6 months ago	5
6 months- 1 year ago	4
>1 year- 2 years ago	7
Place of last delivery	
Health facility	12
Home	4
Mode of last delivery	
Vaginal	12
C-section	4

³⁶ This includes gestational ages that do not fit: "before two months," "after 1 month," "don't know."

7.3.4 Results of the Cognitive Interviews

7.3.4.1 Comprehension

Overall, respondents demonstrated a good understanding of many key concepts in the questionnaire. Their definitions of illness and problems were not limited to those diagnosed by health professionals only but also encompassed those experienced subjectively. The definition of treatment was also not restricted to prescriptions only but also covered home remedies and lay network consultations. Respondents also provided nuances to definitions, which I subsequently reflected in the revised questionnaire. For example, one respondent defined treatment as “*getting a solution to what you’re going through*” and I included the word “solution” in the question since this word potentially broadens the scope of treatment (Table 7.3). Another respondent differentiated between “treatment” and “remedy”- that the former only refers to conventional drugs from the pharmacy or hospital while the latter involves home remedies such as taking bitter kola; thus both words were used in the definition (Table 7.3).

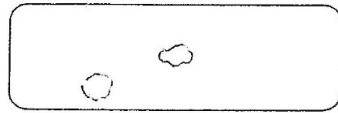
Respondents appreciated the inclusion of visual scales to assess agreement and severity. The agreement scale (Figure 7.1) was unanimously unproblematic throughout the rounds as respondents found it understandable and easy to use. Respondents, however, did not find the severity scale sufficiently descriptive as the emotions expressed did not match the level of pain; one respondent actually reported that the face depicting severe pain/discomfort looked as though it was smiling. They suggested modifying the faces with emotions- smiles, frowns and tears. Therefore I altered the faces to varying degrees in subsequent rounds until the appropriate balance was achieved.

Overall, comprehension issues accounted for the highest number of issues identified during the cognitive interviews. I found that respondents defined a number of key terms in the questionnaire- “mates,” “serious,” “vomiting,” “postpartum period,” “bleeding during delivery,” “bleeding after delivery,” “minimally soaked” and “fully soaked” - in diverse ways that would have impacted validity, as seen in Figure 7.2

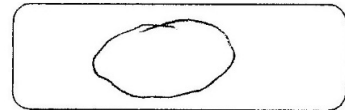
and Table 7.3. In Figure 7.2, for instance, I included rectangles in the topic guides and asked respondents to indicate what the terms “minimally soaked” and “fully soaked” mean to them (with respect to the staining of the material on their delivery surface/bed). Their depictions showed a wide range of ideas. Therefore I found that it was necessary to define terms or depict representations to respondents in order to ascertain uniformity. For the severity question relating to marital consequences, they also found the term “relationship with husband” in the initial draft vague; thus I expatiated the question further with specific examples. It was also important to re-define the delivery and postpartum periods in practical, easy-to-imagine terms even if this meant deviating from the standard medical definition (Table 7.3). The amendments outlined in Table 7.3 only improved clarity and maximised comprehension however; they did not change the content or ‘meaning’ of the questions. Therefore, the original and modified questions were essentially the same, except that question length tended to elongate in the modified versions.

Figure 7.2: Respondents' hand-written understandings of the terms “minimally soaked” and “fully soaked” in Round 3 (Respondent 1 had a C-section and reported that she did not see her delivery surface)

Respondent 2



Minimally stained



Fully soaked

Respondent 3

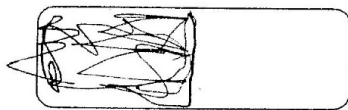


Minimally stained



Fully soaked

Respondent 4



Minimally stained



Fully soaked

Table 7.3: Comprehension issues identified

S/N	Question Version 1	Round 1 Results	Question Version 2	Round 2 Results	Question Ver 3	Rnd 3 Res	Question Ver 4	Round 4 Results
1.	Compared to most of your mates during your last pregnancy, was your health status better, the same or worse? <ul style="list-style-type: none"> What does the word “mates” mean to you? 	The word “mates” did not suit question in most cases: - “ <i>My age mates</i> ” - “ <i>People I grew up with</i> ” (who could be living in various locations; may have also lost contact with them) - “ <i>My colleagues during pregnancy</i> ”	Compared to other women who were also pregnant when you were pregnant with your last baby, was your health status better, the same or worse?	Definition worked well	Not tested further since the question worked well			
2.	Now I would like you to tell me about any illnesses and problems you experienced at any point during your pregnancy only. Please can you list out all the illnesses and problems you experienced?	Need additional information on duration; one respondent thought this question only applied to morbidities that lasted throughout the pregnancy.	Now I would like you to tell me about any illnesses and health problems you experienced at any point during your pregnancy only, whether it happened only once or consistently, whether it happened only at some points during the pregnancy or happened throughout the pregnancy. Please can you list out all the illnesses and problems you experienced?	Definition worked well	Not tested further since the question worked well			
3.	Would you say any of these problems were serious (<i>from #2</i>)? <ul style="list-style-type: none"> What does the term ‘serious’ mean to you?” 	Practically every morbidity was termed serious. Divergent definitions also generated. “ <i>Something: -that involves surgical blade -that disturbed me throughout the pregnancy - doctors said was serious even if I didn’t feel it - that makes you to go back to the hospital -very painful and which made me to really suffer -without a solution, which doesn’t subside with drug</i> ”	Sensitivity of question increased : “ <i>very serious</i> ” used	Sensitivity of question somewhat improved but respondents still had diverse definitions, mainly related to the need for care-seeking at hospital and physical consequences	Same question repeated	Some overlapping definitions, but also some diverse ones.	“Very serious” defined for them using MMWG’s definition of maternal morbidity: “Would you say any of these problems was very serious, that is, did it/they negatively impact your wellbeing and/or functioning very severely?”	Worked well

S/N	Question Version 1	Round 1 Results	Question Version 2	Round 2 Results	Question Ver 3	Rnd 3 Res	Round 4
4.	What treatment did you receive? <ul style="list-style-type: none"> What does the word “treatment” mean to you? 	Generally comprehensive but one woman said “ <i>paying for travel and visiting a hospital</i> ”	Same question tested again	Comprehensive definitions given, with additional insights (see preceding paragraphs). Definition expanded in Round 3	Revised question: Did you seek care/treatment/remedy for (<i>insert morbidity</i>), that is, any solution to (<i>insert morbidity</i>) from anywhere or anyone?	Definition worked well	Not tested further since the question worked well
5	Were you vomiting during your last pregnancy? <ul style="list-style-type: none"> Do you think this question is asking about vomiting during the early stages of the pregnancy only or vomiting throughout the pregnancy? Do you think this question is asking about consistent vomiting or occasional vomiting? 	Question too broad; both consistent and occasional vomiting reported	Revised question: Were you vomiting consistently during your last pregnancy? <ul style="list-style-type: none"> What does the term “vomiting consistently” mean to you? 	Diverse definitions for “vomiting consistently”: <ul style="list-style-type: none"> “<i>Vomiting often, vomiting all the time</i>” “<i>Vomiting from 1st to 9th month</i>” “<i>Vomiting several times a day</i>” “<i>I vomit now, then I vomit again</i>” “<i>Always...you’re just vomiting at a particular time</i>” 	Were you vomiting excessively during your last pregnancy? Yes/No <ul style="list-style-type: none"> What does the term “vomiting excessively” mean to you? Were you vomiting almost every day? Were vomiting more than 3 times per day? 	Question still not sensitive; diverse definitions observed as in the last round	This question was still explored in Round 4 and we also discussed it extensively with my supervisor. We modified and splitted the question in the final questionnaire: <ul style="list-style-type: none"> Were you vomiting frequently during your last pregnancy, that is, vomiting more than 2 times per day even if this did not continue to the end of the pregnancy? (<i>with follow-up questions including onset and when it stopped entirely</i>) How many times were you vomiting per day <u>most times</u> during the period that you were vomiting? (<i>with MCQ options</i>) How many times were you vomiting per day at the <u>most severe period</u> of the vomiting? (<i>with MCQ options</i>)
6.	“To avoid triggering the vomiting, we made significant changes in my family such as changing the location of the cooking counter and fireplace and restricting the usage of substances with distinct smell” <ul style="list-style-type: none"> Do these examples (<i>repeat</i>) actually typify the kinds of changes that vomiting could trigger in your household or not? 	Worked well but repeated in Round 2.	Question repeated	Worked well but one respondent interpreted the question as a causal rather than a severity question: “ <i>It’s the pregnancy that caused me to vomit, not the fireplace. So why should I change it?</i> ”	A severity clause was added to the beginning of the question: “The vomiting was so serious such that we made significant changes in my family such as ...”	Worked well, but “changing the location of the cooking counter and fireplace” was not relevant for one woman. A double-barrelled question.	Question tested again and it worked well. “Changing location of fireplace...” removed in final version: “The vomiting was so serious that we restricted the usage of substances with distinct smell in my family, such as perfume and some cooking oil to avoid triggering the vomiting.”

S/N	Question Version 1	Round 1 Results	Question Version 2	Round 2 Results	Question Ver 3	Rnd 3 Res	Question Ver 4	Round 4 Results
7.	The vomiting affected my relationship with my husband negatively <ul style="list-style-type: none"> What do you think this question is asking for? 	Vague and unclear	“The vomiting affected my relationship with my husband negatively, such as making us quarrel, making us not to spend time together or making us not to be in good terms”	Worked well	Question tested again	Worked well	Question tested again	Worked well
8.	The severity scale	Version 1 was not sufficiently descriptive; emotions expressed did not match the level of pain	Mouth was elongated in Face #0 to smile, another face was used as #1, mouth was made to droop further down on Face #2 and tears were added to Face #3.	Seemed to work well, but tested further.	Revised scale tested again. Result: worked well, but further suggestions given by respondents e.g. Face #1 and #2 looked similar, hence the original Face #1 was brought back again. Face #0 was also made to be laughing.		Revised scale tested again. Mild, moderate, severe pain/ discomfort/worry used (more info. in Section 7.3.4.4)	Worked well.
9.	Now I would like you to tell me about any illnesses and problems you experienced after you delivered your last baby, whether immediately after the delivery, or hours, or days or weeks after the delivery. Please can you list out all the illnesses and problems you experienced? <ul style="list-style-type: none"> When does postpartum period start and when does postpartum period end, in practical terms, to you? 	<p>“After delivery” needs to be defined in practical terms, and this has to be easy to imagine even if it deviates from medical definition.</p> <p>Diverse definitions of postpartum start: - “After I’ve left the hospital” - “After I’ve had my bath following delivery” - “When the baby is out...when I was still in the delivery room but they’ve removed the baby”</p> <p>Diverse definitions of postpartum end: - “6 weeks after delivery (when I went for routine check-up)” - “For CS, it can last for ≥1 month; for normal delivery, it’s like an hour”</p>	<p>Practical terms introduced and WHO definition of postpartum used- up to 6 weeks post-delivery:</p> <p>Revised question: Now I would like you to tell me about any illnesses and health problems you experienced after your last delivery. By after delivery, I mean the time from after you delivered your baby and after aspects such as your clean-up in the delivery room or stitching, up to 6 weeks later. Please can you list out all the illnesses and problems you experienced?</p>	Worked well	Same question repeated	Worked well	Same question repeated	Worked well

S/N	Question Version 1	Round 1 Results	Question Version 2	Round 2 Results	Question Ver 3	Rnd 3 Res	Question Ver 4	Round 4 Results
10.	<p>I would like to ask some questions about the blood you lost during and after your last delivery.</p> <p>When does bleeding during delivery stop and when does bleeding after delivery start, in practical terms?</p>	<p>- “Don’t know...it is not for mothers to tell”</p> <p>- “There isn’t a break somewhere between them”</p> <p>- “Start of bleeding during delivery is after the baby is born”</p> <p>- “Bleeding during delivery starts when the baby is coming out and stops when the baby is out”</p> <p>-Bleeding after delivery: “After I’ve already delivered even if I am still in the delivery room”</p>	<p>Bleeding during delivery and after delivery were asked as separate questions; practical descriptions added (respondents considered the clean-up and stitching as part of the delivery process).</p> <p>The results worked well.</p> <p>During delivery: I would like to ask some questions about the blood you lost during your last delivery. By during your delivery, I mean the blood you lost from the time your labour started seriously up to the time you delivered your baby, including the time when aspects such as your clean-up in the delivery room or stitching were conducted.</p> <p>After delivery: I would like to ask some questions about the blood you lost within the first 24 hours after your last delivery. By within the first 24 hours after your delivery, I mean the blood you lost from the time after you delivered your baby and after aspects such as your clean-up in the delivery room or stitching, up to 24 hours later.</p>		Same questions repeated	Worked well	Same questions repeated	Worked well
11.	<p>Was the bed-covering minimally stained or fully soaked (<i>previous question already inquired about type of bed-covering</i>)?</p> <ul style="list-style-type: none"> What does “minimally stained” mean to you and what does “fully soaked” mean to you? 	<p>Respondents did not appear to have difficulty with defining the terms, but question was repeated in the next round</p>	<p>Question repeated.</p>	<p>Respondents did not appear to have difficulty; one respondent indicated half of a rectangle (which I drew to depict wrapper) as “minimally stained.” I decided to use this technique and investigate further in Round 3.</p>	<p>Respondents were asked to depict their definitions of “minimally stained” and “fully soaked” within two rectangles that I drew.</p>	<p>Diverse judgments. Please refer to Figure 7.2.</p>	<p>Pictures of different gradations of bleeding were shown to respondents (more information in Section 8.2.3.1)</p>	<p>Worked well.</p>

7.3.4.2 Recall

Recalling health problems experienced appeared to be extensive as both mild, moderate and severe health problems were mentioned. Respondents reported that it was easy to remember and list the health problems that they had experienced and also justified their responses: *“the doctor told me;”* *“I really felt it and can’t forget it...”* and *“...I gave birth quite recently, I haven’t forgotten;”* responses relating to perceived negative impacts or suffering endured were particularly common. Some respondents reported that they were tracking their pregnancies; hence it appeared to make recall easier. Recall did not also appear to be dependent on the diagnosis method as both self-perceived and diagnosed morbidities were reported.

In general, they were also able to recall the onset, end-point and duration of health problems as well as the care-seeking options used, except in a few cases where the health problems were frequent or *“gradually crept up”*. For instance, one respondent could not recall the onset of her vomiting because it happened a lot, unlike an illness that occurred once or twice. In some situations, respondents who had C-section were also unable to remember specific details relating to their bleeding during delivery, as observed and reported in Section 7.3.2.

One area that was universally difficult to recall was reporting the amount of money paid for medical services, treatment and/or transportation (Table 7.4). This was due to several reasons: respondents could not remember; their husbands made the payments and hence the information had never been stored in memory; an insurance company paid; a cumulative charge was levied for several services/treatment thus it was difficult to unpick specific amounts paid for individual morbidities; and payment was embedded within the ANC registration plan. I found that inquiring about indicators of financial expenses- borrowing money, selling assets and using reserved funds meant for something else - were better ways of assessing financial consequences of morbidities.

Table 7.4: Recall issues identified

S/N	Question Version 1	Round 1 Results	Question Version 2	Round 2 Results	Question Version 3	Round 3 Results	Question Version 4	Round 4 Results
1.	On average, how many times did you vomit per day during the period you were vomiting? <ul style="list-style-type: none"> How did you arrive at your answer of ---- --- times? 	Problematic because the vomiting had different patterns and also happened several times across the pregnancy.	Please refer to #5 in Table 7.3 (comprehension section)					
2.	Did you pay for care (medical services) and/or treatment (medicines) for (<i>insert morbidity</i>)? Did you pay for transportation for you and/or anyone else in seeking care for <i>insert morbidity</i>)? How much did you pay in total for care, treatment, and transportation for this health issue? <ul style="list-style-type: none"> How did you get the answer of ----- naira? 	Recalling amount of money paid was very difficult in most cases (more info. in preceding paragraphs)	Extent of financial burden asked instead of the amount paid: Did you pay for care (medical services), treatment (medicines) and/or transportation for (<i>insert morbidity</i>)? Did the payment for care, treatment and/or transportation for (<i>insert morbidity</i>) put a significant financial strain on your household? <ul style="list-style-type: none"> “What does the term “significant financial strain” mean to you? Please can you give examples of the significant financial strain that the (<i>insert morbidity</i>) caused? 	This was a better alternative, but some respondents were still unaware because their husbands provided the financial resources	Same questions asked	Respondents had no issues with defining “significant financial strain”, however they struggled to provide one response only. E.g. one respondent selected three responses successively for paying N65,000 (~£135) for C-section: - No: “ <i>because we planned for it....thank God for savings</i> ” - Somewhat: “ <i>But it did [put a significant financial strain], but it came easy</i> ” - Yes: “ <i>because in some hospitals, it wouldn’t have been up to that amount</i> ”	Question was revised and indicators of financial expenses were used: Did you or your family do any of the following to pay for care (medical services) and/or treatment (medicines) for (<i>insert morbidity</i>)?: <ul style="list-style-type: none"> Use money reserved for something else to make the payment? Borrow money to make the payment? Sell an asset to make the payment? 	Worked well

7.3.4.3 Judgment

Questions relating to judgement- such as assessing the severity and impacts of morbidities on various aspects of life- did not appear to be problematic. Respondents agreed that the examples given for these consequences were typical and also provided additional ones in some instances (more information in Section 7.3.4.4). I explored an additional example of marital consequences- “sleeping with husband.” While respondents reported that they were fine with answering this question, they mentioned that some women may not want to discuss this area for privacy reasons and due to being of a certain religious group; hence I declined to include it in the final questionnaire.

I found that asking respondents to compare their health and health problems to previous deliveries was also generally easy, and rational justifications for answer choices picked were also provided. The same was applicable for comparison of health to their mates, although one respondent in Round 1 struggled and this appeared to stem from her understanding of the word “mates”; hence modifications were made (#1, Table 7.3).

While respondents could compare their health to other women, they appeared to be somewhat clueless when asked to make a similar comparison for bleeding during delivery. I discovered that it was easier for respondents to use their previous intrapartum bleeding experiences as comparators rather than other women’s. Therefore, I did not ask about the latter in subsequent rounds. In hindsight, I may have improved responses to this question if I had asked them to use the females in their closest social networks- such as friends or relatives- as comparators.

Table 7.5: Judgment issues identified

S/N	Question Version 1	Round 1 Results	Question Version 2	Round 2 Results	Question Version 3	Round 3 Results	Question Version 4	Round 4 Results
1.	Compared to most of your mates during your last pregnancy, was your health status better, the same or worse? <ul style="list-style-type: none">How did you know that your health status was ----- compared to most of your mates?	Good rationales given: <ul style="list-style-type: none">“I was ill throughout, but my mates were not”“I know based on their complaints about their health”“I don’t know about their health status”	Modification made (#1, Table 7.3) and good rationale still given.	Worked well (only one respondent said “I cannot know how other pregnant women are feeling. I didn’t ask them”)	Not tested further since the question worked well			
2.	Compared to most of your mates, was the bleeding during your last delivery minimal, the same or much? <ul style="list-style-type: none">How did you know that the bleeding during your last delivery was ----- - compared to most of your mates?	They appeared to be clueless in general: <ul style="list-style-type: none">“I don’t know because I didn’t chat with them to know”“I don’t know about their deliveries; I just know my own”Was not conscious during CS, hence couldn’t know and her attention was also not on blood flow during birth.	Not asked in subsequent rounds					

7.3.4.4 Response

The response issues identified related to the scope of the consequences of health problems considered in the questionnaire, which are better reported in prose than tabular. I discovered that health problems exert different types of consequences on women, and therefore, some of the severity domains did not work for certain morbidities, particularly delivery morbidities. For example, one respondent reported that she could not relate being given an episiotomy to her social life. In this situation, “effects on bodily functions such as urinating and sitting down” would have been more relevant. Thus I also asked about the effect of delivery morbidities on bodily functions such as urinating and defecating in Rounds 3 and 4. One respondent also suggested investigating the effects of morbidities on breastfeeding, eating and bathing.

In addition, some health problems may exert consequences in some areas of life but not in others. For example, heartburn during pregnancy did not prevent one respondent from performing household chores but it woke her up at night to vomit, disrupting her sleep. Some conditions such as high blood pressure may not be painful or uncomfortable but could cause worry; therefore I modified the severity scale to reflect this insight. I also found that the effects of some delivery morbidities were not experienced during the delivery period but during postpartum, for instance, prolonged labour resulting in postpartum backache. In addition, the effects of some morbidities extended beyond the postpartum period, as observed in the qualitative phase (Chapter 4). For example, one respondent who experienced backache postpartum was still taking daily medications till date.

A few response issues were also identified besides those relating to the consequences of morbidities. In the morbidities table, the question- *“from the problems you mentioned, which ones did a health professional (a doctor or nurse or midwife) diagnose you with?”*- was not always relevant because respondents self-diagnosed many morbidities themselves. However, this question was still retained to capture the instances where health professionals made the diagnoses. Most of the haemorrhage questions were generally unproblematic, but those relating to being given injections or drugs did not work. This was because some respondents were not sure why these specific interventions were given, as seen in Table 7.6.

Table 7.6: Response issues identified

S/N	Question Version 1	Round 1 Results	Question Version 2	Round 2 Results	Question Version 3	Round 3 Results	Question Version 4	Round 4 Results
1.	<p>Were you given an injection to stop the bleeding or a tablet was inserted into your vagina to stop the bleeding?</p> <ul style="list-style-type: none"> How did you know that you were given an injection or a tablet was inserted into your vagina to stop the bleeding? 	<p>Respondents who said “yes” did not give convincing follow-up reasons:</p> <ul style="list-style-type: none"> <i>“I think the injection given was to stop the bleeding”</i> (she didn’t ask the staff and they didn’t inform her) <i>“I cannot explain”</i> <i>“I was given an injection after delivery but I don’t know its use”</i> 	Question was not asked in subsequent rounds					
2.	<p>Were you given any blood supplements to take after your delivery, that is, drugs to increase your blood level?</p> <ul style="list-style-type: none"> How did you know that the drug you were given was meant to increase your blood level? 	<p>Mixed results: some respondents were aware of the drug’s purpose, some were not.</p>	Question repeated	<p>Question does not work. Some respondents still acknowledged being given drugs but not knowing its purpose. Also, blood supplements were sometimes:</p> <ul style="list-style-type: none"> - given routinely in facilities - self-medicated 	Question was removed entirely from the survey questionnaire			

7.3.5 Other Valuable Insights from the Cognitive Interviews

In addition to highlighting issues relating to the question-and-answer process, the cognitive interview study was also valuable in the following ways:

- Helped generate additional lists of morbidities for relevant tables in the questionnaire and provided extra multiple choice options (a major, unanticipated advantage).
- Highlighted irrelevant questions. For example, I found that questions on care-seeking for intrapartum haemorrhage were not relevant for women who gave birth in health facilities, since they were already there. In the revised questionnaire, only women who had home deliveries were asked this question.
- Highlighted meaningless questions, for instance, “*did you stain the bed-covering during your last delivery?*”
- Showed that the questionnaire was too long, which was subsequently reduced.

7.3.6 Summary of Findings

Research Sub-objective 2a: To adapt existing surveys into a draft questionnaire for use in the community; and Research Sub-objective 2b: To use cognitive interviews to improve the validity of survey questions

- A number of serendipitous findings were obtained from the qualitative phase. It provided colloquial insights; highlighted women’s recall tendencies; helped identify difficulties unique to some demographic groups; and helped identify additional questions for the questionnaire and improved sensitivity of certain questions.
- *Relating to comprehension:* Overall, respondents demonstrated a comprehensive understanding of many key concepts in the questionnaire, but comprehension issues were the highest categories identified during the cognitive interviews. It was necessary to define some terms in order to

ascertain uniformity. Inclusivity (whether a minority could understand the question) rather than majority guided decisions when making changes. While this was a strength, it also tended to elongate questions.

- *Relating to recall:* Recalling health problems experienced appeared to be extensive as both mild, moderate and severe health problems were reported. Recall did not also appear to be dependent on the diagnosis method as both self-perceived and diagnosed morbidities were reported. Respondents were also able to recall the onset, end-point and duration of health problems as well as the care-seeking options used, except in a few cases where the health problems were reoccurring or developed slowly over time. One area that was universally difficult to recall was reporting the amount of money paid for services, treatment and/or transportation; inquiring about indicators of financial expenses worked better.
- *Relating to judgement:* Questions relating to judgement did not appear to be problematic (e.g. assessing the severity and impacts of morbidities on various aspects of life). Asking respondents to compare their health and health problems to previous deliveries was generally easy. The same was applicable for comparison to other women, except when asked to compare their bleeding experiences to other women.
- *Relating to response:* The response issues identified mainly related to the scope of the consequences of health problems considered in the survey and their unique natures. Health problems exerted different types of consequences on women and some of the severity domains did not work for certain health problems, particularly delivery morbidities. In addition, some health problems may exert consequences in some areas of life but not in others. The effects of some delivery morbidities were not experienced during the delivery period but during postpartum.

Chapter 8: Prevalence of Self-reported Maternal Morbidity

“Delivery comes with difficulties these days. Out of 10 women, you may find only 3 women without issues, but all the rest will have problems”- FGD 1.

8.1 Chapter Structure

In this chapter, I will address the last objective of the PhD: “to measure self-reported maternal morbidities,” which has three sub-objectives (3a, 3b and 3c):

- To estimate the prevalence of self-reported maternal morbidities.
- To measure the severity and consequences of the self-reported morbidities.
- To obtain detailed quantitative measures on three selected morbidities- vomiting, prolonged labour, and haemorrhage during and after delivery.

The quantitative phase of my PhD was exploratory since morbidities have rarely been studied within community settings. Therefore, the results in this chapter are mainly descriptive. In some cases, I also analysed specific methods and results to obtain useful information about ways to measure morbidities.

8.2 Methods

8.2.1 Study Design

The study aims to estimate the prevalence of self-reported morbidities; therefore, a cross-sectional study was conducted. It is anticipated that the estimated prevalence and lessons learnt from the findings would help inform future large-scale population-based surveys.

8.2.2 Sampling

8.2.2.1 Sampling Methods

A three-stage cluster sampling was conducted at the ward, settlement and participant levels (Figure 8.1). At the first stage, 12 out of the 22 wards in Yola North and Yola South were selected by probability proportional to size (PPS). Five settlements from each of the 12 wards were then selected by PPS in the second stage, giving a total of 60 clusters. On average, smaller wards (defined as having total population less than 45,000) had 28 settlements with a range of 7- 72 settlements, while bigger wards (total population $\geq 45,000$) had 70 settlements on average with a 32- 101 range. At the third stage, a fixed number of eligible participants was selected from each of the 60 clusters; the fixed number was calculated as 11 in Section 8.2.2.3. A master list of settlements- which contained data on the size of wards, settlements and households- was used as the sampling frame and also for estimating sampling for the PPS. This was obtained via house-to-house visits by Adamawa health authorities, the World Health Organisation and other partners in 2014 and it appeared to be the most accurate sampling frame for the study area.

The study area has urban, rural and mixed wards. All the wards in Yola North are urban while wards in Yola South are urban, rural and mixed (Table 8.1). Implicit stratification was carried out so that the sample was proportionately distributed by type of ward. In other words, all the wards were arranged in a continuous list according to their geographical sub-groups (all urban wards, followed by rural ones, and then mixed wards) and then 12 wards were selected from that list [235].

Figure 8.1: The three-staged cluster sampling in the study area

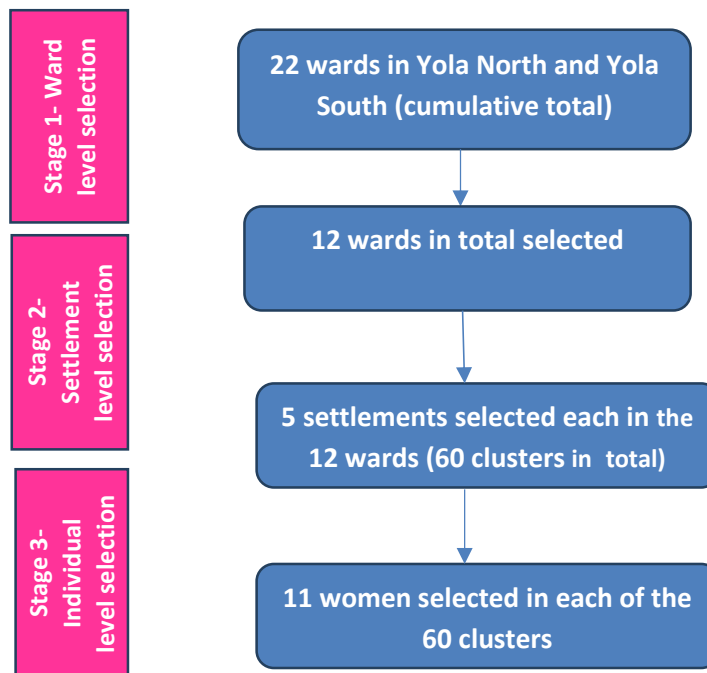


Table 8.1: Distribution of wards in Yola-North and Yola South LGAs (2014 data)

LGA	Ward	Total Population	Target Population of Pregnant Women (4% ³⁷ of Total Pop)	Total Number of Settlements	Total Number of Households	Type
Yola-North	Ajiya	26,060	1,042.4	16	3,172	Urban
	Alkalawa	24,180	967.2	25	2,421	Urban
	Doubeli	33,390	1,335.6	13	2,533	Urban
	Gwadabawa	32,672	1,306.9	27	3,954	Urban
	Jambutu	69,346	2,773.8	32	8,426	Urban
	Karewa	77,274	3,090.96	52	12,262	Urban
	Limawa	25,550	1,022	14	3,861	Urban
	Luggere	36,305	1,452.2	29	3,672	Urban
	Nassarawo	67,024	2,680.96	86	9,445	Urban
	Rumde	28,825	1,153	12	2,482	Urban
	Yelwa	20,875	835	7	1,888	Urban
Yola-South	Adarawo	26,354	1,054.16	61	7,680	Urban
	Bako	17,155	686.2	17	2,666	Urban
	Makama A	36,165	1,446.6	43	7,290	Urban
	Makama B	17,330	693.2	16	2,928	Urban
	Mbamoi	19,710	788.4	22	3,474	Urban
	Toungo	23,310	932.4	27	3,902	Urban
	Mbamba	22,681	907.24	50	4,814	Rural
	Ngurore	61,218	2,448.72	101	8,504	Rural
	Yolde Kohi	25,777	1,031.08	72	3,781	Rural
	Bole Yolde Parte	47,174	1,886.96	70	9,344	Mixed
	Namtari	84,845	3,393.8	76	23,265	Mixed
	Total	823,220	32,928.78	870	131,764	

8.2.2.2 Wards and Settlements Selected

Appendix 8.1 shows the wards selected based on the methods described in section 8.2.2.1. The sampling interval was calculated thus: $823,220/12 = 68,601.6667 = 68,602$. The random start was 42,751 from a random numbers table [236]. Yola North and Yola South LGAs each had six wards in the final selection. In addition,

³⁷ Even though Nigerian authorities use 5% of the total population as the proportion of pregnant women, the target proportion for routine immunisation- 4% - was used here. This is because one of the study's eligibility criteria is women who have given birth (not pregnant women), which theoretically, 'equals' the target population for children's routine immunisation. It is also generally a good idea to use the most conservative figures when making estimates about potential target populations, hence 4% as opposed to 5% was used. The "target population of pregnant women" column, however, exists solely for rough estimation purposes and it did not directly inform the sample size calculation.

urban, rural and mixed wards each account for roughly one-third of the population of Yola South (36.7%, 28.7% and 34.6% respectively) and two wards each in these three geographical sub-divisions were represented in the sampling. The settlements selected by PPS in the second stage are shown in Appendix 8.2. During the fieldwork, the desired number of women was not reached in two settlements- one in Ngurore ward (due to being a small farming community) and another in Bole-Yolde Parte ward (a section of the settlement lived across a river); respondents were selected from another neighbouring settlement similar in characteristics in each case to compensate.

The Expanded Program of Immunisation (EPI) sampling method was used to select eligible participants [237, 238] who were: women of child-bearing age (aged 15-49 years); married; residents of Yola (should not have migrated newly to the area, for example, being internally displaced persons due to Boko Haram terrorist activities); and had given birth within the past two years preceding the study. The EPI method has sometimes been criticised for being deficient in methodological rigor [239-241]; however similar results have been obtained in some studies when EPI and other methods were used to measure the same parameters [242, 243]. Prior to the data collection, a key health staff with extensive experiences in immunisation campaigns in the study area showed the centre and boundaries of the selected settlements in their areas. Eleven women were then selected per settlement. I planned a rigorous sampling procedure prior to the fieldwork; however these were not followed completely on the field (please see limitations). Households were tracked and revisited to minimise non-response bias, but data collectors were instructed to move on after visiting a house three times, including the first visit.

8.2.2.3. Sample Size

The sample size was calculated to measure prevalence with 5% precision at 5% significance level within 95% confidence interval (CI) bracket and by assuming a prevalence of 50%. Generally, the prevalence of self-reported morbidities in previous community studies conducted in Sub-Saharan Africa ranged from 0.2% to

39%. The proportion of women who report experiencing one morbidity ranged from 17.8% to 43.9%. A conservative estimated prevalence of 50% was used, as it gives the largest sample size of any percentage one could measure. This brought the sample size to 384. Design effect is expected to be minimal based on estimates from a previous study [244]; nevertheless a design effect of 1.5 was applied to ensure an adequate sample, yielding a sample size of 576 women. The final sample size became 615 after a 10% non-response rate was taken into account. The mathematical workings are shown below:

Formula:

$$n \geq \frac{Z^2 \times (p) \times (1-p)}{D^2}$$

Where n= Required sample size

Z= Value corresponding to desired confidence interval

p= Expected proportion

D= Margin of error (desired precision)

Values of the above for study:

Z= 1.96 (95% CI, p<0.05)

p= 50% (that is, 0.5)

D= 5% (that is, 0.05)

$$\text{Thus } n \geq \frac{1.96^2 \times (0.5) \times (1-0.5)}{0.05^2} = 384$$

Accounting for a 1.5 design effect= $384 \times 1.5 = 576$

Additional sample size from estimated 10% non-response rate= $0.1 \times 384 = 38.4$

Final sample size= $576 + 38.4 = 614.4 = 615$

Number of women to be selected in each of the 60 clusters = $615/60 = 10.25 = 11$

Grand final sample size = $60 \times 11 = \mathbf{660}$

8.2.3 Data Collection

8.2.3.1 Data Collection Tools

As reported in Chapter 7, I developed and pretested a questionnaire for the survey; Appendix 8.3 shows the final questionnaire used. The questionnaire consisted of questions relating to: i) background information (socio-demographic details, obstetric history, care and support received during the last pregnancy, delivery and postpartum, and outcomes of the last delivery); and ii) morbidities (perceptions of general state of health, illnesses or health problems experienced during pregnancy, delivery and postpartum, the severity and consequences of these health problems, and the three selected morbidities- vomiting, prolonged labour and haemorrhage).

Where it was needed, scales and pictures were used to aid measurement and comprehension of certain questions in the questionnaire. These included:

- A facial scale showing emotions that depict the level of agreement to statements [232]. With the author's permission, I removed the neutral face in order to make respondents select an opinion (Figure 7.1).
- The Facial Affective Scale (FAS) which uses facial expressions to help respondents indicate the consequences of morbidities; the scale was originally designed to measure pain in children [245] (Appendix 8.4). As reported in Chapter 7, I intended to use an alternative scale but the author declined permission for me to use modifications that would have made the scale more contextually appropriate (please see limitations in Section 9.4.2).
- Pictures showing forceps and vacuum extractor deliveries to enable respondents report their mode of deliveries.
- Pictures showing different gradations of blood staining to enable respondents better indicate the perceived soaking of their delivery surface (Appendix 8.5).

8.2.3.2 Data Collectors and Training

I recruited four data collectors for the fieldwork and their eligibility criteria included: female; Yola resident; completed bachelor's education; fluent in English and Hausa; and able to commit to working full-time for the entire study period (one data collector left to participate in a mandatory national assignment and missed fieldwork in the very last ward. Another data collector sadly had an accident and was away for a short period of time. She missed fieldwork in one ward completely and two wards partly).

I developed a standard operation procedures (SOPs) document (Appendix 8.6), which included a comprehensive description of the survey procedures, checklist of items to carry along to the field, definition of morbidities and key terms in the questionnaire, list of morbidities and key terms in Hausa, and so on. I gave the SOPs to the data collectors upfront to familiarise themselves with it prior to the training days. I then trained the data collectors, covering various aspects including:

- **Introduction and the study area:** This covered the goal of the study, relevant updates from the qualitative research, list of wards and settlements to be visited, greeting and obtaining permission from community leaders (*“mai anguwa”*), safety and dress code.
- **The survey processes:** This included the eligibility criteria, ethics and informed consent, confidentiality, privacy while collecting data, definition of a household, sampling, probability of selection and recording responses.
- **Quality aspects:** Including validity, consistency, random selection, response rates, bias, and revisits.
- **The questionnaire:** We spent significant time going through every question in the questionnaire step-by-step to ensure that the team interprets and administers the questions consistently.

- **Role-plays and pre-tests:** I administered the questionnaire to a volunteer eligible woman while the data collection team watched, discussing relevant aspects at intervals. We also went to a rural community where the data collectors practised the survey with volunteer eligible women while I observed and provided appropriate feedback. After these, I encouraged the data collectors to practise and pre-test the questionnaire again with eligible women in their social circles and they provided feedback.
- **Administrative-related aspects:** We also discussed transportation, payments, keeping in touch with me and logistics. I returned back to London to continue other aspects of my PhD while the survey was on-going in Nigeria. However, I had frequent phone calls with the data collection team to obtain updates, discuss any challenges experienced and also remind them about best practices. A lecturer at a local university, who is a member of my social circle, voluntarily served as the supervisor on ground for logistical aspects.

8.2.3.3 Data Collection Schedule and Processes

The survey was conducted between October and November 2016. The questionnaire was paper-based and administered face-to-face in Hausa or English in respondents' homes. The questionnaire was in English as it was easier for data collectors to read; it took on average 40 minutes to administer. All questionnaires were collected and kept at a central place at the end of a data collection day. The data collectors worked in teams of two. All settlements in a ward were surveyed before the teams moved on to the next ward. However, this was not possible in one case because there was tension in the area due to a religious rally. The teams abandoned it for a while for safety reasons and moved on to another ward, but eventually returned to complete the data collection when things had resolved. This tension, in addition to the data collector's accident reported earlier, eventually changed the schedule in three wards and the data collectors adapted things accordingly.

8.2.4 Analysis

8.2.4.1 Data Entry and Management

I designed a database for the data entry using EpiData 3.1 [246] and built in the following features to minimise errors: ranges and acceptable values; specified compulsory questions; dialog box prompts if wrong values are mistakenly entered and a reminder provided about correct values; automatic skip patterns; spelling out answer responses in prose beside the numerical codes selected; and automatic fills. Specific codes were entered for missing data, questions that were not applicable, questions that were refused and “don’t know” responses.

I developed a data entry guide (Appendix 8.7) and recruited four data entry assistants, whom I supervised remotely from London. I sent all necessary materials developed upfront, and together with a key data entry assistant, we entered a sample questionnaire line-by-line over the phone. The data entry assistant recorded this session, shared it with others and also cascaded any necessary information to them before commencing the process. The data entry assistants contacted me whenever they had questions or needed clarification. A data entry log was also maintained to keep track of records and relevant comments. The data entry was conducted across two months (except for a few records which may have been entered after this timeline). All data entered were exported to Microsoft Excel and I merged all four files into one central document.

8.2.4.2 Data Cleaning

I went through the entire dataset column-by-column and row-by-row to double-check the data, identify inconsistencies and clean the data. This systematic process also involved following up on connected questions and skip patterns. I corrected obvious mistakes and did deductive imputation [247], for example, filling in a gate-keeper question with “yes” where there is a blank and its follow-up questions were answered, and making informed guesses about parity from gravidity and number of miscarriages. For places with missing data and inconsistencies that could not be resolved through these recognised methods, I recorded them systematically and sent

them back to the data entry workers for verification against the questionnaires (in a few cases, some of the data collectors were contacted and asked). We used this back-and-forth process for the verification and I corrected issues where apparent, recorded responses in the dataset with a special code if inconsistencies could not be resolved after the verification, and accepted data as missing if found as missing.

8.2.4.3 Missing Data

Three types of missing data are generally recognised in literature: missing completely at random (MCAR) where data are missing due to unpatterned, random events; missing at random (MAR) where the missingness is related to another factor/variable but not due to the particular answer to the question; and missing not at random (MNAR) where the missingness is specifically related to the answer to the question and not random [248, 249]. Missing data are also thought to arise from four sources: total/unit non-response (when survey data are not collected for a respondent selected); non-coverage (which results from selection bias); item non-response (when answers are not available in one or more survey questions for a respondent); and partial non-response (generally considered to be a middle ground between total and item non-response) [247].

I studied the missing data in my study and found that they were mainly MCAR and item non-response. Some of these may have been avoided with steps such as rearranging the layout of a few questions, closer supervision of data collectors and inclusion of “don’t know” in some answer responses. A few cases appeared to be MAR, for example, the missing data related to payments for care-seeking appeared to be because the respondents’ husbands made the payments.

The discourse on handling missing data are diverse in the research community and I made efforts to use rational, common-sense and evidence-based methods as much as possible, as reported in the preceding section. Some of these methods were somewhat more closely aligned to *editing* than *imputation* [247]. I created codes for each type of missing data (blanks, refused, don’t know) during data entry and retained them in the final dataset. The respondents with such data were part of the total number of observations, but the specific missing data items were not included in the analyses (that is, did not constitute the denominator in calculations).

8.2.4.4 Data Analysis Methods

The data were organised and managed using Stata 14 [250] and Microsoft Office packages. The dataset was configured appropriately at the beginning of the analysis to adjust for clustering and different probabilities of selection. The different probabilities of selection arose from the third stage of sampling (at the individual level) where some households had more than one eligible woman (for example, polygamous families) and only one woman was selected per household; 87% of the sample had 1 as probability of selection, 8% had 0.50, 4% had 0.33, and 0.5% had 0.25. All proportions reported in the results are weighted estimates unless stated otherwise.

Summary measures (proportions, frequencies, medians, interquartile ranges, etc) were used to provide the descriptive results. I also used principal component analysis (PCA) to generate the wealth status variable (derived from type of roof, floor, walls, main drinking water source and a list of 15 assets) and then used additive scores to summarise three variables: quality of ANC (using standard DHS indicators [12]); quality of postnatal care (using standard WHO indicators [251]); and level of male involvement (explanation in Section 8.3.2.5). I also conducted bivariate logistic regression to find out preliminary associations between socio-demographic factors, obstetric and healthcare factors and maternal morbidity, and then multivariate logistic regression to adjust for potential confounding. In reporting measures of effects, odds ratios with 95% CI were provided for the binary outcomes considered. Chi-squared test was used to test for significance of associations and the cut-off was set at $p < 0.05$.

8.3 Results

8.3.1 Structure of the Results Section

I will start by describing my participant population- the number of women who participated, their socio-demographic details, obstetric history, the details and outcomes of their last deliveries and the care/support they received during their last pregnancies and postpartum. I will then proceed to report the results for the three sub-objectives of my last PhD objective.

For the first sub-objective (3a), I'll first present the estimates on prevalence obtained via the unprompted method (involving respondents' spontaneous reports of illnesses or health problems experienced) and also via the prompted method (respondents were asked whether or not they experienced specific symptoms and procedures); I'll then compare the prevalence of selected symptoms and procedures associated with severe morbidities using both methods. I'll also report the results from the logistic regression conducted to test the association between morbidities and a number of factors. For the second sub-objective (3b), I'll report estimates relating to the severity and consequences of morbidities on women's lives. For the last sub-objective (3c), which is focused on the three selected morbidities, I'll report the prevalence, severity and consequences of vomiting and prolonged labour. For haemorrhage, I focused primarily on measuring various severity indicators since the morbidity occurs on a continuum and it is important to understand potential thresholds. I was also interested in testing some of the lay methods that women used to 'diagnose' haemorrhage in the qualitative phase (Chapter 5). The survey had multiple outcomes due to its exploratory design.

8.3.2 Participant Population

8.3.2.1 Break-down of the Participant Population

The target population was 660 women. Of these, 15 women refused to participate while three women were incapacitated, yielding a response rate of 97%. The result of visit for the 642 women who participated included: 618 completed, 11 partly

completed, 11 break-off³⁸ and 2 outstanding³⁹. Data from the partly completed and break-off questionnaires were still included in the dataset, therefore the participant population was 640 women.

8.3.2.2 Socio-demographic Details of Respondents

Table 8.2 shows the socio-demographic details of the participant population. Approximately three-quarters of the respondents were between ages 20-34 years (76.7%), lived in urban areas (75.0%), were Muslims (74.7%) and were in monogamous marriages (74.8%). A little over half of the women (55.8%) were not literate in any language. 52.0% of the respondents had never attended school or only had primary or non-western education compared to 32.2% of their husbands. Similarly, only 8.8% of the respondents had post-secondary education compared to 29.4% of their husbands; the proportions for secondary education were similar in both groups (39.3% vs. 38.4%). Differences between respondents and their husbands were more prominent in occupation. While 58.0% of the women were unemployed/house-wives, only 1.7% of husbands were unemployed. The proportion of husbands in skilled employment was almost four times that of the women- 38.5% compared to 10.7%.

³⁸ “Break-off” means the respondent answered some questions but refused to continue at some later points. “Partly completed,” on the other hand, means the respondent had to discontinue the survey due to emergencies, competing priorities, or similar reasons.

³⁹ Searches were made but these questionnaires were never recovered. One of the data entry assistants found the cover page of one questionnaire and then a dissociated portion of an unidentifiable questionnaire, perhaps due to stapling malfunction. I therefore tagged these two questionnaires as “outstanding.”

Table 8.2: Socio-demographic details of respondents (n=640)

Characteristic	Frequency	Weighted Proportion % (95% CI)
Age (years)		
15-19	52	8.5 (5.3- 13.4)
20-34	476	76.7 (73.4- 79.7)
35-49	93	14.8 (10.8- 20.0)
Residence		
Rural	161	25.0 (8.0- 56.1)
Urban	479	75.0 (43.9- 92.0)
Religion		
Islam	476	74.7 (58.8- 85.9)
Christianity	161	25.3 (14.1- 41.3)
Type of marital union		
Monogamous	475	74.8 (66.9- 81.4)
Polygamous	147	25.2 (18.6- 33.1)
Literacy		
Can read in any language	255	44.2 (34.8- 54.0)
Cannot read in any language	341	55.8 (46.0- 65.2)
Highest educational level completed/currently attending		
Never attended school/ non-western education	199	32.6 (23.6- 43.1)
Primary	137	19.4 (15.0- 24.6)
Secondary	243	39.3 (30.4- 48.9)
Post-secondary	58	8.8 (5.1- 14.9)
Husband's highest edu. level completed/currently attending		
Never attended school/ non-western education	141	24.0 (17.3- 32.4)
Primary	51	8.2 (5.7- 11.7)
Secondary	246	38.4 (33.6- 43.4)
Post-secondary	187	29.4 (21.6- 38.5)
Main occupation		
Unemployed/house-wife	361	58.0 (54.3- 61.6)
Unskilled	202	31.3 (24.7- 38.9)
Skilled	72	10.7 (6.6- 16.9)
Husband's main occupation		
Unemployed	13	1.7 (1.0- 2.9)
Unskilled	366	59.7 (49.7- 69.0)
Skilled	257	38.5 (29.4- 48.6)

* Missing data: 19 in age, 2 in religion (1 other), 18 in type of marital union, 44 in literacy (likely due to some respondents being 'semi-literate' and questionnaire did not have the option), 3 in woman's highest educational level, 15 in husband's highest educational level, 5 in main occupation and 4 in husband's main occupation.

8.3.2.3 Obstetric History

Table 8.3 shows the obstetric history of respondents. Gravidity ranged from 1-19 with a median of 3 and interquartile range (IQR) 2-6; 28.5% of the population had been pregnant at least 5 times. Parity ranged from 1-14 with a median of 3 and IQR 2-5. About 27.7% had ever experienced miscarriages, with the majority having had one miscarriage. The proportion of women who had ever experienced pre-term births, neonatal deaths, multiple births and C-section deliveries each made up around or less than 5% of deliveries. Still-births were slightly higher at 7.6% and post-term births were about 1 in 5 births (21.8%). Data relating to respondents' pre-existing health conditions before the last pregnancy were also collected (not shown in table)- 4.8% of respondents reported hypertension, 0.8% diabetes, 1.9% anaemia, 1.3% asthma and 0.1% epilepsy when asked "*before you got pregnant with your last baby, has a doctor ever told you that you had [condition]?*"

Table 8.3: Obstetric history of respondents (n=640)

Obstetric Detail	Frequency	Weighted Proportion % (95% CI)
Gravidity (range 1-19, median 3, IQR 2-6)		
1	91	14.9 (11.9- 18.6)
2-4	322	51.3 (46.3- 56.2)
5-9	191	28.5 (23.8- 33.8)
≥10	34	5.3 (3.6- 7.8)
Parity (range 1-14, median 3, IQR 2-5)		
1	115	18.8 (15.1- 23.3)
2-4	336	53.6 (49.4- 57.8)
5-9	165	24.6 (20.3- 29.5)
≥10	19	3.0 (1.7- 5.1)
Ever had a miscarriage		
Yes	175	27.7 (22.9- 33.0)
No	463	72.3 (67.0- 77.1)
Number of miscarriages (range 1-10, median 1, IQR 1-2)		
1	121	69.5 (61.0- 76.8)
≥2	51	30.5 (23.2- 39.0)
Ever had pre-term birth		
Yes	32	5.1 (3.5- 7.5)
No	602	94.9 (92.5-96.5)
Ever had post-term birth		
Yes	141	21.8 (16.6- 28.1)
No	493	78.2 (71.9- 83.4)
Ever had still-birth		
Yes	51	7.6 (5.7- 10.1)
No	577	92.4 (89.9-94.3)
Number of still-births (range 1-2, median 1, IQR 1-1)		
1	36	79.2 (65.5- 88.4)
≥2	9	20.8 (11.6- 34.5)
Ever had neonatal death (within first 24 hours)		
Yes	41	5.8 (2.7- 12.1)
No	588	94.2 (87.9- 97.3)
Ever had neonatal death (beyond the first 24 hours but within the first 28 days)		
Yes	14	2.2 (1.1- 4.4)
No	614	97.8 (95.6-98.9)
Ever had multiple births		
Yes	28	4.5 (2.8- 7.0)
No	602	95.5 (93.0-97.2)
Ever had C-section deliveries		
Yes	34	5.5 (4.1- 7.3)
No	593	94.6 (92.7-95.9)

* Missing data: 2 in gravidity, 5 in parity, 2 in ever had a miscarriage, 3 in number of miscarriages, 6 in pre-term birth, 6 in post-term birth, 12 in ever had a still-birth, 6 in number of still-births, 11 in ever had neonatal death (within 1st 24 hours), 12 in ever had neonatal death (beyond 1st 24 hours but within first 28 days), 10 in every had multiple births and 13 in ever had C-section

8.3.2.4 Details and Outcomes of Last Delivery

I also collected information relating to their last delivery (Table 8.4). Home-births accounted for 36.5% of all deliveries, public health facility births for 54.0% and private health facility births for only 9.4%. Most reports of place of delivery change from an initial plan were unrelated to morbidities but due to factors such as ‘fast delivery,’ although social desirability bias cannot be ruled out. About a third of births (32.1%) were attended to by unskilled individuals; nurses/ midwives/ community health workers delivered the majority of the remaining births. Most respondents delivered spontaneously (94.5%) and only 1.8% and 3.8% of births were instrumental and via C-section respectively. The reasons given for C-section deliveries included obstructed labour (8), prolonged labour (4), requested by the woman (2), placenta praevia (1), placental abruption (1), diabetes (1), post-term baby (1) and missing (8).

Table 8.4: Details and outcomes of respondents’ last deliveries (n=640)

Characteristic	Frequency	Weighted Proportion % (95% CI)
Place of last delivery		
Home/TBA’s place	228	36.5 (27.0- 47.2)
Public health facility	350	54.0 (46.3- 61.6)
Private health facility	55	9.4 (5.8- 15.0)
Birth Attendant		
Unskilled	194	32.1 (22.8- 43.0)
Nurse/midwife/CHW	381	58.7 (50.1- 66.8)
Doctor	54	9.2 (5.5- 15.1)
Mode of delivery		
Spontaneous	598	94.5 (91.3- 96.3)
Instrumental	11	1.8 (0.8- 3.7)
C-section	24	3.8 (2.7- 5.3)
Proportion of women with still-births		
Yes	8	1.3 (0.5- 3.4)
No	627	98.7 (96.7-99.5)
Proportion of women with pre-term births		
Yes	24	3.3 (1.8- 5.8)
No	607	96.8 (94.2-98.2)
Proportion of women with post-term births		
Yes	93	14.6 (9.3- 22.1)
No	532	85.4 (77.9-90.7)

* Missing data: 7 in place of delivery, 11 in birth attendant, 7 in mode of delivery, 5 in proportion of women with still-births, 9 in proportion of women with pre-term births and 15 in proportion of women with post-term births

8.3.2.5 Care and Support Received during the Last Pregnancy and Postpartum

Table 8.5 shows a summary of the antenatal and postnatal care that respondents received. ANC attendance was nearly universal at 94.1% although more than three-quarters of the respondents started it late- 67.9% in the second trimester and 11.8% in the third trimester. Most respondents (82.8%) reported that they had at least four ANC visitations and the quality appeared to be universally good based on standard DHS indicators (median= 9, out of a total of nine indicators) [12]. This high proportion was not replicated for postnatal care where only 15.9% reported receiving at least four checks from the period immediately after their deliveries up to six weeks later; the quality did not appear to be sufficient based on standard indicators (median= 4 and interquartile range= 2- 5, out of a total of six indicators) [251].

Table 8.5: Care and support received during last pregnancy and postpartum (n=640)

Domain	Characteristic	Frequency	Weighted Proportion % (95% CI)
Antenatal care (ANC)	Ever attended ANC		
	Yes	602	94.1 (90.8- 96.3)
	No	35	5.9 (3.7- 9.2)
	Onset of ANC		
	1 st trimester	126	20.3 (16.3- 25.0)
	2 nd trimester	404	67.9 (64.7- 70.9)
Postnatal care (PNC) ⁴⁰	3 rd trimester	64	11.8 (9.1- 15.2)
	ANC tally		
	Less than 4	102	17.3 (12.6- 23.1)
	4 and above	483	82.8 (76.9- 87.4)
	Quality of ANC (9 indicators total)		
	Median= 9 IQR= 8-9		
Postnatal care (PNC) ⁴⁰	Had PNC		
	Yes	385	60.7 (53.77- 67.3)
	No	249	39.3 (32.7- 46.3)
	PNC tally		
	Less than 4	304	84.2 (77.2- 89.3)
	4 and above	64	15.9 (10.7- 22.8)
Postnatal care (PNC) ⁴⁰	Quality of PNC (6 indicators total)		
	Median= 4 IQR= 2-5		
	Care-seeking for any problem at facility within 6 weeks postpartum		
	Yes	97	15.1 (10.8- 20.6)
Postnatal care (PNC) ⁴⁰	No	514	85.0 (79.4- 89.2)

* Missing data: 3 in ever attended ANC, 11 in ANC onset, 17 in ANC tally, 6 in had PNC, 17 in PNC tally and 29 in care-seeking within 6 weeks postpartum

⁴⁰ This was based on a six-week duration rather than 24 or 48 hours. The gatekeeper question asked was: “did any health professional check on your health in the first 6 weeks after you gave birth to your last baby, for example, by asking you questions about your health or examining you?”

Male involvement has been linked to better maternal health outcomes [252], therefore I also collected data relating to the care/support that respondents received from their husbands as part of their background information (Table 8.6). Male involvement was observed to be strongest in financial support, with almost every woman (95.2%) reporting that her husband contributed money for her food, transportation, medical services, treatments or other similar needs during her last pregnancy. This near-universal support was not reported in the “participation in maternal health” domain where only approximately a third of women (34.8%) reported that their husbands accompanied them at least once for ANC; “accompanied” was defined as staying with the respondent while she was in one of the following places- the antenatal care room, ultrasound room, laboratory or the doctor’s/ nurse’s office.

More than half of respondents (55.1%) strongly agreed with the statement “*during my last pregnancy, my husband supported me emotionally (such as in giving me encouragement, comfort, allaying my fears and listening to me),*” with a further 21.2% mildly agreeing with the statement; 9.1% and 13.3% mildly and strongly disagreed with the statement respectively. Practical support- whether the woman’s husband supported her practically such as helping her to lift heavy objects and arranging for others to help her with household chores- was also reported in similar high proportions with about two-thirds of respondents acknowledging it, although the percentage points were slightly lower (48.5% strongly agree and 16.7% mildly agree). The difference was more pronounced in levels of disagreement: almost a quarter of respondents (22.7%) strongly disagreed that their husbands supported them practically compared to a more modest 13.3% for emotional support.

I computed an additive score for male involvement. “Yes” was given a score of 3 and “no” a score of zero for participation in maternal health services and financial support. For emotional and practical support, “strongly agree” was given a score of 3, “mildly agree” 2, “mildly disagree” 1 and “strongly disagree” zero. Out of a possible total score of 12, the median score was 9 and interquartile range was 6-10. I also summarised the data using ordinal categories: low male involvement was

defined as scores 0-4; moderate as scores 5-9; and high as scores 10-12. The results suggest that 12.4%, 59.2% and 28.4% of the respondents had low, moderate and high levels of male involvement respectively.

Decision-making was also measured, that is, who made decisions about the woman's health such as whether or not she visited the health centre or whether or not she received treatment. The result suggests that husbands were the chief decision-makers, making health-related decisions for over two-thirds (69.3%) of the respondents, compared to the woman alone or jointly with her (14.2% and 14.6%). In rare cases (2.0%), other individuals- particularly relatives- made the decisions alone or in conjunction with the woman.

Table 8.6: Male involvement during last pregnancy (n=640)

Domain	Response	Frequency	Weighted Proportion % (95% CI)
Participation in maternal health services	Yes	207	34.8 (29.9- 40.1)
	No	389	65.2 (59.9- 70.1)
Financial support	Yes	570	95.2 (90.9- 97.5)
	No	33	4.8 (2.5- 9.1)
Practical support	Strongly agree	300	48.5 (38.1- 59.1)
	Mildly agree	102	16.7 (14.6- 19.1)
	Mildly disagree	67	12.1 (8.1- 17.6)
	Strongly disagree	141	22.7 (15.8 – 31.5)
Emotional support	Strongly agree	341	55.1 (46.7- 63.2)
	Mildly agree	129	22.4 (18.1- 27.5)
	Mildly disagree	56	9.1 (6.3- 13.0)
	Strongly disagree	84	13.3 (10.3- 17.1)
Decision-making	Woman	89	14.2 (10.5- 18.8)
	Her husband	419	69.3 (63.6- 74.4)
	Jointly with husband	89	14.6 (11.2- 18.8)
	Others	13	2.0 (1.0- 4.0)
Overall male involvement	Low	74	12.4 (8.5- 17.8)
	Moderate	343	59.2 (53.6- 64.6)
	High	163	28.4 (23.3- 34.0)

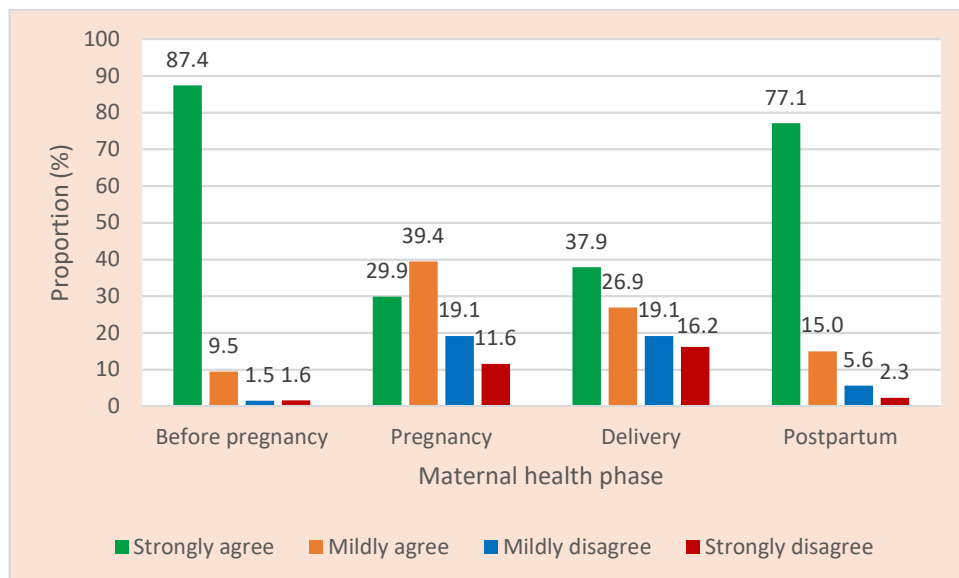
* Missing data: 12 in participation in maternal health services (question was not applicable to all women), 37 in financial support, 30 in practical support, 30 in emotional support and 30 in decision-making

8.3.3 The Prevalence of Self-reported Maternal Morbidities

8.3.3.1 Perception of General State of Health

To find out whether morbidity was salient in respondents' perceptions about their health, I measured respondents' level of agreement to the statement “*my health status was generally fine [before my last pregnancy/ during my last pregnancy/ during my last delivery/ after I gave birth to my last baby]*”. Most women (87.4%) strongly agreed that their health status was generally fine before pregnancy with a further 9.5% mildly agreeing, and then 1.5% and 1.6% mildly and strongly disagreeing (Figure 8.2). This strong level of agreement fell drastically at 29.9% for pregnancy and then 37.9% for delivery. A little over three quarters of the women (77.1%) felt that their postpartum health was generally fine. Another question which asked respondents to compare their health to other women at these different time points also showed a similar pattern where women felt that pregnancy made their health worse (data not shown).

Figure 8. 2: Proportion of women and their perceptions to the question “*my health status was generally fine [before my last pregnancy/ during my last pregnancy/ during my last delivery/ after I gave birth to my last baby]*” respectively



8.3.3.2 Prevalence of Self-reported Morbidities: The Unprompted Data Collection Method

Respondents were asked to report any illnesses or problems they experienced during pregnancy, delivery and postpartum (each phase asked separately) and whatever they reported was recorded. This was the main method used to measure self-reported morbidities. All women should have delivered within the past two years. 69.5% (95% CI 62.7- 75.6) of the respondents reported at least one health problem during pregnancy, 30.6% (95% CI 21.7- 41.3) during delivery and 24.3% (95% CI 19.8- 29.6) during postpartum. 78.4% (95% CI 70.7- 84.4) reported at least one health problem in any of the three maternal health phases while 9.3% (95% CI 6.0- 14.1) reported at least one health problem in all three phases.

Tables 8.7-8.9 show the distribution of the health problems and procedures reported using this unprompted method for each maternal health phase (some modifications made to maximise table space/content). The diagnoses and symptoms were left as separate categories in the tables to capture nuances and to maximise details. This was also done to distinguish self-reported symptoms from diagnosed ones since more objective measurement methods (for example, physical examination and medical record validation) were not used in the PhD research. In addition, I tried to use C-section and other procedures as proxies for morbidities. Hence even if the C-section was planned, it could be that the women who reported them unprompted experienced negative consequences as a result of undergoing the procedure. As seen in the tables, most health problems reported during pregnancy had prevalences below 5% (Table 8.7), with those exceeding this threshold mainly associated with pain such as chest pain, leg pain, abdominal pain, backache, fever, headache and so on. Similar trends were also observed for health problems reported during delivery and postpartum (Tables 8.8 and 8.9). Many health problems which respondents frequently used to classify a pregnancy as difficult in the qualitative phase (Chapter 4) had higher prevalences (at least 10%) in the pregnancy phase- vomiting, inability to eat, spitting and malaria.

Table 8.7: Distribution of self-reported morbidities and procedures during pregnancy using the unprompted method

No report	<1%	1.0- 4.9%	5.0-9.9%	10.0-19.9%	≥20%
<ul style="list-style-type: none"> • Antepartum depression • Blurred vision or seeing things hazy • Infection or sepsis • Insomnia • Placental abruption • Placenta praevia • Uterine rupture • Pregnancy-induced diabetes (PID) • Premature rupture of membranes (PROM) • Shallow or rapid breathing • Skin problems • Nose bleeding • Inability to or difficulty in walking (<i>variants reported in other columns</i>) • Bleeding (either from placental abruption, placenta praevia, vasa praevia, uterine rupture or no cause given/not known) • Co-morbidities (such as abdominal pain plus vomiting) • Leaking urine and/or leaking faeces • ICU admission • Referral to another health institution • Senior personnel summoned in hospital • Mini surgery conducted 	<ul style="list-style-type: none"> • Fainting • Pre-eclampsia • Unable to urinate or urine retention • Convulsion/fits/eclampsia • Hyperemesis gravidarum • Bleeding (other) • Haemorrhoids • Swollen toe (nail in-growth) • Jaundice • Obstructed breathing • Unconsciousness • Fever plus vomiting • Fever/malaria plus abdominal pain • Bleeding during intercourse • Eating a lot • Typhoid • Low blood pressure • Health worker summoned home • Hospitalisation ≥ 3 days • Hospitalisation more than once across pregnancy 	<ul style="list-style-type: none"> • Anaemia/insufficient blood • High blood pressure/PIH/hypertension • Painful intercourse • Vomiting blood • Constipation • Bleeding (threatened abortion) • Diarrhoea/stooling, frequent urination • Foul smelly vaginal discharge • Leaking urine • Body pain • Painful urination • Side pain • Breast problems • Stomach bloating • Swollen body • Swollen face • Swollen hands • Body numbness • Body weakness or fatigue • Leg numbness • Weight loss • Blood transfusion • Given drip at home • Given drip at health facility 	<ul style="list-style-type: none"> • Chest pain • Nausea • Leg pain • Lower abdominal pain • Swollen feet/leg • Dizziness or vertigo • Excessive sleeping 	<ul style="list-style-type: none"> • Inability to eat • Spitting • Abdominal pain • Ulcer/heart burn • Body heaviness (<i>kasala</i>) 	<ul style="list-style-type: none"> • Vomiting • Fever (body hotness only) • Fever/malaria • Backache • Headache

Table 8.8: Distribution of self-reported morbidities and procedures during delivery using the unprompted method

No report	<1%	1.0- 4.9%	5.0-9.9%	10.0-19.9%	≥20%
<ul style="list-style-type: none"> • Vomiting blood • Bleeding (either from uterine atony, tear, retained products of birth, clotting failure or disorder, placental abruption, placenta praevia, threatened abortion and vasa praevia) • Ulcer/heartburn • Leaking faeces • Leaking urine • Uterine rupture • Placental abruption • Placenta praevia • Anaemia or insufficient blood • Convulsions/fits/ec lamsia • Inability to walk • Nausea 	<ul style="list-style-type: none"> • Delayed placental expulsion or retained placenta • Fainting • Leg pain • Tear • High blood pressure/PIH/hypertension • Unconscious ness • Body pain • Inability to eat • C-section • Episiotomy • Induced labour 	<ul style="list-style-type: none"> • Shivering/body shaking/feeling cold • Bleeding (no cause given or not known/ other) • Cord around baby's neck • Prolonged labour or failure to progress • Fever/malaria • Chest pain • Headache • Dizziness 	<ul style="list-style-type: none"> • Obstructed labour (mal-presentation, oversized baby, small pelvis, no cause given or not known) • Fever (body hotness only) • Vomiting 	-----	<ul style="list-style-type: none"> • Abdominal pain • Backache • Lower abdominal pain

Table 8.9: Distribution of self-reported morbidities and procedures during postpartum using the unprompted method

No report	<1%	1.0- 4.9%	5.0-9.9%	10.0-19.9%	≥20%
<ul style="list-style-type: none"> • Foul, smelly vaginal discharge • Postpartum depression • Postpartum psychosis • Painful intercourse • Convulsion/fits/eclampsia • Fainting • Unconsciousness • Infection or sepsis • Pelvic floor prolapse • Constipation • Bleeding (either from uterine atony, tear, retained products of birth, clotting failure or disorder) • Pre-eclampsia • Pregnancy-induced diabetes • Diarrhoea or stooling • Frequent urination • Leaking faeces • Leaking urine • Nose bleeding • Painful stretch marks • Spitting • Vomiting blood • Perineal pain or discomfort • Haemorrhoids • Stomach bloating • Swollen face or hands or toe-nail in-growth • Blurred vision or seeing things hazy • Body heaviness or numbness or weakness/fatigue • Inability to walk or difficulty in walking • Insomnia • Jaundice • Leg numbness • Obstructed breathing • Shallow or rapid breathing • Skin problems • Stitches loosened- vaginal area • Weight loss 	<ul style="list-style-type: none"> • C-section stitches loosened • Itchy C-section scar • Unable to urinate or urine retention • Painful urination • Bright red bleeding >4 days postpartum • Low blood pressure • Blood transfusion • Given drip at health facility • Health worker summoned home • Referral to another health institution • Senior personnel summoned • Mini surgery conducted 	<ul style="list-style-type: none"> • Tear • Shivering/body shaking/feeling cold • Breast problems • High blood pressure/PIH/hypertension • Unable to urinate • Anaemia or insufficient blood • Painful C-section scar • Swollen body • Swollen feet/leg • Vomiting • Inability to eat • Nausea • Body pain • Chest pain • Headache • Leg pain • Ulcer or heartburn • Excessive sleeping • Eye problems 	<ul style="list-style-type: none"> • Bleeding (uterine rupture/no cause given or not known/other) • Fever (body hotness only) • Dizziness or vertigo 	<ul style="list-style-type: none"> • Fever or malaria • Backache • Lower abdominal pain 	<ul style="list-style-type: none"> • Abdominal pain

Table 8.10 shows the distribution of the top five health problems in each phase. Vomiting was the most reported health problem during pregnancy, accounting for 40.8% of all health problems reported in this phase. Headache, backache, fever (body hotness only) and fever/malaria⁴¹ made the remaining top five spots with prevalences between 20.2% and 25.2%. Abdominal pain accounted for a little over half (52.7%) and a little over one-third (35.8%) of all health problems reported during delivery and postpartum respectively, which may likely have been muddled up with labour pains and post-delivery pains. Backache, lower abdominal and fever (body hotness only) were the second, third and fifth most frequently-cited health problems in both delivery and postpartum phases. Obstructed labour was the fourth most cited morbidity for delivery (7.8% prevalence) and fever/malaria for postpartum (10.2%).

Table 8.10: Distribution of the top five health problems in each phase (frequencies, proportions of women reporting in the respective phase)

Position	During pregnancy (frequency, %)	During delivery (frequency, %)	During postpartum (frequency, %)
1 st	Vomiting (169, 40.8%)	Abdominal pain (88, 52.7%)	Abdominal pain (49, 35.8%)
2 nd	Headache (110, 25.2%)	Backache (49, 29.2%)	Backache (18, 14.1%)
3 rd	Backache (84, 21.2%)	Lower abdominal pain (49, 28.8%)	Lower abdominal pain (17, 13.1%)
4 th	Fever- body hotness only (94, 20.8%)	Obstructed labour (16, 7.8%)	Fever/malaria (14, 10.2%)
5 th	Fever/malaria (79, 20.2%)	Fever- body hotness only (11, 6.7%)	Fever- body hotness only (9, 7.4%)

⁴¹ It is somewhat tricky to differentiate between fever and malaria. In addition, the same Hausa word- *zazzabi*- is used for both fever and malaria. In the study area however, women who have fever tend to talk about “body hotness” only without mentioning other common symptoms accompanying malaria such as pain in the joints, vomiting and headache. Therefore, I included an instruction in the SOPs to record a morbidity as “fever (body hotness only)” if the woman talks about body hotness only and then as “fever/malaria” if she talks about fever and these other accompanying symptoms. During pregnancy, “fever (body hotness only)” and “fever/malaria” were both reported in 36 records (that is, of the 94 respondents who reported “fever- body hotness only,” 36 of them also had “fever/malaria”; and also of the 79 respondents who reported “fever/malaria”, 36 of them also had “fever- body hotness only”).

Table 8.11 shows the number of health problems reported per woman across the three maternal health phases. Respondents reported the highest number of health problems during pregnancy compared to delivery and postpartum, with the margin widening as the number of health problems per woman increased. 3.5% of respondents reported at least ten health problems during pregnancy, with no such reports in the other two phases. A higher number of health problems were reported in the delivery phase compared to the postpartum one for all categories.

Table 8.11: Number of health problems reported per woman (unweighted proportions)

Number of health problems	Proportion of women reporting during pregnancy (%)	Proportion of women reporting during delivery (%)	Proportion of women reporting during postpartum (%)
One health problem	69.1	28.1	22.6
Two health problems	41.0	12.1	5.5
Three health problems	23.4	3.3	1.8
Four health problems	15.7	1.3	0.8
Five health problems	10.8	0.3	-----
At least ten health problems	3.5	-----	-----

8.3.3.3 Prevalence of Self-reported Morbidities: Unprompted and Prompted Data Collection Methods Combined

Respondents were prompted on a number of symptoms and procedures associated with severe outcomes and asked if they had experienced each of them. I then compared the frequencies of these symptoms and procedures with those obtained via

the unprompted method (Section 8.3.3.2). This was carried out to further understand how to measure maternal morbidities from community settings.

The results suggest a wide difference in frequencies for most symptoms and procedures compared using these two methods (Table 8.12). In general, the prompted method elicited a higher number of symptoms and procedures reported in all cases across the maternal health phase except two (blood transfusion and ICU admission during pregnancy). It also elicited responses for symptoms and problems with zero reports when the unprompted method was used (in three cases for pregnancy and eleven cases each for delivery and postpartum), including for severe conditions/procedures such as premature rupture of membranes during pregnancy, hysterectomy and referral during delivery and pelvic floor prolapse and hospitalisation during postpartum.

An overwhelmingly wide margin (difference of at least 100 women) was observed for foul, smelly vaginal discharge, swollen body, weight loss and given drip at health facility during pregnancy and then for bright red bleeding >4 days postpartum and foul, smelly vaginal discharge during postpartum. Wide margins of 50-99 were also observed for anaemia and blurred vision during pregnancy and then for fever (body hotness only), shivering, cord around baby's neck, delayed placental expulsion >30 minutes/retained placenta, tears and induced labour for delivery. Conditions with the least difference (single digits) tended to be very severe conditions (such as convulsions, unconsciousness and pelvic floor prolapse) and a few procedures, although these could also be due to their low prevalence in reality in general. Clear-cut trends were not easily deciphered in some cases. For example, while the same number of women reported blood transfusion during pregnancy for both methods, a difference of six and eight were observed for the delivery and postpartum phases.

Table 8.12: Comparison of frequencies of symptoms/procedures between the unprompted and prompted methods

Phase	Symptom/ procedure	Unprompted (frequency)	Prompted (frequency)	Difference
Pregnancy	Bleeding (any vaginal bleeding)	7	49	42
	Foul, smelly vaginal discharge	7	143	136
	Vomiting blood	5	18	13
	Swollen body	15	118	103
	Anaemia/insufficient blood	11	91	80
	Weight loss	13	122	109
	Blurred vision/ seeing things hazy	0	75	75
	Convulsion (fits)/ eclampsia	1	5	4
	Fainting/ unconsciousness	5	13	8
	High blood pressure/ PIH/ hypertension	11	39	28
	Premature rupture of membranes, PROM	0	17	17
	Blood transfusion	7	7	0
	Given drip at home	6	28	22
	Given drip at health facility	9	110	101
	Health worker summoned home	3	44	41
	Hospitalisation- ≥ 3 days in one episode	3	30	27
	Hospitalisation- >1 across pregnancy	1	27	26
	ICU admission	0	0	0
	Referral to another health institution	0	11	11
	Senior personnel summoned in hospital	0	17	17
Delivery	Vomiting blood	0	9	9
	Fever- body hotness only	11	85	74
	Shivering/ body shaking/ feeling cold	6	85	79
	Cord around baby's neck	6	50	44
	Delayed placental expulsion >30 minutes/ retained placenta	1	54	53
	Obstructed labour (mal-presentation)	7	25	18
	Tear	2	67	65
	Convulsion (fits)/ eclampsia	0	6	6
	Fainting/ unconsciousness	4	11	7
	High blood pressure	1	14	13
	Blood transfusion	0	6	6
	Planned C-section	0	46	46
	Episiotomy	1	21	20
	Hospitalisation- ≥ 3 days in one episode	0	17	17
	Hysterectomy	0	2	2
	ICU admission	0	5	5
	Induced labour	7	80	73
	Manual placental expulsion	0	20	20
	Referral to another health institution	0	12	12
	Senior personnel summoned in hospital	0	21	21
	For home deliveries: Health worker summoned home	0	25	25

Phase	Symptom/ procedure	Unprompted (frequency)	Prompted (frequency)	Difference
Postpartum	Bright red bleeding >4 days	1	450	449
	Foul, smelly vaginal discharge	0	163	163
	Leaking urine or faeces	0	16	16
	Vomiting blood	0	6	6
	Shivering/ body shaking/ feeling cold	3	43	40
	Anaemia/ insufficient blood	4	25	21
	Blurred vision/ seeing things hazy	0	24	24
	Convulsion (fits)/ eclampsia	0	5	5
	Fainting/ Unconsciousness	0	6	6
	High blood pressure/ PIH/ hypertension	4	5	1
	Pelvic floor prolapse	0	1	1
	Blood transfusion	1	9	8
	Given drip at home	0	12	12
	Given drip at health facility	1	30	29
	Health worker summoned home	1	18	17
	Hospitalisation- ≥ 3 days in one episode	0	11	11
	Hospitalisation- >1 across	0	6	6
	ICU admission	0	4	4
	Referral to another health institution	1	4	3
	Senior personnel summoned in hospital	1	8	7

8.3.3.4 Association between Socio-demographic, Obstetric Details and Healthcare Factors with Self-reported Maternal Morbidities

I conducted bivariate and then multivariate logistic regression to find out whether reporting health problems was associated with a number of socio-demographic, obstetric and healthcare factors. This was not a direct objective of my PhD, however I carried it out to obtain further potentially valuable information about measuring morbidities from community settings. I tested 16 independent variables that emerged from my qualitative research, my own understanding and the literature as particularly important or potentially linked to women's experiences of morbidities- age, residence, religion, marital union, literacy, highest level of education, occupation, husband's highest level of education, husband's occupation, wealth status, gravidity, parity, level of male involvement, total number of ANC visits, birth attendant and place of delivery. I investigated their association with five binary outcomes: any self-reported morbidity during pregnancy yes/no; any self-reported morbidity during delivery yes/no; any self-reported morbidity during postpartum yes/no, any self-

reported morbidity in either pregnancy, delivery or postpartum yes/no and any self-reported morbidity in all three phases yes/no.

Table 8.13 shows the results of the bivariate and multivariate logistic regressions. In the bivariate analyses, the independent variables were only significantly associated with three of the five outcomes: self-reported morbidity during pregnancy yes/no, self-reported morbidity during delivery yes/no and any self-reported morbidity in either of the three phases (Appendix 8.8 shows the results for the other two outcomes). Eight variables- literacy, highest level of education, occupation, husband's highest level of education, gravidity, parity, number of ANC visits and place of delivery- were significantly associated with at least one outcome; two factors- husband's highest level of education and birth attendant- showed borderline significance in one outcome each. Literacy showed statistical significance with all three outcomes while five factors (highest education, occupation, husband's highest education, number of ANC visits and place of delivery), two factors (gravidity and parity) and two other factors (highest education and number of ANC visits) were significantly associated with only self-reported morbidity during pregnancy, self-reported morbidity during delivery and self-reported morbidity in either phase respectively.

All variables which were significantly or borderline associated with any of the three outcomes were then tested using multivariate logistic regression within their respective categories. The results (Table 8.13) showed that only literacy (OR 2.32, 95% CI 1.12-4.83, $p=0.028$) and number of ANC visits (OR 1.85, 95% CI 1.01-3.42, $p=0.048$) were significantly associated with reporting a health problem during pregnancy; only literacy for reporting a health problem during delivery (OR 1.71, 95% CI 1.02-2.87, $p=0.043$) and again only literacy (OR 2.66, 95% CI 1.32-5.37, $p=0.011$) and number of ANC visits (OR 1.99, 95% CI 1.03-3.82, $p=0.041$) for reporting any health problem in either one of the three phases.

Table 8.13: Bivariate and multivariate associations between self-reported maternal morbidities and socio-demographic, obstetric and healthcare factors (n=640)

Independent Variable	Frequency	Self-reported morbidity during pregnancy yes or no (unprompted)		Self-reported morbidity during delivery yes or no (unprompted)		Any self-reported morbidity in either pregnancy or delivery or postpartum yes or no	
		Bivariate OR (95% CI)	Multivariate OR (95% CI)	Bivariate OR (95% CI)	Multivariate OR (95% CI)	Bivariate OR (95% CI)	Multivariate OR (95% CI)
Age (years)							
15-19	52	Ref.		Ref.		Ref.	
20-34	476	1.02 (0.45- 2.31)		0.99 (0.40- 2.44)		1.08 (0.47- 2.48)	
35-49	93	1.17 (0.40- 3.40)		0.57 (0.17- 1.96)		1.06 (0.33- 3.41)	
Residence							
Rural	161	Ref.		Ref.		Ref.	
Urban	479	1.21 (0.66- 2.21)		0.91 (0.45- 1.83)		1.10 (0.54- 2.25)	
Religion							
Christianity	161	Ref.		Ref.		Ref.	
Islam	476	1.14 (0.83- 1.58)		1.45 (0.72- 2.94)		1.14 (0.72- 1.79)	
Type of marital union							
Monogamous	475	Ref.		Ref.		Ref.	
Polygamous	147	0.76 (0.38- 1.51)		1.40 (0.81- 2.40)		0.79 (0.48- 1.29)	
Literacy							
Cannot read in any language	341	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.
Can read in any language	255	2.28 (1.28- 4.08)*	2.32 (1.12- 4.83)*	1.95 (1.16- 3.28)*	1.71 (1.02- 2.87)*	2.74 (1.56- 4.81)**	2.66 (1.32- 5.37)*
Highest edu. level							
Less than secondary	336	Ref.		Ref.		Ref.	
Secondary and above	301	1.56 (1.16- 2.11)**		0.82 (0.43- 1.56)		1.68 (1.10- 2.55)*	
Husband's highest edu. level							
Less than secondary	192	Ref.		Ref.		Ref.	
Secondary and above	433	1.79 (1.39- 2.30)**		0.96 (0.58- 1.59)		1.60 (0.97- 2.65)	
Main occupation							
Unemployed/house-wife	361	Ref.		Ref.		Ref.	
Unskilled	202	1.14 (0.78- 1.67)		(1.33 (0.95- 1.88)		1.30 (0.84- 2.01)	
Skilled	72	1.96 (1.11- 3.48)*		1.02 (0.40- 2.62)		2.26 (0.92- 5.55)	
Husband's main occupation							
Unemployed	13	Ref.		Ref.		Ref.	
Unskilled	366	2.27 (0.58- 8.93)		0.30 (0.05- 1.74)		1.49 (0.27- 8.16)	
Skilled	257	3.55 (0.89- 14.20)		0.21 (0.03- 1.39)		1.83 (0.30- 11.04)	

Independent Variable	Frequency	Self-reported morbidity during pregnancy yes or no (unprompted)		Self-reported morbidity during delivery yes or no (unprompted)		Any self-reported morbidity in either pregnancy or delivery or postpartum yes or no	
		Bivariate OR (95% CI)	Multivariate OR (95% CI)	Bivariate OR (95% CI)	Multivariate OR (95% CI)	Bivariate OR (95% CI)	Multivariate OR (95% CI)
Wealth status							
Poor	183	Ref.		Ref.		Ref.	
Middle	181	1.40 (0.70- 2.79)		1.03 (0.59- 1.80)		1.21 (0.55- 2.66)	
Rich	182	1.53 (0.79- 2.94)		0.78 (0.38- 1.62)		1.31 (0.61- 2.80)	
Gravidity							
1 pregnancy	91	Ref.		Ref.		Ref.	
2-4 pregnancies	322	0.71 (0.34- 1.46)		0.62 (0.33- 1.16)		0.82 (0.37- 1.82)	
≥5 pregnancies	225	0.91 (0.48- 1.74)		0.44 (0.23- 0.84)*		0.79 (0.43- 1.45)	
Parity							
1 delivery	115	Ref.		Ref.		Ref.	
2-4 deliveries	336	0.76 (0.35- 1.62)		0.61 (0.36- 1.03)		0.74 (0.41- 1.33)	
≥5 deliveries	184	1.00 (0.47- 2.12)		0.46 (0.29- 0.75)**		0.79 (0.45- 1.39)	
Level of male involvement							
Low	74	Ref.		Ref.		Ref.	
Moderate	343	1.19 (0.62- 2.29)		0.70 (0.32- 1.52)		1.09 (0.53- 2.23)	
High	163	0.95 (0.48- 1.88)		0.67 (0.24- 1.88)		0.88 (0.41- 1.86)	
Number of ANC visits							
Less than 4	102	Ref.	Ref.	Ref.		Ref.	Ref.
4 and above	483	1.81 (1.02- 3.23)*	1.85 (1.01- 3.42)*	1.63 (0.78- 3.41)		1.99 (1.06- 3.73)*	1.99 (1.03- 3.82)*
Birth attendant							
Unskilled	194	Ref.		Ref.		Ref.	
Nurse/midwife/CHW	381	1.48 (0.82- 2.68)		1.23 (0.47- 3.18)		1.25 (0.68- 2.35)	
Doctor	54	2.06 (0.90- 4.72)		0.83 (0.41- 1.70)		2.57 (0.99- 6.67)	
Place of delivery							
Home/TBA's place	228	Ref.		Ref.		Ref.	
Public health facility	350	1.57 (0.95- 2.60)		0.98 (0.48- 2.00)		1.38 (0.81- 2.33)	
Private health facility	55	1.83 (1.14- 2.96)*		0.90 (0.30- 2.68)		1.85 (0.67- 5.10)	

* Significant at p<0.05

** Significant at p<0.01

8.3.4 The Severity and Consequences of Self-reported Maternal Morbidities

The severity and consequences section was directly linked to the health problems that respondents reported unprompted in Section 8.3.3.2. When women reported health problems spontaneously, they were asked whether they felt any of these problems was very serious (that is, negatively impacted their wellbeing and/or functioning very severely), and if they answered in the affirmative, the detailed questions in the severity and consequences section were then asked. Due to the scope and time-frame of the PhD, respondents were only asked about the two most serious health problems per maternal health phase (pregnancy, delivery and postpartum) if they reported more than two health problems as very serious.

Two aspects of severity were measured: duration of and care-seeking for the health problem. Care-seeking was defined as care/treatment/remedy for the problem, that is, any solution to the problem from anywhere or anyone; therefore this encompassed a wide range including home management and care from the formal health service. Payment for care/treatment could be considered a financial consequence, but in the survey results, I am categorising it under care-seeking as a marker of severity (ie, whether the respondent or her family either borrowed money, sold an asset or used money reserved for something else to make the payment).

I also measured the consequences of the health problems on different aspects of the respondents' lives: physical, marital, social⁴² (for pregnancy morbidities only) and nurturing (for delivery and postpartum morbidities only). These were defined as the effect of the health problem on her:

- Day-to-day activities such as cooking, sweeping, walking to the shop and going to work (*physical*).

⁴² Social consequences were not included for delivery and postpartum morbidities for pragmatic reasons. The questionnaire was quite long and I had to prioritise areas of life to measure for the three phases. Nurturing emerged as an important area during the cognitive interviews and I included it instead of social consequences.

- Relationship with her husband such as communicating with him, spending time with him or being in good terms with him (*marital*).
- Social life such as chatting with her family and others, or participating in important events like weddings and naming ceremonies (*social*).
- Ability to breastfeed her baby or care for him/her (*nurturing*).

I also obtained an overall severity score by asking respondents to “*rate the overall severity of the pain/discomfort/distress of the (insert morbidity).*” This was essentially an overall consequences score. I put the three dimensions (pain, discomfort, distress) together to form a generic measure that could apply across a range of health problems. This is because morbidities are complex and characteristically different, for example, some morbidities may not be painful but could cause distress, as I learnt during the cognitive interviews. Therefore, it was important to use language that would capture such circumstances.

In total, 74 out of 437 respondents reported that one or more of the health problems they spontaneously mentioned were very serious in the pregnancy phase (that is, 16% of those who reported health problems in the pregnancy phase unprompted), 2 out of 176 respondents (0.9%) in the delivery phase, and 26 out of 140 respondents (19%) in the postpartum phase. As a proportion of the entire participant population, 11.6%, 0.3% and 4.1% of respondents reported that their morbidities were very serious for the pregnancy, delivery and postpartum phases respectively (unweighted proportions). The focus of this section will therefore be on the severity and consequences of health problems experienced during pregnancy, as this was the only phase that produced substantial data. However, the health problems that were reported as very serious in the delivery and postpartum phases have been summarised in Appendix 8.9.

Twenty-four different health problems were reported as very serious during pregnancy (Table 8.14). The results show a wide range of health problems from mild to moderate to severe health problems using a biomedical viewpoint, as also seen in

the ‘worst morbidity that can happen’ question in the qualitative phase (Section 4.3.6). Some conditions which health professionals would not term as morbidities (such as body heaviness) were also reported, just as in the qualitative phase. The top five health problems reported were fever, abdominal pain, backache, vomiting, headache (joint 4th), high blood pressure and malaria (joint 5th).

Table 8.14: Distribution of health problems reported as very serious during pregnancy (n=74; some respondents reported more than one health problem hence the total does not add up to 74)

S/N	Health problem	Frequency
1.	Fever	15
2.	Abdominal pain	10
3.	Backache	9
4.	Vomiting	8
5.	Headache	8
6.	High blood pressure	5
7.	Malaria	5
8.	Chest pain	4
9.	Anaemia	3
10.	Dizziness	3
11.	Bleeding- threatened abortion	2
12.	Typhoid	2
13.	Body pain	2
14.	Leg pain	2
15.	Swollen body	2
16.	Bleeding during intercourse	1
17.	Breast problems	1
18.	Fainting	1
19.	Low blood pressure	1
20.	Lower abdominal pain	1
21.	Nausea	1
22.	Unable to urinate	1
23.	Body heaviness	1
24.	Ulcer	1
Total		89

I collected data on the duration, care-seeking for and consequences of the health problems. These will now be discussed.

A. Duration of health problems reported as very serious during pregnancy

To measure duration, respondents were asked when the health problem started and how long it lasted. If a health problem occurred more than once, the cumulative total duration was recorded. I did not include an instruction in the questionnaire to indicate when this was the case; hence it is unclear if the cumulative total duration was ever reported or not (in one case- ulcer- data for two time periods were reported; the health problem still persisted until date, hence I reported this as the cumulative).

Table 8.15 shows a summary of the duration for all health problems. One in every three health problem reported (34.2%) had lasted between six months and one year. The categories with the fewest health problems reported were those lasting less than 7 days (7.6% of total) and health problems persisting until date (2.5%). It is worth noting that a category for health problems lasting until date was not specifically included in the questionnaire, although a maximum cap on duration was not imposed; however two cases where health problems persisted until date were recorded in the questionnaires. More than half of the health problems (55.4%, 46 cases) started in the first trimester, while 26.5% (22 cases) and 18.1% (15 cases) began in the second and third trimesters respectively (data not shown in table).

Table 8.15: Summary of the duration for all health problems reported as very serious during pregnancy (n=74). Some of these cases may have been reoccurring rather than persisting in one long, continuous episode

Duration of health problem	Frequency	Unweighted Proportion (%)⁴³
Less than 7 days	6	7.6
1 week- 1 month	18	22.8
>1 month but \leq 3 months	14	17.7
>3 months but \leq 6 months	12	15.2
>6 months- 1 year	27	34.2
Morbidity still persists till date	2	2.5

⁴³ The denominator used here was 79 as opposed to 89, since there were 10 missing data on duration.

Table 8.16 shows a summary of the duration for individual health problems. The results suggest that while some health problems appear to have lasted within a 'normal' time-frame from a biomedical viewpoint, many health problems appear to have persisted longer. For example, abdominal pain and fever are usually short-lasting pathologically, but many cases were reported to have lasted beyond a window that could be considered normal, which may have been reoccurring rather than persisting in one long, continuous episode. Some symptoms associated with more serious morbidities- such as dizziness, headache, high blood pressure, swollen body, chest pain, unable to urinate, and low blood pressure- appeared to have also followed this trend. Two health problems- backache and ulcer- were reported to still persist until date.

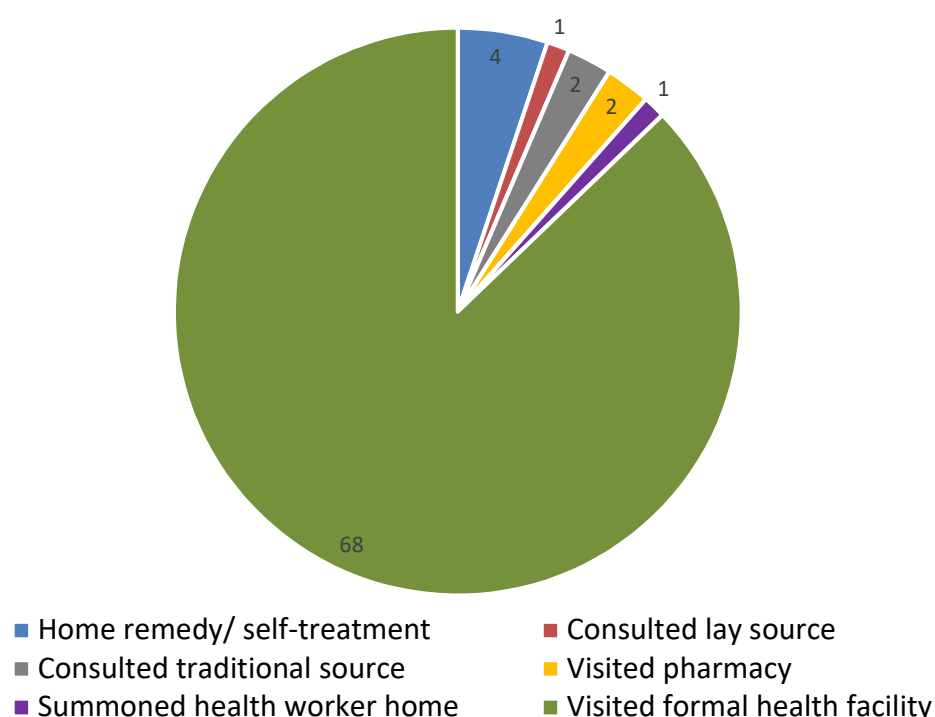
Table 8.16: Health problems reported as *very serious* during pregnancy and their duration (n=74)

S/N	Health problem	Frequency	Duration (frequency)						
			Less than 7 days	1 week-1 month	>1 month but ≤3 months	>3 months but ≤6 months	>6 months - 1 year	Health problem still persists till date	Missing data on duration
1.	Fever	15	3	6	2	1			3
2.	Abdominal pain	10	1		1	2	2		4 (1 inconclusive)
3.	Backache	9		1		1	5	1	1
4.	Vomiting	8		1	2	3	2		
5.	Headache	8		1	2	1	4		
6.	High blood pressure	5		1	1		3		
7.	Malaria	5	1	1	2		1		
8.	Chest pain	4		1		1	1		1
9.	Anaemia	3		3					
10.	Dizziness	3		1		1	1		
11.	Bleeding- threatened abortion	2			2				
12.	Typhoid	2		1	1				
13.	Body pain	2	1		1				
14.	Leg pain	2		1			1		
15.	Swollen body	2					2		
16.	Bleeding during intercourse	1				1			
17.	Breast problems	1					1		
18.	Fainting	1				1			
19.	Low blood pressure	1					1		
20.	Lower abdominal pain	1					1		
21.	Nausea	1					1		
22.	Unable to urinate	1					1		
23.	Body heaviness	1							1
24.	Ulcer	1						1	

B. Care-seeking for health problems reported as very serious during pregnancy

Of the 89 health problem cases reported in the preceding section, care was sought for 80 cases or 96.4% of the total⁴⁴. Health facility consultation was the dominant care-seeking option reported, as seen in Figure 8.3 where it was used for 68 health problems while the remaining options each had less than five reports of usage. Of those who used health facilities, the majority (54 cases) reported that they visited them specifically because of the morbidity while eight cases utilised them during ANC (opportunistic care-seeking- Chapter 6) and five used both.

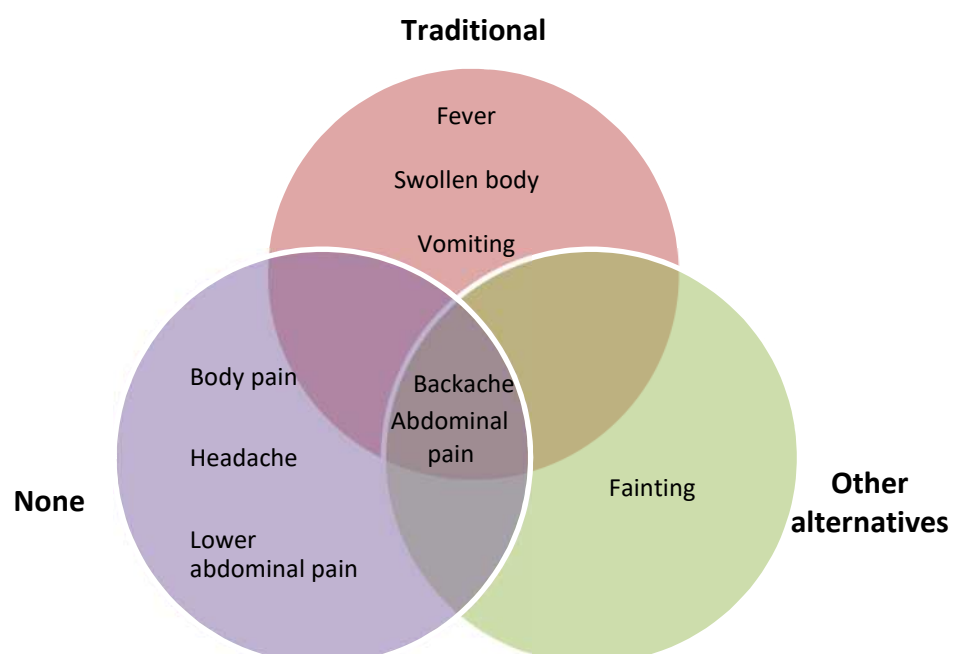
Figure 8. 3: Care-seeking options used for health problems reported as very serious during pregnancy



⁴⁴ The denominator used here was 83 because there was missing data in six cases. The proportion is also unweighted.

In terms of the treatments received from the options above, conventional regimens were observed to have dominated again, accounting for 64 cases. The remaining treatments received included none (five cases), traditional (seven cases) and other alternatives (three cases). I analysed further to see which health problems these later treatment categories were used for and I found that they were mainly used for health problems that could be considered mild or moderate from a biomedical stand-point, except in a few cases where they involved ‘more serious’ morbidities such as fainting and fever (Figure 8.4). It is worth mentioning that respondents were asked to mention all treatments that they used, hence these health problems may have also been treated with conventional regimens in addition. For example, the fainting case also used conventional regimens in addition to “other alternatives” and also utilised most care-seeking options (home remedy, pharmacy, health worker summoned home and hospital).

Figure 8. 4: Distribution of pregnancy health problems where non-conventional treatment regimens were reported to have been used



There was also almost a unanimous report that payment was made for care and/or treatment for the health problems (73 out of 76 cases where data was available).

However, there were very few reports of specific financial impacts: three instances of having borrowed money; two for having sold assets; and five for having used money reserved for something else. One-third of the data were observed to be missing in these categories.

C. Consequences of the health problems reported as very serious during pregnancy

Respondents were asked about their perceptions of the consequences of the health problems on different areas of their lives as explained in the beginning of this section. I collapsed the categories of the Facial Affective Scale (Appendix 8.4) to five levels:

- Level I (Laughter): Pictures A and B
- Level II (Smiles): Pictures C and D
- Level III (Neutral): Picture E
- Level IV (Contortions): Pictures F and G
- Level V (Tears & cries): Pictures H and I

Table 8.17 shows a break-down of respondents' perceived consequences of the very serious health problems on different aspects of their lives while Figure 8.5 shows a summary of the women's responses whether less severe (Levels I and II) or more severe (Levels IV and V); the neutral options were not included.

Table 8.17: Break-down of respondents' perceived consequences of the very serious health problems on their lives (n=74)

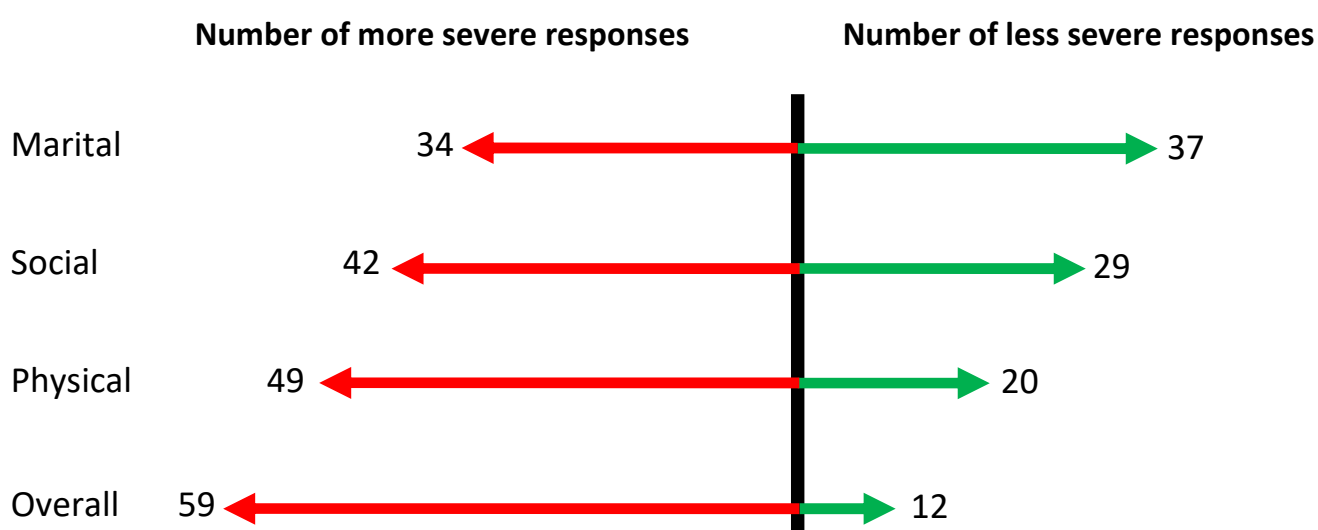
#	Health Problem	Freq.	Physical					Social					Marital					Overall				
			I	II	III	IV	V	I	II	III	IV	V	I	II	III	IV	V	I	II	III	IV	V
1	Fever	15	2	1	2	5	4	3	1	2	5	3	3	4	-	4	3	-	1	2	3	8
2	Abdominal pain	10	-	1	1	2	5	1	2	1	2	3	1	2	1	1	4	-	1	-	3	5
3	Backache	9	-	2	1	1	1	2	2	-	1	-	1	2	-	2	-	-	2	-	3	-
4	Vomiting	8	2	-	-	2	3	4	-	-	-	4	3	2	1	-	1	1	-	1	3	3
=	Headache	8	1	2	2	-	2	1	3	1	-	2	3	2	-	1	1	1	2	1	1	2
5	High blood pressure	5	-	-	1	1	1	-	-	1	1	1	-	1	-	1	1	-	-	1	-	2
=	Malaria	5	-	-	-	1	2	-	-	-	1	2	-	-	1	1	1	-	-	-	1	2
	Others ⁴⁵	29	2	7	1	7	12	4	6	2	6	11	6	7	3	4	9	1	3	2	5	18
Total (frequency)		89	7	13	8	19	30	15	14	7	16	26	17	20	6	14	20	3	9	7	19	40
Total (proportion %)⁴⁶			9.1	16.9	10.4	24.7	39.0	19.2	17.9	9.0	20.5	33.3	22.1	26.0	7.8	18.2	26.0	3.8	11.5	9.0	24.4	51.3

* Frequencies may not add up due to missing data

⁴⁵ Chest pain (4), anaemia (3), dizziness (3), bleeding- threatened abortion (2), typhoid (2), body pain (2), leg pain (2), swollen body (2), bleeding during intercourse (1), breast problems (1), fainting (1), low blood pressure (1), lower abdominal pain (1), nausea (1), unable to urinate (1), body heaviness (1), ulcer (1)

⁴⁶ Denominators used: 77 (physical and marital) or 78 (social and overall).

Figure 8. 5: Summary of the direction of women’s responses (more severe or less severe) about their perceived consequences of health problems on their lives. Gridlines in Microsoft Office Word were used to draw approximate distances.



The results suggest that respondents were more likely to perceive the health problems as having had negative impacts on their lives, with the physical domain having the highest number of more severe responses than less severe ones (49 vs 20), then social (42 vs 29) and lastly marital (34 vs 37). The overall severity scores far outweighed the scores in the individual domains (59 vs 12) which suggests that the morbidities could have had negative consequences on other aspects of the women’s lives which I did not measure, or had negative impacts on several domains.

8.3.5 Detailed Measures on the Three Morbidities of Special Interest

8.3.5.1 Vomiting: Prevalence, Severity and Consequences

In a separate section of the questionnaire, women were asked whether they were vomiting frequently during their last pregnancy, which was defined as vomiting more than two times per day even if this did not continue to the end of the pregnancy. In total, 222 women or 35.4% (95% CI 26.5-45.5) of respondents reported that they were vomiting during their last pregnancies. Table 8.18 provides information about the severity of their vomiting experiences. While 90.6% of

vomiting cases started in the first trimester, only 21.1% were reported to have stopped entirely within the first trimester, with the remaining persisting further. A few cases- 9.4%- started beyond the first trimester.

To understand the frequency of the vomiting holistically, respondents were asked how many times they were vomiting per day *most times* (during the period of their pregnancy that they were vomiting). They were also asked about the number of vomiting episodes per day at *the most severe period* of the vomiting. The results suggest that over half of the women were vomiting at least three times per day most times during the pregnancy, with 16.1% vomiting five or more times per day. The frequency increases when the most severe period is considered- approximately three-quarters of the women vomiting at least three times per day, with 34.7% vomiting five or more times per day. For this latter group of women, 75.3% reported that this severe period had lasted for three months or more.

I also collected data that related to the respondents' subjective assessments of the vomiting. About three-quarters (73.4%) of the women who reported vomiting mentioned that they were unable to retain food in the stomach; 55.7% mentioned that they lost weight around the period they were vomiting (although only about 5% appeared to have reached this conclusion from reliable methods -readings from measuring scales or tapes; the majority used subjective measures such as "clothes felt loose on the body" or "looked lean/ collar bones were visible"); 31.9% reported that the vomiting made them afraid; and lastly, about a quarter of the women (23%) reported that they vomited so much such that they thought they would die.

With regards to care-seeking, 61.5% of the women who had experienced vomiting reported seeking care for the vomiting. Health facility visits accounted for the highest proportion of options used (57.8%). A health worker was reported to have been summoned home in a few instances (6.1%). Pharmacy visits and usage of home remedies/self-treatments were also somewhat common at 19.7% and 11.6% of this population. Lay source and traditional source consultations were observed to be low

(2.0% and 0.7%). In terms of the treatments received, one in every 10 respondents who experienced vomiting (11.5%) reported that they did not receive any treatment; however the majority (84.7%) reported to have received conventional treatment. Again, usage of traditional medicine was observed to be low at 1.9% while 5.1% used other alternatives. 57.1% of the women reported to have paid for care and/or services, with 41.0% having used money reserved for something else, 6.8% having borrowed and 1.5% having sold an asset.

Table 8.18: Severity of respondents' vomiting experiences during pregnancy
(n=222)

Domain	Characteristic	Frequency	Weighted Proportion % (95% CI)
Duration and episodes	Duration		
	Started and ended in 1 st trimester	48	21.1 (13.5- 31.6)
	Started in 1 st trimester, ended in 2 nd trimester	88	39.4 (33.1- 46.2)
	Started in 1 st trimester, ended in 3 rd trimester	60	30.1 (19.5- 43.3)
	Started in 2 nd trimester, ended in 2 nd trimester	9	4.1 (2.1- 7.8)
	Started in 2 nd trimester, ended in 3 rd trimester	5	2.0 (0.5- 8.1)
	Started and ended in 3 rd trimester	6	3.3 (1.2- 8.3)
	Vomiting episodes per day- most times		
	1-2 times	94	41.7 (30.3- 54.1)
	3-4 times	82	42.2 (31.1- 54.1)
	≥5 times	36	16.1 (11.5- 22.1)
	Vomiting episodes per day- most severe period		
	1-2 times	57	23.3 (13.5- 37.0)
	3-4 times	82	42.0 (29.0- 56.3)
	≥5 times	76	34.7 (23.3- 48.1)
Subjective assessments	Duration of vomiting for most severe period if 3-4 times		
	Less than 1 week	2	3.9 (0.9- 15.0)
	1 week- 1 month	16	24.3 (14.4- 38.0)
	>1 month but <3 months	22	25.2 (15.1- 39.1)
	≥3 months	42	46.6 (30.1- 63.9)
	Duration of vomiting for most severe period if ≥5 times		
	Less than 1 week	1	1.2 (0.1- 9.8)
	1 week- 1 month	7	8.2 (3.7- 17.5)
	>1 month but <3 months	14	15.3 (8.2- 26.7)
	≥3 months	54	75.3 (60.8- 85.7)
	Inability to retain food in stomach	156	73.4 (60.2- 83.5)
	Vomiting made her afraid	70	31.9 (21.2- 44.9)
	Thought she was going to die from the vomiting	53	23.0 (14.7- 34.2)
	Lost weight	116	55.7 (39.1- 71.0)

Domain	Characteristic	Frequency	Weighted Proportion % (95% CI)
Care-seeking	Care-seeking options ⁴⁷ (women who sought care/treatment/remedy= 125 or 61.5%)		
	Home remedy/self- treatment	15	11.6 (5.4- 23.2)
	Consulted lay source	3	2.0 (0.4- 9.6)
	Consulted traditional source	1	0.7 (0.1- 5.9)
	Visited pharmacy	25	19.7 (11.0- 32.7)
	Summoned health worker home	6	6.1 (2.2- 16.1)
	Visited formal health facility	70	57.8 (48.2- 66.9)
	Care-seeking treatment received ⁴⁸		
	None	18	11.5 (6.3- 20.3)
	Conventional medicine/therapy	106	84.7 (73.8- 91.6)
	Traditional medicine/therapy	3	1.9 (0.4- 9.3)
	Other alternatives	8	5.1 (2.5- 10.3)
	Ever given drip for the vomiting (n= 43 or 24.4%)		
	1 drip	13	30.9 (18.6- 46.6)
	2-3 drips	14	30.9 (19.2- 45.8)
	≥4 drips	15	38.2 (22.0- 57.5)
	Payment for care and/or treatment (n= 104 or 57.1%)		
	Borrowed money	8	6.8 (3.3- 13.5)
	Sold an asset	2	1.5 (0.2- 10.7)
	Used money reserved for something else	40	41.0 (31.2- 51.7)

* Numbers may not add up due to missing data

To measure the consequences of vomiting on respondents' lives, a number of statements relating to different aspects of life were read to them and then their levels of agreement with the statements were recorded. The statements included:

- *The vomiting made me fully dependent on others to do my day-to-day activities like cooking, sweeping and going to the shop” (physical consequence)*
- *The vomiting was so serious that we restricted the usage of substances with distinct smell in my family, such as perfume and some cooking oil to avoid triggering the vomiting (restrictions at home imposed)*

⁴⁷ All options that applied were ticked. Proportions were calculated per option. For example, 11.6% of women used home remedy for the vomiting and the remaining 88.4% did not use home remedy.

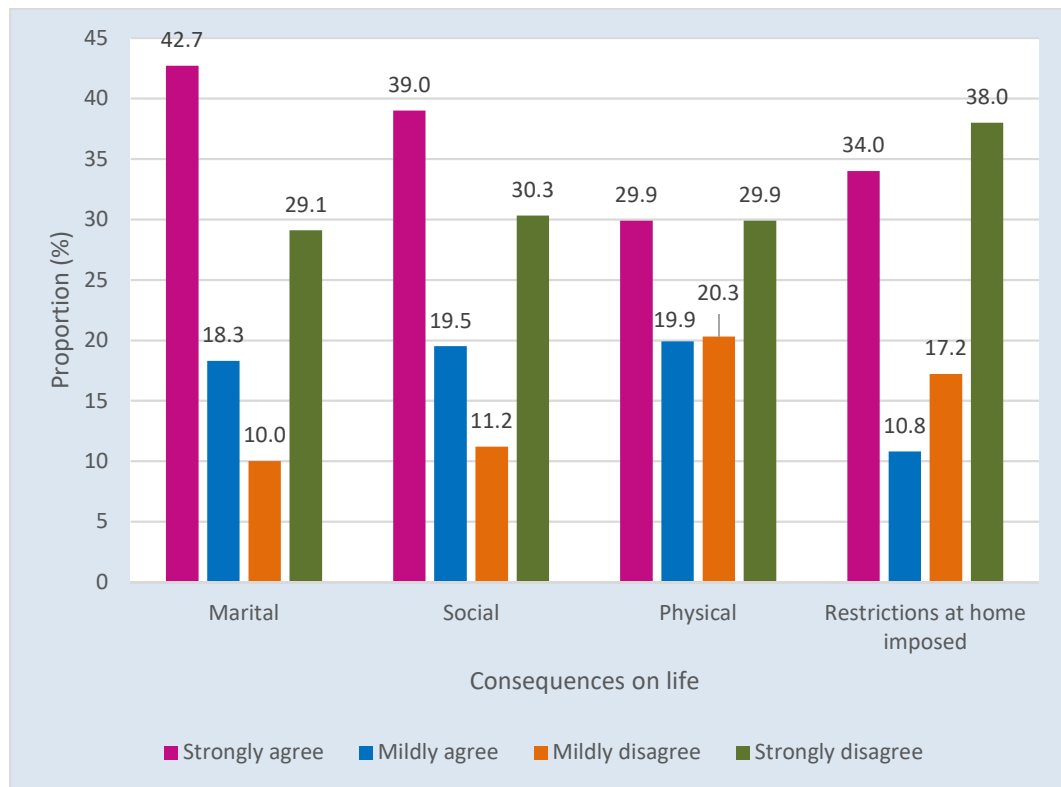
⁴⁸ All options that applied were ticked. Proportions were calculated per option. For example, 84.7% of women received western treatment for the vomiting while the remaining 15.3% did not.

- *The vomiting affected my relationship with my husband negatively such as making us quarrel, making us not to spend time together or making us not to be in good terms* (marital consequence)
- *The vomiting affected my social life negatively such as preventing me from visiting family and friends or making me to avoid gatherings* (social consequence)
- *The vomiting affected my occupation negatively such as making me to be absent from work, receiving reprimand(s) from my supervisor or missing opportunities to make money* (financial consequence; for women with occupations only)
- *The vomiting affected my studies negatively such as making me to be absent from class or missing tests/examinations* (academic consequence; for students only)

Figure 8.6 shows the proportion of women reporting the consequences on different aspects of their lives⁴⁹. The women who strongly agreed with the statements accounted for the highest proportions in the marital and social consequences domain (42.7% and 39.0% respectively). Modestly high proportions were also observed in the restrictions-at-home-imposed and physical consequences domains (34.0% and 29.9% respectively). Considering agreement holistically (either “strongly agree” or “mildly agree”), 61.0% of respondents agreed that the vomiting affected their marital relationships negatively; 58.5% agreed that it affected their social lives negatively; 49.8% agreed that it made them fully dependent on others to do their day-to-day domestic activities; and 44.8% agreed that it made them to impose restrictions at home to avoid triggering it.

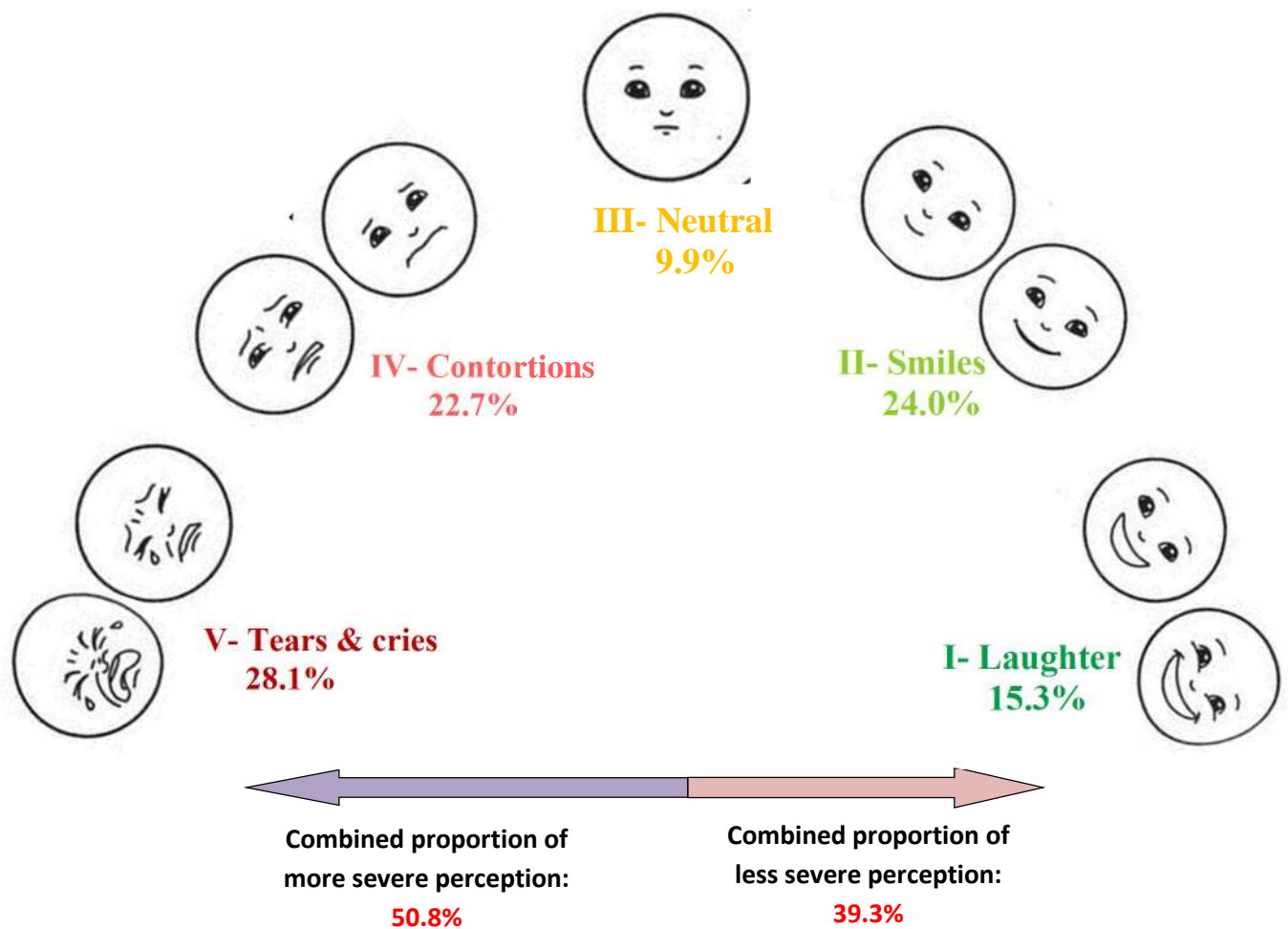
⁴⁹ The financial and academic consequences were not included because they were only relevant to a small proportion of women and also due to the number of missing data involved.

Figure 8. 6: Proportion of women and their levels of agreement to statements aimed at measuring the consequences of vomiting on different aspects of their lives



One question explored respondents' perceptions of the overall severity of the pain/discomfort/distress of the vomiting also using FAS (Appendix 8.4). The results suggest that half of the women (50.8%) perceived the overall severity of the vomiting negatively (Figure 8.7).

Figure 8. 7: Perception of the overall severity of vomiting



8.3.5.2 Prolonged Labour: Prevalence: Severity and Consequences

Respondents were asked how long their labour lasted, that is, from the time they started experiencing very strong continuous pains which stopped them from doing chores to the birth of their babies. Women who reported being in labour for at least 12 hours were then asked follow up questions relating to care-seeking and consequences of the prolonged labour. Only 30 (4.7%) of respondents (unweighted proportion) reported that their labour lasted for at least 12 hours. I will therefore report frequencies as opposed to proportions in this section and will also report most findings in prose since respondent numbers were few.

Table 8.19 shows a break-down of the duration of labour reported. The most frequently reported duration was “1 day/24 hours” (9 women) followed by “12 hours” (8 women) and then “2 days” (5 women). Two women each reported “13 hours” and “3 days.” Four women in total reported unusually long durations: 5, 7 and 8 days.

Table 8.19: Reported experiences of labour duration (n=30)

Reported Length of Labour	Number of Respondents
12 hours	8
13 hours	2
24 hours/ 1 day	9 (8 respondents reported “1 day”)
2 days	5
3 days	2
5 days	1
7 days	2
8 days	1

Twenty women reported that they sought care when the labour was prolonged (five other women were already in the hospital before the 12-hour mark). The first care-seeking option that these 20 women used were home remedy/self-treatment (six women), consulted a lay source (one woman), consulted traditional source (two women) and visited a formal health facility (11 women). Of the nine women who consulted non-formal health sources in the first instance, seven women eventually sought further care (six at a health facility and one at a chemist; one of these women also used another home remedy in addition) and the remaining two did not seek further care. Sixteen women reported that they paid for care, transportation and/or

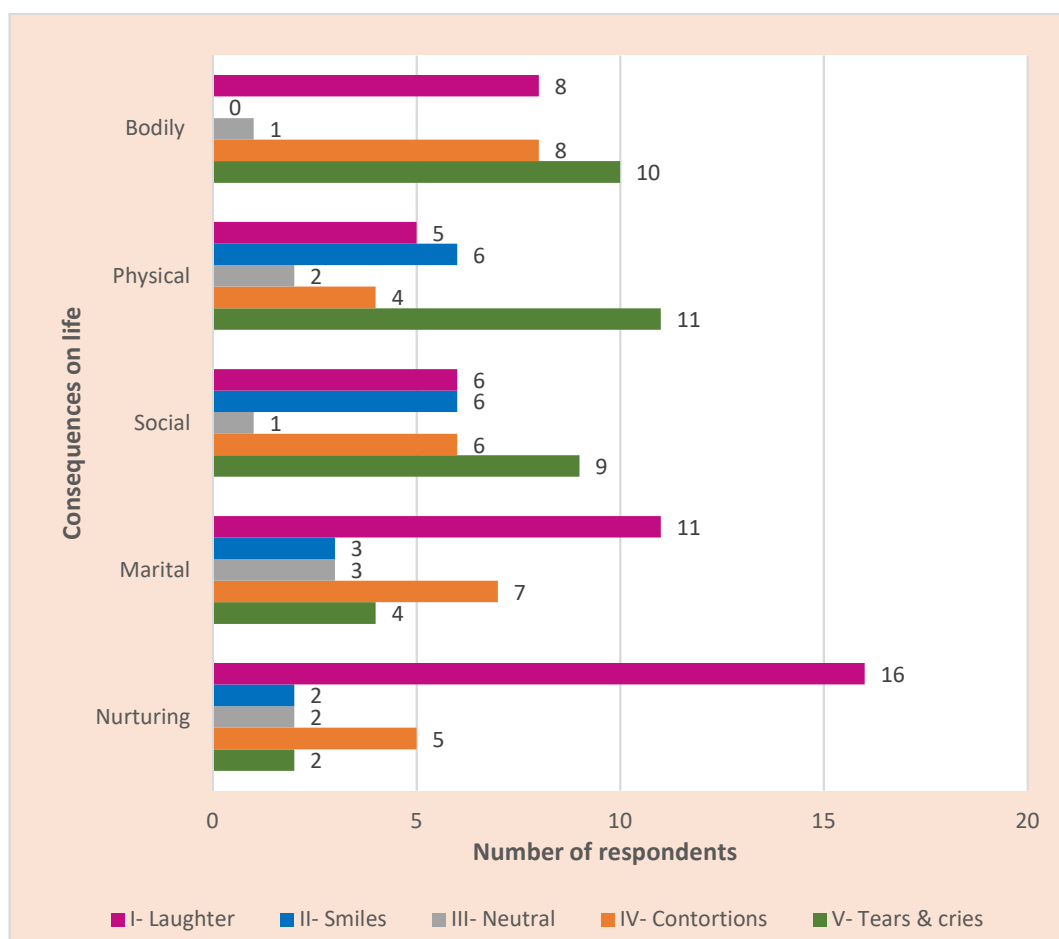
treatment but there was only one report of having borrowed money and no reports of selling an asset or using money reserved for something else⁵⁰.

I measured the consequences of the reported prolonged labour on different aspects of the women's lives including physical, social and marital. I also tested two new domains- bodily and nurturing- since the qualitative and cognitive interview phases showed that certain morbidities are more likely to exert consequences on certain aspects of women's lives than others. I reasoned that prolonged labour may exert consequences on women's ability to perform bodily functions and nurture their babies. The questions asked were: "*what was the effect of the long labour on your bodily functions such as urinating and defecating (bodily consequence)*" and "*what was the effect of the long labour on your ability to breastfeed your baby or care for him/her (nurturing consequences)*." These were also tested using FAS.

Figure 8.8 shows the respondents' perceptions of the prolonged labour's consequences on different aspects of their lives, which were most likely experienced in the postpartum phase. The bodily functions domain accounted for the highest number of negative responses (eight for level IV and 10 for levels V) and the least number of positive responses (eight and zero for levels I and II respectively). The responses for the physical and social domains were nearly the same, with 15 women in total giving negative responses (both levels IV and V) and then 11 and 12 women respectively giving positive responses (both levels I and II); slightly more women however rated the prolonged labour as level V in the physical domain than the social (11 vs. 9). The nurturing domain accounted for the least number of negative responses (seven for both levels IV and V), with a little over half of the women (16) selecting level I. The marital domain was also rated slightly more positively than negatively in general, with about one in every three women selecting level I and a further three women selecting level II; eleven women in total selected negative responses (levels IV and V). The number of neutral responses was very low in all domains- between one and three.

⁵⁰ There were three missing data on financial consequences of the prolonged labour.

Figure 8. 8: Number of women and their levels of agreement to statements aimed at measuring the consequences of reported prolonged labour on different aspects of their lives



8.3.5.3 Haemorrhage: Severity Indicators

Unlike the other two morbidities selected for in-depth exploration (vomiting and prolonged labour), I focused primarily on measuring various severity indicators for haemorrhage (during and after delivery); hence I did not inquire about consequences of haemorrhage. All respondents were asked a range of questions about their bleeding during delivery and also within the first 24 hours after delivery; a few questions were only relevant for some women – multiparas, women who stained the

floor during their deliveries, women who had home-births or hospital births and women who sought care for the bleeding. For women who sought care, 58 respondents or 8.3% reported that they paid for care and/or treatment for the bleeding (either as a separate payment or as part of a lump-sum total hospital bill). Only a few women reported financial consequences as observed in previous sections- four borrowed money, two sold an asset and nine used money reserved for something else. Additional care-seeking information was also collected for respondents who had home deliveries and sought care and/or treatment for the bleeding (53 in total, although there were quite a number of missing data and inconsistencies for this variable). Of these, “health worker summoned home” was the most utilised care-seeking option where almost half of the women (25) used it. I also collected data on the type of and number of materials on the respondents’ delivery bed/surfaces to see whether valuable information about blood loss could somehow be deduced; these were very diverse and a meaningful summary/comparison could not be made readily.

Tables 8.20 and 8.21 show the estimates of different indicators of bleeding during delivery and bleeding within the first 24 hours after delivery respectively from all respondents, which I have categorised under the themes on blood loss that emerged from the qualitative phase (Chapter 5). Unlike the other two morbidities of special interest, there wasn’t a single question asked which indicated the prevalence of haemorrhage, as it occurs on a continuum. I have therefore used graphs to help summarise the diverse haemorrhage indicators in a meaningful way. I arranged all indicators in order of decreasing proportions for both bleeding during delivery and bleeding within the first 24 hours after delivery to observe trends (Figures 8.9 and 8.10). All indicators were binary, except two in the bleeding during delivery section- comparison of the bleeding to previous delivery/ies and perceived soaking of delivery surface from diagrams shown (Appendix 8.5. I collapsed the scale showing the different gradations of staining categories: Pictures A and B as “mild;” Picture C as “moderate;” and Pictures D and E as “severe”). I excluded these two indicators in the graphs since they had multiple responses.

Table 8.20: Measurement of bleeding during respondents' last delivery (n=640)

Domain	Characteristic	Frequency	Weighted Proportion % (95% CI)
Pressure	Blood rushing much like tap water or passing urine	195	32.5 (25.5- 40.5)
Paint	Perceived soaking of delivery surface from diagrams shown		
	Mild	193	37.9 (34.2- 41.6)
	Moderate	195	36.7 (31.6- 42.1)
	Severe	140	25.4 (22.9- 28.1)
	Blood stained floor	128	21.0 (15.8- 27.4)
	Blood ran down across floor when it stained it (of the 128 women who reported staining the floor)	62	50.0 (39.0- 61.0)
Personal comparison	Bleeding compared to previous delivery/deliveries (n=333) ⁵¹		
	Minimal	72	22.3 (17.5- 27.8)
	The same	174	51.8 (44.6- 59.0)
	Much	87	25.9 (21.7- 30.6)
Psychological reaction	Bleeding scared respondent	92	14.9 (12.3- 18.0)
	Bleeding scared respondent's birth attendant	56	9.2 (7.9- 10.8)
Procedures	Given intervention to stop bleeding (all that applied ticked)		
	Injection	276	47.9 (40.0- 56.0)
	Rectal drug	7	1.0 (0.3- 4.0)
	Sublingual drug	64	9.6 (6.7- 13.5)
	Any of the three interventions above given	312	48.6 (40.8- 56.5)
	Sourcing for blood donors initiated	27	4.5 (2.7- 7.5)
	Given blood transfusion	6	0.9 (0.4- 2.0)
	Given referral because facility could not stop bleeding	1	0.2 (0.0- 1.3)

* Numbers may not add up due to missing data

⁵¹ There were quite a number of missing data in this question, in addition to the question not being relevant to primiparous respondents, or women who reported "don't know" or who discontinued.

Table 8.21: Measurement of bleeding within the first 24 hours after delivery (n=640)

Domain	Characteristic	Frequency	Weighted Proportion % (95% CI)
Pressure	Blood rushing much like tap water or passing urine	198	31.6 (25.6- 38.3)
Portion	Many big, thick clots of blood came out frequently	359	63.0 (58.0- 67.7)
Procedures	Birth attendant returned later to scoop out blood after birth	102	14.5 (9.7- 21.3)
People's comments	Maternity staff mentioned that her blood level had reduced, e.g. after packed cell volume test	32	8.5 (5.7- 12.7)
Physiological response	Palms looked white or pale	75	12.4 (9.0- 16.9)
	Dizziness experienced	146	23.3 (19.8- 27.3)
	Shivering experienced	93	14.7 (11.2- 19.0)
	Weakness felt such that she couldn't get up or walk	179	29.9 (23.7- 36.9)
	Fainted	27	4.6 (3.2- 6.5)
Paint	Doubled pad	287	45.7 (37.1- 54.6)
	Tripled pad	21	3.3 (1.6- 6.7)
	Blood trickled/flowed down legs	213	33.1 (27.5- 39.3)
	Stained her cloth	214	33.6 (28.9- 38.7)
	Stained the bed	120	18.1 (14.3- 22.6)
	Stained the floor	43	6.2 (4.7- 8.2)

* Numbers may not add up due to missing data

Figure 8.9 shows the proportion of respondents who reported different indicators of bleeding during delivery. The indicator with the highest proportion was the respondents being given an injection/drug to stop the bleeding (48.6%). This differed significantly from the proportion of other procedures reported which were generally less than 5% and the lowest amongst all indicators: sourcing for blood donors initiated (4.5%); blood transfusion given (0.9%); and given referral because the facility could not stop the bleeding (0.2%). About a third of the respondents (32.5%) reported that the blood was rushing like tap water/ passing urine during delivery and 21.0% mentioned that the blood had stained the floor. The proportion for the

physiological reaction indicators- bleeding scared the respondent and also her birth attendant- were in the middle ranges at 14.9% and 9.2% respectively.

Figure 8. 9: Proportion of respondents who reported different indicators of bleeding during delivery

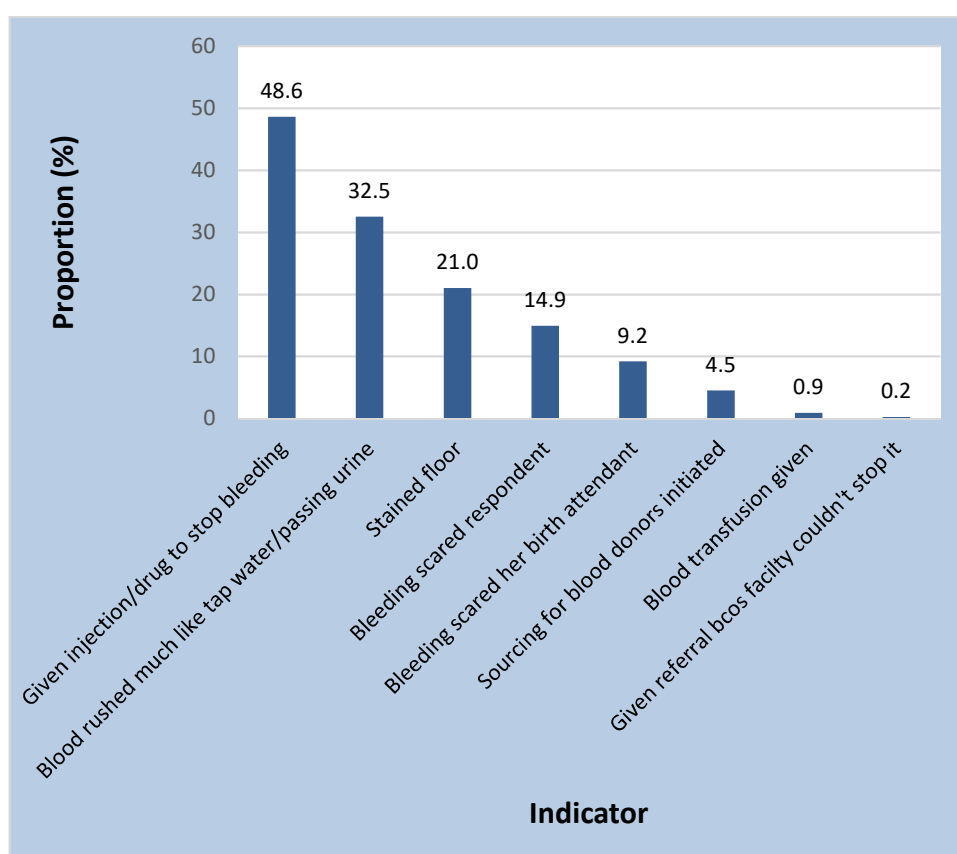
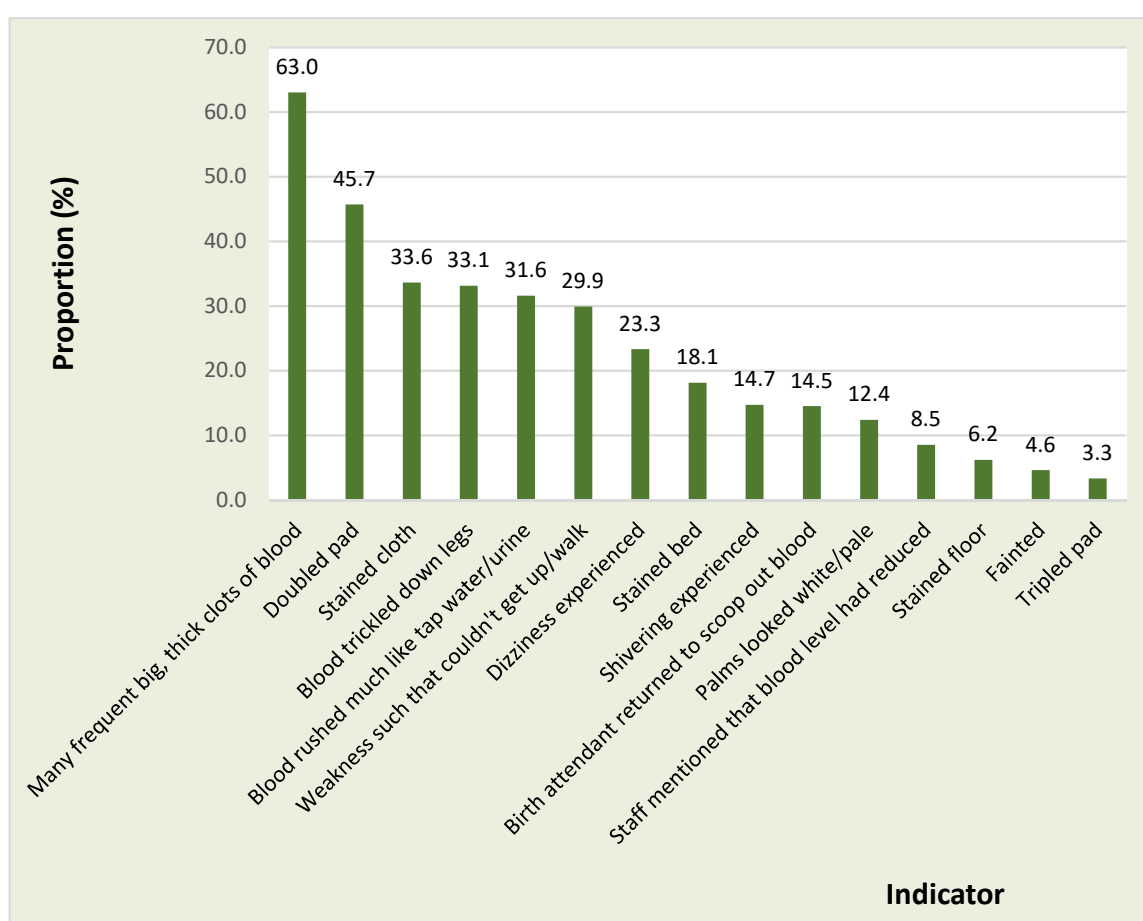


Figure 8.10 shows the proportion of respondents who reported different indicators of bleeding within the first 24 hours after delivery, which included a total of 15 diverse indicators. One trend observed here is that within a particular theme of blood loss (e.g. 'paint,' 'physiological response'), the proportions reduced as the intensity of the indicator increased. For example, considering the theme on paint, more women reported staining their clothes (33.6%) than the bed (18.1%) and then than the floor (6.2%). Similarly, more women reported doubling their pads (45.7%) than tripling it (3.3%). The theme on physiological response also somewhat followed a similar trend: weakness and dizziness accounted for the highest proportions in this category (29.9% and 23.3% respectively) while shivering and palms looked white/pale

appeared to be in the intermediate ranges (14.7% and 12.4% respectively) and lastly fainting accounted for the least proportion in this category (4.6%).

For the remaining five indicators, more subjective indicators tended to have the highest proportions (63.0% for many frequent big, thick clots of blood; 33.1% for blood trickled down legs and 31.6% for blood rushed much like tap water/passing urine) while those involving maternity staff tended to be lower (14.5% for birth attendant returned later to scoop out blood and 8.5% for maternity staff mentioned that the blood level had reduced). Interestingly, the blood rushed much like tap water/passing urine indicator had similar proportions for intrapartum and postpartum haemorrhage- 32.5% and 31.6% respectively.

Figure 8. 10: Proportion of respondents who reported different indicators of bleeding within the first 24 hours after delivery



8.3.6 Summary of Findings

Research Sub-objective 3a: To estimate the prevalence of self-reported morbidities

- Many respondents rated their health status as poor. Most women (87.4%) strongly agreed that their health status was generally fine before pregnancy, but only 29.9% and 37.9% felt the same way for the pregnancy and delivery phases. 77.1% felt that their postpartum health was generally fine.
- Spontaneous reporting of any health problem was 69.5%, 30.6% and 24.3% during pregnancy, delivery and postpartum respectively. Despite these high prevalences, few women reported that the health problems had been severe. The health problems reported (unprompted) were diverse, with most having prevalences below 5% and those exceeding this figure mainly associated with pain and/or fever. On prompting, prevalence increased even more. Literacy and/or number of ANC visits were significantly associated with reporting a health problem.

Research Sub-objective 3b: To measure the severity and consequences of the self-reported morbidities

- The results suggest that many health problems appear to have persisted longer; one in every three health problems reported as severe had lasted between six months and one year. Care was sought in 96.4% of cases with health facility consultation the dominant option reported. Respondents were more likely to perceive the health problems as having had negative impacts on their lives, with the physical domain having the highest number of more severe responses than less severe ones.

Research Sub-objective 3c: To obtain more detailed quantitative measures on three selected morbidities (vomiting, prolonged labour, and haemorrhage during and after delivery)

- About one in three women (35.4%) reported that they were vomiting during their last pregnancies and only 21.1% said it stopped entirely within the first trimester. Over half were vomiting at least three times per day most times and 34.7% were vomiting five or more times per day during the most severe period. 61.5% also reported seeking care. The vomiting was reported to have had consequences on different aspects of their lives and cumulatively, half of the women (50.8%) perceived the overall severity of the vomiting negatively.
- 4.7% of respondents reported that their labour lasted for at least 12 hours. Of the 4.7%, the most frequently reported duration was 1 day/ 24 hours, followed by 12 hours and then 2 days. The prolonged labour was reported to have impacted various aspects of life, with the bodily functions domain accounting for the highest number of severe responses and the nurturing domain the least.
- For bleeding during delivery, the indicator with the highest proportion was the respondents being given an injection/drug to stop the bleeding; the proportions for other procedures were generally less than 5%. All other indicators ranged between 9.2% and 32.5%. For bleeding within the first 24 hours after delivery, the proportions reduced as the intensity of the indicator increased within a particular theme of blood loss. 'Health worker summoned home' was the most utilised care-seeking option used for haemorrhage for women who had home birth and sought care; almost half of the women used it.

Chapter 9: Discussion

9.1 Chapter Structure

In this chapter, I will discuss the results from my PhD research, relate them to existing literature and report the strengths and weaknesses of the research. I will also provide implications for future research and for policy and practice. I will start by summarising all the results obtained (Table 9.1), mapping them to the specific PhD objective(s) they meet and the respective thesis section and chapter where they were reported. I will then proceed to interpret these results and show how they relate to existing literature. Various domains of the qualitative and quantitative phases overlap; therefore instead of structuring this interpretative section by chapters, I've organised them by topic and will report the findings from these two phases concurrently. This section is divided into eight sub-sections (and under each, I've provided the corresponding result being addressed in Table 9.1):

- General perceptions of maternal morbidities: covers women's perceptions about their health during the maternal health phase, as well as their general views about 'normal' vs 'abnormal' morbidities and causes of morbidities.
- Prevalence of self-reported maternal morbidities: discusses the results on levels and categories of health problems reported in the survey and the differences observed by data collection method and socio-economic groups.
- Maternal morbidities- Severity, impacts and issues that are important to women/families: discusses the severity/impacts of morbidities that women reported. It also highlights issues that emerged as important to women.
- Care-seeking for reported maternal morbidities: discusses the results relating to care-seeking for morbidities and the influence of lay networks.
- Vomiting- Perceptions, impacts and prevalence: discusses the results relating to vomiting.
- Prolonged labour- Perceptions, impacts and prevalence: discusses the results relating to prolonged labour.
- Haemorrhage- Perceptions and severity indicators: discusses the results relating to haemorrhage.
- Measuring maternal morbidities from community settings: highlights the strengths and weaknesses of maternal morbidity measurement within community settings that I have observed from my PhD research.

9.2 Summary of Key Findings

Table 9.1 shows a summary of key findings from my PhD research.

Table 9. 1: Summary of key findings from the PhD research

S/N	Result		Obj. & Sub-obj. addressed	Thesis Section
Chapter 4: Perceptions of Maternal Morbidity				
1.	Abnormal morbidities are long lasting, uncommon, seen as symptoms of more serious problems, and remedied by ‘unnatural’ medical interventions. What is common is thought to be normal. A normal pregnancy was seen as having similar or better experiences compared to previous pregnancies or those of other women. Respondents tended to use other women’s extreme morbidities as comparators, thereby underplaying their own experiences to feel better. This, however, did not prevent them from acknowledging that they also had issues.		<i>Research sub-objective 1a: To find out respondents’ perceptions of maternal morbidity relating to normal vs. abnormal conditions, causes of morbidities and impacts of morbidities</i>	4.3.4 4.3.5
2.	Perceived causes of morbidities fell under three major sub-themes (biological factors/other morbidities, lifestyle and behaviours, ‘don’t know’) and three minor ones (‘caused by the baby’, spiritual factors/superstitious beliefs, medical personnel errors/procedures). Interestingly, broader social determinants of health and attributes such as high parity were seldom linked to morbidities.			4.3.7
3.	Morbidity status was the most dominant factor used to label a pregnancy as normal or difficult. Pregnancy impacted several areas of life, with physical and nutritional the most prominent.			4.3.3
4.	Impacts of morbidities could be positive (changing long-held traditions and encouraging good health behaviours) or negative (bringing consequences during the maternal health phase or beyond).			4.3.8
5.	Morbidities that were important to women were varied, as seen in the free-listing exercise, ranking exercise and ‘worst morbidity that can happen’ question. Education and age appeared to be the strongest factors that differentiated women with respect to perceptions of severity.		<i>Research sub-objective 1b: To identify morbidities that are important to women and families</i>	4.3.6
Chapter 5: In-depth Exploration of Three Selected Morbidities				
6.	Vomiting was generally seen as a normal part of pregnancy, unless a woman vomits after eating, has poor appetite and isn’t well-nourished due to it. Normal vomiting is short, does not inhibit chores or make one to lie down, and has triggers that can be controlled; abnormal vomiting is prolonged, overwhelming, bad enough to go to hospital and brings out all one eats/drinks. Moderate or severe vomiting impacted women mentally, nutritionally & physiologically. It also impacted their families logistically, physically, financially & maritally.		<i>Research sub-objective 1a: To find out respondents’ perceptions of maternal morbidity relating to normal vs. abnormal conditions, causes of morbidities and impacts of morbidities (please see note in Section 5.3.5)</i>	5.3.2.2 5.3.2.3
7.	Three methods were generally used in discerning ‘true labour’: pain; previous experiences; and physical symptoms. Normal/easy/short labour tended to be expressed in terms of minutes and a few hours and prolonged labour in terms of several hours or several days.			5.3.3.1 5.3.3.2
8.	Three groups were apparent with respect to how a woman should bleed during and/or after delivery: ‘flow proponents’ (believe that blood needs to come out and not stay inside); ‘precautioners’ (tended to stress the consequences of blood loss); and ‘middle-grounders’ (in-between; acknowledged the complexity of blood loss; sometimes struggled to draw a line between acceptable and excessive bleeding).			5.3.4.1

9.	Perceptions of minimal/normal vs much blood loss generally fell under three sub-themes: related to quantity of blood lost and visual stimuli ('portion', 'paint' and 'pressure'); symptoms and interventions ('physiological response' and 'procedures'); and subjective assessment ('psychological reaction', 'personal comparisons' and 'people's comments'). Some respondents also felt that the level of bleeding depended on the individual woman, her birth attendant/place of delivery and her mode of delivery.			5.3.4.2 5.3.4.3
10.	Blood was perceived as being good or diseased/bad/dirty, and colour and consistency were used to differentiate between these two 'types' of blood. Diseased blood was generally seen as a major cause of abdominal pain postpartum if not expelled.			5.3.4.4
Chapter 6: Care-seeking for Reported Maternal Morbidity				
11.	Women and their families used a number of approaches in using available treatment options: uni-dimensional (only one option used until the morbidity is remedied; usually for morbidities at the extreme severity ends); step-wise (one option, then another); simultaneous (multiple options tried in tandem); phase-specific (certain options in certain phases); opportunistic (care-seeking for a morbidity is delayed until the next ANC); and in-hospital (summoning maternity staff specifically from their duty stations while on admission).		<i>Research sub-objective 1c: To identify care-seeking behaviours with respect to morbidities</i>	6.3.2
12.	Respondents and their families managed and/or prevented morbidities at home (using regimens from lay knowledge, pharmacies or traditional sources) or through the formal health system (health personnel summoned home or health facility visitation). For home-births, delayed placental expulsion came out strongly as a morbidity that families would initially manage at home using improvised strategies. Women and their families were generally afraid of excessive bleeding and took it very seriously; hospital care-seeking was always used.			6.3.3 6.3.4
13.	Six factors determined which care-seeking options above were used: perceived severity of the morbidity; familiarity with the morbidity or treatment; perceived efficacy of treatment; previous experiences with the morbidity/treatment; perceived cause of the morbidity; and affordability. Perceptions of severity and familiarity were major drivers of care-seeking.			6.3.4
14.	Educational level, age and gravidity/parity influenced care-seeking, with educational level being the most distinguishing factor. Educated women were proactive and came across as being able to take personal responsibility for better health outcomes; uneducated women were generally passive. For age, teenage mothers were generally unable to recognise when to seek care, especially around delivery. For gravidity/parity, care-seeking tended to reduce as women had more children and experience.			6.3.6
15.	Respondents' lay networks consisted of individuals in their social circles and they included mothers, husbands, mothers-in-law, co-wives, sisters, other female relatives, friends and family friends, work colleagues, older women, neighbours, other people in the neighbourhood, women at ANC, and well-wishers who visited them after delivery.		<i>Research sub-objective 1d: To find out lay networks that women consult and how they influence care-seeking</i>	6.3.5
16.	Women consulted individuals in their social circles and these lay networks influenced care-seeking either positively or negatively. Many respondents' care-seeking practices depended on what their families believed/practiced. There were some differences in how lay networks were used: friends tended to give specific advice about how to take treatments; family members handled logistical-related issues and support roles; and neighbours helped logistically, e.g. providing transportation during emergencies when family members were not around.			6.3.5

Chapter 7: Validating a Maternal Morbidity Measurement Tool in the Community				
17.	A number of serendipitous findings were obtained from the qualitative phase. It provided colloquial insights; highlighted women's recall tendencies; helped identify difficulties unique to certain demographic groups; and helped identify additional questions for the questionnaire and also showed ways to improve the sensitivity of certain questions. Other valuable insights were also obtained from the cognitive interviews beside the four main ones described below.			7.3.2 7.3.5
18.	<i>Relating to comprehension:</i> Overall, respondents demonstrated a comprehensive understanding of many key concepts in the questionnaire, but comprehension issues were the highest categories identified during the cognitive interviews. It was necessary to define some terms in order to ascertain uniformity. Inclusivity (whether a minority could understand the question) rather than majority guided decisions when making changes. While this was a strength, it also tended to elongate questions.		<i>Research sub-objective 2a: To adapt existing surveys into a draft questionnaire for use in the community</i>	7.3.4.1
19.	<i>Relating to recall:</i> Recalling health problems experienced appeared to be extensive as both mild, moderate and severe health problems were reported. Recall did not also appear to be dependent on the diagnosis method as both self-perceived and diagnosed morbidities were reported. Respondents were also able to recall the onset, end-point and duration of health problems as well as the care-seeking options used, except in a few cases where the health problems were reoccurring or developed slowly over time. One area that was universally difficult to recall was reporting the amount of money paid for services, treatment and/or transportation; inquiring about indicators of financial expenses worked better.			7.3.4.2
20.	<i>Relating to judgement:</i> Questions relating to judgement did not appear to be problematic (such as assessing the severity and impacts of health problems on various aspects of life). Asking respondents to compare their health and health problems to previous deliveries was generally easy. The same was applicable for comparison to other women, except when asked to compare their bleeding experiences to other women.			7.3.4.3
21.	<i>Relating to response:</i> The response issues identified mainly related to the scope of the consequences of health problems considered in the survey and their unique natures. Health problems exerted different types of consequences on women and some of the severity domains did not work for certain health problems, particularly delivery morbidities. In addition, some health problems may exert consequences in some areas of life but not in others. The effects of some delivery morbidities were not experienced during the delivery period but during postpartum.			7.3.4.4
Chapter 8: Prevalence of Self-reported Maternal Morbidity				
22.	Many respondents rated their health status as poor. Most women (87.4%) strongly agreed that their health status was generally fine before pregnancy, but only 29.9% and 37.9% felt the same way for the pregnancy and delivery phases. 77.1% felt that their postpartum health was generally fine.		<i>Research sub-objective 3a: To estimate the prevalence of self-reported morbidities</i>	8.3.3.1
23.	Spontaneous reporting of any health problem was 69.5%, 30.6% and 24.3% during pregnancy, delivery and postpartum respectively. Despite these high prevalences, few women reported that the health problems had been severe. The health problems reported (unprompted) were diverse, with most having prevalences below 5% and those exceeding this figure mainly associated with pain and/or fever. On prompting, prevalence increased even more. Literacy and/or number of ANC visits were significantly associated with reporting a health problem.		<i>Research sub-objective 3a: To estimate the prevalence of self-reported morbidities</i>	8.3.3.2 8.3.3.3 8.3.3.4

24.	<i>Severity of health problems during pregnancy:</i> The results suggest that many health problems appear to have persisted longer; one in every three health problems reported as severe had lasted between six months and one year. Care was sought in 96.4% of cases with health facility consultation the dominant option reported. Respondents were more likely to perceive the health problems as having had negative impacts on their lives, with the physical domain having the highest number of more severe responses than less severe ones.		<i>Research sub-objective 3b: To measure the severity and consequences of the self-reported morbidities</i>	8.3.4
25.	About one in three women (35.4%) reported that they were vomiting during their last pregnancies and only 21.1% said it stopped entirely within the first trimester. Over half were vomiting at least three times per day most times and 34.7% were vomiting five or more times per day during the most severe period. 61.5% also reported seeking care. The vomiting was reported to have had consequences on different aspects of their lives and cumulatively, half of the women (50.8%) perceived the overall severity of the vomiting negatively.			8.3.5.1
26.	4.7% of respondents reported that their labour lasted for at least 12 hours. Of the 4.7%, the most frequently reported duration was 1 day/ 24 hours, followed by 12 hours and then 2 days. The prolonged labour was reported to have impacted various aspects of life, with the bodily functions domain accounting for the highest number of severe responses and the nurturing domain the least.		<i>Research sub-objective 3c: To obtain more detailed quantitative measures on three selected morbidities</i>	8.3.5.2
27.	For bleeding during delivery, the indicator with the highest proportion was the respondents being given an injection/drug to stop the bleeding; the proportions for other procedures were generally less than 5%. All other indicators ranged between 9.2% and 32.5%. For bleeding within the first 24 hours after delivery, the proportions reduced as the intensity of the indicator increased within a particular theme of blood loss. ‘Health worker summoned home’ was the most utilised care-seeking option used for haemorrhage for women who had home birth and sought care; almost half of the women used it.		<i>(vomiting, prolonged labour, and haemorrhage during and after delivery)</i>	8.3.5.3

9.3 Interpretation of Results and Relationship to Existing Literature

9.3.1 General Perceptions of Maternal Morbidities

Chapters covered: 4 and 8

9.3.1.1 Pregnancy as a health-depleting factor

Results addressed on Table 9.1: #1, #21

How women experience pregnancy and childbirth is rarely documented or discussed by policy makers, program managers, or healthcare providers, nor is it commonly reflected upon by the woman's family or possibly even herself...Yet, given the opportunity, almost every person and community has a story to tell about pregnancy and childbirth, from their own personal experience or those of their relatives, friends, or fellow community members- Say et al., 2018 [139].

This section of my thesis sheds light into women's perceptions about their health during the maternal health phase. While many respondents shared the joys and likes of pregnancy, they also reported negative experiences. Whereas 87.4% of women strongly agreed that their health status was generally fine before pregnancy, only 29.9% and 37.9% still felt this way for during pregnancy and delivery respectively. This result suggests that most women feel that pregnancy makes their health worse. In the qualitative phase, reports of morbidities were high overall and morbidity also emerged as the most dominant factor used to label a pregnancy as normal or difficult. Even when women survive pregnancy and childbirth, it appears that many do not rate their health during those periods positively and they also perceive a depletion in their health as a result of the pregnancy and childbirth.

Community-based studies exploring women's perceptions of or measuring satisfaction with their health status during pregnancy, delivery and postpartum are very rare in low income settings. One study conducted in Madagascar showed that respondents believed pregnancy and delivery leave "women's bodies very damaged, weak and soft" [99]. However, one facility-based study which measured these aspects in a number of low income countries found that 85.5% and 95.5% of women

in Kenya and Malawi respectively were satisfied with their health during and after pregnancy, and 85.2% and 95.0% were satisfied with their quality of life [253]. This near-universal positive perception of health in these settings differed from my findings, although its focus on satisfaction as opposed to perception of general state of health may partly explain these differences observed.

9.3.1.2 'Normal' vs 'abnormal' conditions

Results addressed on Table 9.1: #2

Women labelled morbidities that are long lasting, uncommon, seen as symptoms of more serious problems, and those remedied by 'unnatural' medical interventions as abnormal. In hindsight, "uncomplicated" and "complicated" may have been more appropriate terminologies to use during the data collection than "normal" and "abnormal" since the former terms do not suggest 'typicality' or conformity/non-conformity to an expected 'norm.' A number of implications are worth pointing relating to the findings:

- The definition of 'long lasting' may differ from woman to woman due to differences in perceptions or endurance abilities. A woman with a higher capacity to tolerate the pain/discomfort from a morbidity may delay to seek care, potentially jeopardising good outcomes. It may also mean that women in general suffer for longer than necessary where time is used as a definition. It is important to enable women to understand acceptable thresholds of duration in health promotion messages.
- There was a fairly general perception that what is common is normal, which isn't surprising since most judgments around morbidity/functioning were made by comparing an individual pregnancy with previous pregnancies or those of other women (Section 4.3.5). Humans are social beings and form norms, reach conclusions and make decisions in relation to other people. This communal outlook enables thresholds for abnormalities to be formed and provides reassurance that an experience should be no cause for alarm, after all other women have experienced or are currently experiencing it. The danger, however, comes from *who* is serving as the comparator. In areas with

high levels of morbidity, women are likely to compare themselves with individuals who have an unnecessarily high burden of morbidities, normalising issues that are actually abnormal or treatable.

- Morbidities that were seen as symptoms of more serious problems were labelled as abnormal. For example, headache is normal in pregnancy, but the headache accompanying high blood pressure is not. This means that a symptom may be normal in its own right, but if seen as a danger sign, then it is labelled as a problem. This shows that a good knowledge of danger signs can enable women to identify serious morbidities. In addition, women's perceptions of symptoms could be changed if symptoms are presented to them as potential danger signs of more serious issues.
- Episiotomy was generally perceived as normal and the data suggest that health professionals may have contributed to normalising the procedure as a preventative measure against tears and PPH (especially for primigravidas). It also appears that the intervention is encouraged routinely for primigravidas. The evidence in literature, however, supports selective/restrictive episiotomy for a number of outcomes including perineal trauma and generally discourage routine episiotomy [254, 255]. While women may accept episiotomy, routine administration means that women who do not need the procedure are undergoing surgical incision for no reason and may be worse off [255].
- C-section was generally perceived as abnormal; a general preference for vaginal birth, longer post-delivery recovery period and high costs of C-sections may have contributed to this perception. However, as obstructed labour is a major direct cause of maternal mortality [3], C-section should be normalised as a necessary emergency intervention so that women are able to utilise it in these situations. At 2.2% based on population data, the C-section rate in Nigeria is low, which suggests an unmet need [256].

9.3.1.3 Perceived causes of morbidities

Results addressed on Table 9.1: #4

Biological factors/other morbidities emerged as one of the main perceived causes of morbidities and over half of the morbidities under this theme were attributed to '*it is just the pregnancy.*' This is in line with biomedicine's perspective in which diseases are seen as pathological aberrations or internal abnormalities with respect to functioning, chemistry and structure [32, 33]. Behaviours and lifestyle factors were also perceived as causes of morbidities. This is consistent with reports from other African countries as reported in the scoping review. One key point that came from my study and also from the literature is that hypertensive disorders of pregnancy were generally linked to lifestyle factors and marital/social challenges but hardly to the pregnancy. This view deviates from the medical aetiology of the disease-abnormalities in the placenta. The implication of this is that women may adjust their lifestyles as a precaution against or treatment for pregnancy-induced hypertension but still remain with the morbidity. One FGD respondent actually reported that someone she knew stopped taking salt but her blood pressure still would not come down.

Spiritual factors/superstitious beliefs were minor as opposed to major sub-themes on perceived causes, which suggest a shift in perceptions from earlier Nigerian societies and could also be because the study area has a sizable urban population. It was interesting to see the difference in the way spiritual factors were linked to morbidities in my research and across Africa. In Yola and Tanzania [94], this was mainly about pregnant women being susceptible to a 'strange, unknown' spirit while in some other studies in Africa, it was due to witchcraft from people known to the woman [97, 257]. For instance, the Batswana people of South Africa believe in the concept of '*dikgaba*', malevolent afflictions from others resulting from the afflicted woman's unacceptable social behaviour (such as disobedience and disrespect) [257]. *Dikgaba* could cause any illness/complication during pregnancy and delivery, which can only be averted by consulting traditional healers.

Some causes were morbidity-specific, sometimes multiple causes were linked to one morbidity, and other times causes cut across several morbidities. This shows that community classification of morbidities is complex and multi-faceted; this complexity mirrors the biomedical system. However, broader social determinants of health and individual obstetric-related factors such as high parity were hardly linked to morbidities, unlike in some of the studies in the scoping review (Table 2.1). It is plausible that women in Yola did not mention them because they may not have seen them as causing morbidities directly. Other studies in Nigeria and Africa however have associated individual obstetric-related factors with morbidities. In the FGD component of one mixed-methods study conducted in North-west Nigeria, multiparity (particularly having more than five children) was seen as a risk factor for convulsions, hypertension, bleeding and miscarriage [258]. Primigravidity and multigravidity (having delivered more than five children) were similarly perceived as risk factors for excessive bleeding in a Ugandan study [90]. Another Ghanaian study also linked young maternal age to delivery complications [96].

9.3.2 Prevalence of Self-reported Maternal Morbidities

Chapters covered: 8

Results addressed on Table 9.1: #21

9.3.2.1 Levels of self-reported maternal morbidities

Using the unprompted method, 69.5% (95% CI 62.7- 75.6) of respondents reported at least one health problem during pregnancy, 30.6% (95% CI 21.7- 41.3) during delivery and 24.3% (95% CI 19.8- 29.6) during postpartum. 78.4% (95% CI 70.7- 84.4) reported at least one health problem in any of the three maternal health phases and 9.3% (95% CI 6.0- 14.1) reported at least one health problem in all three phases. These results suggest that the burden of maternal morbidity in Yola is high, which are consistent with findings from many community-level studies from Sub-Saharan Africa and Asia. While I am making comparisons with studies from Sub-Saharan African and Asian countries, I acknowledge that these may have methodological and context-specific differences from my study. For example, some studies were conducted in rural areas while my study had a large urban make-up in addition to rural populations. In terms of how maternal morbidity was measured in these studies,

sometimes this was not reported; for studies which did, they included prompted methods, unprompted methods, observation by health workers and so on.

In a Sri Lankan study, 90.3% of respondents reported at least one illness episode during pregnancy, with the majority (57.2%) reporting three or more morbidities [259]. In an Ethiopian study, 43.1% of women had experienced at least one health issue during pregnancy (non-threatening, life-threatening or both) [117]. A few studies however reported lower prevalences: 22% during pregnancy in rural Malawi [123]; 18%, 8% and 23% during pregnancy, delivery and postpartum respectively in India [46]. The prevalence for postpartum morbidities was slightly lower (24.3%) in my study compared to other studies in Asia. In Pakistan, Fikree et al. (2004) found that 53.3% reported at least one illness symptom during the postpartum period [28] and Bang et al. (2004) found the incidence to be 42.9% [42].

Community-based studies on prevalence have often been linked to over-estimating the burden of morbidities due to their reliance on self-reports [48, 260]. However high morbidity levels have also been found in recent comprehensive facility-based studies, which used a combination of measurement methods (laboratory tests, self-reports and clinical examinations), suggesting that high prevalence through self reported data may indeed reflect an actual high burden. McCauley et al. (2018) assessed the burden of physical, social and psychological ill-health in Kenya, Malawi, Pakistan and India using a convenience sample of women utilising ANC, delivery or PNC services [253]. They found that 73.5% of women had at least one symptom, and 71.3% and 73.5% had abnormalities upon clinical examinations and laboratory examinations respectively [253]. Zafar et al. (2015) assessed the burden of infective (included malaria, STIs, urinary tract infections, HIV, TB, mastitis, breast abscess and perineal infection) and non-infective (nausea, vomiting, haemorrhage, incontinence, anaemia, pre-eclampsia and others) morbidities in Malawi (and also in Pakistan) at the primary care level where 95-96% of women attend ANC. They found that 50.1% of women in the Malawi setting reported at least one morbidity (infective or non-infective), with 32.6% and 28.8% reporting at least one infective

and one non-infective morbidities respectively [261]. These data indicate that the burden of morbidities may indeed be high.

9.3.2.2 Categories of maternal morbidities reported

Non-obstetric health problems, particularly febrile conditions and those associated with pain or discomfort, dominated the survey results. The top five health problems reported during pregnancy were vomiting (accounting for 40.8% of all health problems in this phase), headache, backache, fever (body hotness only) and fever/malaria. For delivery, they were: abdominal pain, backache, lower abdominal pain, obstructed labour (the only obstetric morbidity) and fever (body hotness only). For postpartum: abdominal pain, backache, lower abdominal pain, fever/malaria and fever (body hotness only). These are consistent with findings from other community studies elsewhere. In rural Malawi, van den Broek et al. (2003) found that about half of all cases during pregnancy (49%) were related to pain or discomfort (abdominal, legs, head, back or general body pains) [123]. In Ethiopia, Lakew et al. (2015) found that the most common health issues during pregnancy were malaria (57%), nausea/vomiting (47.1%), severe headache (29.1%), severe lower abdominal pain (25%) and high fever (18.6%) [117]. In a Rwandan study, morbidities with prevalence above 10% (range 12.7%- 19.2%) during pregnancy were vomiting and abdominal pain in addition to other more severe conditions (anaemia, abdominal pain and severe bleeding, dimness/blurring vision) [129]. In a Sri Lankan study, they were nausea and vomiting of pregnancy (NVP), dizziness, backache and heartburn; the prevalence of fever was very low (5.6%) compared to my study however, suggesting the higher endemicity of malaria in Yola [259]. These results suggest that less severe conditions constitute the highest burden of maternal morbidities in communities, which are further discussed in Section 9.3.3.

There were no reports of certain morbidities (unprompted). Some of these morbidities (such as placenta praevia, uterine rupture and pelvic floor prolapse) are very rare in reality and it would have been difficult to come across them in my relatively small sample size of 640. In addition, these morbidities are diagnosed conditions and except in cases where diagnoses were made and relayed, women

could not have been aware of them to give reports. Some other morbidities may have been reported using tracer symptoms as opposed to their specific medical names, for example “fever” instead of “infection” (although fever could also be a symptom of other morbidities such as malaria). Some other morbidities, for instance postpartum depression, may not have been reported at all due to recognition issues, as I found in the qualitative phase that knowledge about postpartum depression in the study setting appeared to be low.

9.3.2.3 Differences observed by methods

A wide difference in frequencies was observed when results from the unprompted and prompted methods were compared. In general, the prompted method elicited a higher number of health problems reported across the maternal health phase. It also elicited responses for health problems with zero reports when the unprompted method was used. Previous studies conducted in the early 1990s on gynaecologic morbidities also found a similar pattern where spontaneous responses resulted in fewer reports than when women were prompted for specific conditions [54, 262]. I conducted further analyses on the data from these methods and found that the discrepancies mainly came from respondents who either: i) reported other health problems in the unprompted section but not the particular ones asked for in the prompted ii) did not report any health problems at all in the unprompted section. Several reasons may have been responsible for these omissions:

- The respondents forgot to mention them. In the qualitative phase, I noticed that women sometimes forgot to mention morbidities that occurred in a particular maternal health phase (for example, during pregnancy) only to bring them up at later parts of the interview (for instance, while discussing the postpartum period) when something in the discussion triggers them.
- The respondents only reported health problems that were important to them (for those under #i above).
- They may have only reported long-lasting or reoccurring health problems as opposed to single episodes after all some women perceive that single

morbidity episodes are normal (Chapter 4), although data collectors had a read-out in the instrument reminding respondents to list out all morbidities regardless of duration.

The above explanations suggest that it is perhaps necessary to prompt about morbidities to elicit reports. This was particularly important for health problems where zero reports were mentioned in the unprompted but were acknowledged in the prompted. But on the other hand, the chances for overestimating morbidities here cannot be ruled out. It is difficult to ascertain if this is the case since I did not validate results with a gold standard. One other issue worth pointing is that in a few cases, women who reported health problems in the unprompted did not report the same health problems in the prompted, which should have been identical. It is unclear why this is so but may relate to wider validity discourse associated with measuring morbidities from self-reports. In addition, using both unprompted and prompted methods could have been problematic, as the women may have felt that they've already reported the morbidities, hence not seeing the need to repeat them.

9.3.2.4 Differences observed by socio-economic groups

Literacy was positively associated with reporting any health problem (OR 2.32, 95% CI 1.12-4.83 for reporting a health problem during pregnancy; OR 1.71, 95% CI 1.02-2.87 for reporting a health problem during delivery; and OR 2.66, 95% CI 1.32-5.37 for reporting any health problem in either one of the three phases). Literacy did not appear to influence the severity of health problems reported however. Of the 89 health problems reported as very serious (Section 8.3.4), 18.7% belonged to literate women and 23.6% to illiterate women. In literature, the association between literacy/educational level and self-reported maternal morbidity in developing countries is varied; some studies show a direct [46, 126], inverse [253, 263]⁵² or no relationship [48]⁵³. The higher level of overall morbidity among the more educated

⁵² Self-reports were only used to assess the social and psychological morbidities in McCauley et al, 2018; laboratory investigations and clinical examinations were used for other categories of morbidities.

⁵³ Please note that the sample size was small in this study. Small differences were observed but these were not statistically significant.

women in my study potentially shows a reporting issue for health problems considered less serious- deprived women may be less likely to recognise or report these health problems. As I reported in the qualitative phase (Chapter 6), educated women were more likely to be conscious during facility consultations and asked questions, hence they may have been more likely to acknowledge and report morbidities. In addition, uneducated women may have perceived their morbidities as less severe or having less impact due to having no choice but to press through life, thus reporting health problems less.

Number of ANC visits was also significantly associated with reporting a health problem (OR 1.85, 95% CI 1.01-3.42 for reporting a health problem during pregnancy; and OR 1.99, 95% CI 1.03-3.82 for reporting any health problem in either one of the three phases). As there was a near universal ANC access in the study area- 82.8% reported having at least four visits- it is unlikely that access deprivation is the explanatory factor. It is plausible that morbidities are more likely to be diagnosed during ANC; therefore women are aware of their status and then report them. In addition, women may go for ANC more because they are ill.

9.3.3 Maternal Morbidities: Severity, Impacts and Issues that are Important to Women and Families

Chapters covered: 4, 6 and 8

Results addressed on Table 9.1: #3, #5, #22

Of the women who reported health problems unprompted in the preceding section, 16.0%, 0.9% and 19.0% felt that these health problems were very serious for the pregnancy, delivery and postpartum phases respectively; ‘very serious’ was defined as negatively impacting their wellbeing and/or functioning very severely. This shows that while any report of health problem was high (Section 9.3.2.1), only a limited proportion of women deemed these health problems as severe. Only a few health problems were perceived as very serious in the delivery phase (0.9%) compared to the pregnancy and postpartum phases. This could be due to the transience of the

delivery phase; hence women may not have experienced the morbidities long enough for perceived impacts to have been felt. On the other hand, it could also be that the severity of the delivery morbidities were experienced during the postpartum period and were misclassified under the postpartum phase.

As a proportion of the entire participant population, 11.6%, 0.3% and 4.1% of respondents reported that their health problems were very serious for the pregnancy, delivery and postpartum phases respectively. I will therefore focus my discussion in this paragraph on the pregnancy phase since it yielded substantial data compared to the other two phases. A cross-section of the health problems shows a wide range from mild, moderate and severe from a biomedical viewpoint, which indicates that morbidities impacting women's lives severely are not limited to life-threatening ones only. Many of these health problems appeared to have persisted longer than usual-one in every three health problems reported had lasted between six months and one year, which is not surprising that they were reported as very serious since women in the setting used duration as one definition of severity. This means that one-third of women who experience health problems deemed severe during pregnancy suffer for most or the entirety of their pregnancies, with some extending beyond pregnancy. In terms of consequences, respondents were more likely to perceive the health problems as having had negative impacts on their lives, with the physical domain having the highest number of more severe impacts than less severe ones (63.6% vs 26.0%), then social (53.8% vs 37.2%) and lastly marital (44.2% vs 48.1%) (proportions for neutral responses not shown). The difference between the more severe and less severe response groups was higher for the overall severity score- 75.6% vs 15.4%. The respondents who reported less severe responses for all these domains may have experienced negative experiences in other domains which I did not measure.

I found that morbidities mainly had negative consequences on women. There is a dearth in the evidence base on the impacts of maternal morbidities in general; however studies that have been conducted have shown physical, psychological and economic consequences as well as loss in productivity and absenteeism from work. Bell et al. (2008) documented the consequences of morbidities for women who had

been pregnant within the past one year in two rural Burkina Faso districts and they found a range of consequences including: 28.0% and 38.3% had experienced difficulty in household chores and agricultural work in the two districts; 4.6% and 9.6% had had to borrow money for the delivery costs; 10.4% and 16.2% reported being seriously ill since the pregnancy; and 17.7% and 19.1% were depressed [264]. One study conducted in rural Bangladesh found that healthcare spending associated with maternal illness largely reduced household resources [265]. Another study carried out in Sri Lanka found that absenteeism from their daily work accounted for 32.9% of total loss of productivity in the last illness episode; the mean number of productivity days lost due to absenteeism was 9.5 and that due to presenteeism was 19.4 in the most recent illness episode [266]. A systematic scoping review on the impacts of maternal morbidity on health-related functioning found a number of gaps in the literature [101]:

- Over 60% of the studies focused on indirect morbidities such as diabetes, depression and incontinence.
- While Africa bears the largest burden of maternal health issues, only 12% of the studies focused on Africa and these mainly focused on depression, obstetric fistula and near-miss morbidities; it is perhaps not a coincidence that these morbidities happen to be the ones with clearly defined manifestations and/or have straight-forward tools for measurement. Thus, the impacts of less severe morbidities were not studied.
- More studies focused on health-related functioning in the postpartum period compared to the pregnancy period. This is in contrast to what I found in my research where women appeared to report more morbidities in the pregnancy period and were most likely to report consequences during the pregnancy period than postpartum.
- Of the five studies that studied the impacts of hyperemesis gravidarum, all were conducted in high income settings except one (in Turkey).
- A limited number of domains of life impacted by the morbidities were considered in many studies- mainly physical and mental. Studies that assessed a comprehensive list of domains were not frequent.

The evidence base on impacts of maternal morbidities needs to be improved. The results from my research show that morbidities affect several aspects of women's lives and/or families- physical, nutritional, social, emotional, marital, financial and professional. While physical consequences of morbidities came out strongly in my research, it was interesting to also see the emergence of nutritional impacts as a prominent domain (discussed later). One additional surprise finding for me was the mental health consequences of being hospitalised. Usually, the discourse on hospitalisation revolves around severity and financial impacts of paying for hospital beds and services, with virtually no attention paid on how women actually experience living within a health facility, a 'temporary home.' As reported in Chapter 4, hospitalised women form communities with other women in the ward, and when someone they have become friends with dies, it shakes them. This shows that the impacts of morbidities are multi-dimensional and can bring about indirect consequences.

Furthermore, the results from both the qualitative and quantitative phases suggest that less severe conditions such as vomiting, inability to eat, abdominal pain, fever, backache, spitting, headaches and body pain are very important to women. There was a dominance of non-obstetric conditions relating to pain, fever or discomfort in the prevalence estimates (Section 9.3.2.2) and also the top five most serious health problems reported during pregnancy in the survey were fever, abdominal pain, backache, vomiting, headache (joint 4th), high blood pressure and malaria (joint 5th). While women generally recognised the life-threatening potential of morbidities such as bleeding, insufficient blood and high blood pressure as also seen in a women's groups study in rural Malawi [267], they also strongly emphasised less severe conditions. An ethnobotanical study which briefly explored women's top health complaints in a free-listing exercise in Benin and Gabon also found that less severe issues such as abdominal pain and "pregnancy-related concerns" (which included vomiting) emerged as top concerns for women, in addition to other conditions such as malaria and infections [268].

Morbidities that are important to women are not necessarily the same ones prioritised by public health. Historically, many ‘bigger’ issues have dominated the maternal health research agenda in developing countries: maternal mortality; improving access to maternal health services; human resources for health; postpartum haemorrhage; obstetric fistula; malaria in pregnancy; family planning; maternal near-misses; prevention of mother-to-child transmission of HIV; and so on. Consequently non-life threatening morbidities were relegated to the back, with the exception of a few such as postpartum depression. The evidence in my study suggests that these morbidities should also be of public health importance since they impact women’s lives and also have high prevalence. Several of these morbidities occurred in the pregnancy and postpartum phases, which means that many women are going through long periods of time suffering.

Both women’s and the biomedical perspectives are important in their own rights but there needs to be a reconciliation or balance between the two. Health professionals do not always seem to consider the severity of morbidities from women’s perspectives. In one of the preliminary interviews that I conducted with health professionals (Appendix 4.3), one doctor asserted that a morbidity which does not hinder a woman from performing her daily chores is not a morbidity. He also argued that patients cannot tell whether or not they have a morbidity because only a doctor can make diagnosis. When I informed him about anthropological perspectives relating to morbidities, he still maintained his initial stance. Such paternalistic views do not serve women’s best interest because they do not acknowledge their experiences nor do they promote patient-centred care. A morbidity may not inhibit a woman’s ability to perform chores but could seriously impact her mental health, her social relationships or her general sense of wellbeing. Vanderkruik et al. (2013) also found a lack of consensus among experts with respect to severity of maternal morbidities. While 66% of their surveyed experts agreed that perinatal conditions which cause dissatisfaction/discomfort for women should be considered morbidities even if these do not result in hospitalisation, some other views suggested that conditions should be considered morbidities only when they require medical treatments/interventions [136]. This latter view has the potential to exclude conditions which limit a woman’s ability to function effectively even if it may not

necessarily involve medical treatment/interventions. It is therefore a welcome development that the recently developed Maternal Morbidity Matrix consists of less severe conditions such as nausea and vomiting of pregnancy, back pain and haemorrhoids [51].

Due to pressing issues in low resources settings, funders and policy makers may need to be convinced to channel some resources towards developing programmes or interventions for less severe conditions such as vomiting, backache and abdominal pain, as they may view these as low priority since they are not life-threatening. Even researchers need to be encouraged to study such conditions, as a recent systematic review of systematic reviews found that there were no reviews on many conditions including less severe ones such as backache [44]. This rhetorical question by Say et al. (2018) is worth considering: “*beyond establishing the burden of disease, would the approach [of measurement] be able to document the issues that are important to women themselves?*” [139]. As the focus, historically, mainly favoured what the biomedical community prioritises, there needs to be a tilt towards what women themselves identify as important.

Recent international strategies offer hope that steps are being taken in the right direction. Former United Nations Secretary General Ban Ki-moon launched the Global Strategy for Women’s, Children’s and Adolescents’ Health (2016-2030) with the three objectives of *Survive* (end preventable deaths), *Thrive* (ensure health and wellbeing) and *Transform* (expand enabling environments) [5]. This suggests that the expectation at the international policy level is no longer for women to merely survive but to also flourish and attain good quality lives. Implementing this strategy at the grassroots level should involve listening to women’s voices and prioritising what they identify as important.

Finally, the results also show that morbidities can have positive unintended consequences by changing long-held traditions and encouraging good health behaviours. Women who have undergone such transitions can be identified from

communities and involved as behaviour change champions. People may be more susceptible to change when they listen to before-and-after accounts from other community members. There is also strong evidence in literature linking community-based interventions to positive maternal health outcomes. Systematic reviews and meta-analyses of a series of trials involving participatory women's groups found a reduction in maternal mortality [269] and improvement in delivery practises (hand-washing by birth attendant before delivery and usage of safe birth kits) [270].

9.3.4 Care-seeking for Reported Maternal Morbidities

Chapters covered: 6 and 8

Results addressed on Table 9.1: #11- #15

9.3.4.1 Care-seeking behaviours relating to maternal morbidities

The results show that care-seeking for maternal morbidities is varied, with several patterns of care-seeking behaviours. I found that women and their families managed/treated maternal morbidities at home (using regimens obtained from lay knowledge, traditional sources or pharmacies) or through the formal health system. These options are not different from those used in many parts of the world. However, usage of traditional regimens raise important safety concerns since their toxicity levels or appropriate dosages may be unknown [271]; they have also been linked to adverse pregnancy outcomes [272]. Delayed placental expulsion came out strongly as a morbidity that families would initially manage at home during home-births, and the strategies used for expulsion were very similar to those reported in a Gambian study [273]. This puts women in danger through delayed or no formal care-seeking and also practices may be harmful. In addition, the length of time for placental delays varied from 10 minutes to two hours. This suggests that some families start the expulsion process either too early or too late, as the medical cut-off for delayed placental expulsion is >30 minutes post-delivery.

On the other extreme end, excessive bleeding was greatly feared and seen as a morbidity to which no known home remedies existed and which should always be taken to the hospital. Bleeding appears to evoke fear across African communities

[99, 267]. A few studies however have reported non-facility care-seeking for bleeding. While most women in a rural Ugandan study reported being unaware of home remedies for excessive bleeding, many TBAs in this setting used soda or cold water to manage it [90]. Another study in North-west Nigeria found that while five out of the 10 self-reported haemorrhage cases eventually reached the health facility, home-based care was the first line of action in seven out of the ten cases [88]. This did not emerge from my study probably because I did not explicitly explore care-seeking steps for excessive bleeding and respondents may have reported the ‘main’ care-seeking option utilised as opposed to the first action taken. Many respondents may also have had better access to facilities because of being urban residents. The North-west Nigerian study however found that there were fewer ‘in-between’ steps that involved usage of other care-seeking options for bleeding compared to the other outcome considered, suggesting that care-seeking for bleeding is still taken seriously in these settings [88].

I also found that care-seeking options were used in a variety of approaches: uni-dimensional; step-wise; simultaneous; phase-specific; opportunistic; and in-hospital (Section 6.3.2). These all have unique implications for maternal health:

- **Uni-dimensional:** Treatment regimens used can be tracked easily with this option. It may also encourage compliance with treatment since only one option is used.
- **Step-wise:** This approach perhaps has the greatest implication for maternal health as it relates to the Three Delays framework [274]. It shows that women and their families may delay care-seeking and eventually reach health facilities too late. A step-wise care-seeking approach appears to be fairly common in Africa, as seen in Kabakyenga et al.’s (2011) study on obstructed labour [115]. As stated earlier, women in labour in these communities conceal the onset of labour and endure it as a means of “protecting own integrity.” When the labour fails to progress normally and they finally decide to seek assistance, they reach out to close female relatives or friends who use a range of local management procedures (give herbs, insert fingers into

vagina, etc). A TBA may also be summoned. When these local options have been exhausted, then the husband is involved, who looks for funds or a means to transport the woman to the hospital. Such procedures involving numerous intermediate steps could jeopardise women's health by delaying access to much needed care.

- **Simultaneous:** This approach is used even in high income settings [275-277]. In reality, morbidities are complex and may sometimes require multiple treatment options to treat. The danger comes when pharmacy-bought medicines or herbal regimens are used alongside prescribed medicines, which may lead to negative interactions or overdosage.
- **Phase-specific:** This approach reflects a potential missed opportunity in maternal health. If health facilities are mainly used during certain maternal health phases and not others, it is worth exploring why the latter is the case.
- **Opportunistic:** This presents both opportunities and problems. As opportunities, women who may otherwise not visit health facilities for morbidities are able to access the care they need during ANC. As problems, it implies that care-seeking is being delayed since women only wait until the next ANC appointment.
- **In-hospital:** In an ideal hospital setting, patients should not bear the responsibility of summoning health workers from their duty stations to keep checking them; this highlights quality of care issues. As I found, less empowered women may lack the agency to take this proactive step, which may further inequities.

In addition to observing the above approaches to care-seeking, I also discovered that certain factors drove care-seeking: perceived severity of the morbidity; familiarity with the morbidity or treatment; perceived efficacy of treatment; previous experiences with the morbidity/treatment; perceived cause of the morbidity; and affordability. Perceptions of severity and familiarity were the major drivers, which

indicates that the key drivers of care-seeking are mainly individual-level factors. This shows that while access to formal health care is less of a challenge in this setting, other issues remain that need to be taken into account when designing interventions and policies. Morbidities will be managed at home if women and their families feel capable of managing them. But as they act promptly on morbidities deemed severe, changing perceptions of severity could improve care-seeking.

Finally, the results from the qualitative phase show that socio-economic factors- educational level, age and gravidity/parity- also influenced care-seeking. Age and gravidity/parity are still constituents of the individual-level factors discussed above. Educational level, in contrast, goes beyond the individual and reflects inequities and system-wide issues. Educated women were proactive, did in-depth research, asked questions and followed what staff were doing step-by-step, tended to 'sieve information', and came across as being able to take personal responsibility for better health outcomes; uneducated women were generally passive. Women's educational status in the study area is dire as only 8.8% have post-secondary education and more than half are not literate in any language. This suggests that the vast majority of women potentially do not demonstrate these positive care-seeking behaviours associated with high educational level. Improving care-seeking in the long run, and by extension maternal health, will require education and empowerment of women [278].

9.3.4.2 Lay networks: Identity, roles and care-seeking influence

In the preceding section, I deduced that the key drivers of care-seeking are mainly factors associated with individual women, which revolve around their perceptions and experiences. These individuals do not form the perceptions in a vacuum but are deeply influenced by people in their social circles- mothers, husbands, mothers-in-law, co-wives, sisters, other female relatives, friends and family friends, work colleagues, older women, neighbours, women at ANC, and well-wishers who visited them after delivery. These lay networks give information, serve logistical purposes and offer support, all of which influence care-seeking positively or negatively.

The importance of involving women's social networks in maternal health cannot be overemphasised and other studies corroborate this assertion. In the verbal autopsy portion of their study, Sharma et al. (2017) found that household members played key roles in recognising symptoms of morbidities, as the women did not always speak out about these symptoms [88]. Lori and Boyle (2011) have documented incidences in Liberia where delayed or a lack of permission to access care by a woman's gate-keepers (mainly husbands or elders) have led to severe maternal morbidities or deaths [279]. A mass radio campaign that provided high exposure to behaviour change messages (a saturation approach) to selected communities in Burkina Faso was linked to improvements in health-seeking behaviours (although these were mainly related to child health outcomes) [280-282]. As reported in Section 9.3.3, participatory women's groups have also been linked to improved maternal health outcomes [269, 270]. In spite of these findings, many maternal health units and programmes in developing countries are still largely 'woman-focused' and are yet to fully maximise the benefits of involving her lay networks.

The influence of lay networks on care-seeking aligns with the first two aspects of the Three Delays model [274]: they can initiate or inhibit care-seeking (delay 1) through provision of information, and they can facilitate, delay or deny access to health services (delay 2) through logistical arrangements. One aspect that stood out for me in my research was learning about how lay networks filled in the vacuum for absence of ambulances in communities during emergencies. This is very important in the Nigerian or African context where emergency services are mostly non-existent or substandard. A study that assessed the current state of affairs for emergency medical services in Africa found that less than one in three countries in Africa had an existing emergency system in place [283]. Another study also found that almost 28% of women of child-bearing age reside more than two hours away (travel time) from their nearest public hospital [284]. These sobering statistics provide further appreciation for the role that lay networks play in emergency care, considering how inability to mobilise transportation on time can result to death- accounting for 41.7% of cases where women who had died were brought in dead to a Nigerian tertiary health facility [285].

9.3.5 Vomiting: Perceptions, Impacts and Prevalence

Chapters covered: 5 and 8

Results addressed on Table 9.1: #6, #23

In the qualitative phase, vomiting was perceived as a normal part of pregnancy unless a woman is unable to retain anything ingested, vomits after eating, has poor appetite, isn't well-nourished, has to go to the hospital, is overwhelmed by the vomiting, or experiences prolonged vomiting. Women also reported how the vomiting negatively impacted them and their families. While the impacts of nausea and vomiting of pregnancy (NVP) are well-documented in high income settings [286-291], such reports appear to be non-existent from low income settings in the literature. The dearth does not mean such experiences are uncommon or 'foreign' in low income settings but rather vomiting has not been prioritised as an issue. Its inclusion in the newly developed Maternal Morbidity Matrix [51] will hopefully raise its profile.

The quantitative results show that many women experience vomiting during pregnancy (35.4% or about 1 in every three women) and are also vomiting for prolonged periods (only 21.1% of the vomiting cases were reported to have stopped entirely within the first trimester, with the remaining persisting further). In addition, over half of these women were vomiting at least three times per day most times during the pregnancy and approximately three-quarters were vomiting at least three times per day at the most severe period (75.3% reported that this severe period had lasted for three months or more). These results suggest that vomiting is a big issue in the study setting. Furthermore, the effects of vomiting on women's lives is also prominent, as seen in the qualitative reports and also in the survey where high proportions reported negative consequences (Figure 8.7) and half of the women (50.8%) perceived the overall severity of the vomiting negatively (Figure 8.8). Vomiting seems to have a synergetic power to disrupt multiple aspects of women's day-to-day lives. Physically, it prevented them from performing their activities/chores and increased the workload for their families. Nutritionally, they were unable to get the nourishment they needed- 73.4% of the women who were vomiting reported being unable to retain food in the stomach. Logistically, it brought

about structural changes for their families such as needing to cook in another house or cooking two separate meals. It also had physiological, marital, financial and mental health consequences (31.9% reported that the vomiting made them afraid and 23.0% that they vomited so much that they thought they would die). These negative impacts appeared to have involved the day-to-day lives of women and their families as opposed to being transient occasional occurrences.

Given the importance of nutrition during pregnancy, it was striking that even in severe cases there was no evidence that these women replenished the food whenever they vomited. When I asked one of the respondents how she survived the long period of being unable to retain food and water for months, she mentioned that “*it was God who sustained me*” and also assumed that “*no matter how difficult it was, there will still be some [food] that will hang in there from the one I ate and then vomited*” (IDI 5). They also reported needing to restrict their diets to control the vomiting, as studies in Ethiopia and the UK also found that women reduced their food intake as a coping mechanism against vomiting [292, 293]. It is worth mentioning that many women would have started pregnancies with a nutritional deficit as the staple food in Nigeria is mainly cereals [294]. Although vegetable-containing soups are sometimes eaten with these cereal-based food, daily consumption of fruits and raw vegetables are still mainly associated with wealth or circumstantial occasions in some Nigerian spheres (for example, remedy for illness or food for breaking religious fasts). Undernutrition in women of reproductive age is 11% whereas overnutrition is 25% [295], with malnutrition inequalities higher among the least educated households, northern states and the Hausa ethnic group (in northern Nigeria) [12, 296]. Therefore, a pre-existing nutritional deficit coupled with the potential loss of nutrients from vomiting could yield to a ‘double burden’ of malnutrition of some sorts during pregnancy. In spite of its public health importance, the impact of vomiting on nutrition is still not clear in literature; this is an area where more evidence is needed.

It is difficult to compare the above findings to other Sub-Saharan African countries as studies on severity and impacts of vomiting appear to be non-existent. However in Sri Lanka, Agampodi et al. (2013) asked women to report any illness episodes during pregnancy (with subsequent validation with medical records and diagnosis cards) and then they measured the effects of the morbidities on daily life using a visual analog scale [259]. They found the impact of NVP to be significant: it accounted for the highest proportion of hospitalisations (43.1%) amongst all morbidities reported in their study and also the highest level of total incapacitation and severe inhibition of every-day activities (32%) [259]. However, in as much as physical symptoms can highlight the debilitating impacts of vomiting, they should not be used as the only barometer to measure severity. One study (although conducted in a high income setting) found that physical symptoms were weakly correlated with women's self-assessment of the severity of their NVP, with the frequency of vomiting accounting for only 9% of the variability of their perceptions of severity ($r^2=0.09$) [297]. They concluded that the severity that women feel cannot be described by the physical symptoms of the NVP alone, as the women considered their wellbeing overall and how other aspects of their lives were being affected. This further highlights the synergetic ability of vomiting to disrupt several aspects of life and also the importance of considering impacts holistically.

The prevalence of vomiting shown in my study- 35.4% (95% CI 26.5- 45.5) - appeared to be lower than estimates reported in other studies elsewhere. In general medical literature, it is often reported that NVP affects around 70-80% of pregnant women [298]. Lakew et al. (2015) study's in Ethiopia found that 47.1% of women had experienced nausea/vomiting [117] while Agampodi et al. (2013) found that 69.7% of the women they surveyed in a Sri Lankan district experienced NVP [259]. A meta-analysis found the global prevalence of NVP to be 69.4%, although most of the studies came from high income settings [299]. The estimate in my study may have been lower because I only focused on vomiting as opposed to nausea and vomiting. Separating these two conditions may appear arbitrary, but I was mainly interested in researching about vomiting because it emerged as particularly important to women in the pre-pilot phase and it is also rarely studied in low income settings.

In addition, the threshold that I imposed in defining vomiting (more than two times per day even if this did not continue to the end of the pregnancy) may have resulted in lowering the prevalence, as these other studies may have measured any occurrence of vomiting. I imposed the threshold for diagnostic reasons to distinguish between occasional and consistent vomiting episodes.

9.3.6 Prolonged Labour: Perceptions, Impacts and Prevalence

Chapters covered: 5 and 8

Results addressed on Table 9.1: #7, #24

I explored how women defined the start of ‘true labour’ and how they perceived the length of labour. Women used pain, previous experiences and physical symptoms to discern ‘true labour,’ which are mostly in line with medical narratives (excluding ‘previous experiences’). One important difference is that women- with the exception of educated ones- hardly used the idea of contractions occurring every few minutes as a method.

Perceptions relating to length of labour shows that normal/easy/short labour tended to be expressed in terms of minutes and a few hours and prolonged labour in terms of several hours or several days. Women often used daily markers (such as being in labour from ‘*morning till night*’, ‘*12 midnight to around 12 noon*’) to define prolonged labour. This description by well-defined time points was also reflected in the survey where the most frequently reported duration was “1 day/ 24 hours” and “12 hours.” While I found that women can remember very specific details about their labour, the possibility for rounding the length of labour up or down to align with these time-points cannot be ruled out completely. Diverse care-seeking options were utilised and perceived impacts reported. The bodily functions domain had the highest number of negative consequences. This is one area where women are likely to need more attention and support following delivery.

I found that 4.7% of respondents reported prolonged labour, although the ‘actual’ duration may perhaps be different in reality from the women’s experience of prolonged labour. In their survey in India, Bhatia and Cleland (1996) reported a similar prevalence of 5.7%, although they defined prolonged labour as labour >18 hours [46]. Khanam et al. (2016) found a slightly higher prevalence of 10.2% in their cohort study in Bangladesh (prolonged labour defined as labour >12 hours) [300]. In general, I found that it is quite difficult to compare prolonged labour findings across studies due to differences in definition and also categorisation issues (some studies sometimes group prolonged labour and obstructed labour into one monolithic group).

9.3.7 Haemorrhage: Perceptions and Severity Indicators

Chapters covered: 5 and 8

Results addressed on Table 9.1: #8- #10, #25

A near-universal perception on bleeding is the concept of ‘bad blood’ which was seen as something to rid from the womb using local therapies (postpartum hot water baths, massages or drinks). Similar perceptions have been reported elsewhere in Africa [90, 99], and in Uganda, the ‘bad blood’ was seen as accumulated blood from not menstruating during pregnancy [90]. Three ‘schools of thought’ also exist with respect to how a women should bleed during and/or after delivery (Section 5.3.4.1). Some of these perceptions may make the recognition of haemorrhage more difficult. As the ‘flow proponents’ see the necessity of bleeding, they may also be less likely to seek timely care and this could be dangerous.

Another finding was the perception relating to minimal/normal vs much blood loss, which were described in various ways: relating to the quantity of blood lost and visual stimuli (‘portion’, ‘paint’ and ‘pressure’); symptoms and interventions (‘physiological response’ and ‘procedures’); and subjective assessment (‘psychological reaction,’ ‘personal comparisons’ and ‘people’s comments’). Some of these methods are subjective while others are in line with medical narratives around excessive bleeding (particularly symptoms and interventions). A number of

studies have also reported descriptions that reflect some of these perceptions; I have categorised them below under the groups that best reflect their descriptions (as explained in Section 5.3.4.2):

- In Uganda, four of the eight methods were reported- **pressure** (“rate or speed of blood flow”), **portion** (clots; flow more than menstrual blood; “two clenched fists” which was a method trained TBAs used), **physiological reaction** (fainting, dizziness, collapsing, being unable to sit up, unconsciousness) and **paint** (changing pads frequently) [90].
- In Gambia, TBAs used three of these sub-themes to differentiate between normal and alarming blood loss- **portion** (amount that fills a standard food can), **paint** (number of soaked pieces of clothes) and **pressure** (blood flowing “like an open tap,” blood that did not flow past the area of delivery was considered normal) [273].
- In North-west Nigeria, three of the sub-themes were reported- **portion** (heavy flow), **paint** (extent of soaking) and **physiological response** (paleness, shivering, weakness, unconsciousness) [88].

The above themes on much blood loss suggest that women use easily, identifiable indicators to decipher whether their blood loss is minimal or much. This is particularly important because the first step to seeking care for PPH is recognising that the bleeding is indeed excessive. Understanding how women perceive much blood loss will enable design of appropriate messages to indicate danger signs and thresholds. Some of the lay ‘diagnosis’ methods will need to be standardised in health promotion messages, however, as the results show that women had different interpretations of what constitutes “much” blood loss. For example, ‘portion’ was described in various terms including “*came out in chunks,*” “*up to 2 or 3 plastic bags [drips],*” “*if it pours too much,*” “*like that their bowl in the hospital [kidney dish],*” “*not more than 1 pint,*” “*not up to a litre*”). One other area worth highlighting is the fact that while women correctly identified symptoms associated with much blood loss (under ‘physiological response’), some of these were extreme

manifestations; hence they will need to be constantly reminded not to wait until these symptoms occur before seeking care.

In the quantitative phase, I tested these lay methods for ‘diagnosing’ haemorrhage to understand severity indicators and learn important implications for measurement. The results (Figures 8.10 and 8.11) suggest that prevalence estimates for excessive bleeding are likely to differ depending on the severity indicator used. More subjective indicators are likely to give higher estimates than more objective ones. For bleeding during delivery for instance, 32.5% said ‘blood rushed much like tap water/passing urine’ compared to 14.9% for ‘bleeding scared respondent,’ 4.5% for ‘sourcing for blood donors initiated’ and 0.9% for ‘blood transfusion given.’ Similarly, for bleeding after delivery, 63.0% reported ‘many frequent big, thick clots of blood’ compared to 29.9% for ‘weakness such that couldn’t get up/walk,’ 14.5% for ‘birth attendant returned to scoop out blood,’ 6.3% for ‘stained floor’ and 4.6% for ‘fainted.’ Some morbidity studies in literature only report estimates without mentioning how the excessive bleeding was assessed; these should be interpreted with caution. The results also indicate that there isn’t one ‘magic bullet’ indicator that can be used to measure haemorrhage in a non-clinical population setting.

From the above reports, it appears that women are more likely to use visual estimates/quantity and symptoms to make judgements about bleeding. Many researchers will rule these out as unreliable; diagnosing PPH by visual estimation methods have largely been reported as inaccurate in literature [301-306]. While these issues abound, visual estimation methods may have some value, especially if attempts are made to standardise them. They also have the appeal of being low cost and feasible in low income settings. A recent study (although conducted with a small sample size) designed a mat for measuring PPH [307]. Each square of the mat absorbs approximately 50mL of blood and blood loss was then calculated by multiplying the number of fully soaked or partially soaked squares by 50mL. When this method was compared to the actual volume of blood lost (difference between the weight of the mat before and after usage), the mean difference was 80.91mL with a strong correlation coefficient of 0.96, suggesting its fair reliability. This mat could be

tested further in community settings as an indicator for measuring blood loss; perhaps it could be given to women and then self-reported blood loss could be compared with the the actual blood loss. Another study approximated blood loss by using the local blood collection towel (*kanga*) commonly used in Tanzania. It found that two *kangas* equalled blood loss slightly more than 500mL and informed TBAs to use it as a threshold for PPH [308].

We need to critically ask whether it is really important to know exact, precise measurements or whether fairly simple standardised methods would suffice. Using accurate, objective measurement methods do not always lead to reduction in morbidity or health outcomes, which tend to be a goal in improving the accuracy of diagnosis methods. A large cluster randomised trial involving 25,381 women (who had vaginal deliveries) in 78 maternity units across 13 European countries found that the routine usage of a blood collection bag, compared with visual estimation of postpartum haemorrhage, did not decrease the rate of severe postpartum haemorrhage [309]. Hence this objective, potentially time-consuming method had no actual value on health outcomes, although findings may differ in a low resource setting. More objective methods may be necessary but this will depend on the purpose for measurement. Kerr and Weeks (2016) argued that “a single definition is no longer enough” for PPH as different definitions are needed for different purposes: to make decisions about the point to commence treatment; for quality of care audits; and for research purposes [310]. It will be necessary to clarify why measurement is being done in the first place, and appropriate methods can then be selected.

9.3.8 Measuring Maternal Morbidities from Community Settings

Chapters covered: All results chapters (4-8)

In this last part of the interpretative section, I have summarised the strengths and weaknesses of maternal morbidity measurement within community settings that I have observed from my PhD research (Table 9.2).

Table 9.2: Strengths and weaknesses of measuring maternal morbidity from community settings using self-reports

Strengths	
Representativeness	This is a major strength. Morbidities are not confined to health facilities alone since some women do not use formal care but manage morbidities at home. Health facility data may provide a limited picture.
Provision of a ‘morbidity profile’	Self-reports can serve as a first-step towards obtaining a mapping insight into the morbidity profile of a population. We are able to find out issues that are common in a population.
Viability	For some conditions such as vomiting, the only viable way of measuring them is through self-reports.
Simplicity	Self-report does not require extensive technology or expensive methods. It only requires listening to women, who are generally very open to talking about their experiences. Depending on the morbidities being studied, facility-based measurement can be expensive and/or too technical. For example, one delphi study aimed at adapting the WHO near-miss tool for use in Sub-Saharan Africa by improving its applicability found that while all the clinical criteria of the tool were deemed workable in the region, only four of the eight laboratory parameters and four of the six management-related criteria were seen as feasible in the region [311].
Weaknesses	
Diagnosis issues	We may not readily see how morbidities are co-related. Morbidities without easily identifiable symptoms may not be reported. We cannot ‘easily decipher’ between morbidities with similar presentations. Reports may also be non-specific, for example most women referred to any hypertensive disorders as “high blood pressure;” hence it wasn’t always clear if they meant pregnancy-induced hypertension, chronic hypertension, pre-eclampsia, etc. Symptoms of eclampsia, on the other hand, were described with sufficient detail. Lastly, we can’t always differentiate between an outcome and a morbidity (that is, is a reported morbidity a morbidity in its own right or an outcome of another morbidity?).
Recall and reporting issues	Reports may be subjective and affected by recall issues. Although recalling morbidities experienced appeared to be extensive since both mild, moderate and severe health problems were reported (from a biomedical perspective), I also found instances where recall and reporting bias appeared to have influenced findings (for example, the influence of educational level on reporting).
Inconclusiveness	A wide difference in frequencies was observed when results from the unprompted and prompted methods were compared. While I could deduce possible reasons for this discrepancy, it was not fully clear in all cases.
Limitations for rare morbidities	Community-based measurement is not the best for studying more severe outcomes, which are usually rare. I did not come across some of these morbidities in my study.
Overestimation of rare conditions	Community-based measurement also overestimates rare conditions, as seen in the results section on haemorrhage (Section 8.3.5.3). Previous studies have also shown this weakness [48, 312].

9.4 Strengths and Limitations

9.4.1 Strengths

My PhD research had several strengths:

A. Impact for women's health

The research findings highlight the high burden of maternal morbidity in the community as well as its impacts on women and families. Perhaps one of the greatest strengths is finding out that morbidities that are important to women may not necessarily be the ones prioritised by public health. If taken on board by policy makers and researchers, this finding will enable a shift towards addressing what women identify as important, which will impact their health and sense of wellbeing positively. I also conducted the research in Northern Nigeria, a region which bears some of the highest global burdens of maternal health issues.

B. Addresses an important research gap

As mentioned previously, maternal morbidity research has until recently been a neglected aspect of the Safe Motherhood movement. My research has contributed to filling this gap by providing valuable information relating to perceptions, care-seeking and measurement. This is the first study, to my best knowledge, to measure maternal morbidity from the community in Nigeria. While there are currently two large global research efforts geared towards maternal morbidity measurement- the MMWG and AMANHI morbidity study-, the former is facility-based while the latter only focuses on severe morbidities. My research's strengths in relation to these global efforts include being community-based, a focus on conditions with differing severities, and using qualitative methods to explore women's experiences and inform the survey instrument.

C. Diversity and representativeness

I made great efforts to include respondents from varied socio-demographic and obstetric backgrounds in all studies; this enabled diverse perspectives to be heard. There was also diversity in terms of morbidities considered as a wide range were considered (mild, moderate and severe from a biomedical viewpoint), as mentioned above. In addition, the focus on the community ensured that I accessed women who

do not use formal care, since health service utilisation is low in the setting (except for antenatal care).

D. 'Bottom-up' approach to measurement

Respondents did not only provide data relating to morbidities but also served as partners by providing input to the questionnaire during the cognitive interviews. Thus the instrument used was based on the lived experiences of women. This step helped ensure that their health experiences were captured and measured in the best way possible.

E. Rigour

I utilised rigorous methodologies from design to completion of my PhD. These included but not limited to: a comprehensive and systematic literature search; verbatim transcription and using the transcription process as part of the analyses; maintaining respondents' discussion style and speech in translation; line-by-line coding; documenting changes and adapting methods as clarity was gained; following-up relevant respondents to clarify unclear areas or acquire further information; usage of innovative methods (for example, the ranking exercise, visual representations and free listing exercises in the qualitative phase); multi-stage questionnaire development; selection of clusters across the breadth of the study area; rigorous data entry with built-in features to minimise errors; row-by-row and column-by-column data cleaning; and verifying inconsistencies against the questionnaires.

F. Triangulation and balance

I used several methods- qualitative methods (FGDs, in-depth interviews and family interviews), cognitive interviews and survey- to meet the PhD objectives. Through these, I obtained a good understanding of the PhD topic from different angles. Similar findings also emerged from these complementary methods, suggesting validity. My PhD research was also wide enough to give me a holistic view of morbidities, but also focused enough to obtain detailed information with respect to three morbidities (vomiting, prolonged labour and haemorrhage).

9.4.2 Limitations

My PhD research also had some limitations:

A. Related to scope

Due to the limited time frame of my PhD, it was not possible to study a wide variety of morbidities in the qualitative phase (for example, obstetric fistula and postpartum depression were not included); the results on impacts of these missed morbidities may have provided additional perspectives had such morbidities been sampled. However, I purposively sampled women with a broad range of health problems which provided varied perspectives on morbidities. In addition, there may have been longer-term reports of impacts of morbidities that I may have missed as I interviewed women who had delivered within two years. I only came across five cases of moderate/severe vomiting and it is plausible that additional perspectives on impacts may have been obtained with a larger sample size. There were some topics that I could have explored in-depth, for example, perceptions of ‘normal labour’ and other aspects of care-seeking (for example, facilitators/barriers to health service utilisation, over-medicalisation, and so on).

In addition, I was unable to cover certain areas in the survey in-depth. While I found that morbidities exert different kinds of consequences, I could only measure the impacts on a limited number of domains of life (physical, social, marital, bodily, nurturing and financial) and did not include other aspects such as mental health consequences. In addition, I included a gatekeeping question in the severity section and only considered the two most serious health problems. This could have reduced the prevalence of individual severe health conditions. In the future, it may be necessary to measure the severity of all morbidities reported in order to get more accurate prevalence measures, although this will be time-consuming. Lastly, the eligibility criteria included only married women who had given birth within the past two years. Out-of-wedlock deliveries are extremely rare in the area and although I do not anticipate that this may have introduced significant selection bias, the experiences and behaviours of this group may be different from their married counterparts.

B. Related to the data collection

The first FGD that I conducted in a rural area turned into a ‘mini community meeting’ because I had minimal control of who came in and who left. Therefore I labelled this as a pilot and it did not contribute to the data. Other individuals were present in a few FGDs and interviews (family members, neighbours, community liaisons) but they were largely non-disruptive and/or did not stay for the entire duration of the discussion. While remaining quiet about 95% of the time, one community liaison- whom the respondents are very free with- interjected in the discussion in a few cases (rephrasing the FGD question to enhance comprehension or commenting on the topic). When this involved the topic, I mitigated the situation and tacitly discouraged the community liaison from contributing. A key lesson learnt is to make FGDs as private as possible and not have the organiser present.

There were additional limitations relating to the data collection. I used different time points (by mistaken definition) to indicate the onset of the postpartum period in the qualitative phase. In the FGDs, it was “*from the time the placenta comes out.....*” and in the interviews “*from the time the baby comes out.....*” I found that women do not generally consider such minute, micro-level details hence this should not have caused any confusion. For haemorrhage, it was somewhat difficult to identify women within the community who had experienced haemorrhage in reality, although a few women gave descriptions that suggested excessive bleeding. In hindsight, the recall section of the cognitive interviews had some missed opportunities that I could have captured during the data collection phase. For example, I could have purposively selected women who had experienced specific morbidities and then asked well-tailored questions to explore recall in-depth for those conditions. These could then be compared to recall for some other group of morbidities. I could have also explored recall by severity of conditions.

I was in London when the survey was conducted and I supervised it remotely. While I held periodic debriefing with the data collection team over the phone to obtain updates, discuss any challenges experienced and also remind them about best practices, this was not the ideal set-up. In one of the debriefing sessions at the earlier

stages of the survey, a data collector mistakenly thought that the severity sections were meant for health problems where hospital care-seeking was made; this affected perhaps tens of interviews. This could have led to a slight underestimation of women who reported a severe health problem. In addition, initially some probing for health problems was mistakenly done in the unprompted section but I corrected this for subsequent rounds of data collection. A post-survey interview with a key data collector and also the data cleaning process helped to show areas of improvement for the next survey I embark upon. In addition, I did not carry out double data entry, although I designed the database with built-in features to minimise errors as much as possible. Lastly, I was unable to use the severity scale that I validated because the author refused to grant permission to use the modified version. However, findings from the modifications helped to inform the choice of the suitable alternative scale that I used subsequently.

C. Using self-reports

I have already outlined the issues that I unpicked relating to using self-reports and measuring morbidity within the community in Section 9.3.8. Unfortunately, these issues are inherent with self-reports and it is difficult to ascertain to what extent they affect results. In addition, I did not validate the survey tool quantitatively nor did I check responses against a gold standard (for example, using medical records). However, qualitative methods informed the design of the survey and I also validated the tool using cognitive interviews.

9.5 Implications for Future Research

A. Improving the evidence base

As highlighted in the scoping review and discussion section, more research is needed on maternal morbidity in community settings, which generally bear the highest burdens of maternal ill-health [50]. The morbidities to be studied should be diverse and include less severe ones since they are important to women. More studies are needed on the impacts of morbidities beyond heavily studied ones such as maternal near misses and obstetric fistula.

More studies are also needed on vomiting in low income settings since these appear to be largely non-existent. I found a high prevalence of vomiting during pregnancy-one in every three women, which suggests a high burden. The impact of vomiting on nutrition as well as its association with anaemia should also be explored, since some women reported nutritional impacts of vomiting. I did not explore treatment regimens for vomiting in my study in-depth but this is one area that could provide additional insights. A Cochrane review found a wide variety of interventions for NVP from ginger to lemon oil to acupuncture and antiemetic medications; the authors concluded that “women and health professionals need clear guidelines about effective and safe interventions” [313]. It will be interesting to obtain perspectives on treatments for vomiting from low income settings.

As the MMWG has made efforts to standardise the definition and measurement of maternal morbidity, future studies should adopt these new developments so that comparisons can be made across settings. However, the Maternal Morbidity Matrix tool may not be applicable or readily feasible outside a facility setting in measuring certain morbidities (for example, those requiring laboratory tests) and alternative tools may be required in areas with low service utilisation.

Lastly, there is a need for higher quality studies in maternal morbidity research as observational studies are the primary study designs used. Cross-sectional studies currently dominate the evidence base and there is a need for more robust studies that are less prone to confounding and bias. The MMWG have suggested longitudinal studies from early pregnancy to the extended postpartum period [140]; this is a welcome idea. While there is an ongoing large-scale cohort study on morbidity- the AMANHI study [53]- many more are needed to address areas not covered by this study (such as less severe morbidities) and should be conducted where resources are available.

B. Usage of qualitative methodology

Measurement efforts will greatly benefit from utilising qualitative methodologies. The qualitative phase of my research enabled me to learn extensively about

morbidities in a way that the survey did not readily allow. Many researchers do not utilise these methods and their value is not always appreciated. The qualitative phase also benefited the survey by: providing colloquial insights; highlighting women's recall tendencies; identifying difficulties unique to certain demographic groups; and identifying additional questions for the questionnaire and showing ways to improve the sensitivity of certain questions. Through the cognitive interviews, I also validated the survey tool and learnt important lessons, such as the need to prioritise respondents' comprehension over achieving academic rigour and the fact that prioritising inclusivity tended to elongate survey questions (which has implications for data collection time). The cognitive interviews were also instrumental in identifying and testing appropriate wording to use in the survey questions.

C. Related to research scope

It is important to clarify the objective of a measurement study as it will determine the scope of the research. If the objective is to measure 'all' maternal morbidities, then a broad, holistic measurement is needed with the potential for missing certain details. If the objective, however, is to obtain in-depth, detailed knowledge, then it may be strategic to focus on a few selected morbidities. My PhD study had both components, each providing unique perspective on the research topic. I observed that most community studies tend to have a 'broad-spectrum' measurement objective aiming to obtain information about a broad range of morbidities and to also obtain a morbidity 'snap-shot' of a population. There is a need to also conduct single-morbidity studies to gain in-depth understanding of these morbidities. However, larger sample sizes will be needed to measure rarer morbidities within community settings and to also allow for disaggregated analyses.

As previously mentioned, I found that morbidities exert consequences on several aspects of women's lives. Studies aimed at measuring consequences therefore have to be sufficiently broad enough in scope to comprehensively capture the impacts of morbidities. To measure financial consequences of morbidities, appropriate methods need to be utilised. As it appears that husbands mainly paid the cost of healthcare and treatments for morbidities in my study, measurements with women as respondents are likely to underestimate the extent of financial consequences. It may

be useful to ask husbands as opposed to wives for financial consequences in this context. Previous studies measuring financial consequences of maternal morbidities/care using catastrophic spending have sometimes interviewed household heads and/or other accompanying females [314-317].

D. Related to self-reports

Self-reports have both strengths and weaknesses. They are very useful for measuring conditions for which there are no alternatives to asking women themselves (for example, vomiting), for measuring functioning and impacts of morbidities, and are generally inexpensive. However, where more reliable diagnostic measures exist and resources allow, more objective measurement should be used. Self-reports should be seen as one component amongst a range of measurement methods. Some experts have already suggested the need for a “mixed criteria” of identifying morbidities using several methods including clinical diagnoses, treatments, self-reports, procedures, and so on [136]. The newly developed Maternal Morbidity Matrix tool also encompasses these diverse methods. As antenatal care is now nearly universal in many developing countries, we may be able to measure morbidities that occur during pregnancy using these more objective methods; measuring morbidities occurring during delivery and postpartum may be more problematic where usage of services within these periods is low.

Less severe conditions constituted the highest burden of maternal health problems in the results. For studies using self-reports, survey researchers would need to make it clear that these conditions are important to women. However in measuring these conditions, they should be aware of the likelihood of obtaining high prevalences of very diverse health problems. Perhaps it may be necessary to focus on some of the most common health problems on the less severe end of the spectrum. Future studies may also need to use both tracer symptoms and specific medical names to capture cases. In addition, specific tests for certain morbidities could also be included in survey tools to capture less recognised morbidities, for example, the Edinburgh Postnatal Depression Scale (EPDS) for postpartum depression.

9.6 Implications for Practice and Policy

The PhD findings suggest the need to improve women's health. Reports of health problems were high overall in both the qualitative and quantitative phases, and many women and their families experienced negative impacts from these conditions. While maternal health has been prioritised since the beginning of the Safe Motherhood movement in the late 1980s, efforts have largely been directed towards preventing maternal mortality; it is important to now focus on preventing, treating and managing maternal morbidity. Maternal health goes beyond surviving pregnancy, and beyond the health of the women [318, 319], and efforts should be geared towards improving women's health and quality of life during pregnancy, delivery and postpartum.

When designing programmes aimed at tackling maternal morbidity, it is imperative to also consider morbidities that are important to women. While these may not necessarily be the ones prioritised by public health since they are not life-threatening, they impact women's lives significantly. There is a need to also prioritise nutrition during pregnancy, since prevalence of vomiting was high and nutritional impacts of morbidities emerged as one of the top concerns in the qualitative phase. As mentioned previously, funders and policy makers may need to be convinced to channel some resources towards developing programmes or interventions for less severe conditions, as they may view these as low priority due to being non-life-threatening. There is a need for advocacy work.

It is also important to sensitise health professionals in the setting about anthropological perspectives relating to morbidities; this will promote patient-centred care and encourage less medicalised viewpoints. Bowling (2005) rightly argues that "a person can feel ill without medical science being able to detect disease. Measures of health status need to take both concepts into account. What matters in the twenty-first century is how the patient feels, rather than how professionals think they feel" [33]. Health professionals should be encouraged to acknowledge women's experiences of less severe morbidities and treat them with sensitivity. While I did not explore health professionals' attitudes towards women's

complaint of less severe health problems in-depth, a few reports suggest that such complaints may likely be discounted and normalised by health professionals. In addition, they should also be encouraged to note the significant difference that education makes with respect to perceptions of morbidities and care-seeking. This awareness will ensure that they take time to explain procedures to uneducated women, who generally came across as passive. A recent systematic review on abuse/disrespect during delivery in Nigeria found a lack of information provision to patients by health professionals as well as the delivery of procedures (such as blood transfusion, pubic hair shaving and C-section) without consent [173]. One other study conducted in rural Ghana found that health professionals hardly explained procedures they were conducting on women, leaving them to be unaware of the purpose [320]. I did not explore this aspect specifically, but I found that educated women were likely to know the specifics of consultations due to being proactive and curious.

My PhD findings also highlight areas that should be targeted in health promotion messages. Women's perceptions of morbidities were varied in areas such as perceptions of causes of morbidities, normal vs abnormal conditions, thresholds of morbidity durations, minimal vs much blood loss and how women should bleed during delivery and postpartum. Some of these perceptions were in line with biomedicine and others deviated from it. The latter group should be targeted and sensitised. However, it will be naive to assume that identifying misconceptions (for example, relating to perceived causes of morbidities, or perceptions around blood loss depending on context) and designing health education programmes to 'correct' them will lead to behaviour change. Human beings are complex and do not live in isolation, but rather belong to networks and are members of communities. The findings show that lay networks influence women's perceptions and care-seeking. Behaviour change programmes should shift increasingly from being 'woman-focused' to also involving her social networks and community.

I have also highlighted several other opportunities that health promotion programmes can maximise relating to care-seeking. As perceptions of severity and familiarity are

key drivers of care-seeking, changing perceptions of severity can influence care-seeking. The universal 'fear' of haemorrhage can also be harnessed to encourage good health behaviours. As women use opportunistic care-seeking during ANC, they should be given similar opportunities in the postpartum period when they visit health facilities to immunise their babies or attend postpartum follow-up.

Chapter 10: Conclusion

This PhD study aimed to explore maternal morbidity within communities in Yola, Adamawa State, Northern Nigeria in order to understand perceptions, care-seeking and measurement. It found that:

- Perceptions of morbidities were varied in areas such as perceptions of causes of morbidities, normal vs abnormal conditions, thresholds of morbidity durations, minimal vs much blood loss, and how women should bleed during delivery and postpartum; some of these perceptions were in line with biomedicine and others deviated from it. This finding shows areas where health knowledge may need to be improved.
- Care-seeking for reported morbidities consisted of numerous approaches, options, drivers and influencers. These present opportunities for reinforcing good health behaviours in health promotion messages as well as provide avenues for addressing practices that may compromise women's health.
- Perceived morbidity status was the most dominant factor used to label a pregnancy as normal or difficult and high levels of health problems were reported in the survey. This underscores the need to improve women's health and experiences of pregnancy and childbirth beyond ensuring survival. While life-threatening issues are likely to continue being prioritised in maternal health research and practice, it is also important to direct some attention to less severe conditions since these are important to women.
- Measuring maternal morbidity in community settings using self-reports has numerous strengths but also has unique limitations. Community measurement using self-reports should therefore be used as a complement to other measurement efforts. In addition, mixed-methods approaches should be employed to obtain comprehensive understanding of morbidities. Currently,

many measurement studies use quantitative methods almost exclusively but would greatly benefit from utilising qualitative methods as well. This will not only provide valuable formative insights but will also ensure that context-specific data are captured.

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Appendices

Appendix 2.1: Search strategy for EMBASE

Perceptions Domain

1. (matern* adj2 (morbidit* or complicat* or disease* or ill* or disorder*)).mp. [mp=title, abstract, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword]
2. (pregnan* adj2 (morbidit* or complicat* or disease* or ill* or disorder*)).mp. [mp=title, abstract, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword]
3. (deliver* adj2 (morbidit* or complicat* or disease* or ill* or disorder*)).mp. [mp=title, abstract, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword]
4. (birth* adj2 (morbidit* or complicat* or disease* or ill* or disorder*)).mp. [mp=title, abstract, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword]
5. (obstetric* adj2 (morbidit* or complicat* or disease* or ill* or disorder*)).mp. [mp=title, abstract, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword]
6. (labo?r adj2 (morbidit* or complicat* or disease* or ill* or disorder*)).mp. [mp=title, abstract, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword]
7. ((childbirth or child-birth) adj2 (morbidit* or complicat* or disease* or ill* or disorder*)).mp. [mp=title, abstract, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword]
8. (postpartum adj2 (morbidit* or complicat* or disease* or ill* or disorder*)).mp. [mp=title, abstract, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword]
9. (postnatal adj2 (morbidit* or complicat* or disease* or ill* or disorder*)).mp. [mp=title, abstract, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword]
10. (puerper* adj2 (morbidit* or complicat* or disease* or ill* or disorder*)).mp. [mp=title, abstract, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword]
11. (matern* adj2 (nearmiss* or near-miss*)).mp. [mp=title, abstract, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword]
12. (obstetric* adj2 (nearmiss* or near-miss*)).mp. [mp=title, abstract, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword]
13. ((nearmiss* or near-miss*) adj2 morbidit*).mp. [mp=title, abstract, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword]
14. ((severe adj acute adj matern* adj morbidit*) or "SAMM").mp. [mp=title, abstract, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword]
15. (antepartum adj h?emorrhage).mp. [mp=title, abstract, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword]

16. (intrapartum adj h?emorrhage).mp. [mp=title, abstract, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword]
17. (postpartum adj h?emorrhage).mp. [mp=title, abstract, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword]
18. (vomiting or hyperemesis gravidarum).mp. [mp=title, abstract, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword]
19. ((prolonged or obstructed or delayed) adj labo?r).mp. [mp=title, abstract, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword]
20. exp maternal morbidity/
21. exp maternal disease/
22. exp pregnancy complication/
23. exp labor complication/
24. exp puerperal disorder/
25. exp puerperal infection/
26. exp puerperal depression/
27. exp puerperal psychosis/
28. or/1-27
29. perception*.mp.
30. perspective*.mp.
31. view*.mp.
32. practi?e*.mp.
33. belief*.mp.
34. experience*.mp.
35. attitude*.mp.
36. understanding*.mp.
37. interpret*.mp.
38. label*.mp.
39. tradition*.mp.
40. Perception/
41. exp maternal attitude/
42. exp attitude to health/ or exp attitude to illness/ or exp attitude to pregnancy/
43. exp health belief/
44. or/29-43
45. exp "Africa South of the Sahara"/
46. ((sub-saharan or subsaharan) adj africa).mp. [mp=title, abstract, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword]
47. 45 or 46
48. 28 and 44 and 47
49. limit 48 to human

Care-seeking Domain

1. (matern* adj2 (morbidity* or complicat* or disease* or ill* or disorder*)).mp. [mp=title, abstract, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword]
2. (pregnan* adj2 (morbidity* or complicat* or disease* or ill* or disorder*)).mp. [mp=title, abstract, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword]
3. (deliver* adj2 (morbidity* or complicat* or disease* or ill* or disorder*)).mp. [mp=title, abstract, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword]

4. (birth* adj2 (morbidity* or complicat* or disease* or ill* or disorder*)).mp. [mp=title, abstract, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword]
5. (obstetric* adj2 (morbidity* or complicat* or disease* or ill* or disorder*)).mp. [mp=title, abstract, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword]
6. (labo?r adj2 (morbidity* or complicat* or disease* or ill* or disorder*)).mp. [mp=title, abstract, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword]
7. ((childbirth or child-birth) adj2 (morbidity* or complicat* or disease* or ill* or disorder*)).mp. [mp=title, abstract, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword]
8. (postpartum adj2 (morbidity* or complicat* or disease* or ill* or disorder*)).mp. [mp=title, abstract, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword]
9. (postnatal adj2 (morbidity* or complicat* or disease* or ill* or disorder*)).mp. [mp=title, abstract, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword]
10. (puerper* adj2 (morbidity* or complicat* or disease* or ill* or disorder*)).mp. [mp=title, abstract, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword]
11. (matern* adj2 (nearmiss* or near-miss*)).mp. [mp=title, abstract, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword]
12. (obstetric* adj2 (nearmiss* or near-miss*)).mp. [mp=title, abstract, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword]
13. ((nearmiss* or near-miss*) adj2 morbidity*).mp. [mp=title, abstract, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword]
14. ((severe adj acute adj matern* adj morbidity*) or "SAMM").mp. [mp=title, abstract, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword]
15. (antepartum adj h?emorrhage).mp. [mp=title, abstract, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword]
16. (intrapartum adj h?emorrhage).mp. [mp=title, abstract, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword]
17. (postpartum adj h?emorrhage).mp. [mp=title, abstract, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword]
18. (vomiting or hyperemesis gravidarum).mp. [mp=title, abstract, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword]
19. ((prolonged or obstructed or delayed) adj labo?r).mp. [mp=title, abstract, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword]
20. exp maternal morbidity/
21. exp maternal disease/
22. exp pregnancy complication/
23. exp labor complication/
24. exp puerperal disorder/
25. exp puerperal infection/
26. exp puerperal depression/
27. exp puerperal psychosis/
28. or/1-27
29. (careseek* or care-seek*).mp. [mp=title, abstract, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword]

30. (healthseek* or health-seek*).mp. [mp=title, abstract, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword]
31. treatment-seek*.mp.
32. (care adj seek* adj behavio?r*).mp. [mp=title, abstract, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword]
33. (health adj seek* adj behavio?r*).mp. [mp=title, abstract, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword]
34. (illness adj behavio?r*).mp. [mp=title, abstract, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword]
35. (health adj utili?ation).mp. [mp=title, abstract, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword]
36. (health adj service* adj utili?ation).mp. [mp=title, abstract, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword]
37. (lay adj network*).mp. [mp=title, abstract, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword]
38. (lay adj referral*).mp. [mp=title, abstract, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword]
39. (lay adj referral* adj system*).mp. [mp=title, abstract, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword]
40. exp help seeking behavior/
41. exp health care utilization/
42. exp illness behavior/
43. or/29-42
44. exp "Africa South of the Sahara"/
45. ((sub-saharan or subsaharan) adj africa).mp. [mp=title, abstract, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword]
46. 44 or 45
47. 28 and 43 and 46

Measurement Domain

1. (matern* adj2 (morbidity* or complicat* or disease* or ill* or disorder*)).mp. [mp=title, abstract, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword]
2. (pregnan* adj2 (morbidity* or complicat* or disease* or ill* or disorder*)).mp. [mp=title, abstract, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword]
3. (deliver* adj2 (morbidity* or complicat* or disease* or ill* or disorder*)).mp. [mp=title, abstract, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword]
4. (birth* adj2 (morbidity* or complicat* or disease* or ill* or disorder*)).mp. [mp=title, abstract, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword]
5. (obstetric* adj2 (morbidity* or complicat* or disease* or ill* or disorder*)).mp. [mp=title, abstract, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword]
6. (labo?r adj2 (morbidity* or complicat* or disease* or ill* or disorder*)).mp. [mp=title, abstract, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword]

7. ((childbirth or child-birth) adj2 (morbidit* or complicat* or disease* or ill* or disorder*)).mp. [mp=title, abstract, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword]
8. (postpartum adj2 (morbidit* or complicat* or disease* or ill* or disorder*)).mp. [mp=title, abstract, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword]
9. (postnatal adj2 (morbidit* or complicat* or disease* or ill* or disorder*)).mp. [mp=title, abstract, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword]
10. (puerper* adj2 (morbidit* or complicat* or disease* or ill* or disorder*)).mp. [mp=title, abstract, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword]
11. (matern* adj2 (nearmiss* or near-miss*)).mp. [mp=title, abstract, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword]
12. (obstetric* adj2 (nearmiss* or near-miss*)).mp. [mp=title, abstract, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword]
13. ((nearmiss* or near-miss*) adj2 morbidit*).mp. [mp=title, abstract, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword]
14. ((severe adj acute adj matern* adj morbidit*) or "SAMM").mp. [mp=title, abstract, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword]
15. (antepartum adj h?emorrhage).mp. [mp=title, abstract, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword]
16. (intrapartum adj h?emorrhage).mp. [mp=title, abstract, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword]
17. (postpartum adj h?emorrhage).mp. [mp=title, abstract, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword]
18. (vomiting or hyperemesis gravidarum).mp. [mp=title, abstract, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword]
19. ((prolonged or obstructed or delayed) adj labo?r).mp. [mp=title, abstract, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword]
20. exp maternal morbidity/
21. exp maternal disease/
22. exp pregnancy complication/
23. exp labor complication/
24. exp puerperal disorder/
25. exp puerperal infection/
26. exp puerperal depression/
27. exp puerperal psychosis/
28. or/1-27
29. prevalence*.mp.
30. incidence*.mp.
31. (crosssectional or cross-sectional).mp. [mp=title, abstract, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword]
32. survey*.mp.
33. (communit* adj2 survey*).mp. [mp=title, abstract, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword]
34. (communit* adj2 stud*).mp. [mp=title, abstract, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword]
35. recall*.mp.

36. (self-report* or selfreport*).mp. [mp=title, abstract, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword]
37. indicator*.mp.
38. (quanti* adj research*).mp. [mp=title, abstract, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword]
39. (risk adj factor*).mp. [mp=title, abstract, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword]
40. determinant*.mp.
41. ((severe or severit*) adj2 (measur* or estimat* or quantif*)).mp. [mp=title, abstract, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword]
42. (pain adj2 (measur* or estimat* or quantif*)).mp. [mp=title, abstract, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword]
43. exp prevalence/
44. exp incidence/
45. exp self report/
46. exp cross-sectional study/
47. exp scoring system/
48. exp injury scale/
49. exp injury severity/
50. exp disease severity assessment/
51. exp pain assessment/
52. exp pain parameters/
53. exp risk factor/
54. or/29-53
55. exp "Africa South of the Sahara"/
56. ((sub-saharan or subsaharan) adj africa).mp. [mp=title, abstract, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword]
57. 55 or 56
58. 28 and 54 and 57
59. limit 58 to human

Appendix 3.1: Ethical approvals obtained

A. Approval from the Adamawa State Ministry of Health



ADAMAWA STATE MINISTRY OF HEALTH

e-mail address: admoh_yola@yahoo.com
Telegram: Sec. Health
Telephone: 075-624063
624003

Ref. No: S/MoH/HS/1131
State Secretariat
P. M. B. 2078
Yola
Adamawa State
Date: 13/07/2015

JUDITH YARGAWA,
INSTITUTE FOR GLOBAL HEALTH,
UNIVERSITY COLLEGE LONDON.

**Re: APPLICATION FOR ETHICAL PERMIT TO UNDERTAKE A STUDY
ON MATERNAL MORBIDITY**

With reference to your letter dated June 29, 2015 on the above request, I wish to convey the ministry's ethical permit to undertake the study within community of Yola North and South LGAs.

You should note that the ethical permit is granted based on the context of study protocol study you submitted. Consequently it is your responsibility to ensure that the protocol is followed through the study area is relevant, the study, design, particularly the duration of minimum of Six (6) month should be observed.

Note, it is also part of the protocol to communicate your findings to the ministry prior to dissemination and ensure that the ministry is invited to any event connected with either the discussion or dissemination of your findings while wishing you a successful project outcome, please accept the assurances of the permanent secretary's consideration.



VAHYALLA MUSA

For: Permanent Secretary

Ministry of Health,
P. M. B. 2058 /
YOLA,
Adamawa State
Date: 13/07/2015

B. Approval from UCL Research Ethics Committee

UCL RESEARCH ETHICS COMMITTEE
ACADEMIC SERVICES



25 June 2015

Dr Zelee Hill
Institute for Global Health
UCL

Dear Dr Hill

Notification of Ethical Approval

Project ID: 6846/003: Maternal morbidity in Northern Nigeria: community perspectives and measurement

Further to your satisfactory responses to the committee's comments, I am pleased to confirm in my capacity as Chair of the UCL Research Ethics Committee (REC) that your study has been approved by the REC for the duration of the project, until June 2016, on condition that local ethical approval is obtained from the Adamawa State authorities.

Approval is also subject to the following conditions:

1. You must seek Chair's approval for proposed amendments to the research for which this approval has been given. Ethical approval is specific to this project and must not be treated as applicable to research of a similar nature. Each research project is reviewed separately and if there are significant changes to the research protocol you should seek confirmation of continued ethical approval by completing the 'Amendment Approval Request Form'.
2. It is your responsibility to report to the Committee any unanticipated problems or adverse events involving risks to participants or others. Both non-serious and serious adverse events must be reported.

Reporting Non-Serious Adverse Events

For non-serious adverse events you will need to inform Helen Dougal, Ethics Committee Administrator (ethics@ucl.ac.uk), within ten days of an adverse incident occurring and provide a full written report that should include any amendments to the participant information sheet and study protocol. The Chair or Vice-Chair of the Ethics Committee will confirm that the incident is non-serious and report to the Committee at the next meeting. The final view of the Committee will be communicated to you.

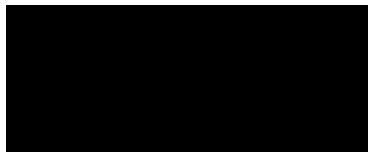
Reporting Serious Adverse Events

The Ethics Committee should be notified of all serious adverse events via the Ethics Committee Administrator immediately the incident occurs. Where the adverse incident is unexpected and serious, the Chair or Vice-Chair will decide whether the study should be terminated pending the opinion of an independent expert. The adverse event will be considered at the next Committee meeting and a decision will be made on the need to change the information leaflet and/or study protocol.

On completion of the research you must submit a brief report (a maximum of two sides of A4) of your findings/concluding comments to the Committee, which includes in particular issues relating to the ethical implications of the research.

With best wishes for the research.

Yours sincerely



Professor John Foreman
Chair of the UCL Research Ethics Committee

Cc: Judith Yargawa, Applicant

Appendix 3.2: Information sheets using during recruitment

Information Sheet (Interviews)

You will be given a copy of this information sheet.

Title of Project: Maternal Morbidity in Northern Nigeria: Community Perceptions, Care-seeking and Measurement

This study has been approved by the Adamawa State Ministry of Health and the UCL Research Ethics Committee (Project ID Number: 6846/003).

Name Judith Yargawa

**Contact
Details**



I would like to invite you to take part in an interview about health in pregnancy, during and after delivery. Before you decide if you want to be interviewed, I would like to provide you with some information. Please read the information below and ask me any questions that come to mind.

Details of Study: Aim of the research

This study aims to understand problems that women may have in pregnancy and related to childbirth in Yola. We would like to learn from you what problems are common and about your experiences during your last pregnancy, delivery and after birth. We believe that this knowledge might help us to better understand ways to improve women's health and the support they get during pregnancy, delivery and after birth.

Recruitment

We would like to invite married women aged 15-49 years who live in and recently delivered in Yola to participate. As you have recently delivered in Yola, we would like to invite you to take part.

Study type and procedures

If you agree to take part in this study, you will be participating in an interview with me. The interview can be conducted at a time that is convenient to you. The interview can take place in your house or any other venue you are comfortable with. It will be a one-off interview that will last for approximately one hour. I will be the only person present with you during the interview, unless you prefer to have someone else with you. I will take some notes during the

interviews, and if you agree, I would like to tape-record the interview so that I do not miss anything you say. If it is OK, I may also conduct an additional interview with you together with some members of your family about issues on pregnancy, delivery and after birth that are important to you as a family. This, of course, will also depend on whether or not your family members would like to participate in the family interview.

Risks and benefits

There will be no direct benefits to you taking part, but it may help us improve maternal care. There are no risks to participating, but we will ask you about any problems you had in pregnancy, during and after delivery. If you do not wish to answer any questions, it is totally fine to skip the question. You can also discontinue the study at any point if you wish without giving any reason.

Anonymity and Confidentiality

I will keep everything you say confidential by not writing your name on my notes, storing the notes and tape recording securely. If the study team reports your opinions or ideas, your name will not appear and we will make sure that you cannot be identified. During the interview, I may call your name but when your interview is written up I will give you a code number as opposed to your name so that you cannot be traced.

Voluntary nature of the study

Taking part in the study is voluntary. You do not have to give a reason to refuse to take part or to stop the interview. Refusing to participate will not cause anything bad to happen. We do not pay people for being interviewed.

Any Further Questions

Please feel free to contact me by email or phone if you have any further questions. (Contact details have been provided at the beginning of this document).

Please discuss the information above with others if you wish or ask me if there is anything unclear or if you would like more information.

It is up to you to decide whether to take part or not; choosing not to take part will not disadvantage you in any way. If you do decide to take part, you are still free to withdraw at any time and without giving a reason.

All data will be collected and stored in accordance with the Data Protection Act 1998.

Thank you for reading this information sheet and for considering taking part in this research.

Information Sheet (Focus Group Discussions)

You will be given a copy of this information sheet.

Title of Project: Maternal Morbidity in Northern Nigeria: Community Perceptions, Care-seeking and Measurement

This study has been approved by the Adamawa State Ministry of Health and the UCL Research Ethics Committee (Project ID Number: 6846/003).

Name Judith Yargawa

**Contact
Details**



I would like to invite you to take part in a discussion about health in pregnancy, during and after delivery. Before you decide if you want to be involved, I would like to provide you with some information. Please read the information below and ask me any questions that come to mind.

Details of Study: Aim of the research

This study aims to understand problems that women may have in pregnancy and related to childbirth in Yola. We would like to learn from you and other women what problems are common and about issues important to women during pregnancy, delivery and after birth. We believe that this knowledge might help us to better understand ways to improve women's health and the support they get during pregnancy, delivery and after birth.

Recruitment

We would like to invite married women aged 15-49 years who live in and recently delivered in Yola to participate. As you have recently delivered in Yola we would like to invite you to take part.

Study type and procedures

If you agree to take part in this study, you and other women in similar age groups will be participating in a discussion with me. The discussion can be conducted at a time that is convenient to you all. The discussion can take place in a central venue close to your homes and which you are all comfortable with. It will be a one-off discussion that will last for approximately one hour. If you agree, I would like to tape-record the discussion so that I do not miss anything you say. I will be the only person present with you during the discussion; however, I'll come along with an assistant to help me coordinate the recording and to also take some notes while we discuss.

Risks and benefits

There will be no direct benefits to you taking part, but it may help us improve maternal care. There are no risks to participating, but I will ask you about general problems that women have in pregnancy, during and after delivery. If you do not wish to answer any questions, it is totally fine to keep quiet. You can also discontinue the study at any point if you wish without giving any reason.

Anonymity and Confidentiality

I will keep everything you say confidential by not writing your name on my notes, storing the notes and tape recording securely. If the study team reports your opinions or ideas, your name will not appear and we will make sure that you cannot be identified. During the discussion, I may call your name but when the information is written up I will give you a code number as opposed to your name so that you cannot be traced. We all will also be setting ground rules at the start of our discussion so that everyone's opinions are respected and kept private.

Voluntary nature of the study

Taking part in the study is voluntary. You do not have to give a reason to refuse to take part or to stop the discussion. Refusing to participate will not cause anything bad to happen. We do not pay people for taking part in a discussion.

Any Further Questions

Please feel free to contact me by email or phone if you have any further questions (Contact details have been provided at the beginning of this document).

Please discuss the information above with others if you wish or ask me if there is anything unclear or if you would like more information.

It is up to you to decide whether to take part or not; choosing not to take part will not disadvantage you in any way. If you do decide to take part, you are still free to withdraw at any time and without giving a reason.

All data will be collected and stored in accordance with the Data Protection Act 1998.

Thank you for reading this information sheet and for considering taking part in this research.

Appendix 3.3: Informed consent forms

For all studies (except the survey's, which is on the next page)

Informed Consent Form

Please complete this form after you have read the Information Sheet and/or listened to an explanation about the research.

Title of Project: Maternal Morbidity in Northern Nigeria: Community Perspectives and Measurement

This study has been approved by the Adamawa State Ministry of Health and the UCL Research Ethics Committee (UCL Project ID Number): 6846/003

Thank you for your interest in taking part in this research. Before you agree to take part, the person organising the research must explain the project to you.

If you have any questions arising from the Information Sheet or explanation already given to you, please ask the researcher before you decide whether to join in. You will be given a copy of this Consent Form to keep and refer to at any time.

Participant's Statement

I,

- have read the notes written above and the Information Sheet, and understand what the study involves.
- understand that if I decide at any time that I no longer wish to take part in this project, I can notify the researchers involved and withdraw immediately.
- consent to the processing of my personal information for the purposes of this research study.
- understand that such information will be treated as strictly confidential and handled in accordance with the provisions of the Data Protection Act 1998.
- agree that the research project named above has been explained to me to my satisfaction and I agree to take part in this study.

Please tick this box if you agree to be contacted for future studies.

☐

Signed/ Thumb-print:

Date:

INTRODUCTION AND ELIGIBILITY (IE)

Inakwana/Inayini. My name is ----- and I am conducting a survey that hopes to understand problems that women may have in pregnancy and related to childbirth in Nigeria. We believe that this knowledge might help us to better understand ways to improve women's health and the support they get during pregnancy, delivery and after birth. INQUIRE ABOUT THE FOLLOWING POLITELY:

IE1. Are there any married women in this household? REMEMBER: WOMEN WHO WERE MARRIED BEFORE BABY WAS BORN BUT ARE NOT CURRENTLY MARRIED ARE STILL ELIGIBLE	IE2. Did she/they give birth within the past two years?	IE3. Is she/they between 15-49 years of age?	IE4. Does she/do they live here in (<i>name of settlement</i>) or she/they came in from another place?																												
<table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <tr> <td>Y</td><td>N</td><td>DK</td></tr> <tr> <td>1</td><td>2</td><td>99</td></tr> </table>	Y	N	DK	1	2	99	<table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <tr> <td>Y</td><td>N</td><td>DK</td></tr> <tr> <td>1</td><td>2</td><td>99</td></tr> </table> <p style="margin-top: 10px;"> PROBE IF 'NO'- By given birth, I mean did she deliver a child who: - either was born without breath? - or who ever breathed or cried or showed other signs of life- even if he or she lived only a few minutes or hours? </p> <table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <tr> <td>Y</td><td>N</td><td>DK</td></tr> <tr> <td>1</td><td>2</td><td>99</td></tr> </table>	Y	N	DK	1	2	99	Y	N	DK	1	2	99	<table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <tr> <td>Y</td><td>N</td><td>DK</td></tr> <tr> <td>1</td><td>2</td><td>99</td></tr> </table>	Y	N	DK	1	2	99	<table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <tr> <td style="width: 50%;">Resident</td><td style="width: 50%;">Non-resident</td></tr> <tr> <td>1</td><td>2</td></tr> </table>	Resident	Non-resident	1	2
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Y	N	DK																													
1	2	99																													
Y	N	DK																													
1	2	99																													
Resident	Non-resident																														
1	2																														

IF ANY 'N', 'DK' OR 'NON-RESIDENT' IS TICKED → THANK RESPONDENT AND MOVE TO NEXT HOUSE.
 IF ALL 'Y' AND 'RESIDENT' ARE TICKED →
 - GO TO 'IC' IF ELIGIBLE WOMAN IS FIRST POINT OF CONTACT.
 - ASK TO SPEAK TO ELIGIBLE WOMAN IF NOT FIRST POINT OF CONTACT. REPEAT INTRODUCTION. GO TO 'IC'.

INFORMED CONSENT (IC)

I would like to invite you to take part in a survey with me, which should take about 1 hour.

Taking part in the study is voluntary; it is up to you to decide whether to take part or not. Refusing to participate will not cause anything bad to happen and you do not have to give a reason for refusing to take part in the survey.

I will keep everything you say confidential by not writing your name on my notes. Whatever information I obtain from you will be secured. Our study team will make sure that you cannot be identified when we report your opinions or ideas.

There are no risks to participating in the survey, but we will ask you about any problems you had in pregnancy, during or after delivery. If you do not wish to answer any questions, it is totally fine to skip the question. You can also discontinue the study at any point if you wish without giving any reason.

If you do decide to take part, you are still free to withdraw at any time and without giving a reason.

GIVE PARTICIPANT INFORMATION SHEET AND EXPLAIN CONSENT FORM.
 PROCEED WITH SURVEY IF CONSENT GIVEN. OTHERWISE, END SURVEY.

Please may I begin now?

Y	N

Time started:

Appendix 4.1: Topic guides for the qualitative phase

FOCUS GROUP DISCUSSION (FGD) TOPIC GUIDE

FGD Code #:

Start Time:

Location:

Date:

End Time:

A. General Information and Ground Rules

- Thank them for coming and give welcome
- Outline aim and objectives of research (purpose of study)
- Explain confidentiality and anonymity
- Explain need for audio recording
- Mention anticipated length of the discussion (approximately 1 hour)
- Remind participants that this is a discussion and they can step in at any time
- Emphasize that there are no right or wrong answers
- Inform them that everyone's views are of interest
- Remind them that not everyone's views will be the same and it is OK to disagree with someone else's point of view
- Remind them to respect other people's views
- Ask if they have any questions
- Ask if they are fine with continuing
- *Switch on recording device*

B. Individual Introductions

- Ask participants to introduce themselves, tell everyone about their favourite food and why they like it
- Introduce yourself and also inform them about your favourite food

C. Opening Question

In general, what do you think women:

- Like about being pregnant?
- Do not like about being pregnant?

D. Pregnancy Questions

1. When one speaks to women who have given birth, some of them will tell you that they had 'normal pregnancies' while others will mention that they had 'difficult pregnancies.'

- What do you think a 'normal pregnancy' is, and what do you think a 'difficult pregnancy' is?

2. Can you list all the illnesses or health problems that can affect a woman during pregnancy? *Any more?*

- From this list, which illnesses or health problems do you think are:
 - The most common
 - The most serious (the ones that need action)
- For each illness or health problem mentioned above, please tell me the following (*If the group generates a long list, select the 'most prominent' morbidities and probe on these*):
 - Cause(s)
 - Symptoms
 - Consequences
 - Treatment (*Probe on any unconventional treatment voiced out- how? when? etc*)

3. What do you think about vomiting during pregnancy? Do you think vomiting is an illness or 'normal' part of pregnancy? *Probe- context in which it is normal and when an illness.*

E. Delivery Questions

1. Let's now talk about labour and delivery. How would a woman know if "true" labour has started? *Probe on differences between true and false labour.*

2. How long would you expect a labour to normally last, that is, from the time a woman starts experiencing very strong, regular contractions which even stopped her from doing chores up to the delivery of her baby?

- How would you define a "long labour?"

3. Can you list all the illnesses or health problems that can affect a woman during labour and delivery? *Any more?*

- From this list, which illnesses or health problems do you think are:
 - The most common
 - The most serious (the ones that need action)
- For each illness or health problem mentioned above, please tell me the following (*If the group generates a long list, select the 'most prominent' morbidities and probe on these*):
 - Cause(s)
 - Symptoms
 - Consequences
 - Treatment (*Probe on any unconventional treatment voiced out- how? when? etc*)

F. Haemorrhage Questions

1. How much quantity of blood would you expect a woman to 'normally' lose **during delivery**? How would you quantify it? *Hear their responses first before showing bottle.*

- Do you think the blood could fill up this bottle (*show them 500mL bottle*), or another bottle less or more than this one?

2. How much quantity of blood would you expect a woman to 'normally' lose **within 24 hours after delivery** (ie, from the time the placenta comes out to 24 hours after delivery)? How would you quantify it? *Hear responses before showing bottle.*

- Do you think the blood could fill up this bottle (*show them 500mL bottle*), or another bottle less or more than this one?

3. How would a woman know if she is losing too much blood after delivery?

4. Do you think a woman needs to seek help at any point of her bleeding? If yes, when?

G. Postpartum Questions

1. Can you list all the illnesses or health problems that can affect a woman after delivery?
Any more?

- From this list, which illnesses or health problems do you think are:
 - The most common
 - The most serious (the ones that need action)
- For each illness or health problem mentioned above, please tell me the following (*If the group generates a long list, select the 'most prominent' morbidities and probe on these*):
 - Cause(s)
 - Symptoms
 - Consequences
 - Treatment (*Probe on any unconventional treatment voiced out- how? when? etc*)

2. Please rank the following health problems/diseases that a woman could experience after birth in order of decreasing severity to you (*Show pictures. Reminder: no right or wrong answers*):

- Leaking urine from genital area (obstetric fistula)
- Burning pain in breasts/painful breasts (mastitis)
- Feeling sad persistently and having crying bouts (Postpartum depression)
- Fever with foul, smelly vaginal discharge (sepsis)
- Soreness/tenderness around genital area (perineal discomfort)
- Bleeding after birth (postpartum haemorrhage)
- Backache (postpartum backache)

Probe: What criteria guided your ranking? Why did you put ----- as #1 and ----- as #7 for example?

H. Lay Networks

Alert participants that these are the last set of questions

1. From time to time, pregnant women or those who delivered may have questions about things such as the health of their baby, their own health, what to eat, what to wear, when to resume work or chores, etc.

- In general, who do you think are useful sources of advice for such questions? *Take note of all sources they provide.*
- What kinds of questions do you think each source is better able to answer/address? (*For example, if they mention "mother" as a source, find out areas/topics that a woman's mother may advise her on*).

I. Conclusion

- Any other thing participants want to say
- Thank participants
- Reassure them of confidentiality and anonymity
- Explain how data will be used
- Adjournment and refreshments

INTERVIEW TOPIC GUIDE

Code #:
Date:

Start Time:
End Time:

Location:

A. Introduction

- Greet and introduce yourself
- Explain aim and objectives of study
- Mention ethical approval
- Mention anticipated length of the interview (approximately 1 hour)
- Explain why you need to record
- Explain anonymity and confidentiality
- Explain benefits and risks
- Explains rights (answer refusal, withdrawal, question clarification, interruption)
- Mention that there are no right or wrong answers (interested in learning from her)
- Mention possibility of follow-up for more information
- Ask if participant has any questions
- Ask if participant is fine with continuing
- Switch on tape recorder

B. Opening Questions

1. Please can you tell me about yourself? Probe for the following if not mentioned or obvious:

- Residence
- Age
- Religion
- Highest educational level
- Occupation
- Wife # (if applicable)
- Number of children
- Gestational age at pregnancy discovery
- Delivery date of last child
- Mode of delivery (Vaginal, C-section, etc)
- Place of delivery

2. I would like to hear about your last pregnancy experience. What do you think about the experience in general, in very broad terms?

C. Pregnancy- 'Normal' vs 'Abnormal' Conditions

1. When one speaks to women who have given birth, some of them will tell you that they had 'normal pregnancies' while others will mention that they had 'difficult pregnancies.'

- What do you think a 'normal pregnancy' is, and what do you think a 'difficult pregnancy' is?
- Do you think your last pregnancy was a 'normal' or a 'difficult' pregnancy? Why do you say that?

D. Pregnancy- Morbidities

1. Would you say you experienced any illness(es) or health problem(s) during your last pregnancy? **Is that all?** Then probe on morbidities

- How did you discover you had (insert morbidity)? Note symptoms
- Did you think (insert morbidity) was a normal part of the pregnancy, or an abnormal aspect? Why do you say that?
- What do you think caused it?
- Did you seek for any treatment/remedy/solution when you had it?
- How did you come about deciding to ---- (insert treatment/remedy/solution)?
- How was this experience for you? How did it impact your day-to-day life?

2. Were you vomiting at any point during your last pregnancy? If yes: Tell me more it. Note:

- Its frequency
- Her weight at this period
- Was the vomiting such that almost everything that goes into her mouth comes out?

Ask these if you suspect HG (vomiting several times a day and weight loss may indicate HG)

- Did you think you were sick or you thought this was normal for a pregnant woman?
- What do you think may have caused this excessive vomiting?
- Did you consult any source about the excessive vomiting?
- How was this experience for you? What was it like to be vomiting this way? Please tell me how a typical day was for you during this time.

E. Labour/Delivery Events

1. Let's now talk about your last labour and delivery.

- How did you know that the labour had started? Probe
- What did you do after the labour had started?
- Was anyone with you during the labour? *If yes: Did s/he play any role during the labour?* Probe
- What do you think about the length of your labour, that is, from the time you started experiencing strong, regular pains (and insert any other descriptions of "serious labour" that woman mentions) to the birth of your baby? Why do you think you had a (long/normal/short) labour?
- Would you say you had a 'normal' or a 'difficult' labour? Why do you say that?
- How about your delivery? Would you say you had a 'normal' or a 'difficult' delivery?
- Were you worried at any point during the labour and delivery?

If respondent does not seem to remember the events around her labour and delivery, ask if she had an escort/doula and request to interview him/her.

F. Haemorrhage Questions

1. Now let's talk about your blood loss **during delivery**.

- What can you say generally about the blood you lost during your last delivery?
- Would you say the blood loss was normal or too small or too much? Why do you say that?
- If you were to quantify the blood loss, how would you quantify it? (*show 500mL and 1,000mL bottles if woman finds it difficult to quantify blood loss*)
- Were you worried about the amount of blood you lost?
 - If yes: Why were you worried?
 - If home birth: What did you do then? Did you seek help/solution? If yes: what did you do? At what point?

2. Now let's talk about your blood loss **within 24 hours after delivery** (that is, from the time the baby came out to 24 hours after delivery).

- What can you say generally about the blood you lost within this period?
- Would you say the blood loss was normal or too small or too much? Why do you say that?
- If you were to quantify the blood loss, how would you quantify it? (*show 500mL and 1,000mL bottles if woman finds it difficult to quantify blood loss*)
- Were you worried about the amount of blood you lost?
 - If yes: Why were you worried?
 - What did you do then? Did you seek help/solution? If yes: what did you do? At what point?

3. How was your bleeding in the next few days after delivery? How did it compare with the bleeding within the first 24 hours?

G. Postpartum- Morbidities

1. In general, how was your health after you gave birth?

2. Did you experience any illness(es) or health problems(s) after you gave birth, particularly:

- Within the first 24 hours?
- Within the first one week?
- Beyond the first week?

3. If woman says yes to #2:

- How did you discover you had (*insert morbidity*)? Note symptoms
- Did you think (*insert morbidity*) was a normal after-birth experience, or an abnormal aspect? Why do you say that?
- What do you think caused it?
- Did you seek for any treatment/remedy/solution when you had it?
- How did you come about deciding to ---- (*insert treatment/remedy/solution*)?
- How was this experience for you? How did it impact your day-to-day life?

H. Lay Networks

1. From time to time, pregnant women or those who recently delivered may have questions about their health, what to eat, treatments/remedies for particular issues, etc. In general, who did you ask such questions, excluding antenatal care staff and other hospital staff?:

- When you were pregnant? *Probe on why she consulted this source.*
- After you delivered? *Probe on why she consulted this source.*
- Can you please give me an example of an advice that ----- gave you? *Ask this only if not mentioned spontaneously*

2. Sometimes people voluntarily offer advice or suggestions about issues relating to a woman's health during pregnancy, delivery or after delivery. For example, they give these when they know you are pregnant, when they know you're experiencing a particular health problem or illness, or when they come to greet you after delivery.

- Did anyone give you such advice or suggestions during your last pregnancy, delivery or after delivery? *If yes:*
 - Can you please tell me about it? *Remember to find out how she is related or associated with the person in question.*
 - Did you find the advice/suggestion useful or not? *Probe: How did you find it useful OR how did you not find it useful?*

I. Morbidities Deemed Important

Alert participant that these are the last set of questions

1. In your opinion, what do you think is the worst illness or health problem that a woman can experience:

- During pregnancy?
- During delivery?
- After delivery?

Please tell me why you mentioned this particular illness/ health problem.

J. Conclusion

- Any other thing participant wants to say
- Thank participant
- Reassure them of confidentiality and anonymity
- Explain how data will be used
- Request to interview any additional respondent(s) with woman, if applicable
- Help interviewer change from interview mood to everyday mood
- Listen for any 'door step' data

INTERVIEW TOPIC GUIDE FOR FAMILY INTERVIEWS

Primary Respondent Code #:

Start Time:

Location:

Date:

End Time:

Family Members Present:

A. Introduction

- Greet and introduce yourself
- Explain aim and objectives of the study
- Explain aim of the follow-up and family interview
- Explain anonymity and confidentiality
- Mention anticipated length of the interview (30 minutes max)
- Explain why you need to record
- Mention that there are no right or wrong answers (interested in learning from them)
- Explains rights (answer refusal, withdrawal, question clarification, interruption)
- Ask if participants have any questions and are fine with continuing

B. Follow-up Questions (if primary respondent consents)

- Follow up on any particular issues from the interview with the primary respondent with respect to her:
 - Pregnancy
 - Delivery
 - Postpartum

“----- told me she had ----- What do you remember about this?”

C. Morbidities Deemed Important- Pregnancy

- As a family, are there illnesses or health problems which occur during pregnancy that you would take care of or manage at home? *If yes:*
 - Which ones?
 - Why would you manage or take care of these issues at home?
 - How would you take care of them? *Probe on each: Can you please give me an example of the treatment regimen/ procedure for it?*
- Are there other illnesses or health problems which occur to women during pregnancy that you would seek care for outside your home? *If yes:*
 - Which ones?
 - Why would you seek care outside your home for these issues?
 - What would you do? (*that is, who do they consult or where do they go*)

D. Morbidities Deemed Important- Delivery

- As a family, are there complications or health problems which occur during delivery that you would take care of or manage at home? *If yes:*
 - Which ones?
 - Why would you manage or take care of these issues at home?
 - How would you take care of them? *Probe on each: Can you please give me an example of the treatment regimen/ procedure for it?*
- Are there other complications or health problems which occur to women during delivery that you would seek care for outside your home? *If yes:*
 - Which ones?
 - Why would you seek care outside your home for these issues?
 - What would you do? (*that is, who do they consult or where do they go*)

E. Morbidities Deemed Important- Postpartum

- As a family, are there illnesses or health problems which occur after delivery that you would take care of or manage at home? *If yes:*
 - Which ones?
 - Why would you manage or take care of these issues at home?
 - How would you take care of them? *Probe on each: Can you please give me an example of the treatment regimen/ procedure for it?*
- Are there other illnesses or health problems which occur to women after delivery that you would seek care for outside your home? *If yes:*
 - Which ones?
 - Why would you seek care outside your home for these issues?
 - What would you do? (*that is, who do they consult or where do they go*)

F. Closing

- Any other thing participants want to say
- Reassure them of confidentiality and anonymity
- Thank them

Appendix 4.2: The pre-pilot study

Introduction

I conducted the pre-pilot study to: pre-test the qualitative interview guide for comprehension and length; enhance my transcription and data analysis skills; receive face-to-face feedback from my supervisors. As the focus of the pre-pilot was not on the data per se, I will not report its specific findings relating to my PhD. All data collection tools used are the same as those referred to in the main thesis, except the fieldnotes summary form which I've included as part of this appendix.

Methods

Eligibility and Recruitment

The pre-pilot study was conducted between May and August 2015 in the UK amongst participants that 'best represent/typify' the study population in Nigeria. The eligibility criteria included: Nigerian female; UK resident (but should have spent considerable parts of their lives in Nigeria); given birth in the UK within the past one year; and aged 18-49 years. Respondents were recruited through London-based Nigerian churches, through fellow PhD students, friends and also via snowball. Once identified, I approached respondents face-to-face or through a text message or phone call. The study was explained to them face-to-face using an information sheet and written informed consent was taken from everyone who agreed to participate. The UCL Research Ethics Committee approved the pre-pilot study (Project ID number: 6846/001).

Data Collection

The interviews were mainly carried out in the respondents' homes and lasted for approximately one hour. The interviews were semi-structured and a topic guide was used. Data were recorded using field notes and digital recorders (when respondents consented and where feasible). Feedback was then solicited from respondents after the interview sessions. Particularly, the respondents' opinions were sought on the following areas, and if need be, modified for subsequent sessions [321]:

- General thoughts on the session
- Clarity of instructions
- Nature of questions (ambiguous? repetitive? unclear?)
- Length of interview (too long? too short? just right?)
- Whether any topic has been omitted in respondent's opinion
- Whether respondent objects to answering any question
- Any other comments

While brief notes were taken during the sessions, detailed field notes were written up immediately after concluding sessions to maximise recall. The field notes summary form is shown below:

FIELD NOTES SUMMARY FORM- RESPONDENT #----

Date:

Location:

Domain	Point	Comment
Data-related	Key points from session	
	Themes emerging	
	Relationship of data collected to current research, previous research and analysis	
	Any new information	
	Ideas for later fieldwork	
	Any 'door-step' data	
Methods-related	Topic guide (worked well? Refine it, where?)	
	Modification of methods during study (how and why)	
Dynamics-related	Contextual factors at play during session (presence of others, time of day, location, late arrival, etc)	
	Dynamics observed (hesitation, dominance, interest level, nervousness, evasiveness etc)	
	Atmosphere (relaxed, tensed, moody etc)	
	Non-verbal gestures and cues recorded while interviewing	
	Difficult areas in discussion	
Interviewer-related	Any surprising thing found	
	Areas hard to maintain a 'neutral' stance (potential interviewer bias)	

Any other notes:

Analysis and Data Management

The interview data were transcribed into English. The data were analysed thematically- primarily informed by Braun and Clarke (2006) [207]- and used the methods reported in the main thesis (Section 4.2.5). Microsoft Office packages and Nvivo 10 were used for data management.

Results

Participant Population

Eight women between the ages of 28 and 34 years participated in the study. They all had bachelor's degrees and were from various backgrounds including being medical doctors, house-wives, support workers and retail staff. All women had lived most of their lives in Nigeria (except one woman who left Nigeria at a young age; however she has been visiting the country periodically). Three women were primiparas, three women had two children each, one woman had three children and one woman had four children. In addition, the women had varied circumstances such as spontaneous vaginal deliveries, planned Caesarean Section (C-section), emergency C-section and induced labour.

Decisions and Revisions to the Interview Transcript

The interview transcript eventually went through several revisions along the course of the study. However, care was taken not to modify questions based on 'residency differences,' since Nigerian women in the UK could potentially be different from women residing in Nigeria. Some revisions to the interview transcript and other decisions made include:

- Rearrangement of questions in terms of ordering for better flow.
- Removal, addition or modification of questions to enhance clarity/comprehension, to elicit better responses and to save time (shorten interview). For example, the question, "Did you consult anyone?" was rephrased to "Did you consult any source...?" Also, the question "What are the worst events/illnesses that can happen to a woman?" was rephrased to "What are the worst illnesses or health problems that can happen to a woman?" With the former, women tended to provide answers that related to their baby's health and well-being (such as miscarriages, choking and cot death), which were beyond the scope of the current study.
- Removal of pregnancy narratives (discovery and morbidity narrations). The narratives were taking time and not serving any purpose with respect to the research objectives. Thus I just included "gestational age at pregnancy discovery" as part of the demographic information collected at the beginning, instead of making it part of the detailed interview.
- Deciding areas to probe extensively on and areas to probe minimally on.
- Figuring out a mechanism for generating 'transcripts' from notes when tape-recording is declined or impossible to do.
- Adding an instruction to the introduction section in the guide: That I may contact respondents after the interview at a later date to clarify things or ask for elaboration on certain issues that I identified during analysis, if it's fine with them.

Problematic Areas Identified

I. "Illnesses/diseases experienced" vs. "health problems experienced"

I discovered that it was better to ask about "illnesses/diseases or health problems" than picking either of the two options. Asking about illnesses/diseases experienced tended to

mask nuances and mild morbidities. Respondents also tended to respond with “No, I didn’t have any illnesses/diseases.” On the other hand, asking only about health problems is not very specific and respondents tended to digress.

II. Issues with defining prolonged labour

Identifying prolonged labour is quite difficult. I observed that the initial adapted definition (“time from regular pains to the birth of baby”) was quite vague/ambiguous. For example, there was a respondent who thought her labour was long (said it lasted for days), but then went on to say later that she didn’t “*labour, labour*” because she had emergency CS. Adopting the medical or WHO definitions (which revolve around dilation in centimetres and time) wouldn’t work, since women in the community would not know how much they were dilating. It appears that a better way of identifying prolonged labour among lay women should revolve around continuous pain that doesn’t go away, which keeps getting stronger and doesn’t wane, and which stops them from doing moderate activities such as household chores.

III. Blood loss issues

- Asking about number of times that the pad was changed (to indicate haemorrhage levels) may be useless because some of the women simply changed their pads for hygiene sake. This finding was relevant for the survey however (pretesting the survey tool was not the primary aim of the pre-pilot study).
- Initially, I was showing 500mL and 1,000mL and pictures of various stain gradations of pad to respondents to enable recall of blood loss. However, I observed that I may potentially limit/inhibit respondents’ ‘original/ pure’ expressions of perceptions and may unconsciously be imposing a fixed frame on them. For example, one respondent - who could not remember her blood loss around delivery - automatically answered that her blood loss would fill the 1,000mL bottle because the blood that was dripping afterwards could fill half of the 500mL bottle. Later on, however, she reported that her blood loss wasn’t much- “*mine I wouldn’t classify it as in real hard, very difficult one*” (although she said this in comparison to a friend’s excessive blood loss). In the last few interviews, I did not show the bottles or pictures in the postpartum haemorrhage questions so that I could find out how respondents naturally described the issue. After removing the bottles and pictures, women used the following to quantify blood loss:

Descriptions of minimal blood loss

- The blood lost during delivery would just fill a cup (just 200mL)
- Changing pad just twice a day
- A lay network being surprised that the blood loss was little/minimal compared to her knowledge of usual delivery blood loss (that is, blood loss was below her expectations)

Descriptions of much blood loss (all revolve around usage of pad)

- Changing pads lots of times in a day
- Using more than a full pack of pad within the first day post-delivery (but respondent also acknowledged changing lots of pads because she was uncomfortable)
- Doubling or tripling pads (that is, using more than one pad at the same time)

From these descriptions above, asking about how pads were used (doubling or tripling) appeared to be a better measurement than how frequent the pads were changed (which were sometimes done for hygiene sake).

- Sometimes, women do not vividly remember their blood loss and keep second-guessing.
- Women sometimes reported intrapartum haemorrhage as postpartum haemorrhage and a lot of misclassification can occur if very specific terms are not used. For example, when I asked one woman about her blood loss within the first 24 hours after delivery, she answered that she lost 400mL. I was very surprised that she knew the exact quantity, so I asked how she knew. Then she told me that the midwives wrote it in her chart that she had lost 400mL during her operation. Similarly, another respondent initially mentioned that her blood loss was above normal but then later reported that her blood loss was minimal- half of the pad stained, had changed her pad only twice within the first 24 hours and that she wasn't worried about her blood loss. I later understood that the "above normal" blood loss she reported was intrapartum haemorrhage (she had a tear) and the minimal blood loss she reported later was postpartum haemorrhage. In subsequent interviews, I had to separate haemorrhage into "blood loss during/around delivery" (intrapartum haemorrhage) and "blood loss since you wore the first pad" (postpartum haemorrhage).
- Women who went through CS may not remember their blood loss within the first 24 hours; but some of them remember (those who were awake).

Conclusion

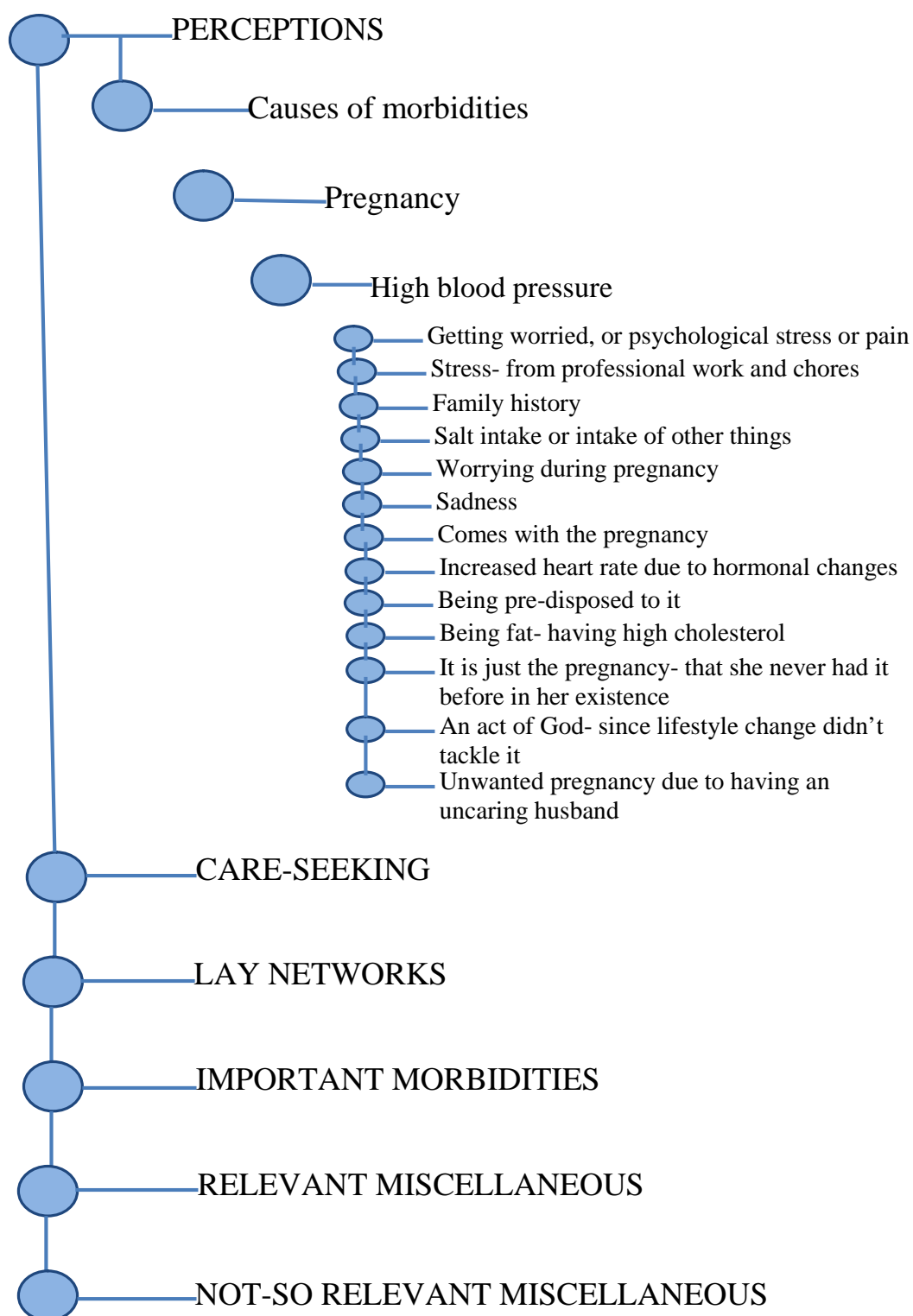
The pre-pilot study enabled me to: identify problematic areas in the interview guide; sharpen my qualitative skills; and receive face-to-face feedback from my supervisors. It was a great learning experience with specific learning opportunities below (in addition to the ones in the results section):

- Conducting interviews in different scenarios including:
 - Private spaces (homes)
 - A private space but having other adults present in a section of the room
 - A noisy, public space with lots of disruptions/interruptions
 - Having active children around
 - Night time
 - Taking breaks when the baby needed his/her mother
- Efficient transcription: I was able to practice transcription and develop strategies for doing it more efficiently.
- Shortening the interview time from one and a half hours to one hour and under, while being able to cover everything
- Understanding and identifying my interview style
- Unpicking useful information for the quantitative study (serendipitously). For example, an added measure of severity was added to the survey tool: Whether the hospital staff had to summon/call a senior person to manage or take over a woman's case. This idea came from a respondent's narrative.

Appendix 4.3: Preliminary interviews with health professionals

Areas covered or lessons learnt
<ul style="list-style-type: none">• Verification of medical and colloquial terms with respect to maternal morbidities• Ascertainment of the Hausa words for key terms in the topic guides• Common maternal morbidities that women report with to facilities• Illnesses that women tend not to report in facilities• How women talk about or describe morbidities• Maternal health metrics that women usually use• Ways women quantify blood loss• The medical definitions of certain morbidities or their diagnostic criteria• Suggestions for detecting/unpicking morbidities from within the community• Differentiation of morbidities with similar presentations• Management of certain morbidities in the Nigerian medical guidelines

Appendix 4.4: An excerpt of codes showing all five levels of the coding tree



Appendix 4.5: Categories formed from codes

Perceptions

'Likes' of getting pregnant

- Getting an addition/ intrinsic reasons
- Fulfilling curiosity/ experiencing mystery/ there's something euphoric about getting pregnant
- Meeting societal/cultural expectations or fitting into society
- Personal reasons

'Dislikes' of getting pregnant

- The morbidities or suffering
- Disruption or inhibition of normal every-life or functions (hers and others)
- You wouldn't receive care from your husband
- The baby- tantrums and responsibilities (*this only came out from the FGD with the 15-19 year olds, which I thought was interesting and could be linked with the child marriage discourse about "children bringing forth children"*)
- Potential societal push-back
- Getting pregnant when the last baby has not yet been weaned

Normal Pregnancy (From broad views, normal pregnancy and whether pregnancy was normal or difficult)

- Euphoric/ utopia
- Minimal or no morbidities
- No disruption to normal life or activities
- Similar or better experiences compared to other pregnant women
- The pregnancy was better than previous pregnancies
- Authoritative sources (doctors, the internet, books) say your experiences are normal, or your health and baby's are normal
- You have a happy ending (delivery is fine, baby has no issues, etc)
- The pregnancy happens at the right time (ie, baby was weaned before pregnancy set in)

Difficult Pregnancy (From broad views, difficult pregnancy and whether pregnancy was normal or difficult)

- Not euphoric
- You experience morbidities (occurrence, number of episodes- frequent visits, hospitalisation)
- Had issues with food (was unable to eat)
- Disrupts normal everyday life, activities and functions
- The pregnancy was tougher than previous pregnancies
- Negatively affected her job (got a reprimand)
- Husband complains about having to always treat you (*from FGDs only*)
- Exhibiting weird behaviours
- No happy ending
- Pregnancy happened at the wrong time

Deviant views on normal vs difficult pregnancy (*these came from the IDIs only*):

- It's alright to experience some morbidities in a normal pregnancy (A normal pregnancy means what is common across board for many women. It means going through pregnancy without the additional stress that pregnancy normally gives. Your pregnancy can also be normal even if you don't end up having a normal delivery).
- A pregnancy can be **both** normal and difficult (This is usually because one aspect was good but not another aspect. For example, you may not lie down due to malaria but you may be unable to eat food for 3 months. The pregnancy may also be better compared to other women but you may have experienced one hospitalisation episode. The pregnancy may start out difficult but become normal as it progresses).
- A pregnancy can be **neither** normal nor difficult (Every pregnancy is unique and comes differently for everyone. A pregnancy can also be neither normal nor difficult if one aspect was good but not another aspect).

Normal vs. Abnormal Morbidities

- If a morbidity is fairly common, it is normal. If it is not common, it is not normal.
- Morbidities that have to do with pain (e.g. headache, backache, abdominal pain) are generally seen as normal. But if such morbidities are perceived as potential symptoms of 'more serious' morbidities, then they are considered abnormal.
- Delivery procedures (such as episiotomy and induced labour) are normal (*add further support for episiotomy from the FGD relevant misc nodes*). However, C-section is not normal because delivery is supposed to be natural/ vaginal. In other words, procedures that are usually done around delivery time are normal (episiotomy and induced labour); the only exception is CS.
- A morbidity has a threshold or boundary for normality. Once a morbidity exceeds this threshold, then it is abnormal.
- If it differs from what you would usually expect, then it is not normal.
- Morbidities characterised by extended time (prolonged labour, delayed placental expulsion) are not normal.

- Bleeding during pregnancy is not normal because one is not supposed to be seeing blood during pregnancy.
- Eclampsia is not normal because it doesn't happen to many people (*expressed by a teenage mum in a rural area. It was interesting to see that its life-threatening potential isn't the reason why it is abnormal*)
- When a morbidity is weird or unexplainable, women normalise it by reporting other women's experiences with the same thing.

Causes of morbidities

Pregnancy

- It's just the pregnancy
- Other morbidities/ physiological factors
- Baby-inspired
- An act of God
- Individual lifestyle or factors
- Stress- physical, psychological, professional
- Unwanted pregnancy due to having an uncaring husband
- No proper care from husband in terms of nutrition
- Family history/ genetics
- Spirit possession- woman's body is raw
- Don't know

Delivery

- Other morbidities
- Medical personnel errors
- Baby-inspired
- Individual factors
- Stress- physical, professional
- Family history/ genetics
- Failure of husband to care for wife during pregnancy- especially relating to feeding
- Other external factors (the heat, weather conditions)
- Don't know

Postpartum

- Not performing postpartum procedures (relating to bath and evacuating blood)
- Stress
- Husband not providing food
- Other morbidities/ physiological factors
- Spirit possession- woman's body is still raw
- Individual lifestyle or factors
- Family history/ genetics
- Superstition- because umbilical cord of the baby has not yet fallen off
- It's the delivery
- Medical errors/ procedures
- Don't know

Consequences of morbidities

Pregnancy

- Can become lifelong/ forever
- Inhibits normal functioning/ disrupts life
- Nutritional impacts
- Becoming dependent on others/ added burden on family members and others
- Can cause miscarriage or other issues to baby
- Can cause other morbidities or physiological consequences
- Life-threatening- death to mother and/or baby
- Cause pain and suffering
- Changed one's knowledge, perspective or inspired certain decisions
- Euphoria-related
- Husband-inspired
- Social consequences
- Mental health consequences/ death scare
- Other additional consequences

Delivery

- Persists or can persist beyond labour to postpartum
- Can cause other morbidities
- Life-threatening to mother and/or baby
- Cause pain or suffering
- Inhibits normal functioning/ disrupts life
- Changed one's knowledge, perspective or inspired certain decisions (*include this code from "hospital-why" here: "Previous excessive intrapartum bleeding and delayed placental expulsion made her decide to give birth in hospital"*)
- Economic consequences
- Mental health consequences

- Marital consequences

Postpartum

- Can persist onwards
- Inhibits normal functioning/ disrupts life
- Can cause other morbidities
- Life-threatening to mother and/or baby
- Caused or can cause pain or suffering
- Baby bonding issues
- Nutritional impacts
- Mental health consequences
- Becoming dependent on others/ added burden on family members and others
- Economic consequences
- Social consequences
- Marital consequences

Consequences across all 3 phases (consequences of giving birth or morbidities in general)

- Persist after maternal health phase
- Can cause other morbidities
- Inhibits normal functioning/ disrupts life
- Social consequences

*Deviant views

- Hospitalisation due to excessive bleeding didn't affect her family since they had people taking care of them.

Most common morbidities

These morbidities have to do with:

- Pain
- Discomfort
- Inhibits normal functioning/ disrupts life

* An exception: High blood pressure

Most serious morbidities

- These morbidities are also in line with the reasons given in the ranking exercise in the FGDs and the "worst morbidities" section in the IDIs. They have to do with:
 - Life-threatening potential
 - Pain
 - Inhibits normal functioning/ disrupts life
- People's comments on seriousness of women's morbidities

List of morbidities

Covers a wide range of morbidities which I've analysed interpretatively (*this section was also very useful for the morbidity tables in the survey*).

Descriptions or symptoms or discovery of morbidities

- The way women describe morbidities, which are sometimes very interesting (*include this code from IDI 9 here: "People's comment on seriousness- health worker got tired and voiced that he had never seen a pregnancy like this before"*)
- That high blood pressure is not something that will come down totally at once (came from "relevant miscellaneous")

Morbidities that are important

-In the FGD exercise

- How women ranked it (including differences observed with respect to education and age)
- Why some morbidities were ranked low and why some were ranked high
- What this tells us about morbidities that are important to women

-“Worst morbidity” question- cumulative reasons for pregnancy, delivery and postpartum (*Make table of the morbidities mentioned and number of times*)

- Life-threatening to mother/ can kill mother
- Life-threatening to foetus in womb (including "can cause miscarriages")
- Knows someone who experienced it or died from it
- Experienced it before
- Necessitates receiving interventions like drip, blood transfusion, CS, etc
- Aesthetic reasons (affects appearance)
- Emphasised by or measures taken against it by hospital staff
- Can cause other morbidities
- It is mysterious/weird
- Euphoric reasons (not enjoy one's body)
- Painful, makes you suffer
- Common

- You can't eat or keep food down
- Persists after MH phase
- It is difficult to manage
- Inhibits normal functioning (can't do chores, can't communicate to receive care, can't work, can't care for baby, can't feed baby)
- Mental health effects
- Non-specific consequences (it is bad, frustrating, ugly, difficult, overwhelming, can affect mother)
- Don't know
- Deviant views- one morbidity is not better than another

Varies from woman to woman

- Pregnancy experience
- Common morbidities experienced
- Vomiting
- Labour- length and type
- Delivery experience
- Postpartum haemorrhage

Varies from pregnancy to pregnancy for one specific woman

- Pregnancy experience
- Vomiting
- Labour and/or delivery

Comparison with previous experiences

- Pregnancy experience
- Vomiting- during pregnancy and postpartum
- Labour- length and type
- Delivery experience
- Bleeding- during delivery and postpartum
- Common morbidities experienced, and whether or not she experienced morbidities
- Manifestations of or experiences with other morbidities (CS, abdominal pain, high blood pressure, pre-term deliveries, placental expulsion experience)
- Nature of babies born

Comparison with other women

- Pregnancy experience
- Bleeding- during delivery and postpartum
- Reducing severity based on other people's experiences
- Labour- length and extent of suffering, ability to be stoic
- Manifestations of or experiences with other morbidities (CS, pain from CS, placental expulsion)
- Cross-check type of care or treatment being given as part of ANC package

Previous experiences influence actions with respect to morbidities

- Made women take preventive measures or not to take certain home regimens
- Made women make diagnosis or be aware that a condition was present
- Made them decide to seek care at hospital (*from relevant misc: pregnancy morbidities made her decide to go to hospital as soon as labour started*)
- Made one to negotiate care with her doctors
- Influenced perception of what is normal

Three morbidities of interest

A. Vomiting

- Vomiting is generally perceived as a normal part of pregnancy, but hyperemesis gravidarum is not normal
- How normal vomiting differs from serious vomiting
- I got such very different views on vomiting in the FGDs and the IDIs. In the FGDs, vomiting is not perceived as an illness, but it was in the IDIs.

B. Prolonged labour

Perceptions on length of labour

- There wasn't any particular pattern observed as views on normal length of labour vs prolonged labour were varied.
- However, normal or easy labour tended to be expressed in terms of minutes and a few number of hours while prolonged labour tended to be expressed in terms of days or time periods (being in labour from morning till evening/sunset, being in labour from night till morning).
- When women were worried during labour and delivery

How true labour is discerned

- Varied views:

- Water breaks (*though there's an acknowledgement that this may not always be a good indicator since one may be in labour but water will not break*)
- Mobility is seriously inhibited
- Pain and contractions (no lenience, no lessening)
- Stops you from doing chores or even talking
- From previous experiences
- Accompanying symptoms (bleeding, feeling very cold, feeling like pooing but poo never comes out, falling into a very sweet sleep)

C. Haemorrhage

Perceptions of minimal or normal blood loss during delivery

- Quantity
- Procedures not given
- Comments from others
- Emotions not triggered
- No accompanying symptoms
- Comparisons- with previous experiences
- Not having to use blood stored up for you

Perceptions of minimal or normal blood loss within the first 24 hours

- Quantity
- Nature of flow
- Comparisons- with other women's experiences
- Comparisons- with previous experiences
- Emotions not triggered
- No accompanying symptoms

Perceptions of minimal blood loss beyond first 24 hours or time not specified

- Pads-related
- Having a knowing
- Short duration of flow

Perceptions of much blood loss during delivery

- Quantity
- Accompanying symptoms
- Procedures given or done
- Sourcing for blood initiated
- Emotions triggered
- Having a knowing that it's much
- Comments from others (maternity staff and other women)
- Stains/messes

Perceptions of much blood loss within the first 24 hours

- Stains/messes
- Pads-related
- Quantity
- Accompanying symptoms
- Emotions triggered
- Care-seeking
- Procedures given or done
- Comparisons- with others
- Nature of flow

Perceptions of much blood loss beyond first 24 hours or time not specified

- Nature of flow
- Quantity
- Stains/messes
- Procedures given
- Accompanying symptoms
- Emotions triggered
- Long duration of bleeding

Discerning much blood loss

- Accompanying symptoms
- Procedures given
- Pads-related
- Stains/messes
- Comparisons- with previous experiences

Other themes on bleeding (besides minimal/normal vs much blood loss)

- Good blood, bad blood (*Also include this code from the FGDs under hospital when- one needs to seek care for postpartum haemorrhage in the hospital so that they can tell whether your bleeding is for good or bad*).
- Minimal or much blood loss depends on context (*Also include these codes here: "1. She's a matured women now and her blood loss was less compared to when she was a youth, pattern for blood loss for maturity and youthfulness are different;" "2. Blood loss is lower in CS compared to normal delivery; it was CS delivery, hence blood loss should somehow be under control;" "3. Bleeding within the first 24 hours*

after delivery is less compared to bleeding during delivery;" "4. If home birth, blood must come out since it has not been scooped out;")

- It is better for blood to come out than stay inside (hence bleeding is induced using hot water)
- It is not good to bleed too much
- Dilemma: Bleeding is dangerous but it is better for blood to come out than stay inside; it is good to bleed but not too much
- You wouldn't know your blood loss if you had a C-section
- Blood loss was much, but nothing bad happened
- When blood loss quantification using bottles was difficult
- Human blood is human blood. Any loss is a lot.
- Very subjective measure of blood loss- you that have the blood will know when it is too much

Care-seeking

Hospital- when or why

- Morbidity has exceeded a certain threshold of time of what is considered normal duration
- Morbidity has inhibited/disrupted life, activities or functioning (physically or anatomically)
- One cannot really pin-point cause of a morbidity (diagnostic reasons)
- The morbidity is the type meant for hospital ("eclampsia is the type of illness for hospital and white people- its treatment and management"- from relevant miscellaneous)
- Initial regimens failed to treat morbidity
- Morbidity exhibited something visually scary (the "scare-tactics" factor) or one experienced a physiological/anatomical response
- Morbidity occurred just out of the blues (ie, weird, unusual, an oddity)
- For delivery complications during home-birth
- Morbidity is painful, unbearable or causing discomfort
- Lay networks cannot help the morbidity
- For 'serious' morbidities (placenta praevia, excessive bleeding, high blood pressure, etc)
- Preventive reasons (to prevent unforeseen circumstances)
- Belief in the health service or to get specialist care or for knowledge-sakes
- Baby-inspired
- Nothing special, just to find remedy
- The morbidity is prolonged

Hospital- when not or why not

- Perception that hospital cannot remedy it (e.g. spirit possession)
- Morbidity is tied to pregnancy (i.e. pregnancy is the seen as the cause of the morbidity), it will go away after delivery or when its time comes (*there's a node on this from relevant miscellaneous*)
- Having alternatives
- Hospital will only give advice and nothing else; didn't want to go to hosp and suffer
- Received hospital reassurance that morbidity was normal
- When lay networks provided explanation for cause of morbidity, or contradict what a doctor has prescribed
- For spiritual illness
- Economic reasons
- Morbidity waned and eventually stopped

Traditional- When

- Spiritual illness (*Give more info on why the spirit possesses the woman, consequences of spirit possession and other bits of spirit possession from the "relevant misc" and "not so relevant node" of the FGDs*)
- Lay networks provided it
- Hospital couldn't handle it
- Economic reasons

Traditional- When not

- Perception that hospital makes one feel better- trust in efficacy of hospital regimens
- For illnesses meant for the hospital like eclampsia
- For high blood pressure during pregnancy

Self-management or home-management- When or why

- For spitting
- For painful morbidities
- For weird morbidities
- Morbidities perceived to be needing self-care as treatments
- Postpartum procedures (postpartum hot water birth)
- Delayed placental expulsion
- Other remedies for high blood pressure, fever, hastening delivery, etc
- Home-birth- why
 - Delivery usually comes easy or fast, doesn't usually experience any problem
 - Going to hospital requires effort
 - Financial constraint
 - Potential for arguing with husband over health care costs
 - For privacy
 - Doctors were on strike

Self-management or home management- When not

- Didn't know what the morbidity was
- Had a bad experience with a home management regimen
- If morbidity is seen as always recurring and only ceases on its own
- Had a bad experience with a home management remedy (*From IDI 2*)

Chemist- When

- For morbidities associated with pain
- To buy drugs initially given at hospital (more like top-up for later use)

Health worker management at home- When

- For hyperemesis gravidarum
- For delayed placental expulsion during home-birth
- To serve as woman's birth attendant

Other care-seeking themes

- Care-seeking in hospital can be opportunistic, not intentional
- Multiple remedies are sometimes tried at once
- Multiple remedies are sometimes tried in succession
- Risky care-seeking behaviours
- Nonchalant attitudes or assumptions made about delivery
- Primigravidas' early care-seeking or eagerness for care-seeking
- When deviant behaviour was concealed

Why lay networks are consulted

- Have experience (old people, people who have gone before you)
- For support (spiritual, emotional, etc)
- They are inquisitive about your health, hence you answer them
- Can give suggestions for unanswered questions, or to get info that you can't get from books, or they give advice
- Can explain cause of a morbidity
- Are health personnel themselves
- If an issue is suspected
- Serve as first point of call or first responders to emergency
- They live together, hence are consulted
- Women are free with them
- Serves as woman's birth attendant

When or why lay networks are not consulted

- Woman wanted to maintain a stoic appearance
- They will talk and criticise woman or woman wasn't comfortable with it
- Go contrary to advice given in hospital
- When there's no problem, hence no need
- When you already know what to expect
- So as not to agitate them
- It was not logistically possible to do so

How lay networks influence care-seeking positively

- Encourage one to revisit hospital if morbidity persist, if there's no improvement after initial visit or if morbidity reoccurs again
- Provide ambulatory services during emergencies
- Raise initial alarm that something is amiss
- Notify women's gate-keepers to health care about observed abnormality
- Discourage women from ingesting harmful local preventive remedies
- Alert hospital staff that something is wrong- care-seeking while in hospital
- Recognise emergency situations and quickly summon expert care
- Facilitate access to health services by physically taking women to the hospital
- Explain the cause of an abnormality, which subsequently result in hospital visit
- Woman demanded for CS because her labour room mate died right before her eyes

How lay networks influence care-seeking negatively

- Delay or discourage care-seeking
- Not initiating care-seeking as gatekeepers to health
- Can make the wrong diagnosis
- Normalise a morbidity, assuring women not to worry
- Suggest and give diverse treatment options for one particular morbidity
- Can discourage demonstration of vulnerability to morbidity and encourage stoicism
- Advise women to endure issues, making them to suppress what should be voiced out
- Discourage care-seeking at hospital
- Suggest harmful local preventive remedies

Other themes about lay-networks

- Lay networks can also influence care-seeking both positively and negatively
- Lay networks can also neither encourage care-seeking nor discourage it
- Lay networks also influence perceptions of morbidities
- Lay networks play other numerous roles that have implications for women's health and wellbeing during the maternal health phase

Appendix 4.6: Descriptions of the seven postpartum morbidities shown during the ranking exercise

I downloaded photos from Google Images for illustrative purposes for the ranking exercise; I am unable to reproduce them in my thesis for copyright reasons. However, I have described the photos below and provided weblinks to the photos (where copyright credits were traceable and/or weblinks could be retraced).

- Obstetric fistula: Shows a woman standing (lower body shown) with urine on a concrete floor flowing from her.
<https://www.flickr.com/photos/freedomtcreate/5058509295>
- Mastitis: Shows an inflamed breast.
- Sepsis: Two fingers showing a scoop of yellowish discharge.
- Backache: Shows a woman with both hands on her lower back, wincing in pain
<https://www.gettyimages.dk/detail/photo/aching-back-royalty-free-image/172170262>
- Postpartum depression: Shows a woman with both hands on her head (head slightly bent backwards) and tears flowing from her eyes. This is a common posture for sadness in Nigeria.
- Perineal discomfort: Shows a naked, middle-half of a woman's body, with one of her hands covering the perineal area.
- Bleeding: Shows part of a mattress with a portion stained with blood (what appears to be a woman's thigh is shown beside the bloodstain).

Appendix 6. 1: Reasons given for home-deliveries in the IDIs and family interviews

Reason for home-birth	Further information
1. Speedy labour and/or delivery	Labour and/or delivery usually come very fast or easy. This was the predominant reason given in the IDIs and family interviews- mentioned in more than half of the families where the last delivery was a home-birth.
2. Hospital policies or attitudes of maternity staff	<p>To avoid the teasing of hospital staff: “<i>You this big person, you have given birth? You this big person, you have given birth?</i>” (that is, the woman is too old to be giving birth)- Rural, multipara family.</p> <p>Not being allowed a birth companion to support the woman during delivery, unlike in their village where a male (her husband or maybe her younger brother) is positioned around her back as a pillar to support her. That in the hospital, a woman is “<i>just thrown like that</i>”- Urban, multipara family.</p> <p>Being turned back at the hospital and then asked to return later; the woman goes home and doesn’t eventually return.</p> <p>Doctors were on strike.</p>
3. Delivery is usually problem-free	They have never experienced a delivery complication or are usually fine after delivery. One respondent’s neighbour asserted that she has given birth to eight children and has never had a miscarriage, a C-section or any other issue.
4. This is not the first delivery	A perception that the hospital is usually for first deliveries or for young pregnant women, but old, matured women can give birth at home. Some respondents reported that they had their first few deliveries (especially the first) in the hospital and then later ones at home.
5. Financial reasons	They cannot afford hospital delivery. There is also the potential for arguing with one’s husband over health care costs.
6. Confidence in one’s abilities	They are already experienced and know everything about delivery.

Appendix 7.1: Adapted questions from existing surveys

Source	Original Question/Item	Adapted Version
Demographic and Health Surveys (DHS), 2013 [12]	<p>Q: Main material of roof Record observation</p> <p>Natural roofing No roof Thatch/palm leaf</p> <p>Rudimentary roofing Rustic mat Palm/bamboo Wood planks Cardboard 24</p> <p>Finished roofing Metal/zinc Wood Ceramic tiles Cement Roofing shingles Other</p>	<p>Q: Main material of roof RECORD OBSERVATION</p> <p>-Thatch/palm leaf/make-shift -Metal/zinc/asbestos -Roofing shingles (lento and ceramic) Other</p>
DHS, 2013 [12]	<p>Q: Main material of the exterior walls. RECORD OBSERVATION</p> <p>Natural walls No walls Cane/palm/trunks Dirt (mud)</p> <p>Rudimentary walls Bamboo with mud Stone with mud Plywood Cardboard Reused wood</p> <p>Finished walls Cement Stone with lime/cement Bricks Cement blocks Wood planks/shingles Other (specify)</p>	<p>Q: Main material of exterior walls RECORD OBSERVATION</p> <p>-Natural or rudimentary (mud, thatch, cane, cardboard) -Finished (cement blocks, bricks) -Other</p>
DHS, 2013 [12] and Multiple Indicator Cluster Survey (MICS, 2011) [322]	<p>Q: Main material of the floor RECORD OBSERVATION</p> <p>Natural floor Earth/sand Dung</p> <p>Rudimentary floor Wood planks Palm/bamboo</p> <p>Finished floor Parquet or polished Wood Vinyl or asphalt strips Ceramic tiles Cement Carpet/rug Other</p>	<p>Main material of floor RECORD OBSERVATION</p> <p>-Natural or rudimentary (earth, dung, palm) -Finished (vinyl, ceramic, cement) -Other</p>

Source	Original Question/Item	Adapted Version
DHS, 2013 [12] and MICS, 2011 [322]	<p>Q: What is the main source of drinking water for members of your household?</p> <p>Piped water Piped into dwelling Piped to yard/plot Public tap/standpipe Tube well or borehole</p> <p>Dug well Protected well Unprotected well</p> <p>Water from spring Protected spring Unprotected spring Rainwater Tanker truck Cart with small tank Surface water river/dam/lake/ pond/ stream/ canal/ Irrigation channel) Bottled water Other (specify)</p>	<p>What is the <u>main</u> source of drinking water for members of your household?</p> <p>Surface water (river, stream, dam, lake, pond, canal, irrigation channel) Public well/ public bore-hole/ public tap Tanker-truck/ cart with small tank or drum or jerrican Private well Private tap in dwelling/ private borehole/ bottled or sachet water Other</p>
DHS, 2013 [12]	<p>Q: Does your household have: Electricity? A radio? A television? A mobile telephone? A non-mobile telephone? A refrigerator? A cable TV? A generating set? Airconditioner? A computer? Electric iron? A fan?</p> <p>AND</p> <p>Does any member of this household own any agricultural land? Yes/No</p>	<p>Q: Does your household have: An agricultural land? A wall clock? A wardrobe (built-in or movable)? Electricity? A generator? A radio? A television? A cable TV? A fan? An air-conditioner? A refrigerator?</p>
	<p>Q: Does any member of this household own: A watch? A bicycle? A motorcycle or motor scooter An animal-drawn cart? A car or truck? A boat with a motor? A canoe?</p>	<p>Q: Does any member of your household own: A watch? An animal drawn cart? A bicycle? A motorcycle or motor scooter? A car or truck? A mobile phone? A computer?</p>
	<p>Q: How many months pregnant were you when you first received antenatal care for this pregnancy?</p> <p>Months ----- Don't know</p>	<p>Q: How many months pregnant were you the first time you received antenatal care for your last pregnancy?</p> <p><1 month 1 month 2 months 3 months 4 months 5 months 6 months 7 months 8 months ≥9 months</p>

Source	Original Question/Item	Adapted Version
DHS, 2013 [12]	<p>Q: As part of your antenatal care during this pregnancy, were any of the following done at least once: Was your blood pressure measured? Y/N Did you give a urine sample? Y/N Did you give a blood sample? Y/N AND During (any of) your antenatal care visit(s), were you told about things to look out for that might suggest problems with the pregnancy? Y/N/DN AND During this pregnancy, were you given an injection in the arm to prevent the baby from getting tetanus, that is, convulsions after birth? Y/N/DN AND During this pregnancy, were you given or did you buy any iron tablets or iron syrup? Y/N/DN AND During this pregnancy, did you take any drugs to keep you from getting malaria? Y/N/DN</p>	<p>Q: Were any of the following done at least once as part of your antenatal care?</p> <p>Did you give a urine sample? Did you give a blood sample? Were your weight and height measured? Was your blood pressure measured (that is, was a sheet put around your upper arm, which tightened after a pump was pressed several times)? Were you given an injection in the arm to prevent the baby from getting tetanus (that is, convulsions after birth)? Were you given any iron tablets or iron syrup? Were you given/prescribed any drugs to keep you from getting malaria? Were you told about things to look out for that might suggest problems with the pregnancy? Did you have an ultrasound scan (that is, did they project the inside of your womb on a computer screen)?</p>
	<p>Q: Who assisted with the delivery or (NAME)? Anyone else? Health personnel (doctor, nurse/midwife, auxiliary midwife, community extension health worker), other person (TBA, relative/friend, other -----), no one assisted</p>	<p>Q: Who assisted with the delivery of your last baby? TICK WHO RECEIVED BABY AT DELIVERY</p> <p>Doctor Nurse/midwife Community health worker TBA Relative/friend No one assisted Other</p>
	<p>Q: ... did they cut your belly open to take the baby out? (<i>to describe C-section</i>)</p>	<p>Same</p>
	<p>Q: I would like to talk to you about checks on your health after delivery, for example, someone asking you questions about your health or examining you. Did anyone check on your health after you gave birth to (NAME)? Y/N</p> <p>How long after delivery did the first check take place? (If less than one day, record hours; if less than one week, record days)</p>	<p>Q: I would now like to ask some questions about the care you received after your last delivery. Did any health professional check on your health in the first 6 weeks after you gave birth to your last baby, for example, by asking you questions about your health or examining you?</p> <p>Same</p>
	<p>Also adapted DHS' schema of interviewer visit (that is, the very first page of the questionnaire)</p>	

Source	Original Question/Item	Adapted Version
MICS, 2011 [322]	Relevant part of question: Have you ever given birth Y/N. <i>If “no” probe by asking: I mean, to a child who ever breathed or cried or showed other signs of life- even if he or she lived only a few minutes or hours?</i>	Q: By given birth, I mean did she deliver a child who: - either was born without breath? - or who ever breathed or cried or showed other signs of life- even if he or she lived only a few minutes or hours?
MICS, 2011 [322] and DHS, 2013 [12]	When your last baby was born, was he/she very large, larger than average, average, smaller than average or very small? Options Very large Larger than average Average Smaller than average Very small Don't know	Same
Diabetic Association of Bangladesh, Women and Children First-UK and UCL Centre for International Health and Development, 2009 [323]	Was the baby moving when you went into labour? Yes/ No/Don't know	Same
	When did you last feel the baby moving? _____hours before delivery _____ days before delivery Don't know	Same
	Did the bleeding stain her clothes, the bed or the floor? Clothes Y/N/DK Bed Y/N/DK Floor Y/N/DK	Did you stain any of the following since you wore the first pad: Your cloth? Y/N/DK The bed? Y/N/DK The floor? Y/N/DK
	General layout and coding style	
Standard question for measuring postpartum haemorrhage in previous studies	Did you bleed so much that you thought you were going to die?	Same
Fottrell, 2015 [324]	Peer group comparison as a method for measuring health.	Compared to most of your mates during your last pregnancy, was your health status better, the same or worse? (<i>Asked also in other maternal phases</i>)
WHO, 2012 [325]	Definition of preterm birth: Babies born alive before 37 weeks of pregnancy are completed.	Same

Source	Original Question/Item	Adapted Version
WHO 2013 [251]	Guidelines on postnatal care.	<p>Q: Were any of the following done at least once as part of the checks after you gave birth?:</p> <p>Was your vagina checked for bleeding?</p> <p>Was your blood pressure measured (that is, was a sheet put around your upper arm, which tightened after a pump was pressed several times)?</p> <p>Was your temperature measured (that is, was an instrument put in your armpit, mouth or ear to check how hot your body was)?</p> <p>Were you asked about any experiences of headaches?</p> <p>Were you asked about any experiences of convulsions?</p> <p>Were you asked about any experiences of smelly vaginal discharge?</p> <p>Were you asked about your general emotional health (that is, about your mood or feelings)?</p> <p>Were you told about things to look out for that might suggest problems with your health after delivery?</p> <p>Were you told how to delay pregnancy from occurring too soon?</p>
Haghparast-Bidgoli, 2015 [326]	Did you pay to receive treatment and/or care for this health problem (together with medicine and services)? Yes/No	Did you pay for care (medical services) and/or treatment (medicines) for (<i>insert morbidity</i>)?
	Did you pay for transportation to receive medical attention for this health problem? (e.g. bus, motorbike, other transport) Yes/No	Did you pay for transportation in seeking care for <i>insert morbidity</i>)?
	How much did you pay to receive treatment and/or care for this health problem (together with medicine, service and transport)?	<p>How much did you pay in total for care, treatment, and transportation for this health issue?</p> <p>1- No payment</p> <p>2- <N1,000</p> <p>3- N1,000- N10,000</p> <p>4- >N10,000</p> <p>99- Don't know</p>
	<p>What was the source of finance to pay for this health problem? (both transportation, services and medicine)</p> <p>1- Household income/savings</p> <p>2- Family member not living in the same household/friend/neighbour</p> <p>3- Loan from a family member</p> <p>4- Loan from a friend/neighbour</p> <p>5- selling assets</p> <p>6- Other (social welfare, NGO, donation, health insurance)</p>	<p>What was the source of finance used to pay for care, treatment, and transportation for (<i>insert morbidity</i>)?</p> <p>1-Household income/savings</p> <p>2- Non-resident family member/friend/neighbour</p> <p>3- Loan from family member</p> <p>4- Loan from friend/neighbour</p> <p>5- Selling assets</p> <p>6- Other (NGO, social welfare, health insurance, donation)</p>

Source	Original Question/Item	Adapted Version
Questionnaire from Kivap Obaapavita Project, Kintampo Health Research Centre, 2009 [327]	Now, I would like to ask about SERIOUS problems you may have experienced during labour or soon after delivery.	Would you say any of these problems were serious? (<i>relating to morbidities during pregnancy, delivery and postpartum</i>)
Tuncalp et al., 2013 [328]	Did a health care provider give you a medication or drip to start your labour? Y/N/DK	Q: Induced labour (did your birth attendant put his/her fingers into your vagina to burst the water, or give you a drip or medication to start your labour?)

Appendix 7. 2: Pre-fieldwork draft of the questionnaire

RESPONDENT IDENTIFICATION (RI)	
RI1. Cluster code: <div style="border: 1px solid black; width: 100px; height: 20px; margin: 5px 0;"></div>	RI2. Respondent number: <div style="border: 1px solid black; width: 100px; height: 20px; margin: 5px 0;"></div>
RI3. Name of household head: -----	

INTERVIEWER VISITS (IV)				
	1	2	3	
Date (D/M/Y):	-----	-----	-----	Total number of visits: -----
Interviewer's name:	-----	-----	-----	
Result of visit (SEE CODE BELOW):	-----	-----	-----	
Next visit				
Date: Time:	----- -----	----- -----		
Result of visit codes : 1- Completed 2- No household member at home or no competent person at home at time of visit 3- Eligible woman not at home 4- Eligible woman incapacitated 5- Postponed 6- Refused 7- Partly completed 8- Other				

PROBABILITY OF SELECTION	
Total number of eligible women in household	-----
Number of women included in study	-----

INTRODUCTION AND ELIGIBILITY (IE)

Inakwana/Inayini. My name is ----- and I am conducting a survey that hopes to understand problems that women may have in pregnancy and related to childbirth in Nigeria. We believe that this knowledge might help us to better understand ways to improve women's health and the support they get during pregnancy, delivery and after birth. INQUIRE ABOUT THE FOLLOWING POLITELY:

IE1. Are there any married women in this household?	IE2. Did she/they give birth within the past two years?	IE3. Is she/they between 15-49 years of age?	IE4. Does she/ do they live here in (<i>name of settlement</i>) or she/they came in from another place?																												
<table border="1"> <tr> <th>Y</th> <th>N</th> <th>DK</th> </tr> <tr> <td>1</td> <td>2</td> <td>99</td> </tr> </table>	Y	N	DK	1	2	99	<table border="1"> <tr> <th>Y</th> <th>N</th> <th>DK</th> </tr> <tr> <td>1</td> <td>2</td> <td>99</td> </tr> </table> <p>PROBE IF 'NO' - By given birth, I mean did she deliver a child who:</p> <ul style="list-style-type: none"> - either was born without breath? - or who ever breathed or cried or showed other signs of life- even if he or she lived only a few minutes or hours? <table border="1"> <tr> <th>Y</th> <th>N</th> <th>DK</th> </tr> <tr> <td>1</td> <td>2</td> <td>99</td> </tr> </table>	Y	N	DK	1	2	99	Y	N	DK	1	2	99	<table border="1"> <tr> <th>Y</th> <th>N</th> <th>DK</th> </tr> <tr> <td>1</td> <td>2</td> <td>99</td> </tr> </table>	Y	N	DK	1	2	99	<table border="1"> <tr> <th>Resident</th> <th>Non-resident</th> </tr> <tr> <td>1</td> <td>2</td> </tr> </table>	Resident	Non-resident	1	2
Y	N	DK																													
1	2	99																													
Y	N	DK																													
1	2	99																													
Y	N	DK																													
1	2	99																													
Y	N	DK																													
1	2	99																													
Resident	Non-resident																														
1	2																														

IF ANY 'N', 'DK' OR 'NON-RESIDENT' IS TICKED→ THANK RESPONDENT AND MOVE TO NEXT HOUSE.

IF ALL 'Y' AND 'RESIDENT' ARE TICKED→

- GO TO 'IC' IF ELIGIBLE WOMAN IS FIRST POINT OF CONTACT.
- ASK TO SPEAK TO ELIGIBLE WOMAN IF NOT FIRST POINT OF CONTACT. REPEAT INTRODUCTION. GO TO 'IC'.

INFORMED CONSENT (IC)

I would like to invite you to take part in a survey with me, which should take about 45 minutes.

Taking part in the study is voluntary; it is up to you to decide whether to take part or not. Refusing to participate will not cause anything bad to happen and you do not have to give a reason for refusing to take part in the survey.

I will keep everything you say confidential by not writing your name on my notes. Whatever information I obtain from you will be secured. Our study team will make sure that you cannot be identified when we report your opinions or ideas.

There are no risks to participating in the survey, but we will ask you about any problems you had in pregnancy, during or after delivery. If you do not wish to answer any questions, it is totally fine to skip the question. You can also discontinue the study at any point if you wish without giving any reason.

If you do decide to take part, you are still free to withdraw at any time and without giving a reason.

GIVE PARTICIPANT INFORMATION SHEET AND EXPLAIN CONSENT FORM.

PROCEED WITH SURVEY IF CONSENT GIVEN. OTHERWISE, END SURVEY.

Please may I begin now?

Y	N

Time started:

DEMOGRAPHICS (DG)				
S/N	Question	Response	Code	Go to
DG1	To begin, I would like to ask some general questions about you and your household. How old were you at your last birthday?	----- years DK	99	DG3
DG2	Can you tell me how old you are approximately?	15-19 20-29 30-39 40-49	1 2 3 4	
DG3	What is your religion?	Christianity Islam Other	1 2 3	
DG4	How many wives does your husband have?	1 2 3 4 > 4	1 2 3 4 5	DG6 DG5
DG5	Which wife position are you?	1 st 2 nd 3 rd 4 th Other	1 2 3 4 5	
DG6	What is the highest level of education you have completed or are currently attending?	Never attended school Primary Secondary Non-university post-secondary University Non-western	1 2 3 4 5 6	
DG7	Can you read a newspaper or a book in any language?	Yes No	1 2	
DG8	What is your <u>main</u> occupation? SELECT ONE ONLY	Unemployed/ house-wife Student Unskilled worker (house-help, cleaner, petty trader, farmer, fisherman) Skilled manual (hairdresser, seamstress) Skilled non-manual (clerk, cashier, teacher, entrepreneur, civil servant <level 10, junior-level armed forces official) Professional (doctor, lecturer, engineer, banker, civil servant ≥level 10, senior-level armed forces official)	1 2 3 4 5 6	
DG9	What is the highest level of education your husband has completed or is currently attending?	Never attended school Primary Secondary Non-university post-secondary University Non-western	1 2 3 4 5 6	

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PRE-EXISTING CONDITIONS BEFORE PREGNANCY (PX)					
S/N	Question	Response	Code		
PX1	Now I would like to ask some questions about your health.		Yes	No	DK
	Has a doctor ever told you that you had:	Hypertension?	1	2	99
		Diabetes?	1	2	99
		Anaemia?	1	2	99
		Heart disease?	1	2	99
		Asthma?	1	2	99
		Liver disease?	1	2	99
		Kidney disease?	1	2	99
		Epilepsy?	1	2	99

PERCEPTION OF GENERAL STATE OF HEALTH- BEFORE PREGNANCY (PB)			
S/N	Question	Response	Code
PB1	Now I would like to ask what you think about your general state of health before your last pregnancy . There are no right or wrong answers.		
	Compared to most of your mates before you became pregnant, was your health status better, the same or worse?	Better	1
		The same	2
		Worse	3
PB2	I am going to read a statement to you now. Tell me whether you strongly agree, agree, disagree or strongly disagree with the statement. “My health status was generally fine before my last pregnancy.”	Strongly agree	1
		Agree	2
		Disagree	3
		Strongly disagree	4

OBSTETRIC HISTORY (OH)				
S/N	Question	Response	Code	Go to
OH1	I would like to ask some questions about your pregnancy and childbirth in the past. How many times have you been pregnant before, even if it did not lead to a live birth?	-----		
OH2	Did any of the pregnancies end in a miscarriage?	Yes No	1 2	OH3 OH4
OH3	How many of the pregnancies ended in a miscarriage?	-----		
OH4	How many times have you ever given birth, even if the baby was not born alive?	-----		
OH5	Were any of the births preterm, that is, before 37 weeks or 8 and a half months of pregnancy were completed?	Yes No	1 2	OH6 OH7
OH6	How many of the births were preterm?	-----		
OH7	Were any of the babies stillborn, that is, were born with no signs of life at or after 28 weeks or 7 months of pregnancy?	Yes No	1 2	OH8 OH9
OH8	How many of the babies were stillborn?	-----		
OH9	Were any of the babies born alive and cried and showed some signs of life, but died soon after?	Yes No	1 2	
OH10	Were any of the births multiple births (that is, twins, triplets or quadruplets)?	Yes No	1 2	OH11 OH12

S/N	Question	Response	Co de	Go to
OH11	How many of the births were multiple births?	-----		
OH12	Were any of the births through caesarean section (that is, did they cut your belly open to remove the baby?)	Yes No	1 2	OH13 OH14
OH13	How many of the births were through caesarean section?	-----		
OH14	How many of your children are currently alive?	-----		

[illegible]

DELIVERY (DV)

S/N	Question	Response	Code	Go to
DV1	I would now like to ask some questions about your last delivery. Where did you give birth to your last baby? (TICK AS APPROPRIATE)	Home/TBA's place Public health post/ centre Public hospital Private hospital/centre Other	1 2 3 4 5	
DV2	Who assisted with the delivery of your last baby? TICK WHO RECEIVED BABY AT DELIVERY	Doctor Nurse/midwife Community health worker TBA Relative/friend No one assisted Other	1 2 3 4 5 6 7	
DV3	Did you plan to deliver at (<i>place of delivery</i>) originally/initially?	Yes No	1 2	DV6 DV4
DV4	Where did you plan to deliver originally/initially??	Home/TBA's place Public health post/ centre Public hospital Private hospital/centre Other	1 2 3 4 5	
DV5	Why did you not deliver in the place you intended?	Problem detected in pregnancy Problem in labour/delivery Other	1 2 3	
DV6	How was your baby delivered? (FOR INSTRUMENTAL, SHOW PICTURE OF DELIVERY BY FORCEP & VACUUM EXTRACTOR IF NECESSARY)	-Spontaneous (through vagina, no instrument used to pull out your baby) -Instrumental (an instrument was used to pull out the baby from your vagina) -C-section (they cut your belly open to take the baby out)	1 2 3	
DV7	Was a cut made around your vagina to enlarge the opening for your baby to come out?	Yes No Don't know	1 2 3	

OUTCOME OF LAST BIRTH (OB)				
S/N	Question	Response	Code	Go to
OB1	I would like to ask more questions about your last birth. Was your baby born alive or dead?	Alive Dead	1 2	OP5 OP2
OB2	Was the baby moving when you went into labour?	Yes No Don't know	1 2 99	OB4 OB3
OB3	When did you last feel the baby moving?	_____hour(s) before delivery _____day(s) before delivery Don't know	99	
OB4	Did the baby's appearance and features look like that of a normal baby (that is, fresh and fully developed)?	Yes No Don't know	1 2 99	
OB5	Was the baby born pre-term (that is, born before 37 weeks or 8 and a half months of pregnancy were completed)?	Yes No	1 2	
OB6	When your last baby was born, was he/she very large, larger than average, average, smaller than average or very small?	Very large Larger than average Average Smaller than average Very small Don't know	1 2 3 4 5 99	
OB7	Is your baby still alive?	Yes No	1 2	PC1 OB8
OB8	When did the baby die?	Within first week of delivery Within 8-28 days of delivery Post-neonatal (>28 days post-delivery) Don't know	1 2 3 99	

POSTNATAL CARE (PC)						
S/N	Question	Response	Code			Go to
PC1	I would now like to ask some questions about the care you received after your last delivery. Did any health professional check on your health in the first 6 weeks after you gave birth to your last baby, for example, by asking you questions about your health or examining you?	Yes No	1 2			PC2 PC5
PC2	How long after delivery did the first check take place? (RECORD HOURS IF LESS THAN ONE DAY. RECORD DAYS IF LESS THAN ONE WEEK)	----- Hour(s) ----- Day(s) ----- Week(s)				
PC3	How many times did you receive the check from the period immediately after your delivery to 6 weeks after your delivery (excluding care for your baby only such as immunisations)?	Once 2-3 times 4 and above	1 2 3			
PC4	Were any of the following done at least once as part of the checks after you gave birth?	Was your vagina checked for bleeding? Was your blood pressure measured (that is, was a sheet put around your upper arm, which tightened after a pump was pressed several times)? Was your temperature measured (that is, was an instrument put in your armpit, mouth or ear to check how hot your body was)? Were you asked about any experiences of headaches? Were you asked about any experiences of convulsions? Were you asked about any experiences of smelly vaginal discharge? Were you asked about your general emotional health (that is, about your mood or feelings)? Were you told about things to look out for that might suggest problems with your health after delivery? Were you told how to delay pregnancy from occurring too soon?	Yes 1 1 1 1 1 1 1 1 1	No 2 2 2 2 2 2 2 2 2	DK 99 99 99 99 99 99 99 99 99	
PC5	Did you have to go to a health facility because of any health problems you experienced at any point within 6 weeks after your delivery?	Yes No	1 2			

MALE INVOLVEMENT (MI)				
S/N	Question	Response	Code	Go to
	<p>SKIP MI1 AND MI2 IF THE WOMAN NEVER HAD ANTENATAL OR POSTNATAL CARE</p> <p>I am going to ask you some questions about the overall support you received from your husband during your pregnancy, delivery and after delivery.</p> <p>Participation in maternal health services</p>			
MI1	Did your husband accompany you at least once for antenatal care during your last pregnancy, that is, did he stay with you while you were in one of the following places: the antenatal care room, lab., ultrasound room, or doctor's/nurse's office?	Yes No Declined	1 2 3	
MI2	Did your husband accompany you at least once for postnatal care after you had your last baby, that is, did he stay with you while you were in one of the following places: the postnatal care room, lab., ultrasound room, or doctor's /nurse's office?	Yes No Declined	1 2 3	
	Financial Support			
MI3	Did your husband provide money for your food, transportation, treatments, medical services or other similar needs during your last pregnancy?	Yes No Declined	1 2 3	
MI4	Did your husband provide money for your food, transportation, treatments, medical services or other similar needs after you delivered your last baby?	Yes No Declined	1 2 3	
	Practical support			
	I am going to read some statements to you. Tell me whether you strongly agree, agree, disagree or strongly disagree with the statements.			
MI5	"During my last pregnancy, my husband supported me practically (such as in helping me lift heavy objects and arranging for others to help me with household chores)."	Strongly agree Agree Disagree Strongly disagree	1 2 3 4	
MI6	"After I delivered, my husband supported me practically (such as in helping me lift heavy objects and arranging for others to help me with household chores)."	Strongly agree Agree Disagree Strongly disagree	1 2 3 4	

S/N	Question	Response	Code	Go to
MI7	Emotional support “During my last pregnancy, my husband supported me emotionally (such as in giving me encouragement, comfort, allaying my fears and listening to me).”	Strongly agree Agree Disagree Strongly disagree	1 2 3 4	
MI8	“After I delivered, my husband supported me emotionally (such as in giving me encouragement, comfort, allaying my fears and listening to me).”	Strongly agree Agree Disagree Strongly disagree	1 2 3 4	
MI9	Decision-making Who made the decisions about your health, such as whether or not you visited the health centre, or whether or not you received treatment?	Woman Her husband Jointly with husband Relatives (mother-in-law, mother, etc) Jointly with relatives Other	1 2 3 4 5 6	

PERCEPTION OF GENERAL STATE OF HEALTH- DURING PREGNANCY (PP)			
S/N	Question	Response	Code
PP1	Now I would like to ask you about your health during your last pregnancy only. Compared to most of your mates during your last pregnancy, was your health status better, the same or worse?	Better The same Worse	1 2 3
PP2	I am going to read a statement to you. Tell me whether you strongly agree, agree, disagree or strongly disagree with the statement. “My health status was generally fine during my last pregnancy.”	Strongly agree Agree Disagree Strongly disagree	1 2 3 4

MORBIDITIES DURING PREGNANCY- UNPROMPTED (MP-U)					
Type	Question	Tick	Question	Question	Question/Tick
	<p>MP-U1: Now I would like you to tell me about any illnesses and problems you experienced during your pregnancy only. Please can you list out all the illnesses and problems you experienced?</p> <p>TICK ALL THAT RESPONDENT REPORTS. RECORD ANY PROBLEMS NOT ON THE LIST UNDER "OTHER."</p> <p>ASK "Any other?"</p>		MP-U2: From the problems you mentioned, which ones did a health professional (a doctor or nurse or midwife) diagnose you with?	MP-U3: Would you say any of these problems were serious?	MP-U4: Which ones? ASK FOR 3 MOST SERIOUS IF MORE THAN 3 ARE REPORTED. DON'T ASK FURTHER QUESTIONS ON VOMITING IF REPORTED.
Symptoms	Pain			↓ ↓	
	Backache	-----	-----		-----
	Headache	-----	-----		-----
	Abdominal pain	-----	-----		-----
	Swelling	-----	-----		-----
	Swollen feet	-----	-----		-----
	Swollen face	-----	-----		-----
Digestion-related	-----	-----	↓		-----
Vomiting	-----	-----			-----
Constipation					
Febrile-related	-----	-----			-----
Fever (Non-malarial)	-----	-----			-----
Convulsions (fits)					
Uncategorised	-----	-----			-----
Leaking urine	-----	-----		-----	
Dizziness/ vertigo	-----	-----		-----	
Blurred vision					
Weakness					
Loss of consciousness (shock)					
Insomnia					
Others (Specify here)					
Named Morbidities	Discharges	-----	-----	MP-U4	-----
	Antepartum haemorrhage				
	Tears/Detachments	-----	-----		-----
	Placental abruption	-----	-----		-----
	Premature rupture of membranes, PROM				
Obstructions/Delays	-----	-----		-----	
Placenta praevia					
Uncategorised	-----	-----		-----	
Hypertension					
Infection					
Anaemia					
Malaria					
Hyperemesis gravidarum					
Antepartum depression					
Diabetes (gestational diabetes)					
Others (Specify here)					
Procedures	Prolonged antenatal admission (≥5 days)	-----	-----		-----
	ICU admission	-----	-----		-----
	Blood transfusion	-----	-----		-----
	Given antibiotics	-----	-----		-----
	Senior personnel summoned	-----	-----		-----
	Referral to another health institution	-----	-----		-----
	Others (Specify here)				

SEVERITY OF MORBIDITIES- PREGNANCY (SP)												
Line #	Onset	Duration	Care-seeking			Consequences on life				Physical	Social	Perception of severity
						Financial						
	SP1. When did (<i>insert morbidity</i>) start?	SP2. How long did (<i>insert morbidity</i>) last? RECORD NUMBER OF DAYS OR WEEKS OR MONTHS	SP3. Did you seek care for (<i>insert morbidity</i>)?	SP4. What did you do?	SP5. What treatment did you receive?	SP6. Did you pay for care (medical services) and/or treatment (medicines) for (<i>insert morbidity</i>)?	SP7. Did you pay for transportation in seeking care for (<i>insert morbidity</i>)?	SP8. How much did you pay in total for care, treatment, and transportation for this health issue?	SP9. What was the source of finance used to pay for care, treatment, and transportation for (<i>insert morbidity</i>)?	SP10. What was the effect of (<i>insert morbidity</i>) on your day-to-day activities like cooking, sweeping and walking to the shop?	SP11. What was the effect of (<i>insert morbidity</i>) on your relationship with the following:	SP12. Rate the severity of (<i>insert morbidity</i>) on a scale of 0 to 10, with 0 being no pain/discomfort and 10 being highest pain/discomfort. SHOW CARD.
Morbidity #1	----- month of pregnancy	--- day(s) --- week(s) ---month(s)	Y N 1 2 ↓ ↓ SP4 SP10	1 2 3 4 5	1 2 3 4	Y N 1 2	Y N 1 2	1 2 3 4 99	1 2 3 4 5 6	1 2 3 99	Husband 1 2 3 99 Baby (bonding) 1 2 3 99 Others 1 2 3 99	-----
Morbidity #2	----- month of pregnancy	--- day(s) --- week(s) ---month(s)	Y N 1 2 ↓ ↓ SP4 SP10	1 2 3 4 5	1 2 3 4	Y N 1 2	Y N 1 2	1 2 3 4 99	1 2 3 4 5 6	1 2 3 99	Husband 1 2 3 99 Baby (bonding) 1 2 3 99 Others 1 2 3 99	-----
Morbidity #3	----- month of pregnancy	--- day(s) --- week(s) ---month(s)	Y N 1 2 ↓ ↓ SP4 SP10	1 2 3 4 5	1 2 3 4	Y N 1 2	Y N 1 2	1 2 3 4 99	1 2 3 4 5 6	1 2 3 99	Husband 1 2 3 99 Baby (bonding) 1 2 3 99 Others 1 2 3 99	-----

Codes for SP4

1-Home remedy/self-treatment
2- Consulted lay source (e.g. mother)
3- Consulted traditional source
4- Visited chemist
5- Visited formal health facility
6- Joint consultation

Codes for SP5

1- None
2-Western medicine/ therapy
3-Traditional medicine/ therapy
4- Joint western and traditional

Codes for SP8

1- No payment
2- <N1,000
3- N1,000- N10,000
4- >N10,000
99- Don't know

Codes for SP9

1-Household income/savings
2- Non-resident family member/friend/neighbour
3- Loan from family member
4- Loan from friend/neighbour
5- Selling assets
6- Other (NGO, social welfare, health insurance, donation)

Codes for SP10 & SP11

1- No disruption
2-Some disruption
3-Serious disruption
99- Don't know

MORBIDITIES DURING PREGNANCY- PROMPTED (MP-P)					
S/N	Question/ Types	Responses	Code		
MP-P1	Now I would like to find out whether you experienced any other problems apart from the ones you mentioned previously. Did you experience any of the following during pregnancy?	DO NOT PROMPT RESPONDENT FOR MORBIDITIES ALREADY MENTIONED IN PRECEDING SECTION (MP-U).	Yes	No	DK
	Symptoms	Backache	1	2	99
		Headache	1	2	99
		Abdominal pain	1	2	99
		Swollen feet	1	2	99
		Swollen face	1	2	99
		Haemorrhoids (did you have swelling in your anus?)	1	2	99
		Vomiting	1	2	99
		Constipation (did you have difficulty in passing stool?)	1	2	99
		Fever	1	2	99
		Convulsions (fits)	1	2	99
		Leaking urine	1	2	99
		Dizziness/ vertigo	1	2	99
		Blurred vision	1	2	99
		Weakness	1	2	99
		Loss of consciousness (shock)	1	2	99
		Insomnia (Did you have consistent trouble in sleeping well?)	1	2	99
	Named morbidities	- Antepartum haemorrhage (were you bleeding from your vagina at any point during the pregnancy?)	Yes 1	No 2	DK 3
		- Placental abruption (did your placenta- the organ connecting your baby to your womb- get detached from its place?)	1	2	99
		- Premature rupture of membranes, PROM (did your water break too early, that is, before 37 weeks or 8 and a half months of pregnancy?)	1	2	99
		- Placenta praevia (did your placenta block the opening where your baby was to come out from?)	1	2	99
		- Hypertension (was your blood pressure up?)	1	2	99
		- Infection (did anyone tell you that you had a serious infection)	1	2	99
		- Anaemia (were you told that you did not have enough blood)	1	2	99
		- Malaria	1	2	99
		-Hyperemesis gravidarum (were you vomiting excessively?)	1	2	99
		-Antenatal depression			
		- Diabetes (did you develop diabetes in pregnancy?)	1	2	99
	Procedures	- Prolonged antenatal admission (were you admitted in the hospital/health centre for 5 days or more?)	Yes 1	No 2	DK 3
		- ICU admission (were you admitted in a special care ward with very limited access by non-hospital staff?)	1	2	99
		- Blood transfusion (were you given blood?)	1	2	99
		- Senior personnel summoned (did the hospital staff have to call a senior staff- their “oga”- to manage your case?)	1	2	99
		- Referral to another health institution (were you transferred to another health centre because the first place could not care for you very well?)	1	2	99

VOMITING (VM)				
S/N	Question	Response	Code	Go to
VM1	I would like to ask some specific questions about vomiting in your last pregnancy. Were you vomiting during your last pregnancy?	Yes No	1 2	VM2 PD1
VM2	When did the vomiting start?	First trimester Second trimester Third trimester Don't know	1 2 3 99	
VM3	When did the vomiting stop?	First trimester Second trimester Third trimester Don't know	1 2 3 99	
VM4	On average, how many times did you vomit per day during the period you were vomiting?	Once 2-3 times 4 and above Don't know	1 2 3 99	
VM5	Did you vomit so much that almost everything that goes into your mouth comes out?	Yes No	1 2	
VM6	Did you lose weight around this time that you were vomiting?	Yes No Don't know	1 2 99	
VM7	Did you seek care for the vomiting?	Yes No	1 2	VM8 VM14
VM8	What did you do?	Home remedy/self-treatment Consulted lay source (e.g. mother) Consulted traditional source Visited chemist Visited formal health facility Joint consultation	1 2 3 4 5 6	
VM9	What treatment did you receive?	None Western medicine/ therapy Traditional medicine/ therapy Joint western and traditional	1 2 3 4	
VM10	Did you pay for care (medical services) and/or treatment (medicines) for the vomiting?	Yes No	1 2	
VM11	Did you pay for transportation in seeking care for the vomiting?	Yes No	1 2	
VM12	How much did you pay in total for care, treatment, and transportation for the vomiting?	No payment <N1,000 N1,000- N10,000 >N10,000 Don't know	1 2 3 4 99	

S/N	Question	Response	Code	Go to
VM13	What was the source of finance used to pay for care, treatment, and transportation for the vomiting?	Household income/savings Non-resident family member/friend/neighbour Loan from family member Loan from friend/neighbour Selling assets Other (NGO, social welfare, health insurance, donation)	1 2 3 4 5 6	
VM14	What was the effect of the vomiting on your day-to-day activities like cooking, sweeping and walking to the shop?	No disruption Some disruption Serious disruption Don't know	1 2 3 99	
VM15	What was the effect of the vomiting on your occupation?	No disruption Some disruption Serious disruption Not employed then Don't know	1 2 3 4 99	
VM16	What was the effect of the vomiting on your relationship with your husband?	No disruption Some disruption Serious disruption Don't know	1 2 3 99	
VM17	What was the effect of the vomiting on your relationship with others?	No disruption Some disruption Serious disruption Don't know	1 2 3 99	
VM18	Rate the severity of the vomiting on a scale of 0 to 10, with 0 being no pain/discomfort and 10 being highest pain/discomfort. SHOW CARD	-----		

PERCEPTION OF GENERAL STATE OF HEALTH- DELIVERY (PD)			
S/N	Question	Response	Code
PD1	Now I would like to ask you about your health during your last delivery only. Compared to most of your mates around the time you delivered your last baby, was your health status better, the same or worse?	Better The same Worse	1 2 3
PD2	I am going to read a statement to you. Tell me whether you strongly agree, agree, disagree or strongly disagree with the statement. “My health status was generally fine during my last delivery.”	Strongly agree Agree Disagree Strongly disagree	1 2 3 4

MORBIDITIES DURING DELIVERY- UNPROMPTED (MD-U)

Type	Question	Tick	Question	Question	Question
	<p>MD-U1: Now I would like you to tell me about any illnesses and problems you experienced during your delivery only. Please can you list out all the illnesses and problems you experienced?</p> <p>TICK ALL THAT RESPONDENT REPORTS. RECORD ANY PROBLEMS NOT ON THE LIST UNDER "OTHER."</p> <p>ASK "Any other?"</p>		MD-U2: From the problems you mentioned, which ones did a health professional (doctor or nurse or midwife or pharmacist or lab technician) diagnose you with?	<p>MD-U3: Would you say any of these problems were serious?</p> <p>Y N DK</p> <p>1 2 99</p> <p>↓ ↓ ↓</p>	MD-U4: Which ones? ASK FOR 3 MOST SERIOUS IF MORE THAN 3 ARE REPORTED. DON'T PROBE FURTHER ON PROLONGED LABOUR AND INTRAPARTUM HAEMORRHAGE IF REPORTED.
Symptoms	Febrile-related			<p>MD-U4</p>	
	Fever	-----	-----		
	Convulsions (fits)	-----	-----		
Shivering	-----	-----			
Uncategorised					
Loss of consciousness (shock)	-----	-----			
Others (Specify here)					
Named Morbidities	Discharges				
	Intrapartum haemorrhage	-----	-----		
	Tears/Detachments				
	Uterine rupture	-----	-----		
	Perineal laceration ('natural' tear)	-----	-----		
	Obstructions/Delays				
	Mal-presentation	-----	-----		
Prolonged labour (>12 hours)	-----	-----			
Delayed placental expulsion (>30 minutes)	-----	-----			
Cord around baby's neck					
Uncategorised					
Retained placenta	-----	-----			
Hypertension	-----	-----			
Others (Specify here)					
Procedures	Induced labour	-----	-----		
	Manual placenta expulsion	-----	-----		
	C-section	-----	-----		
	Hysterectomy	-----	-----		
	Episiotomy	-----	-----		
	Blood transfusion	-----	-----		
	ICU admission	-----	-----		
	Senior personnel summoned	-----	-----		
	Referral to another health institution	-----	-----		
	Others (Specify here)				

SEVERITY OF MORBIDITIES- DELIVERY (SD)												
Line #	Onset	Duration	Care-seeking			Consequences on life					Social	Perception of severity
						Financial		Physical				
	SD1. When did (<i>insert morbidity</i>) start?	SD2. How long did (<i>insert morbidity</i>) last? RECORD NUMBER OF HOURS OR DAYS OR WEEKS OR MONTHS	SD3. Did you seek care for (<i>insert morbidity</i>)?	SD4. What did you do?	SD5. What treatment did you receive?	SD6. Did you pay for care (medical services) and/or treatment (medicines) for (<i>insert morbidity</i>)?	SD7. Did you pay for transportati on in seeking care for (<i>insert morbidity</i>)?	SD8. How much did you pay in total for care, treatment, and transportati on for this health issue?	SD9. What was the source of finance used to pay for care, treatment, and transportatio n for (<i>insert morbidity</i>)?	SD10. What was the effect of (<i>insert morbidity</i>) on your day-to-day activities like cooking, sweeping and walking to the shop?	SD11. What was the effect of (<i>insert morbidity</i>) on your relationship with the following:	SD12. Rate the severity of (<i>insert morbidity</i>) on a scale of 0 to 10, with 0 being no pain/discomfort and 10 being highest pain/discomfort. SHOW CARD.
Morbidity #1	-----hour(s) into labour ----hour(s) into birth DK 99	--- hour(s) --- day(s) --- week(s) ---month(s)	Y N 1 2 ↓ ↓ SD4 SD10	1 2 3 4 5	1 2 3 4	Y N 1 2	Y N 1 2	1 2 3 4 99	1 2 3 4 5 6	1 2 3 99	Husband 1 2 3 99 Baby (bonding) 1 2 3 99 Others 1 2 3 99	-----
Morbidity #2	-----hour(s) into labour ----hour(s) into birth DK 99	--- hour(s) --- day(s) --- week(s) ---month(s)	Y N 1 2 ↓ ↓ SD4 SD10	1 2 3 4 5	1 2 3 4	Y N 1 2	Y N 1 2	1 2 3 4 99	1 2 3 4 5 6	1 2 3 99	Husband 1 2 3 99 Baby (bonding) 1 2 3 99 Others 1 2 3 99	-----
Morbidity #3	-----hour(s) into labour ----hour(s) into birth DK 99	--- hour(s) --- day(s) --- week(s) ---month(s)	Y N 1 2 ↓ ↓ SD4 SD10	1 2 3 4 5	1 2 3 4	Y N 1 2	Y N 1 2	1 2 3 4 99	1 2 3 4 5 6	1 2 3 99	Husband 1 2 3 99 Baby (bonding) 1 2 3 99 Others 1 2 3 99	-----

Codes for SD4

- 1-Home remedy/self-treatment
- 2- Consulted lay source (e.g. mother)
- 3- Consulted traditional source
- 4- Visited chemist
- 5- Visited formal health facility
- 6- Joint consultation

Codes for SD5

- 1- None
- 2-Western medicine/ therapy
- 3-Traditional medicine/ therapy
- 4- Joint western and traditional

Codes for SD8

- 1- No payment
- 2- <N1,000
- 3- N1,000- N10,000
- 4- >N10,000
- 99- Don't know

Codes for SD9

- 1-Household income/savings
- 2- Non-resident family member/friend/neighbour
- 3- Loan from family member
- 4- Loan from friend/neighbour
- 5- Selling assets
- 6- Other (NGO, social welfare, health insurance, donation)

Codes for SD10 & SD11

- 1- No disruption
- 2-Some disruption
- 3-Serious disruption
- 99- Don't know

MORBIDITIES DURING DELIVERY- PROMPTED (MD-P)					
S/N	Question/ Types	Responses	Code		
MD-P1	Now I would like to find out whether you experienced any other problems apart from the ones you mentioned previously. Did you experience any of the following during DELIVERY? Symptoms	DO NOT PROMPT RESPONDENT FOR MORBIDITIES ALREADY MENTIONED IN PRECEDING SECTION (MD-U). Fever Convulsions (fits) Shivering Loss of consciousness (shock)			
			Yes	No	DK
			1	2	99
			1	2	99
			1	2	99
	Named morbidities	<ul style="list-style-type: none"> - Intrapartum haemorrhage (were you bleeding excessively from your vagina?) - Uterine rupture (did your womb get detached from its place?) - Perineal laceration (did you have any tear around your vagina as the baby came out, not the cut made by your birth attendant?) - Mal-presentation (was your baby lying in any position besides upside-down at delivery?) - Prolonged labour (did your labour last longer than 12 hours from the time you started experiencing strong, continuous pains that stopped you from doing chores to the time you delivered?) - Delayed placenta expulsion (did your placenta stay longer than 30 minutes before coming out?) - Cord around baby's neck (was the cord around your baby's neck?) - Retained placenta (did any part of your placenta remain in your womb after the other parts had come out?) - Hypertension (was your blood pressure up?) 	Yes	No	DK
			1	2	99
			1	2	99
			1	2	99
			1	2	99
			1	2	99
			1	2	99
			1	2	99
			1	2	99
	Procedures	<ul style="list-style-type: none"> - Induced labour (did your birth attendant put his/her fingers into your vagina to burst the water, or give you a drip or medication to start your labour?) - Manual placenta expulsion (did your birth attendant put his/her hand into your vagina to remove the placenta?) - C-section (did they cut your belly open to take the baby out?) - Hysterectomy (did they remove all or part of your womb?) - Episiotomy (Was a cut made around your vagina to enlarge the opening for your baby to come out?) - Blood transfusion (were you given blood?) - ICU admission (were you admitted in a special care ward with very limited access by non-hospital staff) - Senior personnel summoned (did the hospital staff have to call a senior staff- their "oga"- to manage your case?) - Referral to another health institution (were you transferred to another health centre because the first place could not care for you very well?) 	Yes	No	DK
			1	2	99
			1	2	99
			1	2	99
			1	2	99
			1	2	99
			1	2	99
			1	2	99
			1	2	99

PROLONGED LABOUR (PL)				
S/N	Question	Response	Code	Go to
PL1	I would like to ask some specific questions about your labour. How long did your labour last for, that is, from the time you started experiencing very strong continuous pains which stopped you from doing chores to the birth of your baby? GO TO PS1 IF WOMAN REPORTS <12 HOURS.	----- hours ----- days		
PL2	Did you seek care when the labour took this amount of time?	Yes No	1 2	PL3 PL5
PL3	What did you do?	Home remedy/self-treatment Consulted lay source (e.g. mother) Consulted traditional source Visited chemist Visited formal health facility Joint consultation	1 2 3 4 5 6	
PL4	What treatment did you receive?	None Western medicine/ therapy Traditional medicine/ therapy Joint western and traditional	1 2 3 4	
PL5	Did you pay for care (medical services) and/or treatment (medicines) for the labour?	Yes No	1 2	
PL6	Did you pay for transportation in seeking care for the labour?	Yes No	1 2	
PL7	How much did you pay in total for care, treatment, and transportation for the labour?	No payment <N1,000 N1,000- N10,000 >N10,000 Don't know	1 2 3 4 99	
PL8	What was the source of finance used to pay for care, treatment, and transportation for the labour?	Household income/savings Non-resident family member/friend/neighbour Loan from family member Loan from friend/neighbour Selling assets Other (NGO, social welfare, health insurance, donation)	1 2 3 4 5 6	
PL9	Rate the severity of the labour on a scale of 0 to 10, with 0 being no pain/discomfort and 10 being highest pain/discomfort. SHOW CARD.	-----		

PERCEPTION OF GENERAL STATE OF HEALTH- POSTPARTUM (PS)			
S/N	Question	Response	Code
	Now I would like to ask you about your health after you delivered.		
PS1	Compared to most of your mates after you gave birth to your last baby, was your health status better, the same or worse?	Better The same Worse	1 2 3
PS2	I am going to read a statement to you. Tell me whether you strongly agree, agree, disagree or strongly disagree with the statement. “My health status was generally fine after I gave birth to my last baby.”	Strongly agree Agree Disagree Strongly disagree	1 2 3 4

MORBIDITIES DURING POSTPARTUM- UNPROMPTED (MS-U)						
Type	Question	Tick	Question	Question	Question	
	MS-U1: Now I would like you to tell me about any illnesses/ problems you experienced after you delivered your last baby . Please can you list out all the illnesses and problems you experienced? TICK ALL THAT RESPONDENT REPORTS. RECORD ANY PROBLEMS NOT ON THE LIST UNDER "OTHER." ASK "Any other?"		MS-U2: From the problems you mentioned, which ones did a health professional (doctor or nurse or midwife or pharmacist or lab technician) diagnose you with?	MS-U3: Would you say any of these problems were serious? Y N DK 1 2 99 ↓ ↓ ↓	MS-U4: Which ones? ASK FOR 3 MOST SERIOUS IF MORE THAN 3 ARE REPORTED. DON'T PROBE FURTHER ON POSTPARTUM HAEMORRHAGE IF REPORTED.	
Symptoms	Pain Backache Headache Painful urination Painful intercourse Perineal pain Abdominal pain	----- ----- ----- ----- ----- -----	----- ----- ----- ----- ----- -----	MS-U4	----- ----- ----- ----- ----- -----	
	Swelling Swollen feet Swollen face Haemorrhoids Breast problems (abscess, soreness, etc)	----- ----- ----- ----- -----	----- ----- ----- ----- -----		----- ----- ----- ----- -----	
	Discharges Leaking urine Leaking faeces Too frequent urination Foul, smelly discharge Bright red bleeding >4 days postpartum	----- ----- ----- ----- ----- -----	----- ----- ----- ----- ----- -----		----- ----- ----- ----- ----- -----	
	Digestion-related Constipation Unable to urinate	----- ----- -----	----- ----- -----		----- ----- -----	
	Febrile-related Fever Convulsions (fits)	----- ----- -----	----- ----- -----		----- ----- -----	
	Uncategorised Insomnia Foot drop Weakness Dizziness/ vertigo Rapid or shallow breathing Loss of consciousness (shock)	----- ----- ----- ----- ----- ----- -----	----- ----- ----- ----- ----- ----- -----		----- ----- ----- ----- ----- ----- -----	
	Others (Specify here)					
	Named Morbidities	Discharges Postpartum haemorrhage (primary)	----- -----		----- -----	----- -----
		Tears/Detachments Uterine prolapse Obstetric fistula	----- ----- -----		----- ----- -----	----- ----- -----
		Uncategorised Sepsis Hypertension	----- ----- -----		----- ----- -----	----- ----- -----
Others (Specify here)						
Procedures	Prolonged postpartum admission (≥5 days)	-----	-----		-----	
	ICU admission	-----	-----		-----	
	Blood transfusion	-----	-----		-----	
	Senior personnel summoned	-----	-----		-----	
	Referral to another health institution	-----	-----		-----	
	Others (Specify here)					

SEVERITY OF MORBIDITIES- POSTPARTUM (SS)												
Line #	Onset	Duration	Care-seeking			Consequences on life					Social	Perception of severity
						Financial		Physical				
	SS1. When did (<i>insert morbidity</i>) start?	SS2. How long did (<i>insert morbidity</i>) last? RECORD NUMBER OF DAYS OR WEEKS OR MONTHS	SS3. Did you seek care for (<i>insert morbidity</i>)?	SS4. What did you do?	SS5. What treatment did you receive?	SS6. Did you pay for care (medical services) and/or treatment (medicines) for (<i>insert morbidity</i>)?	SS7. Did you pay for transportati on in seeking care for (<i>insert morbidity</i>)?	SS8. How much did you pay in total for care, treatment, and transportati on for this health issue?	SS9. What was the source of finance used to pay for care, treatment, and transportatio n for (<i>insert morbidity</i>)?	SS10. What was the effect of (<i>insert morbidity</i>) on your day-to-day activities like cooking, sweeping and walking to the shop?	SS11. What was the effect of (<i>insert morbidity</i>) on your relationship with the following:	SS12. Rate the severity of (<i>insert morbidity</i>) on a scale of 0 to 10, with 0 being no pain/discomfort and 10 being highest pain/discomfort. SHOW CARD.
Morbidity #1	1 2 3 4	--- day(s) --- week(s) ---month(s)	Y N 1 2 ↓ ↓ SS4 SS10	1 2 3 4 5	1 2 3 4	Y N 1 2	Y N 1 2	1 2 3 4 99	1 2 3 4 5 6	1 2 3 99	Husband 1 2 3 99 Baby (bonding) 1 2 3 99 Others 1 2 3 99	-----
Morbidity #2	1 2 3 4	--- day(s) --- week(s) ---month(s)	Y N 1 2 ↓ ↓ SS4 SS10	1 2 3 4 5	1 2 3 4	Y N 1 2	Y N 1 2	1 2 3 4 99	1 2 3 4 5 6	1 2 3 99	Husband 1 2 3 99 Baby (bonding) 1 2 3 99 Others 1 2 3 99	-----
Morbidity #3	1 2 3 4	--- day(s) --- week(s) ---month(s)	Y N 1 2 ↓ ↓ SS4 SS10	1 2 3 4 5	1 2 3 4	Y N 1 2	Y N 1 2	1 2 3 4 99	1 2 3 4 5 6	1 2 3 99	Husband 1 2 3 99 Baby (bonding) 1 2 3 99 Others 1 2 3 99	-----

Codes for SS1

- 1- Within 24 hours post-delivery
- 2- >24 hours but less than 1 week post-delivery
- 3- > 1 week but less than one month post delivery
- 4- ≥1 month post-delivery

Codes for SS4

- 1- Home remedy/self-treatment
- 2- Consulted lay source (e.g. mother)
- 3- Consulted traditional source
- 4- Visited chemist
- 5- Visited formal health facility
- 6- Joint consultation

Codes for SS5

- 1- None
- 2- Western medicine/ therapy
- 3- Traditional medicine/ therapy
- 4- Joint western and traditional

Codes for SS8

- 1- No payment
- 2- <N1,000
- 3- N1,000- N10,000
- 4- >N10,000
- 99- Don't know

Codes for SS9

- 1- Household income/savings
- 2- Non-resident family member/friend/neighbour
- 3- Loan from family member
- 4- Loan from friend/neighbour
- 5- Selling assets
- 6- Other (NGO, social welfare, health insurance, donation)

Codes for SS10 & SS11

- 1- No disruption
- 2- Some disruption
- 3- Serious disruption
- 99- Don't know

MORBIDITIES DURING POSTPARTUM PERIOD- PROMPTED (MS-P)					
S/N	Question/ Types	Responses	Code		
MS-P1	<p>Now I would like to find out whether you experienced any other problems apart from the ones you mentioned previously. Did you experience any of the following after delivery?</p> <p>Symptoms</p>	DO NOT PROMPT RESPONDENT FOR MORBIDITIES ALREADY MENTIONED IN PRECEDING SECTION (MS-U).	Yes 1	No 2	DK 3
		Backache	1	2	99
		Headache	1	2	99
		Painful urination	1	2	99
		Painful intercourse	1	2	99
		Perineal pain (did you experience pain in the area around your vagina and anus?)	1	2	99
		Abdominal pain	1	2	99
		Swollen feet	1	2	99
		Swollen face	1	2	99
		Haemorrhoids	1	2	99
		Breast problems	1	2	99
		Leaking urine	1	2	99
		Leaking faeces	1	2	99
		Too frequent urination	1	2	99
		Smelly discharge	1	2	99
		Bright red bleeding >4 days postpartum	1	2	99
		Constipation	1	2	99
		Unable to urinate	1	2	99
		Fever	1	2	99
		Convulsions (fits)	1	2	99
		Insomnia	1	2	99
		Foot drop (did you experience any difficulty in raising the front part of your foot or toes?)	1	2	99
		Weakness	1	2	99
		Dizziness/ vertigo	1	2	99
		Rapid or shallow breathing	1	2	99
		Loss of consciousness (shock)	1	2	99
	Named morbidities	- Postpartum haemorrhage (were you bleeding excessively from your vagina?)	Yes 1	No 2	DK 99
		- Uterine prolapse (Did you feel something drop inside of you while walking, or felt some heaviness in your vagina?)	1	2	99
		- Obstetric fistula (Were you totally unable to control the flow of your urine and faeces?)	1	2	99
		- Sepsis (were you told you had a serious infection?)	1	2	99
		- Hypertension (your blood pressure was up?)	1	2	99
	Procedures	- Prolonged postpartum admission (were you admitted in the hospital/health centre for 5 days or more?)	Yes 1	No 2	DK 99
		- ICU admission (were you admitted in a special care ward with very limited access by non-hospital staff)	1	2	99
		- Blood transfusion (were you given blood?)	1	2	99
		- Senior personnel summoned (did the hospital staff have to call a senior staff- their “oga”- to manage your case?)	1	2	99
		- Referral to another health institution (were you transferred to another health centre because the first place could not care for you very well?)	1	2	99

HAEMORRHAGE (HM)- INTRAPARTUM AND POSTPARTUM

S/N	Question	Response	Code	Go to
HM1	I would like to ask some questions about the blood you lost during and after your last delivery. Firstly, how much blood did you lose during and around your delivery only ? SHOW BOTTLES. ACCEPT RESPONSES ONLY IF WOMAN IS SURE.	Less than 500mL ≥500mL but <1,000mL ≥1,000mL Don't know	1 2 3 99	
HM2	Did you bleed so much during and around your delivery that you thought you were going to die?	Yes No Don't know	1 2 99	
HM3	Did you bleed so much since you wore the first pad you that thought you were going to die?	Yes No	1 2	
HM4	Did you stain any of the following since you wore the first pad:	Your cloth? The bed? The floor?	Yes No DK 1 2 99 1 2 99 1 2 99	
HM5	Did blood trickle/flow down your leg within 24 hours after your delivery?	Yes No Don't know	1 2 99	
HM6	Did so many big, thick clots of blood come out frequently within the first 24 hours after your delivery?	Yes No Don't know	1 2 99	
HM7	How long did it take for one pad (<i>or vaginal cloth</i>) to soak on average within the first 24 hours of your delivery?	<1 hour 2-3 hours 4-5 hours ≥6 hours Don't know	1 2 3 4 99	
HM8	Did you seek care for the bleeding post-delivery?	Yes No	1 2	
HM9	What did you do?	Home remedy/self-treatment Consulted lay source (e.g. mother) Consulted traditional source Visited chemist Visited formal health facility Joint consultation	1 2 3 4 5 6	
HM10	What treatment did you receive?	None Western medicine/ therapy Traditional medicine/ therapy Joint western and traditional	1 2 3 4	
HM11	Did you pay for care (medical services) and/or treatment (medicines) for the bleeding post-delivery?	Yes No	1 2	
HM12	Did you pay for transportation in seeking care for the bleeding post-delivery?	Yes No	1 2	
HM13	How much did you pay in total for care, treatment, and transportation for the bleeding post-delivery?	No payment <N1,000 N1,000- N10,000 >N10,000 Don't know	1 2 3 4 99	
HM14	What was the source of finance used to pay for care, treatment, and transportation for the bleeding post-delivery?	Household income/savings Non-resident family mem/friend/ neighbor Loan from family member Loan from friend/neighbour Selling assets Other (NGO, health insurance, donation)	1 2 3 4 5 6	
HM11	Rate the severity of your bleeding after delivery on a scale of 0 to 10, with 0 being no pain/discomfort and 10 being highest pain/discomfort. SHOW CARD.	-----		

CLOSING (CL)

THANK RESPONDENT FOR HER TIME.

CLOSE SURVEY.

TIME ENDED:

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ANY COMMENTS

Appendix 7.3: Topic guides used during the cognitive interviews (for Rounds 1 and 4)

COGNITIVE INTERVIEW TOPIC GUIDE (Round 1)

Code #:

Start Time:

Location:

Date:

End Time:

A. Introduction

- Greet and introduce yourself
- Explain aim and objectives of study
- Mention anticipated length of the interview (approximately 1 hour)
- Explain why you need to record
- Explain rights (answer refusal, withdrawal, question clarification, interruption)
- Mention that there are no right or wrong answers (interested in learning from her)
- Mention possibility of follow-up for more information
- Explain anonymity and confidentiality
- Ask if participant has any questions
- Ask if participant is fine with continuing
- Switch on tape recorder
- Collect demographic information
 - Name
 - Residence
 - Age
 - Religion
 - Highest educational level
 - Occupation
 - Wife # (if applicable)
 - Number of children
 - Gestational age at pregnancy discovery
 - Delivery date of last child
 - Mode of delivery (Vaginal, C-section, etc)
 - Place of delivery

B. Practice Questions

Explain plan/sequence of the discussion. Then practice with these questions:

1. What is your favourite food?
 - What does the term “favourite food” mean to you?
2. At what time did you go to bed last night?
 - How do remember that you went to bed at -----?

C. General State of Health Questions

Now I would like to ask you about your health **during your last pregnancy only.**

1. Compared to most of your mates during your last pregnancy, was your health status better, the same or worse?
 - What does the word “mates” mean to you?
 - How did you know that your health status was ----- compared to most of your mates?
2. I am going to read a statement to you. Tell me whether you strongly agree, agree, disagree or strongly disagree with the statement. “My health status was generally fine during my last pregnancy.”
Show scale if necessary.
 - How easy or difficult was it to answer this question?

- *If woman used scales: Does this face (point the face that woman selected) really depict your answer (mention answer that she picked)?*

D. Morbidities during Pregnancy

1. Now I would like you to tell me about any illnesses and problems you experienced at any point **during your pregnancy only**. Please can you list out all the illnesses and problems you experienced?

- What does the term “illnesses” mean to you?
- What does the term “problems” mean to you?
- When does pregnancy period start and when does pregnancy period end, in practical terms, to you?
- How well do you remember that you experienced ----- during your last pregnancy? (*Repeat for every morbidity woman mentions*)

2. From the problems you mentioned, which ones did a health professional (a doctor or nurse or midwife) diagnose you with?

- How did they diagnose you with -----? (*Repeat for each morbidity*)

3. Would you say any of these problems were serious? *If yes: Which ones?*

- What does the term “serious” mean to you?

E. Severity of Pregnancy Morbidities

Ask the questions below for each morbidity mentioned in D3.

1. When did (*insert morbidity*) start?

- How sure are you that it started at -----?

2. How long did (*insert morbidity*) last (*If it occurred more than once, ask for cumulative total*)?

- How did you arrive at the answer of ----- days/ weeks/ months?

3. Did you seek care/treatment/remedy for (*insert morbidity*)?

- Can you repeat this question in your own words?

If #3 is “yes” go to #4; if “no” go to #10.

4. What did you do?

- How well do you remember that this is what you did?

5. What treatment did you receive?

- What does the word “treatment” mean to you?

6. Did you pay for care (medical services) and/or treatment (medicines) for (*insert morbidity*)?

- How sure are you that you paid for care (medical services) and/or treatment (medicines) for (*insert morbidity*)?

7. Did you pay for transportation for you and/or anyone else in seeking care for (*insert morbidity*)?

- Which type of transportation did you use?

8. How much did you pay in total for care, treatment, and transportation for this health issue?

- How did you get the answer of ----- naira?

9. What was the source of finance used to pay for care, treatment, and transportation for (*insert morbidity*)?

- How sure are you that ----- was the source of finance used to pay for care, treatment, and transportation for (*insert morbidity*)?

10. What was the effect of (*insert morbidity*) on your day-to-day activities like cooking, sweeping, walking to the shop and going to work?

- What do you think this question is asking for?

11. What was the effect of (*insert morbidity*) on your social life such as chatting with your family and others, or participating in important events like weddings and naming ceremonies?

- Do “chatting with your family and others, or participating in important events like weddings and naming ceremonies” exemplify your social life, or do you think there are other more important aspects of your social life which this question should have mentioned?

12. Rate the severity of (*insert morbidity*) on a scale of 0 to 3, with 0 being no pain/ discomfort, 1 being mild pain/discomfort, 2 being moderate pain/ discomfort and 3 being severe pain/discomfort. *Show scale if necessary.*

- How easy or difficult was it for you to choose an answer from this list?
- *If woman used scales: Does this face (point the face that woman selected) really depict your answer (mention answer that she picked)?*

F. Vomiting- Selected Questions

1. Were you vomiting during your last pregnancy? Y/N

- Do you think this question is asking about vomiting during the early stages of the pregnancy only or vomiting throughout the pregnancy?
- Do you think this question is asking about consistent vomiting or occasional vomiting?

Go to Section G if woman wasn't vomiting during her last pregnancy

2. When did the vomiting start?

- How sure are you that you started vomiting at the ----- month/trimester of your pregnancy?

3. When did the vomiting stop entirely?

- How well do you remember that you stopped vomiting entirely at ----- month/trimester of your pregnancy?

4. On average, how many times did you vomit per day during the period you were vomiting?

- How did you arrive at your answer of ----- times?

5. Did you vomit so much that almost everything that goes into your mouth comes out?

- What does the term “almost everything” mean to you?
- How easy or difficult was it for you to answer this question?

6. Did you lose weight around this time that you were vomiting?

- How do you know that you lost weight around this time that you were vomiting?

7. Were you ever given a drip for the vomiting?

- How do you know that you were given a drip for the vomiting particularly and not for some other problem?

8. How many drips were you given throughout your pregnancy for the vomiting?

- How sure are you that you were given ----- drips?

I am going to read some statements to you about your vomiting experience during your last pregnancy. Tell me whether you strongly agree, agree, disagree or strongly disagree with the statement. *Show card if necessary.*

9. “The vomiting made me fully dependent on others to do my day-to-day activities like cooking, sweeping and going to the shop.”

- What does the term “fully dependent” mean to you?
10. “To avoid triggering the vomiting, we made significant changes in my family such as changing the location of the cooking counter and fireplace and restricting the usage of substances with distinct smell.”
- Do these examples “changing the location of the cooking counter and fireplace and restricting the usage of substances with distinct smell” actually typify the kinds of changes that vomiting could trigger in your household or not?
 - *If no, probe:* Which kinds of changes will it trigger?
11. “The vomiting affected my occupation negatively such as making me to be absent from work, receiving reprimand(s) from my supervisor or missing opportunities to make money.”
- How easy or difficult was it to answer this question?
12. “The vomiting affected my relationship with my husband negatively.”
- What do you think this question is asking for?
13. “The vomiting affected my social life negatively such as preventing me from visiting family and friends or making me to avoid gatherings.”
- Do these examples “preventing me from visiting family and friends or making me to avoid gatherings” actually typify the kinds of negative effects that the vomiting had on your social life or not?
 - *If no, probe:* Which examples of negative effects did the vomiting have on your social life?

G. Morbidities during Delivery

1. Now I would like you to tell me about any illnesses and problems you experienced at any point **during your delivery only**. Please can you list out all the illnesses and problems you experienced?
- How well do you remember that you experienced ----- during your last delivery? (*Repeat for every morbidity woman mentions*)
 - What would you classify as an illness or problem during delivery?
 - When does delivery period start and when does delivery period end, in practical terms, to you?
2. From the problems you mentioned, which ones did a health professional (a doctor or nurse or midwife) diagnose you with?
- How do you know that they diagnose you with ----- during delivery? (*Repeat for each morbidity*)
3. Would you say any of these problems were serious? *If yes:* Which ones?
- What does the term “serious” mean to you in this context of delivery?

H. Severity of Delivery Morbidities

Ask the questions below for each morbidity mentioned in D3.

1. When did (*insert morbidity*) start?
- How sure are you that it started at -----?
2. How long did (*insert morbidity*) last (*If it occurred more than once, ask for cumulative total*)?
- How did you arrive at the answer of ----- days/ weeks/ months?
3. Did you seek care/treatment/remedy for (*insert morbidity*)?
- Can you repeat this question in your own words?
- If #3 is “yes” go to #4; if “no” go to #10.*
4. What did you do?
- How well do you remember that this is what you did?

5. What treatment did you receive?
 - What does the word “treatment” mean to you?
6. Did you pay for care (medical services) and/or treatment (medicines) for (*insert morbidity*)?
 - How sure are you that you paid for care (medical services) and/or treatment (medicines) for (*insert morbidity*)?
7. Did you pay for transportation for you and/or anyone else in seeking care for (*insert morbidity*)?
 - Which type of transportation did you use?
8. How much did you pay in total for care, treatment, and transportation for this health issue?
 - How did you get the answer of ----- naira?
9. What was the source of finance used to pay for care, treatment, and transportation for (*insert morbidity*)?
 - How sure are you that ----- was the source of finance used to pay for care, treatment, and transportation for (*insert morbidity*)?
10. What was the effect of (*insert morbidity*) on your day-to-day activities like cooking, sweeping, walking to the shop and going to work?
 - What do you think this question is asking for?
11. What was the effect of (*insert morbidity*) on your social life such as chatting with your family and others, or participating in important events like weddings and naming ceremonies?
 - Do “chatting with your family and others, or participating in important events like weddings and naming ceremonies” exemplify your social life, or do you think there are other more important aspects of your social life which this question should have mentioned?
12. Rate the severity of (*insert morbidity*) on a scale of 0 to 3, with 0 being no pain/ discomfort, 1 being mild pain/discomfort, 2 being moderate pain/ discomfort and 3 being severe pain/discomfort. *Show scale if necessary.*
 - How easy or difficult was it for you to choose an answer from this list?
 - *If woman used scales:* Does this face (*point the face that woman selected*) really depict your answer (*mention answer that she picked*)?

I. Prolonged Labour- Selected Questions

1. I would like to ask some specific questions about your labour.
How long did your labour last for, that is, from the time you started experiencing very strong continuous pains which stopped you from doing chores to the birth of your baby?
 - How did you arrive at the answer of ----- minutes/ hours/ days?
2. Did you seek care when the labour took this amount of time?
 - Can you repeat this question in your own words?

J. Morbidities Postpartum

Now I would like you to tell me about any illnesses and problems you experienced **after you delivered your last baby, whether immediately after the delivery, or hours, or days or weeks after the delivery.** Please can you list out all the illnesses and problems you experienced?

- How well do you remember that you experienced ----- after your last delivery? (*Repeat for every morbidity woman mentions*)
- What would you classify as an illness or problem after delivery?
- How easy or hard was it for you to answer this question?

- When does postpartum period start and when does postpartum period end, in practical terms, to you?
2. From the problems you mentioned, which ones did a health professional (a doctor or nurse or midwife) diagnose you with?
 - How did they diagnose you with ----- after delivery? (*Repeat for each morbidity*)
 3. Would you say any of these problems were serious? *If yes: Which ones?*
 - What does the term “serious” mean to you in this context of postpartum?

K. Severity of Postpartum Morbidities

Ask the questions below for each morbidity mentioned in D3.

1. When did (*insert morbidity*) start?
 - How sure are you that it started at -----?
 2. How long did (*insert morbidity*) last (*If it occurred more than once, ask for cumulative total*)?
 - How did you arrive at the answer of ----- days/ weeks/ months?
 3. Did you seek care/treatment/remedy for (*insert morbidity*)?
 - Can you repeat this question in your own words?
- If #3 is “yes” go to #4; if “no” go to #10.*
4. What did you do?
 - How well do you remember that this is what you did?
 5. What treatment did you receive?
 - What does the word “treatment” mean to you?
 6. Did you pay for care (medical services) and/or treatment (medicines) for (*insert morbidity*)?
 - How sure are you that you paid for care (medical services) and/or treatment (medicines) for (*insert morbidity*)?
 7. Did you pay for transportation for you and/or anyone else in seeking care for (*insert morbidity*)?
 - Which type of transportation did you use?
 8. How much did you pay in total for care, treatment, and transportation for this health issue?
 - How did you get the answer of ----- naira?
 9. What was the source of finance used to pay for care, treatment, and transportation for (*insert morbidity*)?
 - How sure are you that ----- was the source of finance used to pay for care, treatment, and transportation for (*insert morbidity*)?
 10. What was the effect of (*insert morbidity*) on your day-to-day activities like cooking, sweeping, walking to the shop and going to work?
 - What do you think this question is asking for?
 11. What was the effect of (*insert morbidity*) on your social life such as chatting with your family and others, or participating in important events like weddings and naming ceremonies?
 - Do “chatting with your family and others, or participating in important events like weddings and naming ceremonies” exemplify your social life or do you think there are other more important aspects of your social life which this question should have mentioned?
 12. Rate the severity of (*insert morbidity*) on a scale of 0 to 3, with 0 being no pain/ discomfort, 1 being mild pain/discomfort, 2 being moderate pain/ discomfort and 3 being severe pain/discomfort. *Show scale if necessary.*
 - How easy or difficult was it for you to choose an answer from this list?

- *If woman used scales: Does this face (point the face that woman selected) really depict your answer (mention answer that she picked)?*

L. Haemorrhage- Selected Questions

I would like to ask some questions about the blood you lost during and after your last delivery.

1. When does **bleeding during delivery stop** and when does **bleeding after delivery start**, in practical terms?
2. Did you stain the bed-covering during your last delivery?
 - What type of bed-covering did you use during your last delivery? Can you describe it?
3. Was the bed-covering minimally stained or fully soaked?
 - What does “minimally stained” mean to you and what does “fully soaked” mean to you?
4. How many (*insert type of bed-covering*) were fully soaked during the delivery?
 - How did you arrive at your answer of -----?
5. Did you stain the floor during your last delivery?
 - How well do you remember that you stained the floor during your last delivery?
6. *For hospital deliveries only:* Did any maternity staff attending to your birth mention that your blood level had reduced significantly, for example, after testing your PCV?
 - How easy or hard was it for you to answer this question?
7. Compared to most of your mates, was the bleeding during your last delivery minimal, the same or much?
 - How did you know that the bleeding during your last delivery was ----- compared to most of your mates?
8. Did your birth attendant ask your family members or your escort to look for blood donors at any point during your last delivery, even if you did not use the blood eventually?
 - At what point did you know that your birth attendant asked your family members or escort to look for blood donors to give you blood?
9. Were you given an injection to stop the bleeding or a tablet was inserted into your vagina to stop the bleeding?
 - How did you know that you were given an injection or a tablet was inserted into your vagina to stop the bleeding?
10. Were you given blood, that is, blood transfusion? Yes/ No
11. How many pints of blood were you given during the delivery?
 - How sure are you that you were given ----- pints of blood during the delivery?
12. Did you seek care/ treatment/remedy for the bleeding?
 - What do you think this question is asking for?
13. What did you do?
 - How easy or hard is it to remember this?
14. What treatment did you receive?
 - How well do you remember that you were given -----?

15. Did you have to make any payment for care and/or treatment/medicines for the bleeding? *If yes:* How much?

- How sure are you that you paid ----- for the bleeding alone, and not for your entire medical service and treatment?

16. Were you given any blood supplements to take after your delivery, that is, drugs to increase your blood level?

- How did you know that the drug you were given was meant to increase your blood level?

17. Did your birth attendant or another maternity staff come back at some points after your delivery to scoop out blood from inside you?

- How well do you remember that your birth attendant or another maternity staff came back at some points after your delivery to scoop out blood from inside you?

18. Did you feel dizzy within the first 24 hours after the delivery?

- What do you think caused this dizziness?

19. Did so many big, thick clots of blood come out frequently within the first 24 hours after your delivery?

- How will you describe the term “big, thick clots of blood”?

20. Rate the severity of your bleeding within the first 24 hours after delivery on a scale of 1 to 3, with 1 being mild bleeding, 2 being moderate bleeding and 3 being severe bleeding. **SHOW CARD.**

- How easy or difficult was it to choose an answer from this list?

M. Conclusion

- Any other thing participant wants to say (including any general comments or feedback)
- Thank participant
- Listen for any ‘door step’ data

COGNITIVE INTERVIEW TOPIC GUIDE (Round 4)

Code #:
Date:

Start Time:
End Time:

Location:

A. Introduction

- Greet and introduce yourself
- Explain aim and objectives of study
- Mention anticipated length of the interview (approximately 1 hour)
- Explain why you need to record
- Explain rights (answer refusal, withdrawal, question clarification, interruption)
- Mention that there are no right or wrong answers (interested in learning from her)
- Mention possibility of follow-up for more information
- Explain anonymity and confidentiality
- Ask if participant has any questions
- Ask if participant is fine with continuing
- Switch on tape recorder
- Collect demographic information
 - Name
 - Residence
 - Age
 - Religion
 - Highest educational level
 - Occupation
 - Wife # (if applicable)
 - Number of children
 - Gestational age at pregnancy discovery
 - Delivery date of last child
 - Mode of delivery (Vaginal, C-section, etc)
 - Place of delivery

B. Practice Questions

Explain plan/sequence of the discussion. Then practice with these questions:

1. What is your favourite food?
 - What does the term “favourite food” mean to you?
2. At what time did you go to bed last night?
 - How do remember that you went to bed at -----?

C. Morbidities during Pregnancy

1. Now I would like you to tell me about any illnesses and health problems you experienced at any point **during your pregnancy only**, whether it happened only once, or only at some points during the pregnancy or whether it happened throughout the pregnancy. Please can you list out all the illnesses and problems you experienced?

2. Would you say any of these problems was very serious, that is, did it/they negatively impact your wellbeing and/or functioning very severely? *If yes:* Which ones?

- How was (*insert morbidity*) very serious?

3. Did you seek care/treatment/remedy for (*insert morbidity*), that is, any solution to (*insert morbidity*) from anywhere or anyone?

If #1 is “yes” go to #4; if “no” go to Section E.

4. What did you do?
5. *For western treatment:* How many times did you seek care/treatment/remedy for (*insert morbidity*)?
 - How sure are you that you sought care/treatment/remedy for (*insert morbidity*) ----- times?

D. Severity of Pregnancy Morbidities

Select one of the morbidities mentioned in C2 and ask these questions below.

1. Did you pay for care (medical services) and/or treatment (medicines) for (*insert morbidity*)?
 - How sure are you that you paid for care (medical services) and/or treatment (medicines) for (*insert morbidity*)?
2. Did you or your family do any of the following to pay for care (medical services) and/or treatment (medicines) for (*insert morbidity*)?:
 - Use money reserved for something else to make the payment?
 - Borrow money to make the payment?
 - Sell an asset to make the payment?
 - How easy or difficult was it to answer this question?
3. What was the effect of (*insert morbidity*) on your day-to-day activities like cooking, sweeping, walking to the shop and going to work? Would you say there was no disruption, mild disruption, moderate disruption or serious disruption?
 - Why did you select ----- disruption?
4. What was the effect of (*insert morbidity*) on your social life, such as chatting with your family and others, going for (*pick appropriate one*) church/Islamic activities or participating in important events like weddings, birthdays and naming ceremonies?
 - Do “chatting with your family and others, going for church/Islamic-related activities or participating in important events like weddings, birthdays and naming ceremonies” exemplify your social life, or do you think there are other more important aspects of your social life which this question should have mentioned?
5. What was the effect of (*insert morbidity*) on your relationship with your husband, such as communicating with him, spending time together with him or being in good terms with him? Would you say there was no disruption, mild disruption, moderate disruption or serious disruption?
 - Are these examples “communicating with your husband, spending time together with him or being in good terms with him” important aspects of your relationship with your husband or are there other better examples?
6. Rate the severity of (*insert morbidity*) on a scale of 0 to 3, with 0 being no pain/ discomfort/worry, 1 being mild pain/discomfort/worry, 2 being moderate pain/ discomfort/worry and 3 being severe pain/discomfort/worry. *Show scale if necessary.*
 - How easy or difficult was it for you to choose an answer from this list?
 - *If woman used scales:* Does this face (*point the face that woman selected*) really depict your answer (*mention answer that she picked*)?
7. Are you currently taking drugs prescribed by a doctor, nurse, pharmacist or another trained health personnel or receiving therapy from them for the (*insert morbidity*)? *Probe accordingly*

E. Vomiting- Selected Questions

1. Were you vomiting excessively during your last pregnancy?
 - What does the term “vomiting excessively” mean to you?

Probe if necessary:

- Were you vomiting almost every day?

- Were vomiting more than 3 times per day?

Go to Section F if woman wasn't vomiting during her last pregnancy

2. On average, how many times were you vomiting per day during the period you were vomiting?
 - How did you arrive at your answer of ----- times?
3. Did you vomit so much that almost everything that goes into your mouth comes out?
 - What does the term "almost everything" mean to you?
4. Did you lose weight around this time that you were vomiting?
 - How do you know that you lost weight around this time that you were vomiting?
5. Were you ever given a drip for the vomiting?
 - How do you know that you were given a drip for the vomiting particularly and not for some other problem?
6. How many drips were you given throughout your pregnancy for the vomiting?
 - How sure are you that you were given ----- drips?

I am going to read some statements to you about your vomiting experience during your last pregnancy. Tell me whether you strongly agree, agree, disagree or strongly disagree with the statement. *Show card if necessary.*

7. "The vomiting was so serious such that we made significant changes in my family such as changing the location of the cooking counter and fireplace or restricting the usage of substances with distinct smell to avoid triggering the vomiting."
 - Do these examples "changing the location of the cooking counter and fireplace and restricting the usage of substances with distinct smell" actually typify the kinds of changes that vomiting could trigger in your household or not?
 - *If no, probe:* Which kinds of changes will it trigger?
8. "The vomiting affected my occupation negatively such as making me to be absent from work, receiving reprimand(s) from my supervisor or missing opportunities to make money."
 - How easy or difficult was it to answer this question?
9. "The vomiting affected my relationship with my husband negatively, such as making us quarrel, making us not to spend time together or making us not to be in good terms"
 - Do these examples "making us quarrel, making us not to spend time together or making us not to be in good terms" actually typify the kinds of negative effects that the vomiting had on your relationship with your husband or not?
10. "The vomiting affected my social life negatively such as preventing me from visiting family and friends or making me to avoid gatherings."
 - Do these examples "preventing me from visiting family and friends or making me to avoid gatherings" actually typify the kinds of negative effects that the vomiting had on your social life or not?
 - *If no, probe:* Which examples of negative effects did the vomiting have on your social life?

F. Morbidities during Delivery

1. Now I would like you to tell me about any illnesses and health problems you experienced at any point **during your delivery only**. By delivery, I mean the time from when your labour started

seriously up to the time you delivered your baby, including the time when aspects such as your clean-up in the delivery room or stitching were conducted. Please can you list out all the illnesses and problems you experienced?

2. Would you say any of these problems was very serious, that is, did it/they negatively impact your wellbeing and/or functioning very severely? *If yes: Which ones?*

- How was (*insert morbidity*) very serious?

3. *For home deliveries only:* Did you seek care/treatment/remedy for (*insert morbidity*), that is, any solution to it from anywhere or anyone?

If #3 is “yes” go to #4; if “no” go to Section G

4. *For home deliveries only:* What did you do?

G. Severity of Delivery Morbidities

Select one of the morbidities mentioned in F2 and ask these questions below.

1. Did you pay for care (medical services) and/or treatment (medicines) for (*insert morbidity*)?

- How sure are you that you paid for care (medical services) and/or treatment (medicines) for (*insert morbidity*)?

2. Did you or your family do any of the following to pay for care (medical services) and/or treatment (medicines) for (*insert morbidity*)?:

- Use money reserved for something else to make the payment?
- Borrow money to make the payment?
- Sell an asset to make the payment?
 - How easy or difficult was it to answer this question?

3. What was the effect of (*insert morbidity*) on your day-to-day activities like cooking, sweeping, walking to the shop and going to work? Would you say there was no disruption, mild disruption, moderate disruption or serious disruption?

- Why did you select ----- disruption?

4. What was the effect of (*insert morbidity*) on your bodily functions such as urinating and defecating? Would you say there was no disruption, mild disruption, moderate disruption or serious disruption?

- Why did you select ----- disruption?

5. What was the effect of (*insert morbidity*) on your ability to breastfeed your baby or care for him/her? Would you say there was no disruption, mild disruption, moderate disruption or serious disruption?

- Why did you select ----- disruption?

6. What was the effect of (*insert morbidity*) on your social life such as chatting with your family and others, going for (*pick appropriate one*) church/Islamic activities or participating in important events like weddings, birthdays and naming ceremonies?

- Do “chatting with your family and others, going for church/Islamic activities or participating in important events like weddings, birthdays and naming ceremonies” exemplify your social life, or do you think there are other more important aspects of your social life which this question should have mentioned?

7. What was the effect of (*insert morbidity*) on your relationship with your husband, such as communicating with him, spending time together with him or being in good terms with him? Would you say there was no disruption, mild disruption, moderate disruption or serious disruption?

- Are these examples “communicating with your husband, spending time together or being in good terms with your husband” important aspects of your relationship with your husband or are there other better examples?

8. Rate the severity of (*insert morbidity*) on a scale of 0 to 3, with 0 being no pain/ discomfort/worry, 1 being mild pain/discomfort/worry, 2 being moderate pain/ discomfort/worry and 3 being severe pain/discomfort/worry. *Show scale if necessary.*

- How easy or difficult was it for you to choose an answer from this list?
- *If woman used scales:* Does this face (*point the face that woman selected*) really depict your answer (*mention answer that she picked*)?

9. Are you currently taking drugs prescribed by a doctor, nurse, pharmacist or another trained health personnel or receiving therapy from them for the (*insert morbidity*)? *Probe accordingly*

H. Prolonged Labour- Selected Questions

1. I would like to ask some specific questions about your labour.

How long did your labour last for, that is, from the time you started experiencing very strong continuous pains which stopped you from doing chores to the birth of your baby?

- How did you arrive at the answer of ----- minutes/ hours/ days?

2. *If ≥ 12 hours:* Did you seek care when the labour took this amount of time?

- Can you repeat this question in your own words?

I. Morbidities Postpartum

1. Now I would like you to tell me about any illnesses and health problems you experienced **after your last delivery**. By after delivery, I mean the time from after you delivered your baby and after aspects such as your clean-up in the delivery room or stitching, up to 6 weeks later. Please can you list out all the illnesses and problems you experienced?

2. Would you say any of these problems was very serious, that is, it/they negatively impacted your wellbeing and/or functioning very severely? *If yes:* Which ones?

- How was (*insert morbidity*) very serious?

3. Did you seek care/treatment/remedy for (*insert morbidity*), that is, any solution to the (*insert morbidity*) from anywhere or anyone?

If #3 is “yes” go to #4; if “no” go to Section J

4. What did you do?

5. *For western treatment:* How many times did you seek care/treatment/remedy for (*insert morbidity*)?

- How sure are you that you sought care/treatment/remedy for (*insert morbidity*) ----- times?

J. Severity of Postpartum Morbidities

Select one of the morbidities mentioned in I2 and ask these questions below.

1. Did you pay for care (medical services) and/or treatment (medicines) for (*insert morbidity*)?

- How sure are you that you paid for care (medical services) and/or treatment (medicines) for (*insert morbidity*)?

2. Did you or your family do any of the following to pay for care (medical services) and/or treatment (medicines) for (*insert morbidity*)?:

- Use money reserved for something else to make the payment?
- Borrow money to make the payment?
- Sell an asset to make the payment?

- How easy or difficult was it to answer this question?
3. What was the effect of (*insert morbidity*) on your day-to-day activities like cooking, sweeping, walking to the shop and going to work? Would you say there was no disruption, mild disruption, moderate disruption or serious disruption?
 - Why did you select ----- disruption?
 4. What was the effect of (*insert morbidity*) on your bodily functions such as urinating and defecating? Would you say there was no disruption, mild disruption, moderate disruption or serious disruption?
 - Why did you select ----- disruption?
 5. What was the effect of (*insert morbidity*) on your ability to breastfeed your baby or care for him/her? Would you say there was no disruption, mild disruption, moderate disruption or serious disruption?
 - Why did you select ----- disruption?
 6. What was the effect of (*insert morbidity*) on your social life such as chatting with your family and others, going for (*pick appropriate one*) church/Islamic activities or participating in important events like weddings, birthdays and naming ceremonies?
 - Do “chatting with your family and others, going for church/Islamic activities or participating in important events like weddings and naming ceremonies” exemplify your social life, or do you think there are other more important aspects of your social life which this question should have mentioned?
 7. What was the effect of (*insert morbidity*) on your relationship with your husband, such as communicating with him, spending time together with him or being in good terms with him? Would you say there was no disruption, mild disruption, moderate disruption or serious disruption?
 - Are these examples “communicating with your husband, spending time together with him or being in good terms with him” important aspects of your relationship with your husband or are there other better examples?
 8. Rate the severity of (*insert morbidity*) on a scale of 0 to 3, with 0 being no pain/ discomfort/worry, 1 being mild pain/discomfort/worry, 2 being moderate pain/ discomfort/worry and 3 being severe pain/discomfort/worry. *Show scale if necessary.*
 - How easy or difficult was it for you to choose an answer from this list?
 - *If woman used scales:* Does this face (*point the face that woman selected*) really depict your answer (*mention answer that she picked*)?
 9. Are you currently taking drugs prescribed by a doctor, nurse, pharmacist or another trained health personnel or receiving therapy from them for the (*insert morbidity*)? *Probe accordingly*

K. Haemorrhage- Selected Questions

I would like to ask some questions about the blood you lost during your last delivery. By during your delivery, I mean the blood you lost from the time your labour started seriously up to the time you delivered your baby, including the time when aspects such as your clean-up in the delivery room or stitching were conducted.

1. What type of material was on the bed or surface you delivered on?
 - How sure are you that this was the material on the bed or surface you delivered on?
 - How sure are you that this was the *only* material on the bed or surface you delivered on?

2. How many (*insert type of material*) did you use during the delivery?
 - How did you arrive at your answer of -----?
 3. Which of these diagrams closely resembles the soaking of your (*insert type of material(s)*) by the time your delivery was over? *Show pictures*
 - How well do you remember that your (*insert type of material(s)*) was soaked like this?
 4. Did you stain the floor during your last delivery?
 - How well do you remember that you stained the floor during your last delivery?
 5. *If multipara:* Compared to your previous delivery/deliveries, was the bleeding during your last delivery minimal, the same or much?
 - How did you know that the bleeding during your last delivery was ----- compared to your previous delivery/deliveries?
 6. *For hospital deliveries only:* Did your birth attendant ask your family members or your escort to look for blood donors at any point during your last delivery, even if you did not use the blood eventually?
 - At what point did you know that your birth attendant asked your family members or escort to look for blood donors to give you blood?
 7. Were you given blood, that is, blood transfusion? Yes/ No
 8. How many pints of blood were you given during the delivery?
 - How sure are you that you were given ----- pints of blood during the delivery?
 9. *For home deliveries only:* Did you seek care/ treatment/remedy for the bleeding during your last delivery?
 - What do you think this question is asking for?
 10. *For home deliveries only:* What did you do?
 - How easy or hard is it to remember this?
 11. *For home deliveries only:* What treatment did you receive?
 - How well do you remember that you were given -----?
- I would like to ask some questions about the blood you lost within the first 24 hours after your last delivery. By within the first 24 hours after your delivery, I mean the blood you lost from the time after you delivered your baby and after aspects such as your clean-up in the delivery room or stitching, up to 24 hours later.
12. *For hospital deliveries only:* Did any maternity staff attending to your birth mention that your blood level had reduced significantly, for example, after testing your PCV?
 - How easy or hard was it for you to answer this question?
 13. Did your birth attendant or another maternity staff come back after your delivery to scoop out blood from inside you, that is, did he/she come back after you had been cleaned-up or stitched and then inserted his/her hand into your vagina or massaged your abdomen to expel left-over blood?
 - How well do you remember that your birth attendant or another maternity staff came back at some points after your delivery to scoop out blood from inside you?
 14. Did so many big, thick clots of blood come out frequently within the first 24 hours after your delivery?

- How will you describe the term “big, thick clots of blood”?

15. Rate the severity of your bleeding within the first 24 hours after delivery on a scale of 0 to 3, with 0 being no bleeding, 1 being mild bleeding, 2 being moderate bleeding and 3 being severe bleeding. SHOW CARD.

- How easy or difficult was it to choose an answer from this list?

L. Conclusion

- Any other thing participant wants to say (including any general comments or feedback)
- Thank participant
- Listen for any ‘door step’ data

Appendix 8.1: Wards selected from Stage-1 cluster sampling

LGA	Ward	Type	PSU #	Total Population	Cumulative Size	Sample # Selected	PSU Selected
Yola-North	Ajiya	Urban	001	26,060	26,060		
	Alkalawa	Urban	002	24,180	50,240	42,751	Yes
	Doubeli	Urban	003	33,390	83,630		
	Gwadabawa	Urban	004	32,672	116,302	111,353	Yes
	Jambutu	Urban	005	69,346	185,648	179,955	Yes
	Karewa	Urban	006	77,274	262,922	248,557	Yes
	Limawa	Urban	007	25,550	288,472		
	Luggere	Urban	008	36,305	324,777	317,159	Yes
	Nassarawo	Urban	009	67,024	391,801	385,761	Yes
	Rumde	Urban	010	28,825	420,626		
	Yelwa	Urban	011	20,875	441,501		
Yola-South	Adarawo	Urban	012	26,354	467,855	454,363	Yes
	Bako	Urban	013	17,155	485,010		
	Makama A	Urban	014	36,165	521,175		
	Makama B	Urban	015	17,330	538,505	522,965	Yes
	Mbamoi	Urban	016	19,710	558,215		
	Toungo	Urban	017	23,310	581,525		
	Mbamba	Rural	018	22,681	604,206	591,567	Yes
	Ngurore	Rural	019	61,218	665,424	660,169	Yes
	Yolde Kohi	Rural	020	25,777	691,201		
	Bole Yolde Parte	Mixed	021	47,174	738,375	728,771	Yes
	Namtari	Mixed	022	84,845	823,220	797,373	Yes
	Total			823,220			

Appendix 8.2: Settlements selected from Stage-2 cluster sampling

S/N	Cluster Code	Cluster Name	Ward
001	AL1	Galadima Street	Alkalawa
002	AL2	Hamman Shugaba Street	
003	AL3	Liman Street	
004	AL4	Mubi Road	
005	AL5	Tafida Street	
006	GW1	Baba Yohana	Gwadabawa
007	GW2	G.G. Premises	
008	GW3	Jimeta Division	
009	GW4	Old GRA	
010	GW5	Zango	
011	JB1	Buba Marwa (Mallam Usman)	Jambutu
012	JB2	Damilu (Major Paul)	
013	JB3	Kasuwan Jambutu (Abulkadir St)	
014	JB4	Nyokore (Market Area)	
015	JB5	W/Kuturu (Anglican Church)	
016	KW1	Alh. Abdul	Karewa
017	KW2	Batuki Bore-hole	
018	KW3	Dubai	
019	KW4	Joseph Gella 'B'	
020	KW5	Nyibango 'A'	
021	LG1	Bobboi Street	Luggere
022	LG2	Dampa Street	
023	LG3	Luggere Baki	
024	LG4	Owerri Street	
025	LG5	Up-Bishop Street	
026	NS1	Alh. Buba Kwaya	Nassarawo
027	NS2	Baba Cha Mutum Biyu	
028	NS3	Ebenezer Chi Zing St.	
029	NS4	Kofan Mai Ung. K. Lamido	
030	NS5	Talba Street	
031	AD1	Alh. Hakilu	Adarawo
032	AD2	Babale	
033	AD3	Jesus Army Church	
034	AD4	Mal Kawu	
035	AD5	Yahya Kadiri	

036	MK1	Fadde Diggol	Makama 'B'
037	MK2	Fadde Girei	
038	MK3	Fadde Sanda	
039	MK4	Fadde Sarki Tuta	
040	MK5	Fadde Workshop	
041	MB1	Kapo	Mbamba
042	MB2	Mbamba Mission	
043	MB3	Rumde Jabbi	
044	MB4	Sebore Gari	
045	MB5	Yokosala	
046	NG1	Alh. Buba Danbakai	Ngurore
047	NG2	Bamanga Holere	
048	NG3	Late Alh. Haruna	
049	NG4	Rumde Mallum Dara	
050	NG5	Wuro Dole Tandu	
051	BY1	Ahmadu Ribadu College	Bole Yolde-Parte
052	BY2	Gindin Tsamiya	
053	BY3	Police Station	
054	BY4	Bole Kilaru	
055	BY5	Kofar Mai Anguwa	
056	NM1	Kofare	Namtari
057	NM2	Waurujabbe	
058	NM3	Dundere Malkohi	
059	NM4	Malkohi	
060	NM5	Tudun Hassan	

Appendix 8.3: Final questionnaire used in the survey

RESPONDENT IDENTIFICATION (RI)	
RI1. Cluster code: <div style="border: 1px solid black; width: 100px; height: 20px; margin-top: 5px;"></div>	RI2. Respondent number: <div style="border: 1px solid black; width: 100px; height: 20px; margin-top: 5px;"></div>
RI3. Name of household head: <div style="border: 1px solid black; height: 40px; margin-top: 5px;"></div>	

INTERVIEWER VISITS (IV)				
	1	2	3	
Date (D/M/Y):	<div style="border: 1px solid black; height: 20px; width: 100px;"></div>	<div style="border: 1px solid black; height: 20px; width: 100px;"></div>	<div style="border: 1px solid black; height: 20px; width: 100px;"></div>	Total number of visits: <div style="border: 1px solid black; height: 40px; width: 100px;"></div>
Interviewer's name:	<div style="border: 1px solid black; height: 20px; width: 100px;"></div>	<div style="border: 1px solid black; height: 20px; width: 100px;"></div>	<div style="border: 1px solid black; height: 20px; width: 100px;"></div>	
Result of visit (SEE CODE BELOW):	<div style="border: 1px solid black; height: 20px; width: 100px;"></div>	<div style="border: 1px solid black; height: 20px; width: 100px;"></div>	<div style="border: 1px solid black; height: 20px; width: 100px;"></div>	
Next visit				
Date: Time:	<div style="border: 1px solid black; height: 20px; width: 100px;"></div> <div style="border: 1px solid black; height: 20px; width: 100px;"></div>	<div style="border: 1px solid black; height: 20px; width: 100px;"></div> <div style="border: 1px solid black; height: 20px; width: 100px;"></div>		
Result of visit codes : 1- Completed 2- Partly completed (due to emergency, competing priorities, etc) 3- No household member at home 4- No competent person at home at time of visit 5- Household occupiers away for duration of data collection 6- Eligible woman not at home 7- Eligible woman incapacitated 8- Postponed 9- Break-off (answered some questions but refused to continue) 10- Refused 11- Other				

PROBABILITY OF SELECTION	
Total number of eligible women in household	<div style="border: 1px solid black; height: 20px; width: 100px;"></div>
Number of women included in study	<div style="border: 1px solid black; height: 20px; width: 100px;"></div>

INTRODUCTION AND ELIGIBILITY (IE)

Inakwana/Inayini. My name is ----- and I am conducting a survey that hopes to understand problems that women may have in pregnancy and related to childbirth in Nigeria. We believe that this knowledge might help us to better understand ways to improve women's health and the support they get during pregnancy, delivery and after birth. INQUIRE ABOUT THE FOLLOWING POLITELY:

<p>IE1. Are there any married women in this household? REMEMBER: WOMEN WHO WERE MARRIED BEFORE BABY WAS BORN BUT ARE NOT CURRENTLY MARRIED ARE STILL ELIGIBLE</p>	<p>IE2. Did she/they give birth within the past two years?</p>	<p>IE3. Is she/they between 15-49 years of age?</p>	<p>IE4. Does she/do they live here in (<i>name of settlement</i>) or she/they came in from anotherplace?</p>																												
<table border="1"> <tr> <td>Y</td> <td>N</td> <td>DK</td> </tr> <tr> <td>1</td> <td>2</td> <td>99</td> </tr> </table>	Y	N	DK	1	2	99	<table border="1"> <tr> <td>Y</td> <td>N</td> <td>DK</td> </tr> <tr> <td>1</td> <td>2</td> <td>99</td> </tr> </table> <p>PROBE IF 'NO'- By given birth, I mean did she deliver a child who: - either was born without breath? - or who ever breathed or cried or showed other signs of life- even if he or she lived only a few minutes or hours?</p> <table border="1"> <tr> <td>Y</td> <td>N</td> <td>DK</td> </tr> <tr> <td>1</td> <td>2</td> <td>99</td> </tr> </table>	Y	N	DK	1	2	99	Y	N	DK	1	2	99	<table border="1"> <tr> <td>Y</td> <td>N</td> <td>DK</td> </tr> <tr> <td>1</td> <td>2</td> <td>99</td> </tr> </table>	Y	N	DK	1	2	99	<table border="1"> <tr> <td>Reside nt</td> <td>Non- reside nt</td> </tr> <tr> <td>1</td> <td>2</td> </tr> </table>	Reside nt	Non- reside nt	1	2
Y	N	DK																													
1	2	99																													
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1	2	99																													
Y	N	DK																													
1	2	99																													
Y	N	DK																													
1	2	99																													
Reside nt	Non- reside nt																														
1	2																														

IF ANY 'N', 'DK' OR 'NON-RESIDENT' IS TICKED→ THANK RESPONDENT AND MOVE TO NEXT HOUSE.

IF ALL 'Y' AND 'RESIDENT' ARE TICKED→

- GO TO 'IC' IF ELIGIBLE WOMAN IS FIRST POINT OF CONTACT.

- ASK TO SPEAK TO ELIGIBLE WOMAN IF NOT FIRST POINT OF CONTACT. REPEAT INTRODUCTION. GO TO 'IC'.

INFORMED CONSENT (IC)

I would like to invite you to take part in a survey with me, which should take about 1 hour.

Taking part in the study is voluntary; it is up to you to decide whether to take part or not. Refusing to participate will not cause anything bad to happen and you do not have to give a reason for refusing to take part in the survey.

I will keep everything you say confidential by not writing your name on my notes. Whatever information I obtain from you will be secured. Our study team will make sure that you cannot be identified when we report your opinions or ideas.

There are no risks to participating in the survey, but we will ask you about any problems you had in pregnancy, during or after delivery. If you do not wish to answer any questions, it is totally fine to skip the question. You can also discontinue the study at any point if you wish without giving any reason.

If you do decide to take part, you are still free to withdraw at any time and without giving a reason.

GIVE PARTICIPANT INFORMATION SHEET AND EXPLAIN CONSENT FORM.

PROCEED WITH SURVEY IF CONSENT GIVEN. OTHERWISE, END SURVEY.

Please may I begin now?

Y	N

Time started:

DEMOGRAPHICS (DG)				
S/N	Question	Response	Code	Go to
DG1	To begin, I would like to ask some general questions about you and your household. How old are you? CONFIRM THAT THIS IS AGE AT LAST BIRTHDAY	----- years DK	99	DG3 DG2
DG2	Can you tell me how old you are approximately?	15-19 20-24 25-29 30-34 35-39 40-44 45-49	1 2 3 4 5 6 7	
DG3	What is your religion?	Christianity Islam Other	1 2 3	
DG4	How many wives does your husband have?	1 2 3 4 > 4	1 2 3 4 5	DG6 DG5
DG5	Which wife position are you?	1 st 2 nd 3 rd 4 th Other	1 2 3 4 5	
DG6	What is the highest level of education you have completed or are currently attending?	Never attended school Primary Secondary Non-university post-secondary University Non-western	1 2 3 4 5 6	
DG7	Can you read a newspaper or a book in any language? INCLUDE ENGLISH	Yes No	1 2	
DG8	What is your main occupation? SELECT ONE ONLY	Unemployed/ house-wife Student Unskilled worker (house-help, cleaner, petty trader, farmer, fisherman) Skilled manual (crotchetier, hairdresser, seamstress) Skilled non-manual (clerk, cashier, teacher, civil servant <level 10, junior-level armed forces official, any other junior-level organisational or managerial position) Professional (doctor, lecturer, engineer, banker, civil servant ≥level 10, senior-level armed forces official, any other senior-level organisational or managerial position)	1 2 3 4 5 6	
DG9	What is the highest level of education your husband has completed or is currently attending?	Never attended school Primary Secondary Non-university post-secondary University Non-western	1 2 3 4 5 6	

[illegible]

PRE-EXISTING CONDITIONS BEFORE PREGNANCY (PX)					
S/N	Question	Response	Code		
PX1	Now I would like to ask some questions about your health.		Yes	No	DK
		Hypertension?	1	2	99
		Diabetes?	1	2	99
	Before you got pregnant with your last baby, has a doctor ever told you that you had:	Anaemia?	1	2	99
		Asthma?	1	2	99
		Epilepsy?	1	2	99

OBSTETRIC HISTORY (OH)				
S/N	Question	Response	Code	Go to
	I would like to ask some questions about your pregnancy and childbirth in the past.			
OH1	How many times have you been pregnant before, even if it did not lead to a live birth?	-----		
OH2	Did any of the pregnancies end in a miscarriage?	Yes No	1 2	OH3 OH4
OH3	How many of the pregnancies ended in a miscarriage?	-----		
OH4	How many times have you ever given birth, even if the baby was not born alive?	-----		
OH5	Were any of the births preterm, that is, born before 37 weeks or 8 and a half months of pregnancy were completed?	Yes No	1 2	
OH6	Were any of the births post-term (that is, born at or after 42 weeks, or more than 9 and a half months of pregnancy)?	Yes No	1 2	
OH7	Were any of the babies stillborn, that is, were born with no signs of life at or after 28 weeks or 7 months of pregnancy?	Yes No	1 2	OH8 OH9
OH8	How many of the babies were stillborn?	-----		
OH9	Were any of the babies born alive and cried and showed some signs of life, but died within the first 24 hours?	Yes No	1 2	
OH10	Were any of the babies born alive and cried and showed some signs of life, but died after the first 24 hours but within the first 28 days or first one month of birth?	Yes No	1 2	
OH11	Were any of the births multiple births (that is, twins, triplets or quadruplets)?	Yes No	1 2	
OH12	Were any of the births through caesarean section (that is, did they cut your belly open to remove the baby?)	Yes No	1 2	OH13 OH14
OH13	How many of the births were through caesarean section?	-----		
OH14	How many of your children are currently alive?	-----		

ANTENATAL CARE DURING LAST PREGNANCY (AC)				
S/N	Question	Response	Code	Go to
	I would like to ask some questions about the care you received during your last pregnancy.			
AC1	Did you ever go for antenatal care at a health facility during your last pregnancy?	Yes No	1 2	DV1
AC2	How many months pregnant were you the first time you received antenatal care for your last pregnancy?	<1 month 1 month 2 months 3 months 4 months 5 months 6 months 7 months 8 months ≥9 months	1 2 3 4 5 6 7 8 9 10	
AC3	How many times did you go for antenatal care throughout your last pregnancy, including the first time?	Once 2-3 times 4 and above	1 2 3	

S/N	Question	Response	Code			Go to
AC4	Were any of the following done at least once as part of your antenatal care?	Did you give a urine sample?	Yes	No	DK	
		Did you give a blood sample?	1	2	99	
		Were your weight and height measured?	1	2	99	
		Was your blood pressure measured (that is, was a sheet put around your upper arm, which tightened after a pump was pressed several times)?	1	2	99	
		Were you given an injection in the arm to prevent the baby from getting tetanus (that is, convulsions or seizure after birth)?	1	2	99	
		Were you given any iron tablets or iron syrup (that is, drugs to increase your blood level)?	1	2	99	
		Were you given/prescribed any drugs to keep you from getting malaria?	1	2	99	
		Were you told about things to look out for that might suggest problems with the pregnancy?	1	2	99	
		Did you have an ultrasound scan (did they project the inside of your womb on a computer screen)?	1	2	99	

DELIVERY (DV)

S/N	Question	Response	Code	Go to
DV1	I would now like to ask some questions about your last delivery. Where did you give birth to your last baby? (TICK AS APPROPRIATE)	Home/TBA's place Public health post/ centre Public hospital Private hospital/centre Other	1 2 3 4 5	
DV2	Who delivered your last baby? TICK WHO RECEIVED BABY AT DELIVERY	Doctor Nurse/midwife Community health worker TBA Relative/friend No one assisted Other	1 2 3 4 5 6 7	
DV3	Did you plan to deliver at (<i>place of delivery</i>) originally/ initially?	Yes No	1 2	DV6 DV4
DV4	Where did you plan to deliver originally/initially??	Home/TBA's place Public health post/ centre Public hospital Private hospital/centre Other	1 2 3 4 5	
DV5	Why did you not deliver in the place you intended?	Problem detected in pregnancy Prolonged labour (>12 hours) Other problems in labour/delivery Other	1 2 3 4	
DV6	How was your baby delivered? (FOR INSTRUMENTAL, SHOW PICTURE OF DELIVERY BY FORCEP & VACUUM EXTRACTOR IF NECESSARY)	-Spontaneous (through vagina, no instrument used to pull out your baby) -Instrumental (an instrument was used to pull out the baby from your vagina) -Spontaneous (through vagina, but don't know if instrumental) -C-section (they cut your belly open to take the baby out)	1 2 3 4	DV7

S/N	Question	Response	Code	Go to
DV7	Why was the C-section done? TICK ALL THAT APPLY	Prolonged labour (failure to progress) Obstructed labour- small pelvis Obstructed labour- mal-presentation Obstructed labour- oversized baby Multiple babies Placenta praevia Placental abruption Uterine rupture Planned during pregnancy Requested by woman during labour Requested by woman's family during labour Don't know Other (<i>Please specify</i>)	1 2 3 4 5 6 7 8 9 10 11 99	
DV8	Were you given an addition around your vagina, that is was a cut made to enlarge the opening for your baby to come out?	Yes No Don't know	1 2 3	

OUTCOME OF LAST BIRTH (OB)

S/N	Question	Response	Code	Go to
OB1	I would like to ask more questions about your last birth. Was your baby born alive or dead?	Alive Dead	1 2	OB5 OB2
OB2	Was the baby moving when you went into labour?	Yes No Don't know	1 2 99	OB4 OB3
OB3	When did you last feel the baby moving?	_____ hour(s) before delivery _____ day(s) before delivery Don't know	99	
OB4	Did the baby's appearance and features look like that of a normal baby (that is, fresh and fully developed)?	Yes No Don't know	1 2 99	
OB5	Was the baby born pre-term (that is, born before 37 weeks or 8 and a half months of pregnancy were completed)?	Yes No Don't know	1 2 99	
OB6	Was the baby born post-term (that is, born at or after 42 weeks, or more than 9 and a half months of pregnancy)?	Yes No Don't know	1 2 99	
OB7	Where is your last baby now? (TICK AS APPROPRIATE)	Currently alive Dead	1 2	PC1 OB8
OB8	When did the baby die?	Within first week of delivery Within 8-28 days of delivery Post-neonatal (>28 days post-birth) Don't know	1 2 3 99	

POSTNATAL CARE (PC)

S/N	Question	Response	Code	Go to
PC1	I would now like to ask about the care you received after your last delivery. Did any health professional check on your health in the first 6 weeks after you gave birth to your last baby, for example, by asking you questions about your health or examining you?	Yes No	1 2	PC2 PC5
PC2	How long after delivery did the first check take place? (RECORD HOURS IF LESS THAN ONE DAY. RECORD DAYS IF LESS THAN ONE WEEK)	----- Hour(s) ----- Day(s) ----- Week(s)		

S/N	Question	Response	Code			Go to
PC3	How many times did you receive the check from the period immediately after your delivery to 6 weeks after your delivery (excluding care for your baby only such as immunisations)?	Once 2-3 times 4 and above	1 2 3			
PC4	Were any of the following done at least once as part of the checks after you gave birth?	Was your vagina checked for bleeding? Was your blood pressure measured (that is, was a sheet put around your upper arm, which tightened after a pump was pressed several times)? Was your temperature measured (that is, was an instrument put in your armpit, mouth or ear to check how hot your body was)? Were you asked about any experiences of headaches? Were you asked about any experiences of smelly vaginal discharge? Were you told how to delay pregnancy from occurring too soon?	Yes	No	DK	
			1	2	99	
			1	2	99	
			1	2	99	
			1	2	99	
			1	2	99	
			1	2	99	
PC5	Did you have to go to a health facility because of any health problems you experienced at any point within 6 weeks after your delivery?	Yes No	1 2			

MALE INVOLVEMENT (MI)				
S/N	Question	Response	Code	Go to
MI1	SKIP MI1 IF THE WOMAN NEVER HAD ANTENATAL CARE. I am going to ask you some questions about the overall support you received from your husband during your pregnancy. Participation in maternal health services Did your husband accompany you at least once for antenatal care during your last pregnancy, that is, did he stay with you while you were in one of the following places: the antenatal care room, lab., ultrasound room, or doctor's/nurse's office?	Yes No Declined	1 2 3	
MI2	Financial Support Did your husband contribute money for your food, transportation, treatments, medical services or other similar needs during your last pregnancy?	Yes No Declined	1 2 3	
MI3	I am going to read some statements to you. Tell me whether you strongly agree, mildly agree, mildly disagree or strongly disagree with the statements. Practical support "During my last pregnancy, my husband supported me practically (such as in helping me lift heavy objects and arranging for others to help me with household chores)." Strongly agree Mildly agree Mildly disagree Strongly disagree	Strongly agree Mildly agree Mildly disagree Strongly disagree	1 2 3 4	
MI4	Emotional support "During my last pregnancy, my husband supported me emotionally (such as in giving me encouragement, comfort, allaying my fears and listening to me)." Strongly agree Mildly agree Mildly disagree Strongly disagree	Strongly agree Mildly agree Mildly disagree Strongly disagree	1 2 3 4	
MI5	Decision-making Who made the decisions about your health, such as whether or not you visited the health centre, or whether or not you received treatment?	Woman Her husband Jointly with husband Relatives (e.g. mother) Jointly with relatives Other	1 2 3 4 5 6	

PERCEPTION OF GENERAL STATE OF HEALTH- BEFORE PREGNANCY (PB)			
S/N	Question	Response	Code
PB1	Now I would like to ask what you think about your general state of health before your last pregnancy . There are no right or wrong answers. Compared to other women around before you became pregnant, was your health status better, the same or worse?	Better	1
		The same	2
		Worse	3
PB2	I am going to read a statement to you now. Tell me whether you strongly agree, mildly agree, mildly disagree or strongly disagree with the statement. "My health status was generally fine before my last pregnancy."	Strongly agree	1
		Mildly agree	2
		Mildly disagree	3
		Strongly disagree	4

PERCEPTION OF GENERAL STATE OF HEALTH- DURING PREGNANCY (PP)			
S/N	Question	Response	Code
PP1	Now I would like to ask you about your health during your last pregnancy only . Compared to other women who were also pregnant when you were pregnant with your last baby, was your health status better, the same or worse?	Better	1
		The same	2
		Worse	3
PP2	I am going to read a statement to you. Tell me whether you strongly agree, mildly agree, mildly disagree or strongly disagree with the statement. "My health status was generally fine during my last pregnancy."	Strongly agree	1
		Mildly agree	2
		Mildly disagree	3
		Strongly disagree	4

PERCEPTION OF GENERAL STATE OF HEALTH- DELIVERY (PD)			
S/N	Question	Response	Code
PD1	Now I would like to ask you about your health during your last delivery only . Compared to other women who were also giving birth when you delivered your last baby, was your health status better, the same or worse?	Better	1
		The same	2
		Worse	3
PD2	I am going to read a statement to you. Tell me whether you strongly agree, mildly agree, mildly disagree or strongly disagree with the statement. "My health status was generally fine during my last delivery."	Strongly agree	1
		Mildly agree	2
		Mildly disagree	3
		Strongly disagree	4

PERCEPTION OF GENERAL STATE OF HEALTH- POSTPARTUM (PS)			
S/N	Question	Response	Code
PS1	Now I would like to ask you about your health after you delivered . Compared to other women who had also given birth after you gave birth to your last baby, was your health status better, the same or worse?	Better	1
		The same	2
		Worse	3
PS2	I am going to read a statement to you. Tell me whether you strongly agree, mildly agree, mildly disagree or strongly disagree with the statement. "My health status was generally fine after I gave birth to my last baby."	Strongly agree	1
		Mildly agree	2
		Mildly disagree	3
		Strongly disagree	4

MORBIDITIES DURING PREGNANCY- UNPROMPTED (MP-U)				
Type	Question/Tick	Question/Write out	Question	Question/Write out
	<p>MP-U1: Now I would like you to tell me about any illnesses and problems you experienced at any point during your last pregnancy only, whether it happened only once, or only at some points or whether it happened throughout the pregnancy. Please can you list out all the illnesses and health problems you experienced?</p> <p>TICK ALL THAT RESPONDENT REPORTS. RECORD ANY PROBLEMS NOT ON THE LIST UNDER "OTHER."</p> <p>ASK "Any other?"</p>	<p>MP-U2: From these problems you mentioned (REPEAT THEM), which ones did a health professional (a doctor or nurse or midwife) diagnose you with?</p> <p><u>WRITE OUT.</u></p> <p>PUT "N/A" IF NOT APPLICABLE</p>	<p>MP-U3: Would you say any of these problems was very serious, that is, did it/ they negatively impact your wellbeing and/or functioning very severely?</p>	<p>MP-U4: Which ones? <u>WRITE IT/THEM OUT</u></p> <p>FOR SEVERITY SECTION: IF MORE THAN 2 ARE REPORTED, ASK FOR 2 MOST SERIOUS.</p> <p>DON'T ASK FURTHER QUESTIONS ON VOMITING (OR NAUSEA & VOMITING COMBINED) IF REPORTED.</p>
Individual/ single	<p>Digestion-related</p> <p>Constipation</p> <p>Hyperemesis gravidarum</p> <p>Inability to eat</p> <p>Nausea</p> <p>Vomiting</p>			<p>Y</p> <p>N</p> <p>D</p> <p>K</p>
	<p>Discharges</p> <p>Bleeding- no cause given/ not known</p> <p>Bleeding- threatened abortion</p> <p>Bleeding- placental abruption</p> <p>Bleeding- placenta praevia</p> <p>Bleeding- vasa praevia</p> <p>Bleeding- uterine rupture</p> <p>Bleeding- other</p> <p>Diarrhoea/ stooling</p> <p>Frequent urination</p> <p>Foul, smelly vaginal discharge</p> <p>Leaking faeces</p> <p>Leaking urine</p> <p>Nose bleeding</p> <p>Spitting</p> <p>Unable to urinate/ Urine retention</p> <p>Vomiting blood</p>		<p>↓ ↓</p> <p>1</p> <p>2</p> <p>9</p> <p>9</p>	
	<p>Febrile-related</p> <p>Fever (Body hotness only)</p> <p>Fever/malaria</p>		↓	<p>M</p> <p>P</p> <p>-</p> <p>P</p> <p>1</p>
	<p>Pain</p> <p>Abdominal pain</p> <p>Backache</p> <p>Body pain</p> <p>Chest pain</p> <p>Headache</p> <p>Leg pain</p> <p>Lower abdominal pain</p> <p>Painful intercourse</p> <p>Painful urination</p> <p>Side pain</p> <p>Ulcer/ heartburn</p>		MP-U4	
	<p>Swelling</p> <p>Breast problems (abscess, mastitis etc)</p> <p>Haemorrhoids</p> <p>Stomach bloating</p>			

	Swollen body Swollen face Swollen feet/ leg Swollen hands Swollen toe (nail in-growth)			
	Uncategorised Anaemia/ insufficient blood Antepartum depression Blurred vision/ seeing things hazy Body heaviness (kasala) Body numbness Body weakness/ fatigue Convulsion (fits)/ eclampsia Dizziness/ vertigo Excessive sleeping Fainting High blood pressure/ PIH/ Hypertension Inability to walk or difficulty in walking Infection/ sepsis Insomnia Jaundice Leg numbness Obstructed breathing Placental abruption (no bleeding) Placenta praevia (no bleeding) Pre-eclampsia Pregnancy-induced diabetes/ PID Premature labour Premature rupture of membranes, PROM Shallow or rapid breathing Skin problems (boils, rashes, acne, etc) Unconsciousness Uterine rupture (no bleeding) Weight loss			
	Others (<i>Specify here</i>)			
Multiple	High blood pressure group (TICK ALL THAT OCCURRED SIMULTANEOUSLY OR ACROSS) Blurred vision/ seeing things hazy Convulsion (fits)/ eclampsia Dizziness/ vertigo Headache High blood pressure/ PIH Pre-eclampsia Swollen body Swollen face Swollen feet/ leg Swollen hands Ulcer/heartburn			
	>1 morbidity at once Abdominal pain plus vomiting			

	Fever plus vomiting Fever/malaria plus abdominal pain Leaking urine plus leaking faeces Lower abdominal pain plus bleeding Nausea and vomiting			
	Others (<i>Specify here</i>)			
Procedures	Blood transfusion Given drip at home Given drip at health facility Health worker summoned home Hospitalisation (≥ 3 days in one episode) Hospitalisation (> 1 across pregnancy) ICU admission (Intensive Care Unit admission) Referral to another health institution Senior personnel summoned in hospital Mini-surgery conducted (<i>Specify why</i>)			
	Others (<i>Specify here</i>)			

SEVERITY OF MORBIDITIES- PREGNANCY (SP)

Morbidity #	Onset	Duration	Care-seeking				Financial		Physical	Social	Marital	Overall Severity
WRITE OUT THE 2 MOST SERIOUS MORBIDITIES FROM SECTION MP-U	SP1. When did (<i>insert morbidity</i>) start?	SP2. How long did (<i>insert morbidity</i>) last? RECORD NUMBER OF DAYS OR WEEKS OR MONTHS. IF IT OCCURRED MORE THAN ONCE, PUT CUMULATIVE TOTAL	SP3. Did you seek care/treatment/remedy for (<i>insert morbidity</i>), that is, any solution to (<i>insert morbidity</i>) from anywhere or anyone?	SP4. What did you do? TICK ALL THAT APPLY	SP5. FOR OPTION “VISITED FORMAL HEALTH FACILITY ONLY”: When did you seek the care/treatment/remedy?	SP6. ALL OPTION S FROM SP4: What treatment / remedy did you receive? TICK ALL THAT APPLY	SP7. Did you pay for care (medical services) and/or treatment (medicines) for (<i>insert morbidity</i>)?	SP8. Did you or your family do any of the following to pay for care (medical services) and/or treatment (medicines) for (<i>insert morbidity</i>)?	SP9. What was the effect of (<i>insert morbidity</i>) on your day-to-day activities like cooking, sweeping, walking to the shop and going to work? SHOW CARD	SP10. What was the effect of (<i>insert morbidity</i>) on your social life such as chatting with your family and others, or participating in important events like weddings and naming ceremonies? SHOW CARD	SP11. What was the effect of (<i>insert morbidity</i>) on your relationship with your husband such as communicating with him, spending time with him or being in good terms with him? SHOW CARD	SP12. Rate the overall severity of the pain/discomfort/distress of the (<i>insert morbidity</i>) SHOW CARD.
Morbidity #1	----- month of pregnancy	----- day(s) ----- week(s) -----month(s)	Y N 1 2 ↓ ↓ SP4 SP7	1 2 3 4 5 6	1 2 3 99	1 2 3 4	Y N 1 2	Borrow money 1 / 2 / 99 Sell an asset 1 / 2 / 99 Use money reserved for something else 1 / 2 / 99 <i>Please specify what the money was meant for originally :</i>	A B C D E F G H I 99	A B C D E F G H I 99	A B C D E F G H I 99	A B C D E F G H I 99
Morbidity #2	----- month of pregnancy	----- day(s) ----- week(s) ----- month(s)	Y N 1 2 ↓ ↓ SP4 SP7	1 2 3 4 5 6	1 2 3 99	1 2 3 4	Y N 1 2	Borrow money 1 / 2 / 99 Sell an asset 1 / 2 / 99 Use money reserved for something else 1 / 2 / 99 <i>Please specify what the money was meant for originally :</i>	A B C D E F G H I 99	A B C D E F G H I 99	A B C D E F G H I 99	A B C D E F G H I 99

***** PLEASE REFER TO CARD FOR THE CODES FOR THE OPTIONS ABOVE *****

MORBIDITIES DURING PREGNANCY- PROMPTED (MP-P)					
S/N	Question/ Types	Responses	Code		
MP-P1	<p>Now I would like to find out whether you experienced any other problems during your last pregnancy, apart from the ones you mentioned previously, whether the problem happened only once, or only at some points or whether it happened throughout the pregnancy.</p> <p>Did you experience any of the following during your last pregnancy?</p>	DO NOT PROMPT RESPONDENT FOR MORBIDITIES ALREADY MENTIONED IN PRECEDING SECTION (MP-U).			
		Symptoms	Yes 1	No 2	DK 99
		- Bleeding (were you bleeding from your vagina at any point during the pregnancy?)	1	2	99
		- Foul, smelly vaginal discharge (was bad smelly discharge coming out from your vagina during the pregnancy?)	1	2	99
		- Vomiting blood (did you ever vomit blood during the pregnancy?)	1	2	99
		- Swollen body (did your body or any part of your body swell?)	1	2	99
		- Anaemia/ insufficient blood (did a doctor, nurse or midwife ever tell you that you did not have enough blood?)	1	2	99
		- Weight loss (did you lose weight during the pregnancy?)	1	2	99
		- Blurred vision/ seeing things hazy (were you seeing things cloudy, dark-dark or not very clearly at any point during the pregnancy?)	1	2	99
		- Convulsion (fits)/ eclampsia (did you ever experience convulsion?)	1	2	99
		- Fainting/unconsciousness (did you ever faint or lose consciousness at any point during the pregnancy?)	1	2	99
		- High blood pressure/ PIH/ hypertension (were you told by a doctor, nurse or midwife that you had high blood pressure during the pregnancy?)	1	2	99
		- Premature rupture of membranes, PROM (did your water break too early, that is, did it break when you were not yet in labour?)	1	2	99
			1	2	99
		Procedures			
		- Blood transfusion (were you given blood?)			
		- Given drip at home (were you ever given drip at home?)			
		- Given drip at health facility (were you ever given drip at the hospital?)	1	2	99
		- Health worker summoned home (did you or someone close to you ever had to bring/call a doctor, nurse or midwife to your home to check or treat you during your last pregnancy?)	1	2	99
		- Hospitalisation - ≥3 days in one episode (were you admitted in the hospital for 3 days or more at one particular point in time?)	1	2	99
		- Hospitalisation - >1 across pregnancy (were you admitted in the hospital more than once during pregnancy, that is more than once from the beginning to the end of the pregnancy?)	1	2	3
		- ICU admission (were you admitted in a special care ward for women who are seriously ill and which has very limited access by non-hospital staff?)	1	2	99
		- Referral to another health institution (were you transferred to another health centre because the first place could not treat you?)	1	2	99
		-Senior personnel summoned in hospital (did the hospital staff have to call a senior staff- their "oga"- to manage your case?)	1	2	99
			1	2	99
			1	2	99

VOMITING (VM)

S/N	Question	Response	Code	Go to
VM1	I would like to ask some specific questions about vomiting in your last pregnancy. Were you vomiting frequently during your last pregnancy, that is, vomiting more than 2 times per day even if this did not continue to the end of the pregnancy?	Yes No	1 2	VM2 PD1
VM2	When did the vomiting start?	First trimester Second trimester Third trimester Don't know	1 2 3 99	
VM3	When did the vomiting stop entirely?	First trimester Second trimester Third trimester Don't know	1 2 3 99	
VM4	Did you vomit so much that almost everything that goes into your mouth comes out?	Yes No	1 2	
VM5	Did you vomit so much that you were afraid?	Yes No	1 2	
VM6	Did you vomit so much that you thought you were going to die?	Yes No	1 2	
VM7	Did you lose weight around this time that you were vomiting?	Yes No Don't know	1 2 99	VM8
VM8	How did you know that you lost weight? TICK ALL THAT APPLY	Clothes felt loose on body Looked lean/ collar bones showed Measured with tape- Dimensions narrower than before Measured with scale- weighed less than before Other	1 2 3 4 5	
I am going to read some statements to you about your vomiting experience during your last pregnancy. Tell me whether you strongly agree, mildly agree, mildly disagree or strongly disagree with the statement. SHOW CARD.				
VM9	"The vomiting made me fully dependent on others to do my day-to-day activities like cooking, sweeping and going to the shop."	Strongly agree Mildly agree Mildly disagree Strongly disagree	1 2 3 4	
VM10	"The vomiting was so serious that we restricted the usage of substances with distinct smell in my family, such as perfume and some cooking oil to avoid triggering the vomiting."	Strongly agree Mildly agree Mildly disagree Strongly disagree	1 2 3 4	
VM11	WITH OCCUPATION ONLY: "The vomiting affected my occupation negatively such as making me to be absent from work, receiving reprimand(s) from my supervisor or missing opportunities to make money."	Strongly agree Mildly agree Mildly disagree Strongly disagree	1 2 3 4	
VM12	STUDENTS ONLY: "The vomiting affected my studies negatively such as making me to be absent from class or missing tests/examinations."	Strongly agree Mildly agree Mildly disagree Strongly disagree	1 2 3 4	
VM13	"The vomiting affected my relationship with my husband negatively such as making us quarrel, making us not to spend time together or making us not to be in good terms"	Strongly agree Mildly agree Mildly disagree Strongly disagree	1 2 3 4	

VM14	"The vomiting affected my social life negatively such as preventing me from visiting family and friends or making me to avoid gatherings."	Strongly agree Mildly agree Mildly disagree Strongly disagree	1 2 3 4	
VM15	Did you seek care/ treatment/ remedy for the vomiting, that is, any solution to the vomiting from anywhere or anyone?	Yes No	1 2	
VM16	What did you do? TICK ALL THAT APPLY	Home remedy/self-treatment Consulted lay source (e.g. mum) Consulted traditional source Visited chemist Summoned health worker home Visited formal health facility	1 2 3 4 5 6	
VM17	What treatment did you receive? TICK ALL THAT APPLY	None Western medicine/ therapy Traditional medicine/ therapy Other alternatives	1 2 3 4	
VM18	Were you ever given a drip for the vomiting?	Yes No Don't know	1 2 99	VM19 VM20
VM19	How many drips were you given throughout your pregnancy for the vomiting?	1 drip 2-3 drips 4-5 drips 6 and above	1 2 3 4	
VM20	Did you pay for care (medical services) and/or treatment (medicines) for the vomiting?	Yes No	1 2	
VM21	Did you or your family do any of the following to pay for care (medical services) and/or treatment (medicines) for the vomiting? <ul style="list-style-type: none"> Borrow money to make the payment? Sell an asset to make the payment? Use money reserved for something else to make the payment? <i>Please specify what the money was meant for originally:</i> 	Yes / No / Don't know Yes / No / Don't know Yes / No / Don't know	1 / 2 / 99 1 / 2 / 99 1 / 2 / 99	
VM22	How many times were you vomiting per day <u>most times</u> during the period that you were vomiting?	1-2 times 3-4 times 5-6 times 7 and above Don't know	1 2 3 4 99	
VM23	How many times were vomiting per day at the <u>most severe period</u> of the vomiting?	1-2 times 3-4 times 5-6 times 7 and above Don't know	1 2 3 4 99	
VM24	How long did this severe period last for?	Less than 1 week 1 week- 1 month >1 month but less than 3 months 3 months and above Don't know	1 2 3 4 99	
VM25	Rate the overall severity of the pain/discomfort/distress of the vomiting throughout the period you were vomiting during the pregnancy. SHOW CARD.	A B C D E F G H I Don't know	1 2 3 4 5 6 7 8 9 99	

MORBIDITIES DURING DELIVERY- UNPROMPTED (MD-U)				
Type	Question	Question/ Write out	Question	Question/ Write out
	<p>MD-U1: Now I would like you to tell me about any illnesses and problems you experienced during your delivery only. By delivery, I mean the time from when your labour started seriously up to the time you delivered your baby, including the time when aspects such as your clean-up in the delivery room or stitching were conducted. Please can you list out all the illnesses and health problems you experienced?</p> <p>TICK ALL THAT RESPONDENT REPORTS. RECORD ANY PROBLEMS NOT ON THE LIST UNDER "OTHER."</p> <p>ASK "Any other?"</p>	<p>MD-U2: From these problems you mentioned (REPEAT THEM), which ones did a health professional (doctor or nurse or midwife or pharmacist or lab technician) diagnose you with?</p> <p><u>WRITE IT/THEM OUT.</u></p> <p>PUT "N/A" IF NOT APPLICABLE</p>	<p>MD-U3: Would you say any of these problems was very serious, that is, did it/ they negatively impact your wellbeing and/or functioning very severely?</p>	<p>MD-U4: Which ones? <u>WRITE IT/THEM OUT.</u></p> <p>FOR SEVERITY SECTION: IF MORE THAN 2 ARE REPORTED, ASK FOR 2 MOST SERIOUS.</p> <p>DON'T PROBE FURTHER ON PROLONGED LABOUR AND BLEEDING IF REPORTED.</p>
Individual/ single	<p>Discharges</p> <p>Bleeding- no cause given/ not known</p> <p>Bleeding- threatened abortion</p> <p>Bleeding- placental abruption</p> <p>Bleeding- placenta praevia</p> <p>Bleeding- vasa praevia</p> <p>Bleeding- uterine rupture</p> <p>Bleeding- uterine atony</p> <p>Bleeding- tear (cervical, vaginal, etc, but not uterine)</p> <p>Bleeding- retained products of birth</p> <p>Bleeding- clotting failure/ disorder</p> <p>Bleeding- other</p> <p>Vomiting blood</p>		<p>↓ ↓</p>	<p>Y</p> <p>N</p> <p>D</p> <p>K</p> <p>1</p> <p>2</p> <p>9</p> <p>9</p>
	<p>Febrile-related</p> <p>Fever (Body hotness only)</p> <p>Fever/ malaria</p> <p>Shivering/ body shaking/ feeling cold</p>		<p>↓</p>	
	<p>Obstructions/Delays</p> <p>Cord around baby's neck</p> <p>Delayed placental expulsion (>30 minutes)/</p> <p>Retained placenta</p> <p>Prolonged labour or failure to progress (>12 hours)</p> <p>Obstructed labour- no cause given/ not known</p> <p>Obstructed labour- mal-presentation</p> <p>Obstructed labour- oversized baby</p> <p>Obstructed labour- small pelvis</p>		<p>↓</p>	<p>M</p> <p>D</p> <p>-</p> <p>P</p> <p>1</p>
	<p>Pain</p> <p>Abdominal pain</p> <p>Backache</p> <p>Chest pain</p> <p>Headache</p> <p>Leg pain</p> <p>Lower abdominal pain</p> <p>Ulcer/ heartburn</p>		<p>MD-U4</p>	

	Tears/Detachments Leaking faeces Leaking urine Tear ("natural" tear) Uterine rupture (no bleeding)			
	Uncategorised Anaemia/ insufficient blood Convulsions (fits)/ eclampsia Dizziness Fainting High blood pressure/ PIH/ Hypertension Inability to walk Nausea Placental abruption (no bleeding) Placenta praevia (no bleeding) Unconsciousness Vomiting			
	Others (Specify here)			
Multiple	>1 morbidity at once Fever plus shivering Nausea and vomiting			
	Others (Specify here)			
Procedures	Blood transfusion C-section (CS) Episiotomy Health worker summoned home Hysterectomy ICU admission (Intensive Care Unit admission) Induced labour Manual placenta expulsion Referral to another health institution Senior personnel summoned Planned CS (<i>Specify why</i>)			
	Others (Specify here)			

SEVERITY OF MORBIDITIES- DELIVERY (SD)												
Morbidity #	Onset	Duration	Care-seeking				Financial		Physical	Nurturing	Marital	Overall Severity
WRITE OUT THE 2 MOST SERIOUS MORBIDITIES FROM SECTION MP-U	SD1. When did (insert morbidity) start?	SD2. How long did (insert morbidity) last? RECORD NUMBER OF DAYS OR WEEKS OR MONTHS. IF IT OCCURRED MORE THAN ONCE, PUT CUMULATIVE TOTAL	SD3. Did you seek care/treatment/remedy for (insert morbidity), that is, any solution to (insert morbidity) from anywhere or anyone?	SD4. What did you do? TICK ALL THAT APPLY	SD5. FOR OPTION "VISITED FORMAL HEALTH FACILITY ONLY": When did you seek the care/treatment/remedy?	SD6. ALL OPTIONS FROM SP4: What treatment/remedy did you receive? TICK ALL THAT APPLY	SD7. Did you pay for care (medical services) and/or treatment (medicines) for (insert morbidity)?	SD8. Did you or your family do any of the following to pay for care (medical services) and/or treatment (medicines) for (insert morbidity)?	SD9. What was the effect of (insert morbidity) on your day-to-day activities like cooking, sweeping, walking to the shop and going to work? SHOW CARD	SD10. What was the effect of (insert morbidity) on your ability to breastfeed your baby or care for him/her? SHOW CARD	SD11. What was the effect of (insert morbidity) on your relationship with your husband such as communicating with him, spending time with him or being in good terms with him? SHOW CARD	SD12. Rate the overall severity of the pain/discomfort/distress of the (insert morbidity) SHOW CARD.
Morbidity #1	----- month of pregnancy	----- day(s) ----- week(s) ----- month(s)	Y N 1 2 ↓ ↓ SD4 SD7	1 2 3 4 5 6	1 2 3 99	1 2 3 4	Y N 1 2	Borrow money 1 / 2 / 99 Sell an asset 1 / 2 / 99 Use money reserved for something else 1 / 2 / 99 <i>Please specify what the money was meant for originally :</i>	A B C D E F G H I 99	A B C D E F G H I 99	A B C D E F G H I 99	A B C D E F G H I 99
Morbidity #2	----- month of pregnancy	----- day(s) ----- week(s) ----- month(s)	Y N 1 2 ↓ ↓ SD4 SD7	1 2 3 4 5 6	1 2 3 99	1 2 3 4	Y N 1 2	Borrow money 1 / 2 / 99 Sell an asset 1 / 2 / 99 Use money reserved for something else 1 / 2 / 99 <i>Please specify what the money was meant for originally :</i>	A B C D E F G H I 99	A B C D E F G H I 99	A B C D E F G H I 99	A B C D E F G H I 99

***** PLEASE REFER TO CARD FOR THE CODES FOR THE OPTIONS ABOVE *****

MORBIDITIES DURING DELIVERY- PROMPTED (MD-P)					
S/N	Question/ Types	Responses	Code		
MD-P1	<p>Now I would like to find out whether you experienced any other problems during your last delivery, apart from the ones you mentioned previously.</p> <p>By delivery, I mean the time from when your labour started seriously up to the time you delivered your baby, including the time when aspects such as your clean-up in the delivery room or stitching were conducted.</p> <p>Did you experience any of the following during DELIVERY?</p>	DO NOT PROMPT RESPONDENT FOR MORBIDITIES ALREADY MENTIONED IN PRECEDING SECTION (MD-U).			
		Symptoms	Yes 1	No 2	DK 99
		- Vomiting blood (did you vomit blood during the delivery?)	1	2	99
		- Fever- body hotness only (did you experience fever, that is, did your body get very hot during the delivery?)	1	2	99
		- Shivering/body shaking/feeling cold (was your body shivering/ shaking during the delivery as if you were feeling cold?)	1	2	99
		- Cord around baby's neck (was the cord around your baby's neck?)	1	2	99
		- Delayed placental expulsion >30 minutes/ retained placenta (did all or part of your placenta stay longer than 30 minutes before coming out?)	1	2	99
		- Obstructed labour- malpresentation (was your baby lying in any position besides upside-down at delivery such that he/she couldn't come out?)	1	2	99
		- Tear (did you have any tear around your vagina as the baby came out, not the cut made by your birth attendant?)	1	2	99
		- Convulsion (fits)/eclampsia (did you experience convulsion during the delivery?)	1	2	99
		- Fainting/unconsciousness (did you faint or lose consciousness at any point during the delivery?)	1	2	99
		- High blood pressure/ PIH/ hypertension (were you told by a doctor, nurse or midwife that your blood pressure had gone up during the delivery?)	1	2	99
			1	2	99
		Procedures			
		- Blood transfusion (were you given blood?)			
		- Planned C-Section (did you make an arrangement ahead of time to have a CS, that is, did you and/or your doctor make the decision to have a CS while you were still pregnant?)	1	2	99
		- Episiotomy (Was a cut made around your vagina by your birth attendant to enlarge the opening for your baby to come out?)	1	2	99
		- Hospitalisation - ≥3 days in one episode (were you admitted in the hospital for 3 days or more for your delivery?)	1	2	99
		- Hysterectomy (did they remove all or part of your womb?)	1	2	99
		- ICU admission (were you admitted in a special care ward for women who are seriously ill and which has very limited access by non-hospital staff?)	1	2	99
		- Induced labour (did your birth attendant put his/her fingers into your vagina to burst the water, or give you a drip or medication to start your labour?)	1	2	99
		-Manual placenta expulsion (did your birth attendant put his/her hand into your vagina to remove the placenta?)	1	2	99
		- Referral to another health institution (were you transferred to another health centre because the first place could not treat you?)	1	2	99
		-Senior personnel summoned in hospital (did the hospital staff have to call a senior staff- their "oga"- to manage your case?)	1	2	99
		- <i>For home deliveries</i> : Health worker summoned home (did you or someone close to you bring/call a doctor, nurse or midwife to your home to check you or handle an emergency during your last delivery?)	1	2	99
			1	2	99
			1	2	99

PROLONGED LABOUR (PL)				
S/N	Question	Response	Code	Go to
PL1	<p>I would like to ask some specific questions about your labour.</p> <p>How long did your labour last for, that is, from the time you started experiencing very strong continuous pains which stopped you from doing chores to the birth of your baby?</p> <p>GO TO PS1 IF WOMAN REPORTS <12 HOURS.</p>	<p>----- hours</p> <p>----- days</p>		
PL2	Did you seek care when the labour took this amount of time, that is, any solution to the long labour from anywhere or anyone?	<p>Yes</p> <p>No</p> <p>Was already in hospital before 12-hour mark</p>	<p>1</p> <p>2</p> <p>3</p>	<p>PL3</p> <p>PL8</p> <p>PL8</p>
PL3	What did you do first?	<p>Home remedy/self-treatment</p> <p>Consulted lay source (e.g. mother)</p> <p>Consulted traditional source</p> <p>Visited chemist</p> <p>Summoned health worker home</p> <p>Visited formal health facility</p>	<p>1</p> <p>2</p> <p>3</p> <p>4</p> <p>5</p> <p>6</p>	
PL4	What treatment did you receive? TICK ALL THAT APPLY	<p>None</p> <p>Western medicine/ therapy</p> <p>Traditional medicine/ therapy</p> <p>Other alternatives</p>	<p>1</p> <p>2</p> <p>3</p> <p>4</p>	
PL5	Did you do something else again relating to seeking care or solution to the long labour?	<p>Yes</p> <p>No</p> <p>Don't know</p>	<p>1</p> <p>2</p> <p>99</p>	<p>PL6</p> <p>PL8</p> <p>PL8</p>
PL6	What else did you do? TICK ALL THAT APPLY	<p>Home remedy/self-treatment</p> <p>Consulted lay source (e.g. mother)</p> <p>Consulted traditional source</p> <p>Visited chemist</p> <p>Summoned health worker home</p> <p>Visited formal health facility</p>	<p>1</p> <p>2</p> <p>3</p> <p>4</p> <p>5</p> <p>6</p>	
PL7	What treatment did you receive? TICK ALL THAT APPLY	<p>None</p> <p>Western medicine/ therapy</p> <p>Traditional medicine/ therapy</p> <p>Other alternatives</p>	<p>1</p> <p>2</p> <p>3</p> <p>4</p>	
PL8	Did you pay for care (medical services), transportation and/or treatment (medicines) for the long labour?	<p>Yes</p> <p>No</p>	<p>1</p> <p>2</p>	
PL9	<p>Did you or your family do any of the following to pay for care (medical services) and/or treatment (medicines) for the long labour?</p> <ul style="list-style-type: none"> Borrow money to make the payment? Sell an asset to make the payment? Use money reserved for something else to make the payment? <i>Please specify what the money was meant for originally:</i> 	<p>Yes / No / Don't know</p> <p>Yes / No / Don't know</p> <p>Yes / No / Don't know</p>	<p>1 / 2 / 99</p> <p>1 / 2 / 99</p> <p>1 / 2 / 99</p>	

S/N	Question	Response	Code	Go to
PL10	Now I would like to ask how the prolonged labour affected different aspects of your life after you delivered the baby. What was the effect of the long labour on your bodily functions such as urinating and defecating? SHOW CARD	A B C D E F G H I Don't know	1 2 3 4 5 6 7 8 9 99	
PL11	What was the effect of the long labour on your day-to-day activities like cooking, sweeping, walking to the shop and going to work? SHOW CARD	A B C D E F G H I Don't know	1 2 3 4 5 6 7 8 9 99	
PL12	What was the effect of (<i>insert morbidity</i>) on your social life such as chatting with your family and others, or participating in important events like weddings and naming ceremonies? SHOW CARD	A B C D E F G H I Don't know	1 2 3 4 5 6 7 8 9 99	
PL13	What was the effect of the long labour on your ability to breastfeed your baby or care for him/her? SHOW CARD	A B C D E F G H I Don't know	1 2 3 4 5 6 7 8 9 99	
PL14	What was the effect of the long labour on your relationship with your husband such as communicating with him, spending time with him or being in good terms with him? SHOW CARD	A B C D E F G H I Don't know	1 2 3 4 5 6 7 8 9 99	

MORBIDITIES DURING POSTPARTUM- UNPROMPTED (MS-U)

Type	Question/Tick	Question/Write out	Question	Question/Write out
	<p>MS-U1: Now I would like you to tell me about any illnesses/ problems you experienced after your last delivery. By after delivery, I mean the time from after you delivered your baby and after aspects such as your clean-up in the delivery room or stitching, up to 6 weeks later. Please can you list out all the illnesses and health problems you experienced?</p> <p>TICK ALL THAT RESPONDENT REPORTS. RECORD ANY PROBLEMS NOT ON THE LIST UNDER "OTHER."</p> <p>ASK "Any other?"</p>	<p>MS-U2: From these problems you mentioned (REPEAT THEM), which ones did a health professional (doctor or nurse or midwife or pharmacist or lab technician) diagnose you with?</p> <p><u>WRITE IT/THEM OUT</u></p> <p>PUT "N/A" IF NOT APPLICABLE</p>	<p>MS-U3: Would you say any of these problems was very serious, that is, did it/ they negatively impact your wellbeing and/or functioning very severely?</p>	<p>MS-U4: Which ones? <u>WRITE IT/THEM OUT</u></p> <p>FOR SEVERITY SECTION: IF MORE THAN 2 ARE REPORTED, ASK FOR 2 MOST SERIOUS.</p> <p>DON'T PROBE FURTHER ON BLEEDING IF REPORTED.</p>
Symptoms	<p>Digestion-related</p> <p>Constipation</p> <p>Inability to eat</p> <p>Nausea</p> <p>Unable to urinate</p> <p>Vomiting</p>		<p>↓ ↓</p> <p>↓</p>	
	<p>Discharges</p> <p>Bleeding- no cause given/ not known</p> <p>Bleeding- uterine rupture</p> <p>Bleeding- uterine atony</p> <p>Bleeding- tear (cervical, vaginal, etc, but not uterine)</p> <p>Bleeding- retained products of birth</p> <p>Bleeding- clotting failure/ disorder</p> <p>Bleeding- other</p> <p>Bright red bleeding >4 days postpartum</p> <p>Diarrhoea/ stooling</p> <p>Frequent urination</p> <p>Foul, smelly vaginal discharge</p> <p>Leaking faeces</p> <p>Leaking urine</p> <p>Nose bleeding</p> <p>Spitting</p> <p>Unable to urinate/ Urine retention</p> <p>Vomiting blood</p>			
	<p>Febrile-related</p> <p>Fever (body hotness only)</p> <p>Fever/ malaria</p> <p>Shivering/ body shaking/ feeling cold</p>			
	<p>Pain</p> <p>Abdominal pain</p> <p>Backache</p> <p>Body pain</p> <p>Chest pain</p> <p>Headache</p> <p>Leg pain</p>		MS-U4	

	Lower abdominal pain Painful CS scar Painful intercourse Painful stretch marks Painful urination Perineal pain or discomfort Side pain Ulcer/ heartburn			
	Swelling Breast problems (abscess, mastitis etc) Haemorrhoids Stomach bloating Swollen body Swollen face Swollen feet/ leg Swollen hands Swollen toe (nail in-growth)			
	Uncategorised Anaemia/ insufficient blood Blurred vision/ seeing things hazy Body heaviness (kasala) Body numbness Body weakness/ fatigue Convulsion (fits)/ eclampsia Dizziness/ vertigo Excessive sleeping Fainting High blood pressure/ PIH/ Hypertension Inability to walk or difficulty in walking Infection/ sepsis Insomnia Itchy CS scar Jaundice Leg numbness Obstructed breathing Pelvic floor prolapse- Uterine Pelvic floor prolapse- Others Pelvic floor prolapse- Type not known Postpartum depression Postpartum psychosis Pre-eclampsia Pregnancy-induced diabetes/ PID Shallow or rapid breathing Skin problems (boils, rashes, acnes, etc) Stitches loosened- vaginal area Stitches loosened- CS Tear (“natural” tear) Unconsciousness Weight loss			
	Others (<i>Specify here</i>)			

Multiple	>1 morbidity at once Tear plus bleeding Nausea and vomiting			
	Final outcomes Blindness Infertility			
	Others (<i>Specify here</i>)			
Procedures	Blood transfusion Given drip at home Given drip at health facility Health worker summoned home ICU admission (Intensive Care Unit admission) Hospitalisation (≥ 3 days) Hospitalisation (>1 across postpartum) Referral to another health institution Senior personnel summoned Mini-surgery conducted (<i>Specify why</i>)			
	Others (<i>Specify here</i>)			

SEVERITY OF MORBIDITIES- POSTPARTUM (SS)												
Morbidity #	Onset	Duration	Care-seeking				Financial		Physical	Nurturing	Marital	Overall Severity
WRITE OUT THE 2 MOST SERIOUS MORBIDITIES FROM SECTION MP-U	SS1. When did (insert morbidity) start?	SS2. How long did (insert morbidity) last? RECORD NUMBER OF DAYS OR WEEKS OR MONTHS. IF IT OCCURRED MORE THAN ONCE, PUT CUMULATIVE TOTAL	SS3. Did you seek care/treatment/remedy for (insert morbidity), that is, any solution to (insert morbidity) from anywhere or anyone?	SS4. What did you do? TICK ALL THAT APPLY	SS5. FOR OPTION “VISITED FORMAL HEALTH FACILITY ONLY”: When did you seek the care/treatment/remedy?	SS6. ALL OPTIONS FROM SP4: What treatment/remedy did you receive? TICK ALL THAT APPLY	SS7. Did you pay for care (medical services) and/or treatment (medicines) for (insert morbidity)?	SS8. Did you or your family do any of the following to pay for care (medical services) and/or treatment (medicines) for (insert morbidity)?	SS9. What was the effect of (insert morbidity) on your day-to-day activities like cooking, sweeping, walking to the shop and going to work? SHOW CARD	SS10. What was the effect of (insert morbidity) on your ability to breastfeed your baby or care for him/her? SHOW CARD	SS11. What was the effect of (insert morbidity) on your relationship with your husband such as communicating with him, spending time with him or being in good terms with him? SHOW CARD	SS12. Rate the overall severity of the pain/discomfort/distress of the (insert morbidity) SHOW CARD.
Morbidity #1	----- month of pregnancy	----- day(s) ----- week(s) ----- month(s)	Y N 1 2 ↓ ↓ SS4 SS7	1 2 3 4 5 6	1 2 3 99	1 2 3 4	Y N 1 2	Borrow money 1 / 2 / 99 Sell an asset 1 / 2 / 99 Use money reserved for something else 1 / 2 / 99 <i>Please specify what the money was meant for originally :</i>	A B C D E F G H I 99	A B C D E F G H I 99	A B C D E F G H I 99	A B C D E F G H I 99
Morbidity #2	----- month of pregnancy	----- day(s) ----- week(s) ----- month(s)	Y N 1 2 ↓ ↓ SS4 SS7	1 2 3 4 5 6	1 2 3 99	1 2 3 4	Y N 1 2	Borrow money 1 / 2 / 99 Sell an asset 1 / 2 / 99 Use money reserved for something else 1 / 2 / 99 <i>Please specify what the money was meant for originally :</i>	A B C D E F G H I 99	A B C D E F G H I 99	A B C D E F G H I 99	A B C D E F G H I 99

***** PLEASE REFER TO CARD FOR THE CODES FOR THE OPTIONS ABOVE *****

MORBIDITIES DURING POSTPARTUM PERIOD- PROMPTED (MS-P)					
S/N	Question/ Types	Responses	Code		
MS-P1	<p>Now I would like to find out whether you experienced any other problems after your last delivery, apart from the ones you mentioned previously.</p> <p>By after delivery, I mean the time from after you delivered your baby and after aspects such as your clean-up in the delivery room or stitching, up to 6 weeks later Did you experience any of the following during your last pregnancy?</p>	<p>DO NOT PROMPT RESPONDENT FOR MORBIDITIES ALREADY MENTIONED IN PRECEDING SECTION (MS-U).</p> <p>Symptoms</p> <ul style="list-style-type: none"> - Bright red bleeding >4 days postpartum (was very fresh red blood still coming out of your vagina more than 4 days after your delivery?) - Foul, smelly vaginal discharge (was bad smelly discharge coming out from your vagina after your delivery?) - Leaking urine or faeces (were you totally unable to control the flow of your urine or faeces after your last delivery?) - Vomiting blood (did you ever vomit blood after you delivered?) - Shivering/body shaking/feeling cold (was your body shivering/ shaking after your delivery as if you were feeling cold?) - Anaemia/ insufficient blood (did a doctor, nurse or midwife ever tell you that you did not have enough blood after your last delivery?) - Blurred vision/ seeing things hazy (were you seeing things cloudy, dark-dark or not very clearly at any point after the delivery?) - Convulsion (fits)/ eclampsia (did you ever experience convulsion?) - Fainting/unconsciousness (did you ever faint or lose consciousness at any point after your delivery?) - High blood pressure/ PIH/ hypertension (were you told by a doctor, nurse or midwife that you had high blood pressure after the delivery?) - Pelvic floor prolapse - Uterine (did your uterus fall into or hang down into vagina after the delivery?) <p>Procedures</p> <ul style="list-style-type: none"> - Blood transfusion (were you given blood?) - Given drip at home (were you ever given drip at home?) - Given drip at health facility (were you ever given drip at the hospital?) - Health worker summoned home (did you or someone close to you ever had to bring/call a doctor, nurse or midwife to your home to check or treat you after your last delivery?) - Hospitalisation - ≥3 days in one episode (were you admitted in the hospital for 3 days or more at one particular point in time?) - Hospitalisation - >1 across pregnancy (were you admitted in the hospital more than once after you delivered, that is more than once from the time after you delivered your baby up to 6 weeks later?) - ICU admission (were you admitted in a special care ward for women who are seriously ill and which has very limited access by non-hospital staff?) - Referral to another health institution (were you transferred to another health centre because the first place could not treat you?) -Senior personnel summoned in hospital (did the hospital staff have to call a senior staff- their "oga"- to manage your case after your last delivery?) 	Yes	No	DK
			1	2	99
			1	2	99
			1	2	99
			1	2	99
			1	2	99
			1	2	99
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			1	2	99
			1	2	99

HAEMORRHAGE (HM)- INTRAPARTUM AND POSTPARTUM					
Category	S/N	Question	Response	Code	Go to
I would like to ask some questions about the blood you lost during your last delivery. By during your delivery, I mean the blood you lost from the time your labour started seriously up to the time you delivered your baby, including the time when aspects such as your clean-up in the delivery room or stitching were conducted.					
I. Stains/ messes- Delivery	HM1	What type of material was on the bed or surface you delivered on? TICK ALL THAT APPLY	Nothing Wrapper Nightingale Bed-sheet Towel Plastic bag ("leather") Other (<i>Please specify</i>) Don't know	1 2 3 4 5 6 7 99	
	HM2	How many (<i>insert type of material</i>) did you use during the delivery? WRITE OUT	-----		
	HM3	Which of these diagrams closely resembles the soaking of your (<i>insert type of material(s)</i>) by the time your delivery was over? <i>Show pictures</i>	A B C D E Don't know	1 2 3 4 5 99	
	HM4	Did your blood stain the floor during your last delivery?	Yes No Don't know	1 2 99	HM5 HM6 HM6
	HM5	Did the blood run down across the floor when it stained the floor?	Yes No Don't know	1 2 99	
	II. Nature of flow- Delivery	HM6	Was the blood rushing so much during your last delivery, for example, like tap water or someone passing urine?	Yes No Don't know	1 2 99
III. Emotions triggered	HM7	Did you bleed so much during your last delivery that you were scared?	Yes No Don't know	1 2 99	
	HM8	Did you bleed so much during your last delivery that it scared your birth attendant?	Yes No Don't know	1 2 99	
IV. Comparison	HM9	<i>For multiparas only:</i> Compared to your other delivery/deliveries, was the bleeding during your last delivery minimal, the same or much?	Minimal The same Much Don't know	1 2 3 99	
V. Sourcing for blood initiated	HM10	Did your birth attendant ask your family members or your escort to look for blood donors at any point during your last delivery, even if you did not use the blood eventually?	Yes No Don't know	1 2 99	
VI. Procedure s- Delivery	HM11	Was any of the following done to stop your bleeding during your last delivery? - Were you given an injection? - Was a tablet inserted into your anus? - Was a tablet put under your tongue?	Yes / No / Don't know Yes / No / Don't know Yes / No/ Don't know	1/2 /99 1/2 /99 1/2 /99	
	HM12	Were you given blood, that is, blood transfusion?	Yes No Don't know	1 2 99	HM13 HM14 HM14
	HM13	How many pints of blood were you given?	1 2-3 4 and above Don't know	1 2 3 99	
	HM14	Were you transferred to another health centre because the first place could not stop the bleeding?	Yes No Don't know	1 2 99	

VII. Financial Consequences	HM15	Did you pay for care (medical services) and/or treatment (medicines) for the bleeding?	Yes No Payment included in total bill	1 2 3	HM16 HM17 HM16
	HM16	Did you or your family do any of the following to pay for care (medical services) and/or treatment (medicines) for the bleeding? <ul style="list-style-type: none"> Borrow money to make the payment? Sell an asset to make the payment? Use money reserved for something else to make the payment? <i>Please specify what the money was meant for originally:</i> 	Yes / No / Don't know Yes / No / Don't know Yes / No / Don't know	1/ 2/99 1/ 2/99 1/2/99	
VIII. Care-seeking-Home deliveries only	HM17	<i>For home deliveries only:</i> Did you seek care/ treatment/remedy for the bleeding during your last delivery?	Yes No Don't know	1 2 99	
	HM18	<i>For home deliveries only:</i> What did you do? TICK ALL THAT APPLY	Home remedy/self-treatment Consulted lay source (e.g. mother) Consulted traditional source Visited chemist Summoned health worker home Visited formal health facility	1 2 3 4 5 6	
	HM19	<i>For home deliveries only:</i> What treatment did you receive? TICK ALL THAT APPLY	None Western medicine/ therapy Traditional medicine/ therapy Other alternatives	1 2 3 4	
IX. Accompanying symptoms		I would like to ask some questions about the blood you lost <u>within the first 24 hours after your delivery</u> . By <u>within the first 24 hours after delivery</u> , I mean the blood you lost from the time after you delivered and after aspects such as your clean-up in the delivery room or stitching, up to 24 hours later.			
	HM20	Did your palms look pale or white within 24 hours after the delivery?	Yes No Don't know	1 2 99	
	HM21	Did you experience dizziness within the first 24 hours after the delivery?	Yes No Don't know	1 2 99	
	HM22	Were you shivering, that is shaking from feeling cold, within the first 24 hours after the delivery?	Yes No Don't know	1 2 99	
	HM23	Did you feel very weak within the first 24 hours after the delivery such that you were unable to get up or walk?	Yes No Don't know	1 2 99	
	HM24	Did you faint within the first 24 hours after delivery, that is, become unconscious for a brief period?	Yes No Don't know	1 2 99	
X. Nature of flow-Postpartum	HM25	I would like to ask some questions about your blood flow within the first 24 hours after your delivery: <ul style="list-style-type: none"> - Was the blood rushing, for example, like tap water or someone passing urine? - Did the blood trickle/flow down your legs? - Did so many big, thick clots of blood come out frequently? - Did you have to double your pad? - Did you have to triple your pad 	Yes / No / Don't know Yes / No / Don't know Yes / No / Don't know Yes / No / Don't know Yes / No / Don't know	1 /2/99 1 /2/99 1 /2/99 1 /2/99 1 /2/99	

XI. Stains/messes-Postpartum	HM26	Did you stain any of the following within the first 24 hours after the delivery? - Your cloth? - The bed? - The floor?	Yes / No / Don't know Yes / No / Don't know Yes / No / Don't know	1/2/99 1/2/99 1/2/99	
XII. Procedures-Postpartum	HM27	Did your birth attendant or another maternity staff come back after your delivery to scoop out blood from inside you, that is, did he/she come back after you had been cleaned-up or stitched and then inserted his/her hand into your vagina or massaged your abdomen to expel left-over blood?	Yes No Don't know	1 2 99	
XIII. Maternity Staff Comments	HM28	<i>For hospital deliveries only:</i> Did any maternity staff mention that your blood level had reduced significantly, for example, after testing your PCV?	Yes No Don't know	1 2 99	
XIV. Care-seeking-Hospital deliveries only	HM29	Did you have to summon/call a maternity staff at some points after the delivery to check you because you were worried about your bleeding?	Yes No Don't know	1 2 99	

CLOSING (CL)

THANK RESPONDENT FOR HER TIME. CHECK FORM TO SEE THAT YOU HAVE NOT MISSED OUT ANY QUESTION.

CLOSE SURVEY.

TIME ENDED:

ANY COMMENTS

Appendix 8.4: The Facial Affective Scale used to measure consequences of morbidities

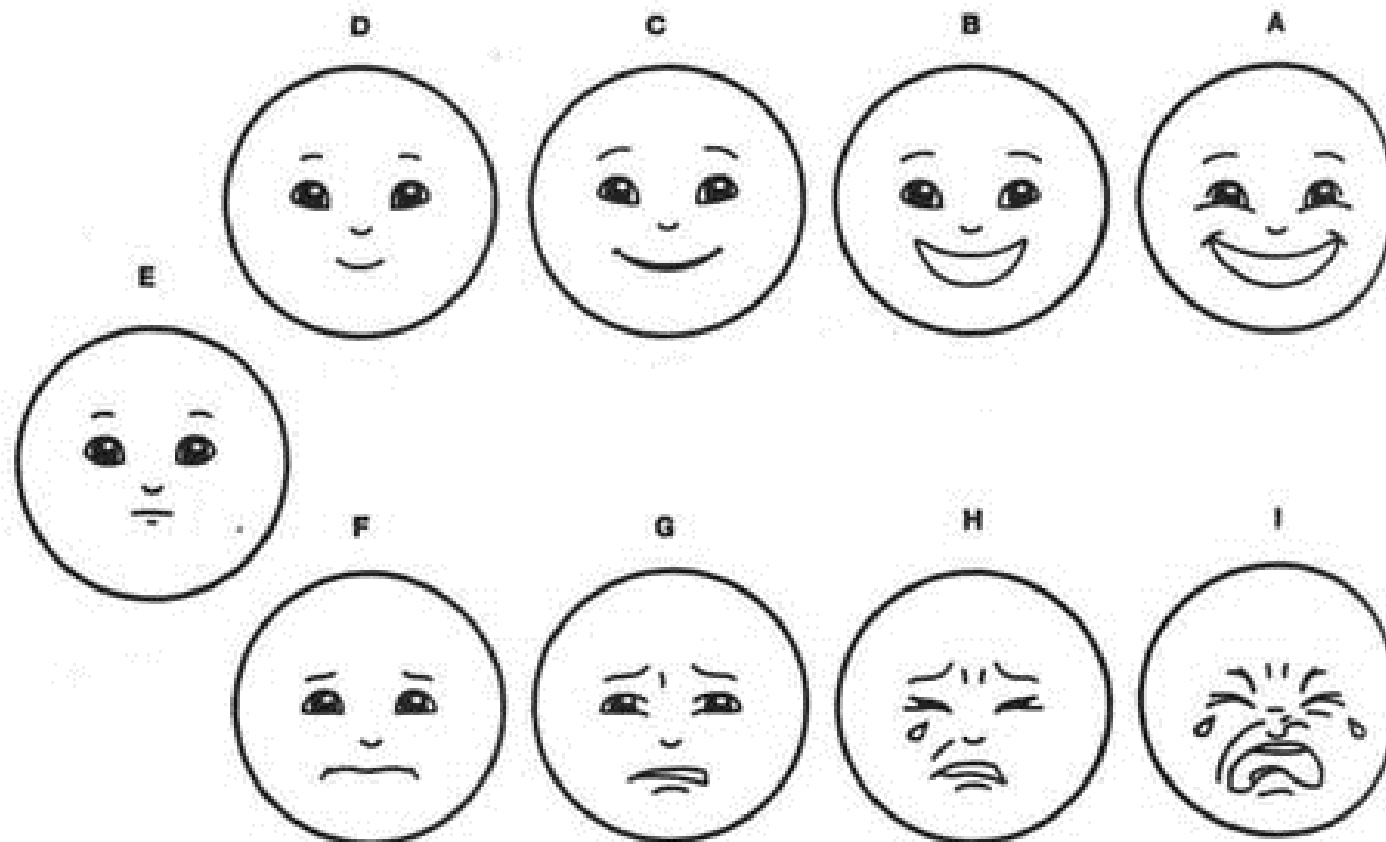
Instruction to read out for the facial scale about the effect of a morbidity on physical life, social life, marital life, nurturing and bodily functions (that is, the scale for questions SP9, SP10, SP11, SD9, SD10, SD11, PL10, PL11, PL12, PL13, PL14, SS9, SS10, SS11)

Now I am going to show you some faces and I want you to choose the face which looks like how you felt when you were experiencing the effect of the (*insert morbidity*) on your (*insert aspect of life*). Choose the face which looks like you how you felt deep down inside- not just how your face looked, but how you really felt inside.

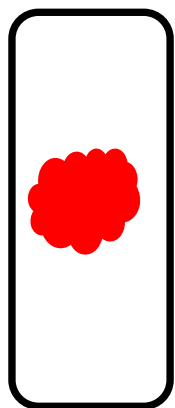
(For example, for SP9 with respect to the severity of headache during pregnancy on her physical life, say: “Now I am going to show you some faces and I want you to choose the face which looks like how you felt when you were experiencing the effect of the headache on your day-to-day activities like cooking, sweeping, walking to the shop and going to work. Choose the face which looks like you how you felt deep down inside- not just how your face looked, but how you really felt inside”).

Instruction to read out for the facial scale about the severity of pain/discomfort/distress of a morbidity (that is, for questions SP12, VM25, SD12, SS12)

Now I am going to show you some faces and I want you to choose the face which looks like how you felt. Choose the face which looks like you how you felt deep down inside- not just how your face looked, but how you really felt inside.



Appendix 8.5: Pictures showing different gradations of blood staining



A



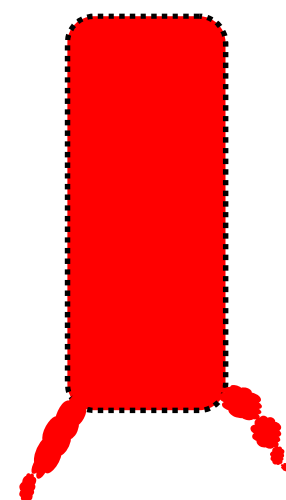
B



C



D



E

Appendix 8.6: Standard Operating Procedures (SOPs) used in the survey

STANDARD OPERATION PROCEDURES (SOPs) FOR SURVEY MEASURING MATERNAL MORBIDITY IN NORTHERN NIGERIA

The aim of this survey is to measure selected self-reported maternal morbidities in Yola, Adamawa State. The following sections give further information on different aspects of the survey.

A. Checklist of Items to Carry Along

Before heading to the field every day, please make sure you have the following:

- SOPs
- Map
- Questionnaires
- Cards
 - Scale for agreement
 - Scale for severity of pain/discomfort/distress and disruption
 - Picture of forceps delivery and vacuum extraction delivery
 - Picture of different gradations of staining
- Random numbers table
- Informed consent forms
- Stamp pad
- Pen
- Notebook
- Ethical approval form
- Incentives for respondents
- Your phone

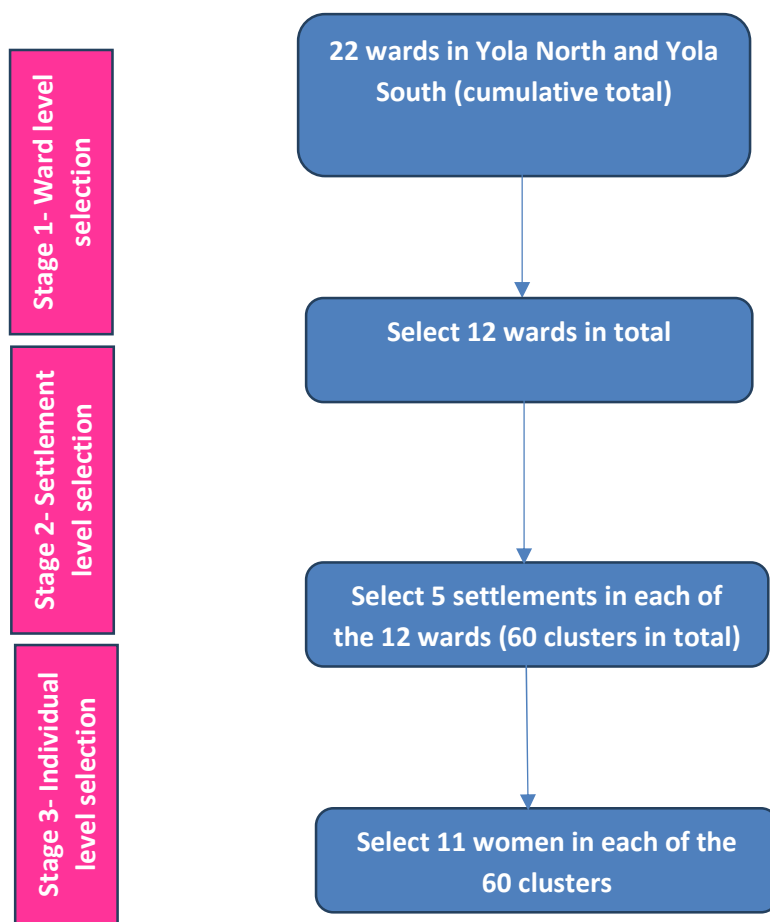
B. Eligibility Criteria

Women would need to meet the following criteria to be included in the study:

- Of child-bearing age (aged 15-49 years)
- Married (Please note that women who were married before the baby was born but are not currently married are still eligible).
- Residents of Yola (Yola North and Yola South)
- Given birth within the past two years preceding the study

C. Sample Sites

A three-stage cluster sampling will be conducted at the ward, settlement and participant levels as seen in the figure below. I have already completed selection at the first two stages. At the first stage, 12 out of a cumulative total of 22 wards in Yola North and Yola South were selected. Five settlements from each of the 12 wards were then selected in the second stage, giving a total of 60 clusters. It is the third and final stage of the sampling that we will be conducting- selection of 11 women from each of the 60 clusters.



Below are the settlements to be visited to sample women for the third stage of the survey:

S/N	Cluster Code	Cluster Name	Ward
001	AL1	Galadima Street	Alkalawa
002	AL2	Hamman Shugaba Street	
003	AL3	Liman Street	
004	AL4	Mubi Road	
005	AL5	Tafida Street	
006	GW1	Baba Yohana	Gwadabawa
007	GW2	G.G. Premises	
008	GW3	Jimeta Division	
009	GW4	Old GRA	
010	GW5	Zango	
011	JB1	Buba Marwa (Mallam Usman)	Jambutu
012	JB2	Damilu (Major Paul)	
013	JB3	Kasuwan Jambutu (Abulkadir St)	
014	JB4	Nyokore (Market Area)	
015	JB5	W/Kuturu (Anglican Church)	

016	KW1	Alh. Abdul	Karewa
017	KW2	Batuki Bore-hole	
018	KW3	Dubai	
019	KW4	Joseph Gella 'B'	
020	KW5	Nyibango 'A'	
021	LG1	Bobboi Street	Luggere
022	LG2	Dampa Street	
023	LG3	Luggere Baki	
024	LG4	Owerri Street	
025	LG5	Up-Bishop Street	
026	NS1	Alh. Buba Kwaya	Nassarawo
027	NS2	Baba Cha Mutum Biyu	
028	NS3	Ebenezer Chi Zing St.	
029	NS4	Kofan Mai Ung. K. Lamido	
030	NS5	Talba Street	
031	AD1	Alh. Hakilu	Adarawo
032	AD2	Babale	
033	AD3	Jesus Army Church	
034	AD4	Mal Kawu	
035	AD5	Yahya Kadiri	
036	MK1	Fadde Diggol	Makama 'B'
037	MK2	Fadde Girei	
038	MK3	Fadde Sanda	
039	MK4	Fadde Sarki Tuta	
040	MK5	Fadde Workshop	
041	MB1	Kapo	Mbamba
042	MB2	Mbamba Mission	
043	MB3	Rumde Jabbi	
044	MB4	Sebore Gari	
045	MB5	Yokosala	
046	NG1	Alh. Buba Danbakai	Ngurore
047	NG2	Bamanga Holere	
048	NG3	Late Alh. Haruna	
049	NG4	Rumde Mallum Dara	
050	NG5	Wuro Dole Tandu	
051	BY1	Ahmadu Ribadu College	Bole Yolde-Parte
052	BY2	Gindin Tsamiya	
053	BY3	Police Station	
054	BY4	Bole Kilaru	
055	BY5	Kofar Mai Anguwa	
056	NM1	Kofare	Namtari
057	NM2	Waurujabbe	
058	NM3	Dundere Malkohi	

059	NM4	Malkohi	
060	NM5	Tudun Hassan	

D. Sampling Procedures

- Go to the centre of the settlement (indicated on the map).
- Spin the pen to indicate the direction of movement.
- Count all the houses along the direction the pen pointed from the centre to the boundary of the settlement.
- Using the random numbers table, pick a random household. This is the first household you will enter.
- Collect data if there is an eligible woman in the household and if she consents. If an eligible woman is not found, visit the household whose front door is closest to the starting household.
- Sample subsequent women using the 'closest front door' criterion until 11 women are interviewed in the settlement.

E. What-if Scenarios for Sampling

Below are possible scenarios you may come across on the field with respect to sampling. Please call Judith if you encounter any problem not covered below or if you come across any other issue. If you are not able to call (for example, due to phone network issues), please write down the issue in your notebook so that we can discuss it during debriefing.

- **If the eligible woman is not present at the time you visited the household**

Ask the members of the household about the time the woman will return and revisit the household at the appointed time. If no member is present, move on to other households but check back at a later time. However move on after visiting a house three times, including the first visit.

- **If a neighbour or a close-by resident can confirm that the house in question has no eligible woman**

You do not need to revisit a household if a neighbour or a close-by resident can confirm that the house in question has no eligible woman (that is, a woman who has given birth within the past two years) or that the occupiers are away for the duration of the data collection period (remember to indicate "Household occupiers away for duration of data collection" under "Interviewer Visits" if the later is the case).

- **If the desired number of 11 women is not reached**

Return to the centre of the settlement and spin the pen again until a different direction is obtained and 11 women sampled. If 11 women are still not found after spinning the pen several times and following different directions and even after tracking non-responders, but at least 10 women have been interviewed, list the data collection as "completed" in the settlement. The study has oversampled by approximately 7% overall, therefore interviewing 10 women in such settlements is sufficient. However, if less than 10 women were interviewed, select the remaining women from another randomly selected cluster.

- **If a settlement is found to be too small**

If a settlement is found to be too small by default through uncontrollable factors such as nomadic movement or having vast areas unoccupied, survey the eligible women there and then randomly select another cluster to compensate for it.

- **If a compound has numerous independent households within it**

Count the households and randomly select one household using the random numbers table. If no eligible woman is found, visit the household whose front door is closest to the starting household until all households within the compound are visited.

- **If a single household has more than one eligible woman**

If a single household has more than one eligible woman, for example a polygamous home, collect data on all the eligible women in the household and then move to household with the closest front door as usual to continue the data collection.

F. Definitions of Morbidities and Key Terms in Questionnaire

* Please note that we are interested in measuring **maternal morbidity** which is defined as “*any health condition attributed to and/or complicating pregnancy and childbirth that has a negative impact on the woman’s wellbeing and/or functioning* (Maternal Morbidity Working Group, 2016).

Abdominal pain: Pain or discomfort in the abdomen. Women in the community usually differentiate abdominal pain from lower abdominal pain thus: abdominal pain is the pain/discomfort that is felt in the abdomen generally or felt above the navel, while lower abdominal pain is the pain/ discomfort that is felt below the navel.

Anaemia/ insufficient blood: A condition in which an individual has very few red blood cells in his/her blood, making him/her feel weak and look pale. Many women report anaemia as “insufficient blood”, “not having enough blood.”

Antepartum depression: A mental condition which some women experience during pregnancy with symptoms including losing pleasure in life, feelings of sadness, crying without any cause, withdrawal from loved ones, feeling guilty, being anxious, feeling inadequate, feeling overwhelmed, getting angry, feeling hopeless, finding it difficult to concentrate and feeling empty. There could also be physical symptoms such as inability to sleep and loss of appetite.

Backache: Pain or discomfort in the back.

Bleeding- no cause given/ not known: Loss of blood, however the cause of the blood loss is not known to the woman. If a woman reports that she experienced bleeding, ask her if she knows what caused the bleeding and record the appropriate choice. Record this option if the woman reports that she does not know what caused the bleeding.

Bleeding- threatened abortion: Vaginal bleeding that occurs when the pregnancy seems as if it will miscarry. It usually happens in the early stages of pregnancy. Women who had threatened abortion may report it as “the pregnancy was not stable.”

Bleeding- placental abruption: Bleeding caused by the premature detachment of the placenta from its normal place. Placental abruption is also called abruptio placentae. It usually comes with abdominal pain. When the woman reports or describes placental abruption, ask her if there was any experience of bleeding. If she says “yes”, record the morbidity here; if she says “no”, record it as “placental abruption (no bleeding).”

Bleeding- placenta praevia: Bleeding that occurs when the placenta is implanted in the lower part of the uterus such that it partially or fully obstructs/blocks the opening of the cervix. Respondents may describe it as “low-lying placenta.” One of my in-depth interview respondents who had placenta praevia describes it this way: “*The unborn child and the placenta had switched positions. The placenta had come down, then the child had moved up. Any movement the child makes, it’s just blood that begins to pour, so the child won’t be able to move downwards until they perform an operation, because the placenta had blocked the passage where the child would come out from.*” Placenta praevia can cause bleeding before or during labour. When the woman reports or describes placenta

praevia, ask her if there was any experience of bleeding. If she says “yes”, record the morbidity here; if she says “no”, record it as “placenta praevia (no bleeding).”

Bleeding- vasa praevia: Bleeding caused when the umbilical blood vessels are presented before the baby’s head during labour. When vasa praevia occurs, the umbilical blood vessels run across and come between the baby and the cervix. Vasa praevia is quite rare however.

Bleeding- uterine rupture: Bleeding that occurs when the uterus detaches completely or incompletely from its place. Uterine rupture usually occurs during labour but it also happens during the late stages of pregnancy.

Bleeding- uterine atony: Bleeding caused when the uterus fails to contract after delivery. This is a very common cause of bleeding after delivery.

Bleeding- tear (cervical, vaginal, etc, but not uterine): Bleeding caused by a laceration/cut that occurs during delivery in the cervix, vagina, perineum or any other part of the genital tract. If the tear was in the uterus, please record under “Bleeding- uterine rupture.”

Bleeding- retained products of conception: Bleeding that occurs when there are left-over parts of the placenta, tissues or clots in the uterus.

Bleeding: clotting failure/ disorder: Bleeding that occurs when the blood fails to clot. Normally when there is an injury, the platelets and some proteins form clots over the injury to prevent continuous bleeding. This is called blood clotting. When the blood doesn’t clot, excessive bleeding can occur.

Bleeding- other: Any other report of bleeding apart from the ones listed/described.

Blindness: Inability to see. Only tick this if the woman got blind as a result of a maternal illness or disease, that is, a condition that came about as a result of the pregnancy, delivery or postpartum (up to 6 weeks after delivery).

Blood transfusion: The process of transferring or putting blood into someone. This intervention is sometimes done when a woman is very anaemic or when she has lost a lot of blood during or after delivery.

Blurred vision/ seeing things hazy: Not seeing clearly, seeing things cloudy.

Body heaviness (*kasala*): A common experience for pregnant women whereby their bodies feel too relaxed (too heavy) to do any work; they will rather just lie down and sleep.

Body numbness: Feeling as if the entire body is dead, feeling unresponsive.

Body pain: Pain in the body.

Body weakness/ fatigue: Not having strength, feeling tired.

Breast problems (abscess, mastitis, etc): Any infection or pain in the breast, or any illness related to one or both breasts. The breast problem should come as a direct result of pregnancy, delivery or the postpartum (Breast cancer, for example, does not qualify here).

Bright red bleeding >4 days postpartum: Very fresh red blood that was still coming out after 4 days postpartum.

Caesarean section (CS or C-Section): Delivery of a baby by cutting through the abdominal wall and removing the baby. CS is what women mean when they say “I had an operation” that is, relating to the way they delivered their baby).

Cervix: The narrow outer end of the womb/uterus, the ‘neck’ of the womb/ uterus.

Chest pain: Pain in the chest. Note the difference between chest pain and ulcer/ heartburn. If, for example, a woman describes pain in the chest as “hot, peppery pain” or talks about pain in the chest after eating peppery, spicy or sour food or drink, she is more likely talking about ulcer/ heartburn. Chest pain is usually a feeling of heaviness on the chest or any general pain in the chest.

Community health workers: These are health facility staff that have some medical training but are not professionals like doctors, nurses, midwives, pharmacists and other professional health staff. Many of them work in rural areas or small health clinics in urban areas.

Constipation: Difficulty in passing faeces, or the insufficient or incomplete evacuation of faeces from the bowels.

Convulsion (fits)/ eclampsia: Experiencing convulsions during pregnancy or immediately after delivery. This is a very serious condition and can result in death or significant organ dysfunction. Please note that the convulsion associated with eclampsia is different from the convulsion associated with epilepsy. Convulsion associated with eclampsia only comes about because of pregnancy while convulsion associated with epilepsy is a pre-existing condition and is usually a chronic condition.

Cord around baby’s neck: The umbilical cord was wrapped around the baby’s neck during labour or delivery.

Delayed placental expulsion (>30 minutes)/ Retained placenta: Failure of the placenta to be expelled from the woman within 30 minutes of delivery. Here, all or part of the placenta remain inside the uterus/womb for more than 30 minutes after delivery. For hospital deliveries, delayed placental expulsion/ retained placenta is taken care of by many methods such as giving the woman injection/ drip to cause expulsion or inserting the hand inside the vagina to remove it manually. For women who had home deliveries, they have different methods for placental expulsion such as putting pepper on hot coals so that the woman inhales and sneezes, which then expels the placenta; putting a spatula into a woman’s mouth to almost induce vomiting so that that process causes the placenta to fall; asking a woman to blow air into a bottle so that that process causes the placenta to fall; and shaking the woman’s abdomen in specific ways to cause the placenta to be expelled. Any mentions of such procedures should indicate delayed placental expulsion/ retained placenta, but double-check that the placenta took more than 30 minutes after delivery before it got expelled.

Diarrhoea/ stooling: Frequent and excessive passing of watery faeces.

Dizziness/ vertigo: A disorienting sensation in which someone feels as if everything is spinning around him/her; feeling unsteady. Vertigo is feeling dizzy or feeling like one would lose balance particularly when looking down from a very high place.

Excessive sleeping: Sleeping more than one would usually do on a normal day. Excessive sleeping is very common with pregnant women. It is not an illness per se but some women classify it as one since it impacts/disrupts their day-to-day life.

Episiotomy: A surgical cut made during delivery from the opening of the vagina outwards to increase the passage for the baby to come out, making delivery easier or safer. Some women call this “addition”, hence you can hear them saying “*I was given an addition during my last delivery.*”

Fainting: An abrupt or sudden, usually brief loss of consciousness; to pass out. To differentiate fainting from unconsciousness, consider fainting as a less severe form of unconsciousness, or think about it as losing consciousness for a very brief period (such as few seconds or few minutes) such that quick first-aid remedies (like fanning or pouring water on the woman) are able to revive the woman.

Fever (body hotness only): Having a temperature higher than normal. It can be tricky to differentiate fever from malaria, but women who had fever tend to talk about “body hotness” only without mentioning other common symptoms accompanying malaria like pain in the joints, vomiting and headache.

Fever/ malaria: Having a temperature higher than normal with other accompanying symptoms such as shivering, vomiting, pain in the joints and headache. Malaria is an infectious disease caused by plasmodium transmitted through mosquito bites. In Hausa, *zazzabi* is the word used for both fever and malaria, hence it is tricky to differentiate fever from malaria. If the woman talks about body hotness only, record it as “fever (body hotness only)”; if she talks about fever and the other accompanying symptoms mentioned above, record it as “fever/malaria.”

Foul, smelly vaginal discharge: Discharge from the vagina which stinks and smells horribly. This is usually caused by an infection.

Frequent urination: Urinating on-and-on, urinating more than one would usually do on a normal day.

Given drip at home: Given liquid through a tube into the vein at home (if the liquid given is blood, record it under “blood transfusion”). Here, a health worker was brought home and he/she gave the drip to the woman at home.

Given drip at health facility: Given liquid through a tube into the vein at a health facility (if the liquid given is blood, record it under “blood transfusion”). Here, the woman was taken to a health facility (health post, clinic or hospital) and was given the drip there.

Haemorrhoids: Painful, itchy, swollen veins at the anus or near the anus. The woman will most likely report it as “boils in the anus” or “boils around the anus.”

Headache: Pain or discomfort in the head

Health worker summoned home: Going out and bringing a trained health worker home to check or treat the woman, or calling the health worker home using a phone.

High blood pressure/ Pregnancy-induced hypertension (PIH)/ Hypertension: Blood pressure that is higher than normal. Sometimes pregnancy can bring about high blood pressure (known as pregnancy-induced hypertension- PIH), which tends to resolve after delivery.

Hospitalisation (≥3 days in one episode): Being admitted in a health facility for three or more days at one particular point in time.

Hospitalisation (>1 across postpartum): Being admitted in a health facility more than once during postpartum (from immediately after delivery up to 6 weeks after delivery).

Hospitalisation (>1 across pregnancy): Being admitted in a health facility more than once during pregnancy (from the beginning to the end of pregnancy. If a hospital admission started during pregnancy and extended to the postpartum period, still record it here).

Hyperemesis gravidarum: Severe, excessive vomiting during pregnancy. Women with hyperemesis gravidarum vomit several times in a day, get dehydrated and can lose more than 5% of their pre-pregnancy weight. Such women generally need to be given drips during pregnancy. Hausa speakers will never tell you “Hyperemesis gradivarum,” hence you’ll need to listen to their description to know whether to tick “vomiting” or “Hyperemesis gravidarum.” The Section VM of the survey should be really helpful.

Hysterectomy: A medical operation done to remove all or part of a woman’s womb/ uterus.

ICU admission (Intensive Care Unit admission): Being admitted into a specialized part of a health facility which has highly trained medical staff and specialized equipment used to provide closely monitored and continuous care to patients who are seriously/critically ill.

Inability to eat: Finding it very difficult to eat. Sometimes women link this to vomiting and report that they found it difficult to keep food down because almost everything they eat comes out. If this is the case, record it under “vomiting.”

Inability to walk/ difficulty in walking: Unable to walk, finding it hard to walk without support.

Induced labour: To bring about labour or to make a woman go into labour by giving her a drip, drugs or inserting the fingers into her vagina to burst the amniotic sac ('burst the water').

Infection/ sepsis: Invasion of tissues or body parts by disease-causing microorganisms. If the infection resulted in producing bad, smelly discharge from the vaginal, record it under "Foul, smelly vaginal discharge." Otherwise record every other infection here.

Infertility: Being unable to reproduce babies. Only tick this option if the woman reports that a maternal illness/disease she experienced caused the infertility, not infertility she experienced due to a non-maternal cause such as female genital mutilation.

Insomnia: Inability to fall asleep or stay asleep for a good period of time.

Instrumental delivery: Vaginal delivery that is not spontaneous but an equipment (such as forceps or vacuum extractor) was used to pull the baby out. Remember to show pictures of a vacuum extractor delivery and forceps delivery to find out if the woman had an instrumental delivery.

Itchy CS scar: Having to keep scratching the abdominal location where a Caesarean section (CS) was done.

Jaundice: A medical condition in which the white part of the eyes or the skin become yellow. Jaundice is a symptom of many diseases such as hepatitis. It occurs when bile salts are deposited in these parts of the body.

Leaking faeces (Obstetric fistula): A condition in which a woman cannot control her faeces but passes it involuntarily because there is a hole between her vagina and rectum. This hole develops from the pressure exerted by the baby's head on the vagina and rectum during prolonged labour. The condition is usually common among girls who start childbearing early (child marriage).

Leaking urine (Obstetric fistula): A condition in which a woman cannot control her urine but passes it involuntarily because there is a hole between her vagina and bladder. This hole develops from the pressure exerted by the baby's head on the vagina and bladder during prolonged labour. The condition is usually common among girls who start childbearing early (child marriage).

Leg numbness: Feeling as if the leg is dead, the leg being unresponsive.

Leg pain: Pain in the leg.

Lower abdominal pain: Pain in the lower part of the abdomen. Women usually differentiate lower abdominal pain from abdominal pain thus: lower abdominal pain is the pain/ discomfort that is felt below the navel, while abdominal pain is the pain/discomfort that is felt in the abdomen generally or above the navel.

Manual placental expulsion: When the placenta is not expelled spontaneously (that is, on its own) after delivery but has to be removed using the hands. Here, a birth attendant inserts his/her hand into the woman's vagina and then removes the placenta.

Maternal: Relating to a mother, in this case, during pregnancy, delivery and the postpartum.

Mini-surgery conducted: Any minor operation undergone during pregnancy, delivery or postpartum such as a surgery to remove a toe nail in-growth caused by expansion of the toes during pregnancy and subsequent shrinking back to size after delivery. Surgeries such as Caesarean section and hysterectomy do not classify as mini surgeries; they are major surgeries.

Miscarriage: Also known as spontaneous abortion. This is the natural termination of pregnancy.

Morbidity: Disease and illness, any health condition that negatively affects someone's functioning, quality of life or wellbeing.

Multipara: A woman who has given birth more than once.

Multiple babies: Giving birth to more than one baby at once, such as twins, triplets or quadruplets.

Nausea: Feeling like vomiting. The nausea we are interested in here is the nausea brought about by pregnancy, not due to other causes such as after-effects of surgery, infection, ulcer, abdominal pain or drug intolerance. Confirm from the woman that it is "pregnancy nausea" that she is talking about. If it is nausea due to other causes, record it under "Other."

Nose bleeding: Loss of blood from the nose.

Obstructed breathing: Experiencing difficulty in breathing.

Obstructed labour- no cause given/ not known: When the baby couldn't come out in spite of strong contractions because there was an obstacle, but the woman does not know what the obstacle was, and hence, doesn't know why the baby couldn't come out.

Obstructed labour- small pelvis: When the baby couldn't come down in spite of strong contractions because the mother's pelvis is too small or narrow. This is what some women mean by saying "she has a narrow waist, that's why the baby couldn't come out." A small pelvis is generally found in women of short height or adolescent mothers.

Obstructed labour- malpresentation: When the baby couldn't come down in spite of strong contractions because the baby's position/lie was not upside-down; the baby might have been lying across, or it could be the feet coming down first, or it could be the shoulder first and so on.

Obstructed labour- oversized baby: When the baby couldn't come down in spite of strong contractions because the baby was too big.

Painful CS scar: Experiencing pain on the abdominal location where a Caesarean section (CS) was done

Painful intercourse: Experiencing pain or discomfort during sex.

Painful stretch marks: Experiencing pain or discomfort on the stretch marks that came about as a result of pregnancy, that is, these stretch marks came about as a result of the expansion of the skin during pregnancy. Such stretch marks are commonly found on the stomach.

Painful urination: Experiencing pain or difficulty when one is passing urine.

Pelvic organ prolapse: A condition that occurs when the pelvic organs (uterus, rectum, bladder) bulge/fall from their location into the vagina. This happens when the muscles and ligaments supporting the pelvic organs (called the pelvic floor) are weakened.

Pelvic organ prolapse- Uterine: A type of prolapse in which the uterus falls into or hangs down into the vagina. It usually happens after delivery. Here women feel a heaviness inside them or may sometimes feel as if something dropped inside them. Sometimes women are able to see a bulge (the uterus) from outside when they check their private part.

Pelvic organ prolapse- Others: Any other type of prolapse that is not uterine, thus prolapse relating to the rectum and bladder.

Pelvic organ prolapse- Type not known: Prolapse in which the organ hanging down into the vagina is not known.

Perineal pain or discomfort: Pain or discomfort in the area between the anus and vulva (the external genitalia of a female). Women will generally report it as pain/discomfort around the private part. Perineal pain/ discomfort is quite common for women who experienced tears during delivery. It is usually very painful when urine or water touches the area or when women sit down in a way that is care-free or not deliberate.

Placenta: The organ which develops during pregnancy and allows exchange between the mother and baby (nutrients and oxygen from the mother to the baby, and release of wastes from it). The placenta is usually expelled from the mother after delivery, which is why it is called the “afterbirth.”

Placental abruption (no bleeding): This is the premature detachment of the placenta from its normal place. Placental abruption is also called abruptio placentae. When the woman reports or describes placental abruption, ask her if there was any experience of bleeding. If she says “yes”, record the morbidity under “Bleeding- placental abruption”; if she says “no”, record it here.

Placenta praevia (no bleeding): Placenta praevia is a condition whereby the placenta is implanted in the lower part of the uterus such that it partially or fully obstructs/blocks the opening of the cervix. Respondents may describe it as “low-lying placenta.” One of my in-depth interview respondents who had placenta praevia describes it this way: *“The unborn child and the placenta had switched positions. The placenta had come down, then the child had moved up. Any movement the child makes, it’s just blood that begins to pour, so the child won’t be able to move downwards until they perform an operation, because the placenta had blocked the passage where the child would come out from.”* Placenta praevia can cause bleeding before or during labour. When the woman reports placenta praevia, ask her if there was any experience of bleeding. If she says “yes”, record the morbidity as “bleeding- placenta praevia.” If she says “no”, record it here.

Planned CS: A Caesarean section that was scheduled before the delivery date as opposed to a Caesarean section conducted as an emergency intervention because of issues such as obstructed labour or placenta praevia. Planned CS can be scheduled ahead of time because of many reasons such as preventing a foreseen problem (for example, a woman who had a number of previous Caesarean section may be advised not to go into labour but have a planned CS).

Postpartum depression: A mental condition which some women experience after delivery with symptoms including losing pleasure in life, feelings of sadness, crying without any cause, withdrawal from loved ones, feeling guilty, being anxious or feeling inadequate about caring for the baby, feeling overwhelmed, getting angry, feeling hopeless, finding it difficult to concentrate and feeling empty. There could also be physical symptoms such as inability to sleep and loss of appetite. Postpartum depression can last for weeks, months and even up to a year.

Postpartum psychosis: This is a severe mental illness that can occur after delivery with symptoms such as hallucinations, extreme mood swings, confusion and strange beliefs. In some cases, a woman with this condition can physically harm herself and/or her baby. Women with postpartum psychosis usually need psychiatric hospitalisation. To identify cases of postpartum psychosis, note descriptions from women such as “ran mad after giving birth.”

Post-term birth: Delivery at or after 42 weeks, or more than 9 and a half months of pregnancy.

Pre-eclampsia: A condition in which a woman has high blood pressure during or immediately after pregnancy and also proteins in her urine, but she has no experiences of convulsions. Pre-eclampsia can progress to eclampsia (convulsions) when it is not managed well, hence it is a serious condition. Other symptoms of pre-eclampsia include blurred vision, swollen hands, swollen feet, swollen face, headaches and heartburn. Women may not know that they are experiencing pre-eclampsia, hence pay attention when they mention some of these symptoms mentioned. Record them in the “Multiple” category under the “High blood pressure group.”

Pregnancy-induced diabetes (PID): This is high blood glucose level that is first identified during pregnancy. It is a type of diabetes that develops during pregnancy. It is also known as gestational diabetes.

Premature labour: Onset of labour before 37 weeks or 8 and a half months of pregnancy are completed.

Premature rupture of membranes (PROM): When the amniotic sac breaks before the onset of labour, that is, when a woman's water breaks early. Normally a woman's water breaks shortly before labour or during labour. For PROM, the woman will not be in labour but her water will just pour out from her vagina. Women who had PROM will usually tell you that water seeped out of them when they were just going about their normal activities and they did not feel any labour pains. The water can come out in a trickle or in a gush.

Pre-term birth: Delivery before 37 weeks or 8 and a half months of pregnancy are completed.

Prolonged labour or failure to progress (>12 hours): Being in labour for more than 12 hours from the time a woman started experiencing very strong continuous pains (which even stopped her from doing chores). A woman's cervix needs to dilate to 10cm for the baby to be born; failure to progress means the cervix has not dilated up to this width (it may just dilate up to a figure less than 10cm- for example 4cm- and just remain at that width for many hours).

Referral to another health institution: Being transferred to another health facility because the first place could not care for the woman very well or could not provide a solution to the problem at hand. It is quite common for health facilities in rural areas to refer women to bigger hospitals in near-by towns/villages or to the Specialist Hospital in Jimeta or the Federal Medical Centre in Yola. However, referral is not limited to rural areas only; even health facilities in urban areas can refer women to bigger or better-equipped/ better-staffed hospitals.

Scanning: To examine the internal parts of the body and have pictorial data. Many women undergo ultrasound scanning during pregnancy which allows for many things such as hearing the baby's heartbeat, knowing the baby's sex and detecting health problems.

Senior personnel summoned: A senior member of staff at the hospital (such as the Head of Department or a supervisor) was called at any point to take over or manage the woman's case because the initial staff handling her couldn't do it. Also tick "senior personnel summoned" if, for example, a nurse or midwife was handling the case but she had to call a doctor to take over because the case was beyond what she could handle.

Shallow or rapid breathing: Breathing superficially (that is, breathing as if someone is not sucking in enough air) or breathing too fast.

Shivering/ body shaking/ feeling cold: The uncontrollable shaking of one's body because she is feeling cold.

Side pain: Pain or discomfort in the side of the body.

Skin problems (rashes, acne, etc): Any appearance of spots, redness or inflammation on the skin that cause itching, pain or significantly tamper with the aesthetics of the woman's skin.

Spitting: Needing to throw out saliva frequently; experienced difficulty in swallowing saliva most times.

Spontaneous delivery: Vaginal delivery where the baby comes out on its own naturally without the need for using instruments such as forceps or vacuum extractor and also without the need for conducting CS. This is what women usually call "normal delivery."

Stillborn: A baby born with no signs of life at or after 28 weeks or 7 months of pregnancy were completed.

Stitches loosened- vaginal area: When the stitches done to close up a tear or an episiotomy cut in the vaginal area get unfastened. This problem usually happens during the postpartum period.

Stitches loosened- CS: When the stitches done to close up a Caesarean section cut get unfastened. This problem usually happens during the postpartum period.

Stomach bloating: When one's stomach feels swollen or full due to conditions such as constipation, excess gas and swallowing air.

Swollen body: Water retention in the body, making it to increase in size beyond normal.

Swollen face: Water retention in the face, making it to increase in size beyond normal.

Swollen feet/ leg: Water retention in the feet/leg, making them to increase in size beyond normal.

Swollen hands: Water retention in the hands, making them to increase in size beyond normal.

Swollen toe (nail in-growth): Expansion of the toes during pregnancy and subsequent shrinking back to size after delivery, which brings about toe nail in-growth. A mini-surgery may be required to remove the toe nail in-growth.

Tear (“natural” tear): A laceration/cut that occurs during delivery in the area between the anus and vaginal opening. Some tears are minor while some are severe and can extend from the vagina to the anus. Note that this is different from episiotomy, which is a surgical cut made deliberately by a maternity staff to increase the passage for the baby to come out. If the woman reports having a tear and also experiencing bleeding, record it under “Bleeding- tear (vaginal, cervical, etc, but not uterine).”

Tetanus: A bacterial disease characterised by muscle spasms in the neck and jaw. It poses great risks to newborns and their mothers, therefore women are encouraged to take the tetanus vaccine during pregnancy.

Ulcer/ heartburn: A burning sensation in the chest caused by indigestion or reflux of acid from the stomach to the oesophagus. The actual name for this condition is “acid reflux” or “gastroesophageal reflux disease (GERD)”, but it is usually called “ulcer” in Nigeria. Note the difference between chest pain and ulcer/ heartburn. If, for example, a woman describes pain in the chest as “hot, peppery pain” or talks about pain in the chest after eating peppery, spicy or sour food or drink, she is more likely talking about ulcer/ heartburn. Chest pain is usually a feeling of heaviness on the chest or any general pain in the chest.

Unable to urinate/ Urine retention: Inability to urinate; finding it difficult to urinate; or urinating only small quantities of urine while feeling the urge to pass out more. Sometimes a catheter (a flexible tube) has to be inserted inside the woman to drain the urine.

Unconsciousness: To be out of consciousness; not being able to use the senses; being unresponsive to external stimuli. To differentiate unconsciousness from fainting, consider unconsciousness as a very severe form of fainting, or think about it as losing consciousness for a relatively long period of time (some hours, days, weeks, months) such that quick first-aid remedies (like fanning or pouring water on the woman) are not able to revive the woman. Record coma under unconsciousness.

Uterine rupture (no bleeding): When the uterus detaches from its position but there is no report of bleeding.

Uterus: Also known as “womb.” This is the organ where a fertilised egg gets implanted into and develops into a foetus.

Vagina: The passage from the opening of the uterus to the vulva in females. The vagina serves as a passage for the baby to come out during delivery and it also receives the penis during sex.

Vomiting: To eject or throw up all or parts of the stomach's content through the mouth. The vomiting we are interested in here is the vomiting brought about by pregnancy, not due to other causes such as after-effects of surgery, infection, ulcer, abdominal pain or drug intolerance. Confirm from the woman that it is "pregnancy vomiting" that she is talking about. If it is vomiting due to other causes, record it under "Other."

Vomiting blood: Bleeding through the mouth; throwing up blood.

Weight loss: When one's body weight decreases.

* Other Words, Phrases or Sentences to Keep in Mind

- Definitions of care-seeking options:
 - **Home remedy/ self-treatment:** Any form of treatment or remedy done at home, without needing to seek care outside the home.
 - **Consulted lay source (e.g. mother):** Seeking advice, remedy and/or treatment from somebody close to the woman such as her mother, friend, neighbour, co-wife, husband, mother-in-law, etc.
 - **Consulted traditional source:** Seeking advice, remedy and/or treatment from a traditional healer. For example, when the woman reports that she visited a traditional healer who gave her a portion in a bottle to take for her abdominal pain, or when a traditional birth attendant was called home to handle a complication during delivery.
 - **Visited chemist:** Seeking advice, remedy and/or treatment from a pharmacist or chemist owner.
 - **Summoned health worker home:** Going out and bringing a trained health worker home to check or treat the woman, or calling the health worker home using a phone.
 - **Visited formal health facility:** Going out and receiving treatment/care from a health facility such as a health post, clinic or hospital.
 - **Joint consultation (Please indicate e.g 1 and 5):** Any form of treatment that involves more than one of the options above. For example, using multiple treatment options at the same time to improve chances of recovery, or when a woman does one treatment option (e.g. home remedy) but because it doesn't work she tries another one (e.g. visit to a formal health facility).
- Definition of care-seeking treatments:
 - **None:** The woman did not receive any kind of treatment/ remedy.
 - **Western medicine/ therapy:** The woman received drugs/therapy usually prescribed or gotten from trained health personnel or formal health institutions (what people call "*maganin bature*"). Hence anything from paracetamol to injections to drips to surgeries will be classified here.
 - **Traditional medicine/ therapy:** The woman received traditional drugs/therapy, that is, non-western medicine/ therapy. For example, inserting a spatula into a woman's mouth in an attempt to expel placenta after delivery, burning a branch from a tree and inhaling the smoke, etc.
 - **Other alternatives:** The woman received treatment/remedies that are neither fully western nor fully traditional. For example, grinding garlic and ginger and taking the mixture, eating crackers as a remedy for vomiting during pregnancy, taking pure honey, etc. Trained health personnel sometimes ask women to try out some of these options.
 - **Joint western and traditional:** A combination of western and traditional medicine/ therapy.

- **Joint western and other alternatives:** A combination of treatments/ therapy from western and other alternatives.
 - **Joint traditional and other alternatives:** A combination of treatments/ therapy from traditional and other alternatives.
 - **Joint western, traditional and other alternatives:** A combination of treatments/ therapy from western, traditional and other alternatives.
- **“Rate the severity of (*insert morbidity*)...”:** If a woman says “sometimes it is mild, sometimes it is severe,” ask her how it was most times (“Yawancin lokaci” in Hausa).
 - **Whether a maternity staff later scooped out blood after delivery (haemorrhage question):** Pay attention and ask follow-up questions to ensure that the woman is not talking about the delivery process where maternity staff usually scoop out blood as part of the delivery process. Explain to the woman that you mean after the entire delivery process was over (*and the woman had been cleaned up or stitched*), did a maternity staff come back later to scoop out blood? It could be that there was left-over blood or that the birth attendant forgot to scoop out blood during the delivery process, hence needing to scoop it out later.
 - **For the list of morbidities experienced tables:** If a woman reports pre-existing illnesses or indirect causes of maternal morbidity such as HIV/AIDS, tuberculosis, asthma and so on, just record them under “Others” but don’t ask them the severity questions.

G. List of Morbidities and Key Terms in Hausa

A

Abdominal hotness: Zafin ciki, ciki yayi zafi kamar borkono

Abdominal pain: Ciwon ciki

Anaemia: Rashin jini, karamshin jini

Antepartum depression: Bakin ciki lokacin ciki ba wai don wani abu ya faru ko wani ya bata miki rai ba, ba kin jin dadin rayuwa

Antenatal care: Awu

Asthma: Fuka (*Fuka is also used for tuberculosis. Hence explain that this is fuka that comes with difficulty in breathing. Also, inhaling dust, smoke and other particulates and exposure to cold can trigger it*).

B

Backache: Ciwon baya

Bleeding- no cause given/ not known: Zub da jinni amma ba ki san dalilin ba

Bleeding- placenta praevia: Zub da jinni don mahaifa (mabiyi) ya zo ya tare gaba/gindi. Zub da jinni don yaro da mahaifa sun chanja yuri: mahaifa ya je kasa, yaro ya zo sama.

Bleeding- placental abruption: Zub da jinni don mahaifa (mabiyi) ya sinke/ciru daga filin shi

Bleeding- threatened abortion: Zub da jinni don ciki ya na so ya zube

Bleeding- uterine rupture: Zub da jinni don mahaifa ya sinke/ciru daga filin shi

Bleeding- vasa praevia: Zub da jinni don igiyan cibiya ya zo sakanin babi da kofar mahaifa.

Bleeding- uterine atony: Zub da jinni don mahaifa ya ki ya mosa.

Bleeding- tear (cervical, vaginal, etc, but not uterine): Zub da jinni don akwai zaguwa a ko wuyan mahaifa, a gaba/gindi ko wani wuri kusa a wurin, amma ba zaguwan mahaifa ba

Bleeding- retained products of conception: Zub da jinni domin dottin-dottin ciki kamar su jinnin haifuwa (bakin-bakin, bansan jinni) ko gusirin mahaifa sun rage a cikin ciki.

Bleeding- clotting failure/ disorder: Zub da jinni domin wa'ansu musamman kwayoyin jinni ba su rufe filin ciwo ba.

Bleeding- other: Zub da jinni don wa'ansu dalilen banda wa'anda an kira
Blindness: Makanta
Blood transfusion: Karin jini
Blurred vision/ seeing things hazy: Ganin abubuwa/wurare duhu-duhu ko hazo-hazo
Body heaviness (*kasala*): Kasala
Body numbness: Mutuwan jiki
Body pain: Ciwon jiki
Body weakness/ fatigue: Jiki ba karfi, jin gajiya
Breast problems (abscess, mastitis, etc): Ciwon nono (ko kumburin nono, zafin nono, etc)
Bright red bleeding >4 days postpartum: Kan zub da jinni JA ZIR sosai fiye da kwana hudu bayan haifuwa

C

Caesarean section: Tiyata, an yi aiki (saga ciki don a fitar da yaro)
Cervix: Wuyan/buduyan mahaifa
Community health workers: Ma'akatan asibiti ban da likita, nurse, mai karban haifuwa, mai ba da magani, da sauran su.
Constipation: Ciki ya daure (bayangida da wuya)
Convulsion: Jijjiga (ciwon "chewing gum")
Cord around baby's neck: Igiyan cibiya ya daure wuyan babi

D

Delayed placental expulsion (>30 minutes)/ Retained placenta: Fitawan mahaifa (mabiyi) ya dadde fiye da minti talatin bayan haifuwa, ko kuma mahaifa (mabiyi) ya makale ko kuma gusirin shi ya rage a ciki fiye da minti talatin bayan haifuwa
Delivery/ childbirth: Haifuwa
Diabetes: Ciwon sugar
Diarrhoea/ stooling: Zawo
Disease: Cuta, chiwo
Dizziness/ vertigo: Jin jiri, ajijiya

E

Emotional health: Yarda ki ke ji a rai, yarda ki ke ji a zuciya
Epilepsy: Farfadiya
Episiotomy: Kari
Excessive sleeping: Yawan barci

F

Fainting: Suma
Fever (body hotness only): Zafin jiki
Fever/ malaria: Zazzabi
Frequent urination: Fisari akai-akai, yawan fisari
Foul, smelly vaginal discharge: Yawki-yawki mai wari, mai karni daga gaba/gindi

G

Given drip at home: Bada ruwa a gida
Given drip at health facility: Bada ruwa a asibiti

H

Haemorrhoids: Basur, maruru ta suliya/duwawu
Headache: Ciwon kai
Health (and also health status): Lafiyan jiki
Health problem: Damuwan lafiya
Heart disease: Ciwon zuciya (*This is different from the Hausa word or description for heartburn/ ulcer*)
High blood pressure/ Pregnancy-induced hypertension (PIH)/ Hypertension: Hawan jini

Hospitalisation (≥ 3 days in one episode): Kwanta (an bada gado) a asibiti fiye da kwana uku a lokaci daya

Hospitalisation (>1 across postpartum): Kwanta (an bada gado) a asibiti fiye da daya daga kin haifu har zuwa mako shida bayan haifuwa.

Hospitalisation (>1 across pregnancy): Kwanta (an bada gado) a asibiti fiye da daya daga fari zuwa karshen ciki

Hyperemesis gravidarum: Amai daya yi sanani sosai (*Hausa speakers will never tell you “Hyperemesis gravidarum,” hence you’ll need to listen to their description to know whether to tick “vomiting” or “Hyperemesis gravidarum.” The Section VM of the survey should be really helpful.*)

Hysterectomy: An chire mahaifa gabadaya a tiyata.

I

ICU admission (Intensive Care Unit Admission): Kwanchiya a ward na masu ciwo mai sanani

Inability to eat: Rashin cin abinci, ba kin iya cin abinci

Inability to walk/ difficulty in walking: Rashin tafiya, tafiya da wuya

Induced labour: Sen da aka yi dabara kafin nakuda ya fara, ko an baki alura ko magani kafin nakudan ya fara ko kuma an sa hannu a cikin gaban/gidin ki aka pasa ruwa kafin nakudan ya fara

Infection/ sepsis: Cuta

Infertility: Rashin haifuwa, rashin sami da.

Illness: Rashin lafiya

Insomnia: Rashin barci

Instrumental delivery: Haifuwa da aka yi amfani da wa’ansu naurori musamman (*show pictures*)

Itchy CS scar: Kaikayi ko rashin jin dadi a filin da aka zaga aka fitar da babi

J

Jaundice: Ciwon shawara

K

Kidney disease: Ciwon koda, ciwon gajeba

L

Labour: Nakuda

Leaking faeces: Yoyon kashi

Leaking urine: Yoyon bisari

Leg numbness: Mutuwan kafa

Leg pain: Ciwon kafa

Liver disease: Ciwon hanta

Lower abdominal pain: Ciwon kasan mara

M

Malaria: Zazzabi

Manual placental expulsion: An cire mahaifa (mabiyi) bayan haifuwa da hannu, ba wai ya fito ta kan shi ba

Maternal: Abun da ya shafe mama, musamman ta gefen ciki, haifuwa ko bayan haifuwa (har zuwa mako shida bayan haifuwa)

Mini-surgery conducted: An yi karamin aiki

Miscarriage: Bari

Morbidity: Rashin lafiya, ciwo, cuta

Multipara: Mace da haifu fiye da son daya

Multiple babies: Yara fiye da daya kamar yan-biyu, yan-uku, yan-hudu

N

Nausea: Jin amai

Nose bleeding: Zub da jinni daga hanci

O

Obstructed breathing: Nunfashi a toshe

Obstructed labour- no cause given/ not known: Yaro ya kasa fita lokacin haifuwa amma ba ki san dalilin ba

Obstructed labour- small pelvis: Yaro ya kasa fita lokacin haifuwa don konkoson maman shi bai yi fadi ba, hanyan konkoson maman shi matsattse

Obstructed labour- malpresentation: Yaro ya kasa fita lokacin haifuwa don kwanchiyan shi bai dache na haifuwa ba (demonstrate *upside down*), amma ya kwanta ko kafa ne fari, ko ya kwanta a sakiya (demonstrate *transverse*), ko wani kwanchiyan da bai dache na haifuwa ba.

Obstructed labour- oversized baby: Yaro ya kasa fita lokacin haifuwa don yaron yayi babba sosai

P

Painful CS scar: Zafi a filin da aka zaga aka fitar da babi

Painful intercourse: Kwana da maigida na zafi

Painful stretch marks: Layi-layi a jikin mache (domin patan ta ya ja sosai lokacin ciki) na zafi

Painful urination: Yin pisari na zafi

Pelvic floor prolapse- Uterine: Mahaifa ya fadi a cikin gindi/gaba

Pelvic floor prolapse- Others: Abun rike fisari (mafitsara, robar kwallo) ko abun rike kashi a cikin ciki ya fadi a cikin gindi/gaba

Pelvic floor prolapse- Type not known: Wani abu a cikin ciki ya fadi a cikin gindi/gaba amma ba ki san ko menene ba.

Perineal pain or discomfort: Zafi-zafi ko rashin jin dadi a ta gaba

Pint: Leda

Placenta: Mahaifa (*The correct word is “mabiyi” but it is known as “mahaifa” in every-day conversation*)

Placental abruption: Mahaifa (mabiyi) ya sinke/ciru daga filin shi

Placental abruption (no bleeding): Mahaifa (mabiyi) ya sinke/ciru daga filin shi (amma ba zub da jinni)

Placenta praevia: Maihaifa (mabiyi) ya zo ya tare gindi. Yaro da mahaifa sun chanja yuri: mahaifa ya zo kasa, yaro ya je sama.

Placenta praevia (no bleeding): Maihaifa (mabiyi) ya zo ya tare gindi. Yaro da mahaifa sun chanja yuri: mahaifa ya zo kasa, yaro ya je sama (amma ba zub da jinni)

Planned CS: An shirya tuntuni cewa za a saga ciki a fitar da yaro a wanni lokaci musamman

Postpartum: Bayan haifuwa

Postpartum depression: Bakin ciki bayan haifuwa ba wai don wani abu ya faru ko wani ya bata miki rai ba, ba kin jin dadin rayuwa

Postpartum psychosis: Kokolwan mace ya tabu bayan haifuwa har kamar ta haukache, mace bata cikin hankalin ta bayan haifuwa.

Pre-eclampsia: Hawan jinni da ya yi sanani kuma an sammu wa'ansu irin kwayoyi a fisarin ki, amma bai kai har jijjiga (ciwon chewing gum) ba (*Hausa speakers will never tell you “pre-eclampsia,” hence you will have to listen carefully and ask her if she was told by a health professional that she had high blood pressure and also that something was found in her urine which signalled something serious. For the English speakers, only tick this if the woman mentions specifically that she was diagnosed with “pre-eclampsia”*).

Pregnancy: Ciki

Pregnancy-induced diabetes (PID): Ciwon sugar da ciki ya kawo

Premature labour: Nakuda ya fara amma anahin lokacin shi bai yi ba

Premature rupture of membranes (PROM): Ruwa ya pashe amma lokacin nakuda bai kai ba

Pre-term birth: Haifuwa kamin watani takwas da rebi (8 and a half) ko makoki talatin da bakwai (37 weeks) na ciki su cika.

Prolonged labour or failure to progress (> 12 hours): Daddewan nakuda don gaba/gindi bai budu ba ko kuma kofar fitan yaro bai budu ba (har yafi awa sha biyu)

Post-term birth: Haifuwa bayan watani tara da rebi (9 and a half) ko makoki arba'in da biyu da sama (42 weeks) na ciki.

Q

Quadruplets: Yan hudu

R

Referral to another health institution: An tura ki babban asibiti ko kuma asibiti a wani gari domin asibitin da ki ka je da fari ba za su iya su lura ko su taimake ki ba.

S

Scanning: Scanning (*pronounced “sky-ning” in Hausa by many women*)

Senior personnel summoned: Ma’aikatan asibiti sen da su ka kira babban shugaban su ko ogan su don damuwa na

Shallow or rapid breathing: Nunfashi sama-sama ko nunfashi da wuri-wuri

Shivering/ body shaking/ feeling cold: Jin dari ko rawan jiki

Side pain: Ciwon gefen jiki, zafi a gefen jiki

Skin problems (boils, rashes, acne, etc): Damuwoyin patan jiki kamar su maruru, kuraraje, pimpus da sauran su.

Spitting: Tufa ya’un

Spontaneous delivery (or vaginal delivery): Haifuwa da kan ki

Stillborn: Babin da aka haifa a mace

Stitches loosened- vaginal area: Dinki ta gaba/gindi ya kunche

Stitches loosened- CS: Dinki a inda aka saga a cire babi ya kunche

Stomach bloating: Ciki ya kumbura

Swollen body: Jiki ya kumbura

Swollen face: Fiska ya kumbura

Swollen feet/ leg: Kafafuwa sun kumbura

Swollen hands: Hanaye sun kumbura

Swollen toe (nail in-growth): Yasan kafa ya kumbura (farshe ya girma a ciki)

T

Tear (“natural” tear): Zaguwa ta gaba/gindi (*Please make sure you stress that this is different from “kari”- episiotomy*)

Tetanus: Sandarewar wuya, rinku

Triplets: Yan uku

U

Ulcer/ heartburn: Ulsa, jin borkono-borkono ko zafi a zuciya

Unable to urinate: Kasa fisari, ba ki iya yin fisari ba

Unconsciousness: Fitan hankali

Urine retention: Fisari ya taru a jiki

Uterine rupture (no bleeding): Mahaifa ya sinke/ciru daga filin shi amma ba zub da jinni

Uterus: Mahaifa (*Note that women also use the word “mahaifa” for placenta, hence you have to verify which one they mean- the uterus or the placenta*).

V

Vagina: Gaba (*The correct word is “gindi” but “gaba” is a ‘softer’ word and more ‘conversationally-friendly’*)

Vomiting: Ama

Vomiting blood: Amain jini

W

Weight loss: Rame

* Other Words, Phrases or Sentences to Keep in Mind

- **Average:** Matsakaici

- **Crochetier:** Mai saka
- **Support:** Taimako
- **Normal:** Na kullum
- **Temperature:** Zafi ko sanyi na jiki
- **Very serious:** Sanani sosai
- **“Compared to other... was your health status better, the same or worse?”:** Ki gwada kan ki da sauran ... lafiyan jikin ki ya fi nasu kyau ne, ko yananan daidai da nasu, ko yafi nasu muni?
- **Generally fine:** Kallau yawancin lokaci
- **Mildly agree:** Kin yarda kadan
- **Strongly agree:** Kin yarda sosai
- **Mildly disagree:** Ba ki yarda ba, amma rashin yardan kin kadan ne
- **Strongly agree:** Ba ki yarda sosai ba, ba ki yarda sam-sam ba
- **“...whether it happened only once, or only at some points during the pregnancy or whether it happened throughout the pregnancy.”:** Ko ya faru son daya, ko ya faru a wa'ansu lokaci kadai lokacin cikin din, ko kuma ya faru daga fari zuwa karshen cikin din
- **“Please can you list out all the illnesses and health problems you experienced?”:** Ki lisafta duk rashin lafiya da damuwoyin lafiya da ki ka samu.
- **“...very serious, that is, did it/they negatively impact your wellbeing and/or functioning very severely?”:** Sanani sosai, wato ya dami zaman lafiyan ki ko kuma aiyukan ki da sanani sosai?
- **“Did you seek care/treatment/remedy for (*insert morbidity*), that is, any solution to (*insert morbidity*) from anywhere or anyone?”:** Kin naimi lura ko jinya ko magani domin (*insert morbidity*), wato mataki daga ko ina ko awurin ko wai?
- **“Did you pay for care (medical services) and/or treatment (medicines) for (*insert morbidity*)?”:** Kin biya kudin asibiti (kudin ganin likita) ko kuma kudin jinya (magunguna) domin (*insert morbidity*)?
- **“Use money reserved for something else to make the payment?”:** Amfani da kudin da aka kebe ko an aje domin wani abu dabban, anyi amfani da shi don ayi biyan din?
- **“Borrow money to make the payment?”:** Arron kudi don ayi biyan din?
- **“Sell an asset to make the payment?”:** Kun sayar da abu mai amfani ko abu mai daraja don ayi biyan din?
- **“What was the effect of...”:** Yaya ne (*insert morbidity*) ya dame ko ya taba...
- **Day-to-day activities:** Ayukan kullum-kullum

- **“...on your social life, such as chatting with your family and others, going for (*pick appropriate one*) church/Islamic activities or participating in important events...”:** A zaman jama’an ki ko zaman cudanyan ki kamar yin hira da iyalin ki da sauran mutane, zuwan church/Islamiya ko zuwan su biki...
- **“...on your relationship with your husband, such as communicating with him, spending time together with him or being in good terms with him?”:** akan zumunchin ki da maigidan ki kamar yin magana da shi, yin hira da shi ko zaman lafiyan ku banda fada...
- **“Rate the severity of (*insert morbidity*)...”:** Ki kwada sananin ...
- *For the picture scales, remember to say this:* Hoto nan alama ne. Kin san a na cewa “labarin zuciya tambaye fuska.”
- **“Are you currently taking drugs prescribed by a doctor, nurse, pharmacist or another trained health personnel or receiving therapy from them?”:** A yanzu hakanan, ki na shan maganin da likita, nurse ko wani ma’aikatan asibiti ya rubuta ko suna miki wa’ansu irin abubuwa don ki sami sauki?
- **“Vomiting excessively”:** Amai sosai
- **“...almost everything that goes into your mouth comes out?”:** Kamar kome da yake shigan bakin ki ya na fitowa?
- **“Were you ever given drip...”:** An taba baki ruwa?
- **“Significant changes...”:** Babban changi
- **“Restricting the usage of substances with distinct smell to avoid triggering the vomiting”:** Hana amfani da abubuwa ma su wani irin wari ko kamshi don kada amai din ya faru?
- **“The vomiting affected my occupation negatively such as making me to be absent from work, receiving reprimand(s) from my supervisor or missing opportunities to make money”:** Amai din ya dame aiki na ko sana’a na kamar hana ni zuwan aiki, ko ya sa shugaba na ya mini fada ko ya hana ni zarafin sami kudi
- **The vomiting affected my schooling negatively such as making me to be absent from class or missing tests/examinations:** Amai din ya dame makaranta na kamar hana ni zuwan aji ko hana ni rubuta jarabawa.
- **“The vomiting affected my relationship with my husband negatively, such as making us quarrel, making us not to spend time together or making us not to be in good terms.”:** Amai din ya dame zumunchin na da maigida na kamar sa mu mu yi fada, ya hana mu hira ko ya hana mu zaman lafiya.
- **“...affected my social life negatively such as preventing me from visiting family and friends or making me to avoid gatherings”:** Ya dame zaman jama’a na ko zaman cudanyan na kamar hana ni fitan ziyarar iyali ko abokane ko hana ni fitan inda jama’a sun taru
- **“By delivery, I mean the time from when you started experiencing very strong continuous labour pains up to the time you delivered your baby, including the time when aspects such as your clean-up in the delivery room or stitching were conducted”:** A haifuwa, ina nufi daga lokacin da kin fara jin nakuda mai karfi/mai sanani sosai akai-akai

har suwa lokacin da kin haife babin ki, tare da lokacin da aka yi abubuwa kamar goggoge ki ko dinka ki.

- **“...on your bodily functions such as urinating and defecating?”**: A ayukan jikin ki kamar su fisari da kashi
- **“What was the effect of (*insert morbidity*) on your ability to breastfeed your baby or care for him/her?”**: Yaya ne (*insert morbidity*) ya dame ko ya taba bawa babin ki nono ko lura da shi/ita?
- **Long-term revisits to hospital postpartum**: Kan zuwan asibiti da daddewa sosai bayan haifuwa
- **“...from the time you started experiencing very strong continuous pains which stopped you from doing chores to the birth of your baby”**: Daga lokacin da kin fara jin nakuda mai karfi/ mai sanani sosai akai-akai wanda har ya hana ki aiki, har zuwa haifuwan babin ki.
- **“By after delivery, I mean the time from after you delivered your baby and after aspects such as your clean-up in the delivery room or stitching, up to 6 weeks later.”**: A bayan haifuwa, ina nufi daga bayan haifuwan babin ki tare da bayan lokacin da aka yi abubuwa kamar goggoge ki ko dinka ki, har zuwa mako shida.
- **“What type of material was on the bed or surface you delivered on?”**: Wani irin abu ne akan gado ko filin da ki ka haifu?
- **“Which of these diagrams closely resembles the soaking...”**: Wani hoto anan ne ya fi kama da yarda jini ya bata inda kin haifu?
- **“Did you stain the floor...”**: Kin bata kasa...
- **Previous delivery/deliveries**: Sauran haifuwan ki
- **“Did your birth attendant ask your family members or your escort to look for blood donors at any point during your last delivery, even if you did not use the blood eventually?”**: Wanda ta haife ki, ta tambaye iyalin ki ko wanda ya/ta raka ki su je su naima wa'anda za su bada jinni lokacin da kin haife babin na karshe, ko dache ba ki ma yi amfani da jinin ba?
- **“...that your blood level had reduced significantly, for example, after testing your PCV?”**: Wai jinin ki ya ragu sosai, kaman bayan da aka yi gwaji?
- **“Did your birth attendant or another maternity staff come back after your delivery to scoop out blood from inside you, that is, did he/she come back after you had been cleaned-up or stitched and then inserted his/her hand into your vagina or massaged your abdomen to expel left-over blood?”**: Wanda ta haifar da ke ta kara dawo don ta cire jinni daga cikin ki ne, wato bayan da ki ka haifu har an gamma goggoge ki ko an gamma dinka ki, ta kara dawo ne ta sa hannu a cikin gaban/gidin ki don ta cire jinni da ya rage a ciki ne ko kuma ta manmasa cikin ki don ta cire jinni da ya rage a ciki ne?
- **“Did so many big, thick clots of blood come out frequently within the first 24 hours after your delivery?”**: Manya-manyan gudajen jinni sun ta fiffitawa ne akai-akai a cikin awa ashirin da hudu baya haifuwa ne?

- **Was the blood rushing so much during your last delivery, for example, like tap water or someone passing urine?:** Lokacin haifuwan babin ki na karshe, jinin ya na ta fitowa sosai ne kamar pampo ko kamar ana fisari?
- **Did the blood run down across the floor when it stained the floor?:** Jinin ya gudu a kasa ne da ya taba kasa?
- **Did you bleed so much during your last delivery that you were scared?:** Kin zub da jini sosai lokacin haifuwan babin ki na karshe ne har ya sa ki soro?
- **Did you bleed so much during your last delivery that it scared your birth attendant?:** Kin zub da jini sosai lokacin haifuwan babin ki na karshe ne har ya soratar da wanda ta haifar da babin ki ne?
- **Compared to your other deliveries, was the bleeding during your last delivery minimal, the same or much?:** Ki gwada jinin da ya zuba lokacin haifuwan ki na karshe da sauran haifuwan ki, jinin haifuwan ki na karshe ba zai kai sauran nan ba, ko zai yi daidai da su, ko zai fi sauran nan?
- **Did you have to summon a maternity staff at some points after the delivery to check you because you were worried about your bleeding?:** Kin kira likita ko nurse ko wani ma'aikatan asibiti a wani lokaci bayan haifuwa don ta duba ki don kin damu akan zub da jinin ki ne?
- **Did your palms look pale or white....:** Tafi hanayen ki sun yi fari ne...
- **Did you have to double your pad....:** Kin hada pad na ki biyu-biyu ne?
- **Did you have to triple your pad....:** Kin hada pad na ki uku-uku ne?

Appendix 8.7: Data entry guide

A. General Notes

- Please make sure the QES, REC and CHK files are **always** in the same folder, otherwise the database will not work! As a general rule of thumb, don't delete or relocate any file within the folder I've sent.
- To minimise errors, I designed the database to spell out the answer responses to the codes you've selected. For example, if you selected "2" as the answer response to DG6, it will spell out "primary." Please always check these responses to double-check what you have entered.
- I have also designed the database with jumps and automatic fills so that if a question is not relevant to a woman, it will automatic skip that question and fill it with "77". However, there are few places where you will need to manually fill in "77" (mentioned in Section C of this document).
- I have put in ranges and acceptable values for the questions (except in the very few cases where manual filling is necessary). If you put in a wrong value, a dialog box will appear and remind you of the correct values. It will only allow you to proceed when you have corrected the error.
- While testing the database, I found that it is faster to use the number keys and the enter key to make entries. However, feel free to use whatever works for you on the keyboard or computer (e.g. the mouse, the arrow keys, etc)!
- Please make sure you fill the data entry log for each questionnaire.
- When in doubt, please contact me (+44 743 814 9587; jtyargawa@yahoo.ie ; judith.yargawa.14@ucl.ac.uk)

B. Meaning of the Number Codes

- **00:** Means "**Missing data.**" Fill this in if the data collector forgot to ask a compulsory question, and hence, no answer was ticked in the question. For example, any unticked question in the section "Male involvement (MI)" should be recorded as "00".
- **77:** Means "**Not applicable.**" As I mentioned earlier, I designed the database in such a way that it automatically fills in "77" if a question is not relevant to a woman. However, there are few cases where you will have to do this manually.
- **88:** Means "**Refused/declined.**" Fill this in only if the data collector recorded that a woman refused to answer a question.
- **99:** Means "**Don't know.**" You may not need to use this code because I've already included it as an answer response for many questions in the questionnaire. However, fill in "99" in case the data collector wrote "don't know" beside a question without this answer choice.

C. Structure of the Questionnaire and Instructions for Data Entry

The questionnaire has 31 sections in total, some of which are compulsory and some are not. Compulsory sections mean data must be collected from the woman regardless of her experiences while the non-compulsory sections are only filled if a woman reported certain illnesses or health problems. Few questions in the compulsory sections may not be relevant for some women and I have indicated these here. In the database, I left spaces to demarcate the 31 sections of the questionnaire.

Below are the 31 sections of the questionnaire with corresponding instructions for each:

1. Respondent identification (RI): Compulsory.

2. Interviewer visits (VI): Compulsory.

- For majority of the questionnaires, you may only be filling boxes iv1a, iv1b, iv1c and iv4. The other boxes will only be filled when there were revisits.

3. Probability of selection: Compulsory.

- Please leave pr3 blank; I will calculate it myself.

4. Introduction and eligibility (IE): This section was compulsory on the field but you do not need to record anything in the database (I did not include this section in the database).

5. Informed consent (IC): This section was also compulsory on the field. The only thing you will record here is just the time the survey started- ts1 (which I have put together with the “probability of selection” questions).

6. Demographics (DG): Compulsory.

- DG2 and DG5 are only relevant for some women. If a woman’s age is provided in DG1, please fill in “77” for DG2 even if the data collector repeats her age in DG2.

7. Pre-existing conditions before pregnancy (PX): Compulsory.

8. Obstetric history (OH): Compulsory.

- OH3, OH8 and OH13 are only relevant for women who had the specified experiences.

9. Antenatal care during last pregnancy (AC): First question compulsory.

- AC2, AC3 and AC4 are only relevant for women who had antenatal care.

10. Delivery (DV): Compulsory.

- DV4, DV5 and DV7 are only relevant for some women.
- For DV6, if “4 (C-section- they cut your belly open to take the baby out)” is picked, then pick the appropriate reason for the C-section in DV7 and select “2 (Not ticked)” for all the other options.

11. Outcome of last birth (OB): Compulsory.

- OB2, OB3, OB4 and OB8 are only relevant for women who lost the babies in their last deliveries.
- Please note that if “alive” is the response for OB1, then “77” is automatically recorded for OB2, OB3 and OB4.

12. Postnatal care (PC): Compulsory.

- PC2, PC3 and PC4 are only relevant for women who had postnatal care.

13. Male involvement (MI): Compulsory.

14. Perception of general state of health- before pregnancy (PB): Compulsory

15. Perception of general state of health- during pregnancy (PP): Compulsory

16. Perception of general state of health- delivery (PD): Compulsory

17. Perception of general state of health- postpartum (PS): Compulsory

18. Morbidities during pregnancy- Unprompted (MP-U): It depends.

- If a woman did not report an illness or health problem under MP-U1 (“mpu0tickyn” in the database), then this entire table will be blank and you should fill in “77” in all the boxes in this section (this is one of the places where I pointed that you will need to record “77” manually).
- If a woman reported one or more illnesses in MP-U1, then MP-U2, MP-U3 and MP-U4 become compulsory. Fill in “00” if data were not recorded in these three questions even though illnesses were reported in MP-U1.
- This table is divided into four major groups:
 - Individual or single pregnancy morbidities: Instead of making 70 lines for the 70 illnesses/ health problems, I made only 12 (I assumed that a woman cannot report more than 12 illnesses/health problems). If a woman, for example, reported “backache” and “fainting”, record the backache in the “mpulsing1” box and the fainting in the “mpulsing2” box. Then fill in “77” for mpulsing3-mpulsing12 boxes, since the woman only reported two issues as opposed to twelve.
 - High blood pressure group: This also follows a similar process as the individual/single morbidities. Record whichever illnesses/health problems that the woman mentioned and then fill in “77” for the remaining boxes (except if the woman reported all the 11 symptoms of high blood pressure here!).
 - More than one morbidity at once: Similar process as directly above.
 - Procedures: Similar process as directly above.
 - One of the procedures was “mini-surgery conducted.” If this was selected, then a reason should be provided why it was conducted. Record this reason in the box “mpul1procms (why mini surgery was conducted).”
- There were a number of boxes for “other” in this table (that is, for illnesses/health problems not listed in the table). Please record these under “mpul1 (other)”.

19. Severity of morbidities- Pregnancy (SP): It depends

- If “no” or “77” was selected for MP-U4, then this entire table is not compulsory and then you should manually fill in “77” for all the questions here.
- If “yes” was selected for MP-U4, then fill out this section.
 - If only one illness/health problem was reported in MP-U4, then write it out in the box “pregmsrmb1 (most serious mb1 preg)” and fill the boxes up to “sp12prgmb1 (overall severity)”. Then fill “77” in all the boxes from “pregmsrmb2 (most serious mb2 preg)” up to “sp12prgmb2 (overall severity)”.
 - If two illnesses or health problems” were reported, then fill the first as outlined in the first part of the immediate bullet point above, and then fill the responses for the second illness/health problem in the boxes from “pregmsrmb2 (most serious mb2 preg)” to “sp12prgmb2 (overall severity)”.
- Note that SP4, SP5 and SP6 are only relevant for women who sought care.

20. Morbidities during pregnancy- Prompted (MP-P): Compulsory

21. Vomiting (VM): First question compulsory

- This table is only compulsory for women who responded with “yes” to VM1. Otherwise, it automatically fills in 77 to all the questions and moves on to the next section.
- VM8, VM16, VM17 and VM19 are only compulsory for some women (please note that VM18 is compulsory even though it is sandwiched between non-compulsory questions).

22. Morbidities during delivery- Unprompted (MD-U): It depends

- If a woman did not report an illness or health problem under MD-U1 (mdu0tickyn in the database), then this entire table will be blank and you should fill in “77” in all the boxes in this section (this is one of the places where I pointed that you will need to record “77” manually).
- If a woman reported one or more illnesses in MD-U1, then MD-U2, MD-U3 and MD-U4 become compulsory. Fill in “00” if data were not recorded in these three questions even though illnesses were reported in MD-U1.
- This table is divided into three major groups:
 - Individual or single delivery morbidities: Instead of making 44 lines for the 44 illnesses/ health problems, I made only 12 (I assumed that a woman cannot report more than 12 illnesses/health problems). If a woman, for example, reported “bleeding- uterine rupture” and “unconsciousness”, record the bleeding- uterine rupture in the “mdulsing1” box and the unconsciousness in the “mdulsing2” box. Then fill in “77” for mdulsing3-mdulsing12 boxes, since the woman only reported two issues as opposed to twelve.
 - Multiple (more than one morbidity at once): Similar process as directly above.
 - Procedures: Similar process as above.
 - One of the procedures was “planned CS.” If this was selected, then a reason should be provided why this was so. Record this reason in the box “mdulprocpc (why the CS was planned).”
- There were a number of boxes for “other” in this table (that is, for illnesses/health problems not listed in the table). Please record these under “mdul1 (other)”.

23. Severity of morbidities- Delivery (SD): It depends

- If “no” or “77” was selected for MD-U4, then this entire table is not compulsory and then you should manually fill in “77” for all the questions here.
- If “yes” was selected for MD-U4, then fill out this section.
 - If only one illness/health problem was reported in MD-U4, then write it out in the box “delmsrmb1 (most serious mb1 del)” and fill the boxes up to “sd12delmb1 (overall severity)”. Then fill “77” in all the boxes from “delmsrmb2 (most serious mb2 del)” up to “sd12delmb2 (overall severity)”.
 - If two illnesses or health problems” were reported, then fill the first as outlined in the first part of the immediate bullet point above, and then fill the responses for the second illness/health problem in the boxes from “delmsrmb2 (most serious mb2 del)” to “sd12delmb2 (overall severity)”.
- Note that SD4, SD5 and SD6 are only relevant for women who sought care.

24. Morbidities during delivery- Prompted (MD-P): Compulsory

25. Prolonged labour (PL): First question compulsory

- This table is only compulsory for women who responded with “yes” to pl1hours. Otherwise, it automatically fills in 77 to all the questions and moves on to the next section.
- PL3, PL4, PL5, PL6 and PL7 are only compulsory for some women.

26. Morbidities during postpartum- Unprompted (MS-U): It depends

- If a woman did not report an illness or health problem under MS-U1 (msu0tickyn in the database), then this entire table will be blank and you should fill in “77” in all the boxes in this section (this is one of the places where I pointed that you will need to record “77” manually).
- If a woman reported one or more illnesses in MS-U1, then MS-U2, MS-U3 and MS-U4 become compulsory. Fill in “00” if data were not recorded in these three questions even though illnesses were reported in MS-U1.
- This table is divided into three major groups:
 - Individual or single delivery morbidities (*written as “symptoms” in the questionnaire; this was an oversight*): Instead of making 78 lines for the 78 illnesses/health problems, I made only 12 (I assumed that a woman cannot report more than 12 illnesses/health problems). If a woman, for example, reported “leaking faeces”, “vomiting blood”, “backache” and “abdominal pain”, record the leaking faeces in the “msulsing1” box, vomiting blood in the “msulsing2” box, backache in the “msulsing3” and the abdominal pain in the “msulsing4” box. Then fill in “77” for msulsing5-msulsing12 boxes, since the woman only reported four issues as opposed to twelve (please note that in the drop-down list for the 78 postpartum illnesses/health problems, I skipped #77 since this is the default code for “not applicable.” Hence the numbering goes from 76 to 78 then 79.
 - Multiple (more than one morbidity at once): Similar process as directly above.
 - Procedures: Similar process as above.
 - One of the procedures was “mini-surgery conducted.” If this was selected, then a reason should be provided why it was conducted. Record this reason in the box “msulprocms (why mini surgery was conducted).”
- There were a number of boxes for “other” in this table (that is, for illnesses/health problems not listed in the table). Please record these under “msul (other)”.

27. Severity of morbidities- Postpartum (SS): It depends

- If “no” or “77” was selected for MS-U4, then this entire table is not compulsory and then you should manually fill in “77” for all the questions here.
- If “yes” was selected for MS-U4, then fill out this section.
 - If only one illness/health problem was reported in MS-U4, then write it out in the box “posmsrmb1 (most serious mb1 pos)” and fill the boxes up to “ss12posmb1 (overall severity)”. Then fill “77” in all the boxes from “ssmsrmb2 (most serious mb2 pos)” up to “ss12posmb2 (overall severity)”.
 - If two illnesses or health problems” were reported, then fill the first as outlined in the first part of the immediate bullet point above, and then fill the responses for the second illness/health problem in the boxes from “posmsrmb2 (most serious mb2 pos)” to “ss12posmb2 (overall severity)”.
- Note that SS4, SS5 and SS6 are only relevant for women who sought care.

28. Morbidities during postpartum- Prompted (MS-P): Compulsory

29. Haemorrhage- intrapartum and postpartum (HM): Compulsory

- HM5, HM9, HM13, HM16, HM17, HM18 and HM19 are only compulsory for some women.
- Multiple responses are possible for HM1. For example, if “wrapper” and “nightingale” were selected, then record “1- Ticked” for both of them and then record “2- Not ticked” for everything else.
- If any of these questions- HM9, HM17, HM18 and HM19- was left blank, please double-check that it is really a case of “not applicable (77)” as opposed to “missing data (00).” For

HM9, a woman who acknowledges in OH4 that she has had at least two deliveries (that is, more than one delivery) should have been asked this question. If this question is blank, then put “00.” Likewise for HM17-HM19, a woman who reports that her place of last delivery was home/TBA’s place in DV1 (that is, option “1”) should have been asked these questions. If any of these questions are blank, then put “00”.

- I have included an additional question in the database (“HM30”) for any comments that have been written with respect to this haemorrhage section.

30. Closing (CL): This section was compulsory on the field. Record the time the survey ended (ts2).

31: Any comments (AM): Not compulsory. Record any other comments here.

D. How to Record Data

- Click on the tab labelled “4. Enter Data”.
- Select the “Quant Database” video icon (it will appear as the icon of the player you usually use to watch videos e.g. VLC).
- Click open.
- Record the data.

E. How to Save the Recorded Data

- The software will prompt you to save at the very end of completing a data entry record (a dialog box will appear with “save record to disk?”).
- Click yes.

Otherwise:

- Click the small “x” button at the top right-hand corner of the screen (that is, the button for closing the page). Please do not click the big, red “X” button, as this is for exiting the programme entirely.
- A dialog box will appear with “save record to disk?”
- Click “yes”.

F. How to View Data

- Go to “Document” on the menu bar.
- Click “view data”.
- Open the “Quant database” video file and you’ll see all the records you’ve saved.
- To close this page, click the small “x” on the top right-hand corner.
- You can view data by **values** (responses will appear as codes -“1”, “2”, etc) or by **labels** (responses will appear as the actual words: “yes”, “no”, “primary”, “secondary”, etc). To do this:
 - Follow the first three steps in this section.
 - Then click “edit” at the top left-hand corner and select either “show values” or “show labels”.

G. How to Find a Record

- Click “Enter Data” on the menu bar and open the “Quant database file”.
- Click “Goto” on the top left corner of the screen that opens.

- Here, you can select the first record, the last record, the previous record, the next record, etc. But if you want to search for a specific record by its cluster code for example, then:
 - Click “find record”.
 - Type the cluster code in the box beside “ri1” (that is, the box directly under “criteria”).
 - Click OK.
- You can also search by respondent number by typing “ri2” and the respondent’s number in the boxes directly below.

H. How to Delete a Record

- Find the record using the procedures outlined in the “how to find a record” section above
- Go to the bottom left hand corner of the screen and click on the red “**x**” mark (“delete record”)
- Then click “save record to disk”. This deleted record will still be visible when you view the data (via “Document”), but it will not be exported when you export the data to Excel or Stata.
- You can still “undelete” a record by re-clicking on the red “**x**” mark (“undelete record”).

I. How to Export Data

You will be exporting the data to two sources: **Excel and Stata**.

Exporting data to Excel:

- For some reasons,

Exporting data to Stata:

- Click “export data”.
- Select “Stata”.
- Click “open” and then click “OK”.
- Please double-check that it is there. The file extension for stata is “.dta”

J. Data storage

At the end of each day, please make sure you export what you have recorded so far to both Excel and Stata. Please save the data using two mechanisms:

- Cumulative record: This will just be one file, made by overwriting the existing file. This is the usual way things are saved.
- Daily record: Have a folder where you save the files by dates (e.g. “Quant Database- July 20.xls”. Then at the end of July 21st, save another file with July 21st as well). This is for tracking purposes, for comparison and contrast if needed and to also ensure that you have a back-up in case something bad happens (then you don’t have to start from scratch!). I used this technique when I was writing my master’s dissertation. These files will eventually be deleted when we compile all the data

Appendix 8.8: Bivariate associations between self-reported maternal morbidities and socio-demographic, obstetric and healthcare factors (for non-significant outcomes, $p>0.05$)

Independent Variable	Frequency	Self-reported morbidity during postpartum yes or no (unprompted)	Self-reported morbidity in all three phases yes or no (unprompted)
Age (years)			
15-19	52	Ref.	Ref.
20-34	476	1.92 (0.82- 4.49)	1.30 (0.46- 3.71)
35-49	93	2.24 (0.95- 5.30)	1.18 (0.31- 4.56)
Residence			
Rural	161	Ref.	Ref.
Urban	479	0.80 (0.43- 1.48)	0.79 (0.37- 1.69)
Religion			
Christianity	161	Ref.	Ref.
Islam	476	1.29 (0.74- 2.26)	2.33 (0.66- 8.22)
Type of marital union			
Monogamous	475	Ref.	Ref.
Polygamous	147	1.68 (0.88- 3.21)	1.44 (0.90- 2.31)
Literacy			
Cannot read in any language	341	Ref.	Ref.
Can read in any language	255	1.56 (0.85- 2.86)	1.97 (0.86- 4.50)
Highest edu. level			
Less than secondary	336	Ref.	Ref.
Secondary and above	301	0.70 (0.47- 1.05)	0.75 (0.30- 1.88)
Husband's highest edu. level			
Less than secondary	192	Ref.	Ref.
Secondary and above	433	0.70 (0.47- 1.05)	0.74 (0.29- 1.91)
Main occupation			
Unemployed/house-wife	361	Ref.	Ref.
Unskilled	202	1.34 (0.60- 3.00)	1.51 (0.72- 3.20)
Skilled	72	2.04 (0.94- 4.44)	1.77 (0.58- 5.42)
Husband's main occupation			
Unemployed	13	Ref.	Ref.
Unskilled	366	1.16 (0.24- 5.50)	0.60 (0.13- 2.77)
Skilled	257	0.94 (0.22- 3.99)	0.46 (0.06- 3.68)

Independent Variable	Frequency	Self-reported morbidity during pregnancy yes or no (unprompted)	Self-reported morbidity in all three phases yes or no (unprompted)
Wealth status			
Poor	183	Ref.	Ref.
Middle	181	0.83 (0.38- 1.78)	0.73 (0.23- 2.33)
Rich	182	0.79 (0.44- 1.41)	0.87 (0.36- 2.09)
Gravidity			
1 pregnancy	91	Ref.	Ref.
2-4 pregnancies	322	1.86 (0.78- 4.48)	0.91 (0.26- 3.15)
≥5 pregnancies	225	1.66 (0.51- 5.37)	1.02 (0.29- 3.63)
Parity			
1 delivery	115	Ref.	Ref.
2-4 deliveries	336	1.74 (0.76- 3.99)	0.90 (0.27- 2.95)
≥5 deliveries	184	1.68 (0.58- 4.81)	1.35 (0.43- 4.28)
Level of male involvement			
Low	74	Ref.	Ref.
Moderate	343	0.82 (0.37- 1.82)	0.81 (0.31- 2.12)
High	163	0.56 (0.25- 1.25)	0.63 (0.23- 1.69)
Number of ANC visits			
Less than 4	102	Ref.	Ref.
4 and above	483	1.05 (0.56- 1.97)	1.07 (0.41- 2.82)
Birth attendant			
Unskilled	194	Ref.	Ref.
Nurse/midwife/CHW	381	1.65 (0.83- 3.24)	1.64 (0.85- 3.15)
Doctor	54	1.04 (0.66- 1.64)	1.06 (0.51- 2.21)
Place of delivery			
Home/TBA's place	228	Ref.	Ref.
Public health facility	350	1.0 (0.57- 1.76)	1.02 (0.44- 2.35)
Private health facility	55	1.38 (0.62- 3.07)	1.75 (0.80- 3.83)

Appendix 8.9: Distribution of health problems reported as very serious during delivery and postpartum phases

Phase	Health Problem	Frequency
Delivery	High blood pressure	1
	Unconsciousness	1
	Prolonged labour	1
Postpartum	Abdominal pain	8
	Bleeding	2
	Swollen body	2
	Swollen leg	2
	High blood pressure	2
	Backache	1
	C-section	1
	Eye problem	1
	Fever	1
	Headache	1
	Insufficient blood	1
	Painful CS scar	1
	Unable to urinate	1
	Vomiting	1