



THE UNIVERSITY OF QUEENSLAND
AUSTRALIA

**UNSAFE ABORTION AND UNSUPERVISED BIRTHS:
UNDERSTANDING THE CHALLENGES OF PREGNANCY AND
CHILDBIRTH IN THE RURAL HIGHLANDS OF
PAPUA NEW GUINEA**

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ABSTRACT

INTRODUCTION

Papua New Guinea (PNG) has one of the highest maternal mortality ratios in the world. Postpartum haemorrhage is the leading cause of maternal death, followed by sepsis related to childbirth and unsafe abortion, the same reasons as identified in other low-resource settings. PNG has a high rate of unsupervised births, with an estimated 60% of women giving birth unsupervised.

Focussing on the leading causes of maternal mortality, the overall aim of this thesis is to describe women's perceptions and experiences of pregnancy and childbirth from one setting in the Eastern Highlands of PNG; and to describe a community-based intervention to improve maternal health outcomes. This thesis comprises of three studies, divided into two themes: (1) unsafe abortion; and (2) community perceptions and experiences of pregnancy and childbirth.

METHODS

Theme One: Unsafe abortion

Through a mixed methods approach, a six month prospective study was undertaken at the Eastern Highlands Provincial Hospital. Women admitted to hospital following both spontaneous and induced abortion were identified through the review of medical records. Clinical and socio-demographic data were captured using a study-specific case note record form. Semi structured and in-depth interviews were undertaken to provide further insight into women's experiences following induced abortion. Health care workers perceptions relating to abortion were also explored.

Theme Two: Community experiences and perceptions of pregnancy and childbirth

Two studies were included in theme two. Both took place in the remote, rural area of Unggai Bena district, Eastern Highlands Province, an area with a high rate of unsupervised births.

The first of these two studies used qualitative methods to identify knowledge, perceptions and experiences of pregnancy and childbirth. Focus group discussions, undertaken with men and women in the community, were followed by in depth interviews. During the in depth women's personal experiences relating to pregnancy and childbirth, especially their reasons for giving birth outside a formal health facility, were explored.

The second study was designed following the findings from the first study. Through a community based intervention study, communities in the study site were provided with key messages relating to the importance of supervised, health facility births and recognising postpartum haemorrhage. Women attending antenatal clinic were invited to participate in a prospective study. After individual instruction 200 women were enrolled and provided with a clean birth kit which included 600mcg of misoprostol (a drug for reducing postpartum haemorrhage), for oral self-administration following an unsupervised birth. All women were followed-up postpartum when data relating to the acceptability of the intervention were collected using a study specific semi-structured questionnaire.

All qualitative data were analysed through a content analysis approach using continuous comparison. All qualitative data were managed using NVivo v.9 (QSL International 2010), a qualitative software data package. Quantitative data were analysed using STATA v10.0 or v12.1 (StataCorp Ltd, TX, USA).

FINDINGS

Theme One: Unsafe abortion

Unsafe abortion to end an unwanted pregnancy resulting in severe, acute morbidity was identified among young women presenting to the Eastern Highlands Provincial Hospital. Compared to those women who presented following a spontaneous abortion, those presenting following an induced abortion were significantly more likely to be younger, unmarried and a student (either at school or university). Obtained illegally, misoprostol was the most frequently used method to end pregnancy.

Theme Two: Community experiences and perceptions of pregnancy and childbirth

Despite knowledge relating to complications that can occur during childbirth, many women continued to give birth, unsupervised in the community. Women faced numerous challenges in accessing care, particularly during childbirth.

The implementation of a community-based package of interventions, providing clean birth kits and misoprostol for self-administration was feasible and highly acceptable in this setting.

Through review of the findings identified in this thesis, one key factor emerged that influenced maternal health outcomes: access to health care. This key factor underpins the uptake of appropriate health care for two vulnerable groups of women: women with poorly timed pregnancies; and women during pregnancy and childbirth.

CONCLUSION

In the absence of safe abortion services, women are putting their lives at risk to end an unwanted pregnancy. Their lives are put further at risk from delayed health care seeking due to fear of repercussions from their family, health care workers and the legal framework surrounding abortion. Improved access to safe abortion services together with the review of post abortion care services in PNG could help in reducing the burden of maternal mortality and morbidity from unsafe, induced abortions.

Constrained by numerous socio-cultural and geographical barriers and a deteriorating and poorly functioning health system, women continue to give birth unsupervised in the community. Identifying and providing appropriate community-based strategies may provide a short term solution to improve maternal health outcomes in remote, rural settings.

DECLARATION BY AUTHOR

This thesis is *composed of my original work, and contains* no material previously published or written by another person except where due reference has been made in the text. I have clearly stated the contribution by others to jointly-authored works that I have included in my thesis.

I have clearly stated the contribution of others to my thesis as a whole, including study design, statistical assistance, survey design, data analysis, significant technical procedures, professional editorial advice, and any other original research work used or reported in my thesis. The content of my thesis is the result of work I have carried out since the commencement of my research higher degree candidature and does not include a substantial part of work that has been submitted to qualify for the award of any other degree or diploma in any university or other tertiary institution. I have clearly stated which parts of my thesis, if any, have been submitted to qualify for another award.

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Lisa M Vallely

PUBLICATIONS DURING CANDIDATURE

PEER REVIEWED PAPERS

In included in this list, papers six to nine were not undertaken as a direct component of this thesis.

1. **Vallely LM**, Homiehombo P, Walep E, Moses M, Tom M, Nataraye E, Kelly-Hanku A, Vallely A, Ninnes C, Mola GDL, Wand H, Morgan C, Kaldor JM, Whittaker A, Homer CSE. **Feasibility and acceptability of clean birth kits and self-administered misoprostol for the prevention of postpartum haemorrhage in rural Papua New Guinea.** *Accepted for publication Int J Gyne Obstet.*
2. **Vallely LM**, Homiehombo P, Kelly-Hanku A, Whittaker A. **Unsafe abortion requiring hospital admission in the Eastern Highlands of Papua New Guinea – a descriptive study of women’s and health care workers’ experiences.** *Reprod Health* 2015, 12:2.
3. **Vallely LM**, Homiehombo P, Kelly-Hanku A, Homer C, Vallely A, Whittaker A. **Childbirth in a rural highlands community in Papua New Guinea: A descriptive study.** *Midwifery* 2015, 31: 380-387.
4. **Vallely LM**, Homiehombo P, Kelly-Hanku A, Kumbia A, Mola GDL, Whittaker A. **Hospital admission following induced abortion in the Eastern Highlands Province, Papua New Guinea- a descriptive study.** *PLoS One.* 2014, Oct 17, 9 (10).
5. **Vallely LM**, Homiehombo P, Angela Kelly, Homer C, Vallely A, Whittaker A. **Exploring women's perspectives of access to care during pregnancy and childbirth: A qualitative study from rural Papua New Guinea.** *Midwifery* 2013, 10:1222-9.
6. **Vallely LM**, Kelly A, Kupul M, Neo R, Fiya V, Kaldor JM, Mola GDL, Worth H. **Infant feeding in the context of HIV: a qualitative study of health care workers’ knowledge of recommended infant feeding options in Papua New Guinea.** *Int Breastfeed J.* 2013 Jun 7, 8 (1).
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TECHNICAL REPORTS

These technical reports do not form part of this thesis.

1. **Vallely LM**, Paul R, Naidi B, Morewaya J, Kariwiga G, Vallely A, Morgan C, Homer CSE. **Village Birth Attendant Programme Review, Milne Bay Province, PNG.** *PNG Institute of Medical Research and Milne Bay Provincial Health Authority*, June 2015.
2. Nguyen PB, Phuanukoonnon S, Gouda H, **Vallely LM**, Abdad Y, Pulford J, Vallely A, Siba P. **Progress Report of Partnership in Health Project. Chapter 6: Maternal and newborn health;** 99-117. *PNG Institute of Medical Research and Exxon Mobil*, Sept. 2014.
3. **Vallely LM**, Homiehombo P, Kelly-Hanku A, Kumbia A, Mola GDL, Whittaker A. **Pregnancy Loss: A mixed methods study of spontaneous and induced abortion presenting to Eastern Highlands Provincial Hospital, Papua New Guinea.** *PNG Institute of Medical Research, Goroka, PNG*, Nov 2013.
4. Kelly A, Worth H, Kupul M, Fiya V, **Vallely LM**, Neo R, Ase S, Ofi P, Mola GDL, Kariwiga G, Jackson YL, Hunahoff T, Kaldor JM. **HIV, pregnancy and parenthood: A qualitative study of the prevention and treatment of HIV in pregnant women, parents and their infants in Papua New Guinea.** *PNG Institute of Medical Research and The University of New South Wales*, 2013.

CONFERENCE PRESENTATIONS

1. **Vallely LM**, Homiehombo P, Kelly-Hanku A, Whittaker A. **Unsafe abortion in Papua New Guinea: A descriptive, hospital based study.** *7th Asia Pacific Conference for*

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2. Homiehombo P, **Vallely LM**, Kelly A, Vallely A, Homer CSE, Whittaker A. **Exploring women's perspectives of access to care during pregnancy and childbirth: A qualitative study from rural Papua New Guinea**. *49th Annual Symposium of the Medical Society of Papua New Guinea*. Lae, Sept. 2013.
3. **Vallely LM**, Homiehombo P, Kelly A, Kumbia A, Mola GDL, Whittaker A. **Induced and spontaneous abortion- a prospective hospital based study from Papua New Guinea**. *49th Annual Symposium of the Medical Society of Papua New Guinea*. Lae, Sept. 2013.
4. **Vallely LM**, Homiehombo P, Kelly A, Mola GDL, Kumbia A, Whittaker A. **Induced and spontaneous abortion - a prospective hospital based study from Papua New Guinea**. *2nd International congress on women's health and unsafe abortion (IWAC)*. Bangkok, Thailand. Jan 2013.

PUBLICATIONS INCLUDED IN THIS THESIS

This thesis consists of five papers, Chapters Four to Eight. Chapters Four to Seven are papers that have been published during my PhD candidature. Chapter Eight is currently under review. Publication details for each chapter are outlined below, together with a statement of contribution and percentage contribution for each author.

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Statement of contribution	Percentage of contribution
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Supervision and conduct of field research	LMV 80%; PH 20%
Data analysis and interpretation	LMV 80%; AKH 15%; PH 5%
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Under review

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Writing of initial manuscript	LMV 100%
Manuscript revisions through provision of detailed commentary	LMV 80%; AKH, AV, AW 10%; CSE, JMK 10%

CONTRIBUTIONS BY OTHERS TO THE THESIS

No contributions were made by others, other than those identified as co-authors above.

STATEMENT OF PARTS OF THE THESIS SUBMITTED TO QUALIFY FOR THE AWARD OF ANOTHER DEGREE

None

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Pregnancy, childbirth, unsafe abortion, traditional practices, cultural beliefs, unsupervised births, supervised births, postpartum haemorrhage, misoprostol, community intervention.

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ABBREVIATIONS

AP	Aid Post
AusAID	Australian Agency for International Development
BSS	Behavioural Surveillance Survey
CHW	Community health worker
CPR	Contraceptive Prevalence Rate
DHS	Demographic and Health Survey
EHP	Eastern Highlands Province
EHPHA	Eastern Highlands Provincial Health Authority
FGD	Focus Group Discussions
HC	Health Centre
HEO	Health Extension Officer
HF	Health Facility
HCW	Health Care Worker
IDI	In depth interview
IRB	Internal Review Board
ICPD	International Conference on Population and Development
MCH	Maternal and Child Health
MMR	Maternal Mortality Ratio
MRAC	Medical Research Advisory Committee
MDG	Millennium Development Goals
NDoH	National Department of Health
NHIS	National Health Information System
NGO	Non-Government Organization
PDoH	Provincial Department of Health

PNG	Papua New Guinea
PNGIMR	Papua New Guinea Institute of Medical Research
PAC	Post abortion care
PPH	Postpartum Haemorrhage
PMGH	Port Moresby General Hospital
PDoH	Provincial Department of Health
PHA	Provincial Health Authority
RCT	Randomised Controlled Trial
SRH	Sexual and Reproductive Health
SSI	Semi structured interview
TFR	Total Fertility Rate
TBA	Traditional Birth Attendant
UN	United Nations
UNFPA	United Nations Fund for Population Assistance
UNICEF	United Nations International Children’s Fund
USAID	United States Agency for International Development
UPNG	University of Papua New Guinea
UQ	University of Queensland
VBA	Village Birth Attendant
WHO	World Health Organization

CHAPTER 1

INTRODUCTION

OVERVIEW

This chapter provides a brief background to the rationale for the research undertaken for this thesis. The overall aims, objectives and methodology are outlined followed by a description of the structure of this thesis.

BACKGROUND

Papua New Guinea (PNG) is a low-middle income country in the Asia-Pacific region [1]. Rich in geography, social, cultural and linguistic diversity, PNG is one of the world's most diverse, dispersed and rural nations, with many remote and inaccessible communities [2].

Situated just five kilometers from the most northern tip of Australia, PNG is Australia's closest neighbour. Despite its close proximity to Australia, a high-income country with a low mortality rate, PNG has among the highest maternal mortality ratios (MMR) in the world [3]. The maternal mortality ratio in PNG is estimated to be between 594 and 733 maternal deaths per 100,000 live births, [3, 4] compared to 4.8 in Australia [3].

As with many low-resource countries, the leading causes of maternal mortality in PNG are postpartum haemorrhage (PPH) and sepsis, due to childbirth and unsafe abortion [5, 6]. One of the key factors associated with maternal deaths is lack of supervised care during childbirth [7]. In PNG, just 43% of women have a supervised, health facility birth; 7% of women give birth alone without any assistance or support [4, 8].

The high maternal mortality ratio in PNG is attributable to deteriorating health services and poor access to health services [5]. In response to the maternal health crisis, in 2009 the Minister for Health and HIV convened a Maternal Health Taskforce, to explore the reasons for the deterioration in maternal health and to help establish a way forward to protect the future health of women in PNG [5]. The Taskforce outlined seven key recommendations, reflecting a comprehensive approach to improving maternal health. These are discussed in more detail in Chapter Three. The commitment to maternal health was further endorsed through two key government documents: (i) The 2010 PNG Development Strategic Plan (2010-2030), highlighting maternal health in key result area five (KRA5): to improve

maternal health, through the reduction of the MMR to less than 100 per 100,000 livebirths by 2030[9]; and (ii) the development of the National Health and HIV research agenda in 2013, recognising maternal health as a priority research area [10]. Research topics relating to maternal and newborn health are ranked the top two of 20 research priorities within the country. Research to identify barriers and enablers to accessing supervised, health facility births is also prioritised [10]. Aside from national data, such as that available through the National Health Information Systems (NHIS) and demographic and health surveys (DHS), there is a paucity of data relating to maternal health in PNG. This is discussed in more detail in Chapter Three of this thesis.

In view of the limited research surrounding maternal health in PNG, I designed a series of three studies to make up this Thesis. These studies reflect the known leading causes of maternal mortality in PNG: postpartum haemorrhage and unsafe abortion; and the poor uptake of maternal health services, in particular the low supervised birth rate. These studies were undertaken between May 2011 and October 2014 and describe women's experiences of pregnancy and childbirth from one rural highland's setting in PNG. The Eastern Highlands Province (EHP) has among the poorest maternal health indicators in the country: 61% of women attend for antenatal care, and 33% have a supervised, health facility birth [8]. As in other parts of the country, postpartum haemorrhage and sepsis relating to childbirth and unsafe abortion are among the leading causes of maternal mortality [6, 11].

My own interest in maternal health stems from a midwifery background and relates back to 1995 when I first arrived at a remote, rural health centre in Milne Bay Province, PNG. As a volunteer my task was to train village birth attendants while undertaking a full range of midwifery duties at the health centre. The experience I gained was life-changing. After three years I returned to England where I undertook my Masters in Maternal and Child Health. Always working within the field of maternal health in clinical, teaching and research settings in Zambia, Kenya, Tanzania and Australia I was offered the opportunity to return to PNG in 2010. Working as a senior research fellow within the PNG Institute of Medical Research I developed the Institutes' first program of maternal health research.

In the next section of this chapter I present the overall aims and objectives for this thesis, and provide a brief overview of the study methodology. This is followed by a description of the structure of this thesis.

AIMS

The overall aims of this thesis are to describe women's perceptions and experiences of pregnancy and childbirth from the Eastern Highlands of Papua New Guinea; and to describe the feasibility and acceptability of a community-based intervention to improve maternal health outcomes.

OBJECTIVES

This thesis has three broad objectives, divided into two themes: (1) unsafe abortion; and (2) community perceptions and experiences of pregnancy and childbirth.

THEME ONE: UNSAFE ABORTION

1. To explore the determinants and outcomes of women presenting for hospital care following spontaneous and induced abortion; and to explore the reasons why and under what circumstances women in Eastern Highlands Province resort to unsafe, induced abortion.

THEME TWO: COMMUNITY EXPERIENCES AND PERCEPTIONS OF PREGNANCY AND CHILDBIRTH

2. To explore women's choices and decisions regarding place of birth; and to explore perceptions, beliefs and health seeking behaviour surrounding pregnancy, childbirth and the postpartum period in Upper Bena, Unggai Bena District, Eastern Highlands Province, Papua New Guinea.
3. To investigate the acceptability, adherence to, and uptake of, an evidence-based package of interventions to improve maternal and neonatal health in Upper Bena, Unggai Bena District, Eastern Highlands Province, Papua New Guinea.

METHODOLOGY

Each of the three studies comprising this thesis were designed following consultation with key stakeholders in PNG, including the National Department of Health, senior obstetricians and gynecologists and non-government organisations. The studies took place in two settings in the Eastern Highlands Province: the Eastern Highlands Provincial Hospital and Upper Bena, Unggai Bena district, Eastern Highlands Province (Figure 1.1).

In this section I provide a brief outline of the research methodology and rationale used in each of the three studies. Further details relating to the research methods, study design and data analysis are provided in Chapters Four to Eight.

THEME ONE: UNSAFE ABORTION

One mixed-methods study was included in theme one, which took place at the Eastern Highlands Provincial Hospital.

Methodology: Following review of relevant hospital admission records, clinical data was captured using study specific case note record forms. Through semi-structured and in depth interviews further insight into women's experiences following both spontaneous and induced abortion was explored. Interviewed as key informants, health care workers perceptions relating to abortion were also explored.

Rationale: The review of clinical data and semi-structured interviews allowed the identification of women admitted to hospital following any abortion (spontaneous and induced). In depth interviews, conducted among women admitted following induced abortion, provided a more extensive and detailed narrative and allowed for more intimate details to be discussed. Through the use of specifically developed interview guides questions could be refined according to the informants' experience and perceptions. Key informant interviews allowed the collection of qualitative data from health care provider's perspective.

THEME TWO: COMMUNITY EXPERIENCES AND PERCEPTIONS OF PREGNANCY AND CHILDBIRTH

Two studies were included in theme two, both took place in the remote, rural area of Upper Bena, Unggai Bena district, Eastern Highlands Province (Figure 1.1).

Women's experiences of pregnancy and childbirth

Methodology: Through qualitative methods, including a community participatory activity followed by focus group discussions and in depth interviews women's experiences of pregnancy and childbirth were explored.

Rationale: The use of a community participatory activity enabled the research team to gain emic data, that is information gained from the point of view of insiders, in this case, members of the community. In our study we used one method, 'spider diagrams', to identify the key

issues around pregnancy and childbirth within the community. The free flow of responses from such an activity allowed for a quick and easy means of data collection from all members of community (literate and illiterate).

Learning from the key terms and vocabulary identified through the participator activity focus group discussions (FGDS) and in depth interviews were undertaken. The FGDs allowed for a large amount of information to be collected in a relatively short space of time. As such they were useful for identifying and exploring a range of beliefs and behaviours in the community; and in helping to identify relevant and appropriate questions for use in individual interviews.

In depth interviews allowed us to explore in more detail, on a one-to-one basis, women's experiences and perceptions of pregnancy and childbirth.

Community-based prospective intervention study

Methodology: Following the findings from the women's experiences of pregnancy and childbirth, a community-based intervention study comprising health education and information related to birth preparedness; enrolment of antenatal women into the intervention study; and postnatal follow up using semi structured interviews was undertaken. Two hundred women attending antenatal clinic were enrolled into the prospective study and received individual instruction prior to being provided with a clean birth kit containing misoprostol tablets for self-administration, for the prevention of postpartum haemorrhage. Semi structured interviews were conducted postpartum to identify key outcomes, specifically where they gave birth and the use of the clean birth kit and misoprostol.

Rationale: Community-based health education and information was undertaken in order to promote supervised, health facility births. Following enrolment into the study, and provision of the intervention, the postpartum interview allowed the research team to collect data relating to key outcomes, some of which were quantifiable and other qualitative.

All qualitative data was analysed through a content analysis approach [12]. Content analysis is the data analysis of choice for qualitative descriptive studies [12]. This approach to data analysis was used in the qualitative aspect of my thesis as it enabled me to keep close to the data, describing events and experiences as they were told. This recognized approach for analyzing qualitative data [12] allowed me to identify both manifest and latent content (what the text says and what the text talks about) [13] of transcripts as a coding framework and

themes were developed. Coding frameworks for each of the studies were continuously developed and modified as new themes emerged from the data.

Transcribing and, where necessary, translation was undertaken by an experienced social science-trained research team. I undertook review of transcripts for each study, developing coding frameworks that were continuously developed and modified as new themes emerged from the data. All qualitative data was managed using NVivo v.9 (QSL International 2010), a qualitative software data package. Quantitative data were analysed using STATA v10.0 or v12.1 (StataCorp Ltd, TX, USA).

Figure 1.1: Eastern Highlands Province and study locations



THESIS STRUCTURE

This thesis comprises five first-author publications, presented in Chapters Four to Eight. The structure of this thesis, together with how the research objectives link to each publication is summarized in Table 1.1. A reference list is included at the end of each Chapter. A bibliography listing all references is provided at the end of the thesis.

In *Chapter Two: Maternal health: A global overview*, I provide a brief background describing how maternal health is now recognized within the field of public health. Global maternal mortality statistics are discussed, along with the causes and timing of maternal deaths. Strategies and interventions to improve maternal health outcomes are also described.

Chapter Three: Maternal health in Papua New Guinea: Context and challenges begins with a brief description of the socio-cultural and geographical diversity in PNG. I then provide an overview of the availability and uptake of health care in PNG. The main focus of this chapter describes the current situation of maternal health in PNG, providing some historical background.

Chapters Four to Eight consist of five papers. Four papers have been published in peer reviewed journals; one paper is currently under review. Each chapter begins with a brief overview of the context within which the research was designed. Publication details are also included. *Chapter Four* describes the burden of hospital admissions to the referral hospital in the highlands of PNG, following spontaneous and induced abortion. In *Chapter Five* I describe women's experiences following induced, unsafe abortion. *Chapter Six* describes women's access to care during childbirth and in *Chapter Seven* traditional and cultural beliefs surrounding childbirth in the community are explored. The final publication, in *Chapter Eight*, describes an intervention study undertaken to identify the feasibility and acceptability of a community-based package of interventions to improve maternal health outcomes in a remote, rural setting in PNG.

In the final chapter, *Chapter Nine: Discussion and conclusion*, key findings from Chapters Four to Eight are highlighted. The common factor of access to care, identified across the two themes of unsafe abortion and pregnancy and childbirth is identified and discussed. Referring to the global evidence and current recommendations to improve maternal health outcomes, and reflecting on the findings from my program of research I propose a way forward for

improved maternal health outcomes in PNG, through identifying key research areas that could be addressed in PNG.

Table 1.1: Thesis structure and link of publications to research objectives

Theme	Chapter	Research Objective
	Chapter 1 Introduction	
	Chapter 2 Maternal health: A global overview	
	Chapter 3 Maternal health in Papua New Guinea: Context and challenges	
Theme 1 Unsafe abortion	Chapter 4 Hospital admission following induced abortion in the Eastern Highlands Province, Papua New Guinea - a descriptive study.	1
	Chapter 5 Unsafe abortion requiring hospital admission in the Eastern Highlands of Papua New Guinea –a descriptive study of women’s and health care workers’ experiences	1
Theme 2 Community experiences and perceptions of pregnancy and childbirth	Chapter 6 Exploring women's perspectives of access to care during pregnancy and childbirth: A qualitative study from rural Papua New Guinea	2
	Chapter 7 Childbirth in a rural Highlands community in Papua New Guinea: A descriptive study	2
	Chapter 8 Feasibility and acceptability of clean birth kits and self-administered misoprostol for the prevention of postpartum haemorrhage in rural Papua New Guinea	3
	Chapter 9 Discussion and Conclusion: Implications for advancing maternal health in Papua New Guinea	

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CHAPTER 2

MATERNAL HEALTH: A GLOBAL OVERVIEW

OVERVIEW

This chapter provides a brief background highlighting how the plight for women, particularly in low-resource settings, was brought to the global public health agenda. Despite a reduction in the number of maternal deaths, there remain discrepancies within countries and different regions of the world. Global maternal mortality statistics are discussed, along with the causes and timing of maternal deaths. Strategies and interventions to improve maternal health outcomes are described.

BACKGROUND

Launched in 1987, the Safe Motherhood Initiative emerged as a powerful campaign for women's health, highlighting the potential for improved care for pregnant women and better functioning health services to reduce the high burden of maternal mortality and morbidity [1]. Two key events were the impetus behind the Safe Motherhood Initiative. Firstly, the World Health Organization (WHO) announced that 500,000 women were dying from pregnancy and childbirth complications every year, the majority in low-resource settings. Secondly, in a key article, Rosenfield and Maine [2] highlighted the absence of "M" in Maternal Child Health (MCH), with activities undertaken within MCH services primarily for the benefit of the infant or child, for example weighing and immunising. By the mid-1990s, safe motherhood was recognised as an important concept, accepted and understood within the field of public health. This commitment to maternal health was further endorsed in 2000 by the United Nations General Assembly, with the inclusion of maternal health in one of the eight Millennium Development Goals (MDGs).

While it is acknowledged that many of the eight MDGs relate directly or indirectly to the health of women, MDG5 explicitly relates to maternal health, with an overall goal to improve maternal health (Figure 2.1). At its inception, there was just one target within MDG5: to reduce by 75% the maternal mortality ratio, between 1990 and 2015. Much of the focus in reaching this goal was directed towards the potential of health system interventions to improve maternal and newborn outcomes, reinforced by the World Health report of 2005: *Make every mother and child count* [3] and supported by the establishing of the Partnership for Maternal, Newborn and Child Health

in 2005 [4]. Following a re-commitment to universal access to reproductive health (family planning, maternal and newborn health, adolescent reproductive health, abortion and post abortion care, control of sexually transmitted infections, combating harmful practices and promoting positive sexual health), outlined by the International Conference on Population and Development in 1994 [5], MDG5 was revised in 2007. Millennium Development Goal Five now had two targets: MDG5a: To reduce by 75% the maternal mortality ratio; and MDG5b: To achieve universal access to reproductive health (Figure 2.1).

Figure 2.1: Millennium Development Goal 5: Improve maternal health

Target 5a - Reduce by 75% the maternal mortality ratio between 1990-2015

- Indicator 5.1: Maternal mortality ratio
- Indicator 5.2: Proportion of births attended by skilled health personnel

Target 5b - Achieve universal access to reproductive health by 2015

- Indicator 5.3: Contraceptive prevalence rate
- Indicator 5.4: Adolescent birth rate
- Indicator 5.5: Antenatal care coverage (one visit and at least four visits)
- Indicator 5.6: Unmet need for family planning

In support of the MDGs, *Countdown to 2015* (known as *Countdown*) was established in 2005. This multi-disciplinary, multi-institutional collaboration was designed to track progress specifically towards MDG4 (child health) and MDG5 (maternal health) in 75 high-priority countries, where more than 95% of all maternal and child deaths occur. *Countdown* uses country-specific data to stimulate and support country progress towards achieving the MDGs, promoting accountability from governments and development partners, identifying knowledge gaps, and proposing new actions to reduce child mortality and improve maternal health [6].

The importance of public health programs, working together through a cohesive approach using evidence based interventions is recognised as integral to improving maternal and child health [7]. Through a continuum of care from pre-pregnancy through to childbirth and infancy, across

community and health facility levels, evidence-based interventions have the potential to reach communities in need of specific information and services in an effort to reduce maternal and neonatal mortality in low-resource settings [3, 7, 8].

MATERNAL MORTALITY

“...the death of a woman while pregnant or within 42 days of termination of pregnancy, irrespective of the duration and site of the pregnancy, from any cause related to or aggravated by the pregnancy or its management, but not from accidental or incidental causes” [9].

Despite a reduction in the global maternal mortality ratio (MMR) from 283 to 209 maternal deaths per 100,000 live births, between 1990 and 2013 [10], there remains wide discrepancy in the MMR between different regions of the world; and maternal deaths remain unacceptably high in many low-resource settings [11]. A number of countries, including Malaysia, Thailand, Sri Lanka, Honduras, Bangladesh and Egypt have demonstrated that reducing the MMR by 75% in 25 years is possible [12], however the drop in the global MMR primarily reflects declines that have taken place in countries with relatively low levels of maternal mortality. Despite accelerated declines in the MMR in many countries for the period 2000-2013, progress towards MDG5 in some regions of the world has been slow and few countries will reach the goal of 75% reduction in MMR [13]. Countries with the highest levels of mortality have made virtually no progress over the 23 year period. In low-resource countries, the MMR is 14 times higher compared to high-income regions with 230 maternal deaths per 100,000 live births, and 16 per 100,000 respectively [14].

While the MMR remains high in many low and middle income countries, important lessons have been learnt about strategies that are effective in reducing maternal mortality, and the health-care solutions to prevent or manage complications are well known [15]. The majority (99%) of maternal deaths occur in low-resource settings, primarily in remote and rural communities [1]. Most maternal deaths occur when births are not assisted by skilled attendants and many occur suddenly and unpredictably [16]. Many maternal deaths could have been avoided if preventive and adequate care had been available [17]. However, health services can only help when women make use of them. Globally, just two thirds of women receive supervised, health facility births [18].

Strategies and interventions to improve maternal health outcomes are described in more detail later on in this chapter.

CAUSES AND TIMING OF MATERNAL DEATHS

Causes of maternal death are typically classified as either direct or indirect. Approximately three quarters of the estimated 290,000 maternal deaths that occur every year are directly obstetric-related [10, 19]. Four main causes are accountable for more than half of the 213,000 maternal deaths directly related to pregnancy or childbirth: obstetric haemorrhage (27%), pregnancy-related hypertension (14%), sepsis (11%) and abortion (8%) (Figure 2.2). Key factors associated with these deaths are absence of skilled health professionals during childbirth, lack of services to provide emergency obstetric care and deal with complications of unsafe abortion, and ineffective referral systems [17]. Nearly two thirds (64%) of maternal deaths occur during the intrapartum and postpartum period [10, 12]. Of all postpartum deaths, nearly half occur in the first 24 hours; up to two thirds occur within the first week [12, 20]. Responsible for 27% of maternal deaths, indirect causes are diseases that complicate or aggravate the pregnancy, including malaria, anaemia, HIV and AIDS and cardio-vascular disease (Figure 2.2).

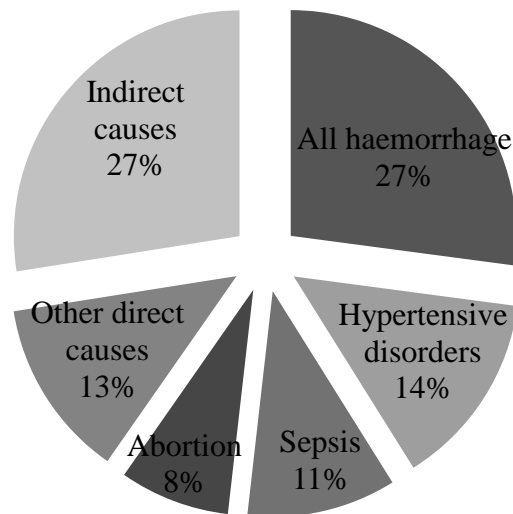
DIRECT CAUSES

Direct causes of maternal deaths are those resulting from complications, interventions (or lack of), incorrect treatment, or a combination of these and other events, as a result of the pregnancy, including the pregnancy, intrapartum or postpartum period. Obstetric haemorrhage and hypertensive disorders of pregnancy are classified as direct causes, as are, for example, complications of anaesthesia or caesarean section. Skilled personnel can detect and manage many of these problems, for example, obstructed labour (labour obstructed due to a disproportion between the fetal head and the mother's pelvis or because of a malpresentation or malposition of the fetal head during labour), can be managed through monitoring the progress of labour, identifying obstructed labour and referring the woman for caesarean section or instrumental vaginal birth.

OBSTETRIC HAEMORRHAGE

Accounting for more than a quarter of maternal deaths, obstetric haemorrhage may occur in the antenatal and intrapartum periods, but the majority of deaths from haemorrhage are due to postpartum haemorrhage (PPH) [19]. Frequently occurring unpredictably, PPH requires prompt, skilled care to manage the situation. Left unattended and without intervention, PPH can kill even a healthy woman within two hours [3], presenting significant challenges in resource-poor regions [21]. An injection of a uterotonic, preferably oxytocin [22], given immediately following the birth of the infant is highly effective in reducing the risk of bleeding [23]. In some situations, manual removal of the placenta is required, a simple but urgent response to PPH. In some cases women may require surgical intervention and /or blood transfusion, both of which require admission to hospital with appropriate staff, equipment and supplies [21]. The proportion of women who will require hospitalisation is due, to some extent, to the quality of the first level of care received by the woman. The proportion of women who die depends on the rapid response with appropriate care. In resource poor settings, without access to professional skilled care, the use of an oral drug, such as misoprostol could save many lives [24-28] and reduce the incidence of anaemia as a result of PPH [3].

Figure 2.2: Global causes of maternal death [19]



HYPERTENSIVE DISORDERS OF PREGNANCY

Hypertensive disorders of pregnancy, a group of diseases and conditions that includes pre-eclampsia and eclampsia, gestational hypertension and chronic hypertension, affect about 10% of all pregnant women [29]. Typically occurring in the antenatal period, hypertensive disorders of pregnancy can occur during the intrapartum period and, infrequently, in the postpartum period and are responsible for 14% of all maternal deaths [19]. While cases of severe pre-eclampsia and eclampsia require specialist, hospital-level care, most deaths could be avoided with timely and effective care when women present with such complications [15].

SEPSIS

Often presenting as a later cause of postpartum mortality, typically around 5-10 days postpartum, 11% of maternal deaths are due to sepsis [19]. A significant problem in the industrialised world during the 19th century, postpartum sepsis was reduced with the introduction of aseptic techniques. Today, postpartum sepsis remains a significant problem in low and middle income countries with one in 20 postpartum women developing an infection requiring prompt treatment to prevent it from becoming fatal or leading to morbidity [30].

ABORTION

Maternal deaths due to unsafe abortion are due primarily to severe infection (sepsis), bleeding or organ damage caused by the unsafe abortion [31]. Responsible for between 8-15% of all maternal deaths [10, 19], 99% of abortion-related deaths occur in low and middle income countries [19]. In addition to the 47,000 maternal deaths every year due to unsafe abortion, five million women are hospitalised due to complications from unsafe abortion [31, 32].

INDIRECT CAUSES

Previously existing diseases, such as cardiac or renal disease, or diseases that developed during pregnancy but not directly due to obstetric causes are referred to as indirect causes of maternal death [31]. At least 70% of indirect causes of maternal deaths are from pre-existing disease, including HIV [19].

MATERNAL MORBIDITY

In addition to the estimated 290,000 maternal deaths every year [10, 19], a further 20 million women suffer pregnancy-related illness or complications and 1.4 million face near-miss events, that is a life threatening complications that the woman survives [33, 34]. Both pregnancy-related illnesses and complications during pregnancy and childbirth are associated with a significant impact on the health of the newborn infant [15, 35].

The next part of this chapter describes strategies and interventions to improve maternal health outcomes.

STRATEGIES TO IMPROVE MATERNAL HEALTH OUTCOMES

In line with the continuum of care approach [3, 7, 8], a package of essential pre-pregnancy and pregnancy related strategies and interventions are outlined to effectively improve outcomes for pregnant women and their newborn infant [36, 37]. Pre-pregnancy interventions, including family planning to space pregnancies at appropriate intervals; prevention and management of sexually transmitted infections, including HIV; and folic-acid supplementation have shown a significant impact on reducing maternal and neonatal morbidity and mortality [37]. During pregnancy, the importance of essential antenatal care, including a range of interventions (Figure 2.3), have shown impact on reducing the burden of maternal and newborn morbidity and mortality [37]. Interventions during childbirth include: social support during childbirth; availability of caesarean section (including prophylactic antibiotic cover); active management of third stage of labour to prevent postpartum haemorrhage; induction of labour for prolonged pregnancy; and management of postpartum haemorrhage [36]. In the postpartum period, prevention and treatment of anaemia, detection and management of sepsis and advice relating to family planning are maternal-related interventions. Interventions for the newborn relate to the essential elements of newborn care: neonatal resuscitation, early and exclusive breast feeding, thermal regulation, promotion and provision of essential cord care, and newborn immunisation [36].

ANTENATAL CARE

Despite evidence from the early 1930s indicating that antenatal screening was not effective for identifying high risk mothers, antenatal care continued to be promoted as a means to screen for high risk mothers throughout the 1970s and 1980s [3]. By the 1990s the recognition that high risk mothers could not always be identified, and that every pregnancy faces risk was beginning to be understood [38, 39]. The importance of antenatal care for all pregnant women, to improve both maternal and newborn health could not be disputed, but the importance of skilled professional care for all births, even for those not considered to be at risk was recognised [38].

Antenatal care remains a vital aspect of care for pregnant women. Received from a skilled, trained health care worker, antenatal care provides effective and appropriate screening, preventative or treatment interventions [37] to promote favourable outcomes. In addition it is a time to offer advice and information relating to danger signs in pregnancy, emphasising the importance of a supervised birth with a skilled attendant. The greatest benefit of antenatal care is seen when the first visit is initiated early in the pregnancy and continued throughout the pregnancy to a minimum of at least four antenatal visits [16, 40]. Globally, the percentage of women attending for at least one professional antenatal visit has increased from 64% to 82% for the period 1990-2013, but in the least developed countries only 74% attend. For those attending antenatal clinic, only 51% attend the recommended four times; in the least developed countries only 38% of women attend four times [18].

SKILLED CARE DURING CHILDBIRTH

Maternal mortality is lower in countries when women give birth with skilled, professional health care workers, with access to equipment, drugs and other supplies needed for effective and timely management of complications [16]. In high income settings, a reduction in maternal mortality was seen in the early 20th Century through the provision of professional midwifery care during childbirth and improved access to hospital. Some low and middle income countries have also managed to reduce maternal mortality through professional midwifery. In Sri Lanka, through the training of midwives, improved access to health facilities and improved management, the MMR was reduced from 80-100 per 100,000 live births in 1975 to less than 30 in the 1990s [41].

Adopting the same strategies, Malaysia saw similar trends and reduced maternal mortality from 100 per 100,000 live births to below 50 over a five year period [41].

Figure 2.3: Essential pregnancy interventions [37]

- iron and folic acid supplementation
- tetanus toxoid immunisation
- prevention and management of malaria and HIV
- prevention of mother to child transmission of HIV (PMTCT)
- calcium supplementation for hypertension
- anti-platelet agents (low dose aspirin) for prevention of pre-eclampsia
- anti-hypertensive medication for severe hypertension
- management of pregnancy-induced hypertension/eclampsia
- management of preterm, premature rupture of membranes
- external cephalic version for breech presentation at term (at more than 36 weeks)
- management of unintended pregnancy
- home visits for women and children across the continuum of care

While progress in reducing maternal deaths has been slow, key lessons have been learnt over the past three decades about effective strategies to reduce maternal mortality. Not least of these is the recognition that every birth should be attended by a skilled birth attendant, that is: *“an accredited health professional, such as a midwife, doctor or nurse, who has been educated and trained to proficiency in the skills needed to manage normal (uncomplicated) pregnancies, childbirth and the immediate postnatal period, and in the identification, management and referral of complications in women and newborns”* [16, 42]. As the definition defines, being a

skilled birth attendant encompasses more than being an individual skilled health professional. In order to practice as a *skilled birth attendant* particular skills and competences need to be attained. The importance of recognising problems and deciding on the right action, or intervention, which may include referral of a woman, at the right time, can be vital to avoid tragic consequences.

Health experts agree that clinical interventions to avert many maternal and perinatal deaths and disabilities are known. What is also known is that these interventions require a functioning health system. As well as women being assisted by competent health personnel, the health professional needs to be equipped with the necessary drugs, supplies and an adequate referral system needs to be in place [1, 43]. This strategy, referred to as '*Skilled Birth Attendance*', therefore consists of two essential components - skilled health personnel and an enabling environment [44, 45].

In many resource-poor settings the health system is weak and cannot adequately respond to the health needs of the mother and her newborn, due to constraints including inadequately trained health professionals, lack of equipment, medications and supplies and a poor referral system. Countries need support to strengthen health systems and ensure availability of skilled health professionals trained in midwifery skills and emergency obstetric care. Emergency obstetric care needs to be available at both the primary and secondary health care levels, each level providing the necessary level of care and management. Within a primary referral facility, *basic* elements of essential obstetric care should be available. At the hospital level (secondary referral), additional elements should be available enabling provision of *comprehensive* obstetric care (Figure 2.4).

Poor women in remote areas are the least likely to receive adequate health care and access to care is lowest for the poor, the very groups who have the highest maternal and neonatal mortality rates [47]. This is especially true for regions with low numbers of skilled health workers, such as sub-Saharan Africa and South Asia. Globally, 68% of women give birth with a skilled attendant; in the least developed countries, the rate is just 47%, compared to 99% for the most developed countries [18].

Figure 2.4: Basic and comprehensive obstetric care services [46]

Standards for basic and comprehensive Emergency Obstetric Care (EmOC)	
Basic EmOC Functions (primary referral facility)	Comprehensive EmOC Functions (secondary referral facility)
Performed in health facility without the need for operating theatre	Requires operating theatre; usually district level hospital
<ol style="list-style-type: none"> 1. Administer parenteral antibiotics 2. Administer parenteral oxytocic drugs 3. Administer parenteral anticonvulsants 4. Manual removal of placenta 5. Removal of retained products of conception (manual vacuum aspiration; dilatation and curettage) 6. Perform assisted vaginal delivery (vacuum, forceps) 7. Perform basic neonatal resuscitation (bag and mask) 	<p style="text-align: center;">All 7 of the basic EmOC <u>PLUS</u></p> <ol style="list-style-type: none"> 1. Perform surgery - caesarean section 2. Perform blood transfusion

Many factors and constraints are described for the lack of skilled assistance during childbirth, and are captured within a “three delay framework” [48], which classifies the common delays in reaching and receiving appropriate care (Figure 2.5). Delay in seeking care during childbirth may not necessarily be a decision of choice but one of circumstances. In many resource poor settings, the decision to seek and access care frequently rests with family members, including the husband, mother, mother-in-law and grandmother and, in some situations, traditional birth attendants and village-based health care providers [49-55]. Other influencing factors include previous experience, cultural and customary beliefs, geographical, structural and health facility barriers as well as economic and social constraints [54]. Delays may occur at any or all of the

three stages. Whatever the reasons for not being attended by a skilled birth attendant, the consequences are reflected in the high number of maternal deaths seen in areas with lack of skilled attendants.

Figure 2.5: Three Delays Framework [48]

1. Delay in *deciding* to seek care

- Danger signs not recognised
- Lack of birth preparedness by family and community
- Lack of decision making powers on the part of the woman
- Lack of education
- Previous experience and perception of quality of care
- Cost of care at facility

2. Delay in *reaching* the facility

- Lack of transport
- Cost of transport
- Poor or lack of roads
- Distance
- Poor communication systems

3. Delay in receiving *appropriate* care at facility

- Inadequately trained staff
- Lack of equipment/supplies
- Poor referral systems

With an estimated 60 million births occurring outside of health facilities every year [18], one in four women in developing countries give birth alone or with assistance from a relative or friend, a figure unchanged since the early 1990s [56]. These unsupervised births, which often take place in rural settings, are the main challenge being faced in the effort to reduce maternal mortality [23]. Significant delays can occur between the onset of a complication, such as PPH and the decision to seek emergency obstetric care. These delays may be due to lack of knowledge or will, lack of access to transport or barriers relating to appropriate treatment at the facility level [48, 57]. When emergencies arise during pregnancy and childbirth, recognising danger signs and seeking care promptly is critical; transport must be available, and appropriately staffed and equipped facilities must be within reach.

COMMUNITY-BASED INTERVENTIONS TO IMPROVE MATERNAL OUTCOMES

At the community level, numerous interventions and strategies have been implemented in an effort to improve maternal health outcomes, particularly since the early 2000s with the focus towards MDG5. With the increasing recognition, that, to improve maternal health outcomes and reduce maternal mortality there is a need for care by a skilled attendant during childbirth, much of the focus has centred on improving awareness of the importance of supervised births; and improving timely access to health facilities. However, the issue remains that while women continue to stay in their communities and give birth unsupervised, they remain at risk of a poor outcome.

Community-based interventions include the training of traditional birth attendants, maternity waiting homes, clean hygienic birth practices and birth preparedness. These are discussed in the next sections below.

TRADITIONAL BIRTH ATTENDANTS

A traditional or community midwife, often referred to as a Traditional Birth Attendant (TBA), is: *“a person who assists the mother during childbirth and who initially acquired her skills by delivering babies herself or through an apprenticeship to other TBAs”* [58]. Frequently with no formal medical training and no connection to the formal health system, TBAs are typically women, entrenched in the community and its socio-cultural structure, chosen by the community to assist women in childbirth, and they play a major role during childbirth [58]. In many regions of the world, particularly in resource-poor settings, TBAs remain an important provider of maternity care [59, 60], especially in poor and remote areas where they may assist 37-62% of all births [18].

Throughout the 1970s and 1980s the training of TBAs was promoted by the World Health Organization (WHO) as a major public health strategy. The overall goals of TBA training programs were to reduce maternal and child morbidity and mortality and to improve the reproductive health of women. TBA training programs, undertaken by non-government organisations (NGOs), church-based organisations, local, state and national government [61], typically included hygienic birth practices, cord care and appropriate techniques for managing

delivery of the placenta to prevent primary postpartum haemorrhage (PPH). Included in many programs was the focus on prevention, screening and referral for maternal complications [62].

In the late 1990s, amid uncertainties surrounding the cost effectiveness of TBA training and the impact TBAs were having on maternal and neonatal mortality [38, 62-66], a shift in policy, led by the WHO [16], with the focus on skilled health professionals meant the training of TBAs was no longer prioritised - TBAs did not fit the criteria of a skilled health professional. The result led to the withdrawal of funding for TBA training, and excluded the training of TBAs in policies and programs worldwide [67]. While the critical role of a skilled birth attendant was recognised, the question remained about what to do with TBAs, as key providers of care during childbirth in the very settings where maternal and neonatal mortality was highest.

A recent systematic review, of trained and untrained TBAs [68], offers encouraging evidence for the integration of maternal and newborn care in community settings, with sufficient evidence to scale up community-based care through packages delivered by a range of community-based workers, including TBAs. However, the importance of skilled birth attendants and facility-based services for maternal and newborn health remains paramount [68]. As with other and earlier reviews [59, 69], no difference in maternal mortality was identified between trained and untrained TBAs. However, significant reductions in neonatal mortality, stillbirths and perinatal mortality; and a reduction in maternal morbidity, with increased referrals to health facilities for pregnancy related problems, and improved rates of early breast feeding was identified among trained TBAs [68].

If pregnancy outcomes are to be improved there is a critical need not only to upgrade health facilities and to train, deploy and retain professional care providers, but also to evaluate, refine and disseminate promising community-based approaches during childbirth and in the postpartum period [61]. While the importance of skilled birth attendants cannot be denied, and there remains a need for efforts to increase access to a skilled birth attendant, these efforts need to be accompanied by interventions to improve the safety for the 60 million non-facility based births that take place every year [56, 70]. An enabling environment that supports TBAs to link women with formal health workers, removing barriers to women accessing skilled birth attendants is required, and the integration of TBAs into the formal health system could increase skilled birth

attendance [71]. While for TBAs this support needs to come directly from community members and health workers, their inclusion in the formal health system also requires changes to policy, strategy, and legislation [71].

Thus, there remains a continuing need to define the role of a TBA, which may benefit from an emphasis on their potential as active promoters of essential newborn care [68, 72-74]. In addition, where coverage of TBAs is high, training TBAs to provide key evidence based interventions and first aid care for selected complications is a viable short term strategy [61].

MATERNITY WAITING HOMES

First advocated in the 1960s to bring women closer to health facilities for supervised births, a maternity waiting home provides accommodation for women towards the end of their pregnancy, enabling quick and easy access to the health facility for a supervised birth [75, 76]. Maternity waiting homes have been used in a number of settings, and evaluation of their effectiveness to improve outcomes for women and their newborn infant is encouraging [77-79]. However, data remains limited with no proven positive effects of increased supervised births among the most rural and remote women [80].

CLEAN, HYGIENIC BIRTH PRACTICES

The intrapartum and immediate postpartum period is a crucial time for both the mother and her newborn, for preventive and curative actions if morbidity and mortality are to be avoided [81]. As already mentioned, sepsis is a leading cause of maternal mortality [34]; it is also a leading cause of neonatal mortality and morbidity [82, 83]. While a number of factors may contribute towards the development of sepsis, poor hygiene during the intrapartum period is a critical risk factor [84]. The importance of a clean birth is a key recommendation from the WHO [85], promoting the practice through the principle of the ‘six cleans’: clean hands, clean perineum, nothing introduced into the vagina, clean delivery surface, clean cord cutting, and clean cord care [85]. Reflecting the WHO recommendations, to support hygienic birth practices during unsupervised births, the use of clean birth kits, typically containing disposable items such as soap, a plastic sheet, cord ties and a blade, have been used in a number of low-resource countries [86]. In settings with low coverage of facility births, maternal-held clean birth kits are reported to be highly cost effective and appropriate [86]. While the effectiveness of the clean birth kit to

reduce sepsis remains unclear, due to the limited evidence from robust studies [87], the use of such an intervention within a combination of education, training and/or community involvement, may achieve positive changes at the community level [82].

BIRTH PREPAREDNESS AND COMPLICATION READINESS

Devised in 2001, and subsequently revised in 2004, the *birth preparedness and complication readiness* matrix is a comprehensive strategy to improve the uptake of supervised births through a process of planning for normal birth, while anticipating and planning necessary actions which may be required in an obstetric emergency situation. Widely promoted by governments and international agencies to reduce maternal and neonatal health risks in resource poor settings, the strategy encourages women, households, and communities to plan for a supervised, health facility birth. Strategies include identifying and establishing available transport and saving money to pay for transport and service fees, in order to facilitate swift decision-making and reduce delays in reaching care, particularly if a problem arises [88]. With elements of the *birth preparedness and complication readiness* included within the WHO model for antenatal care [30], components of the strategy have been implemented and evaluated in a number of settings, in Asia, sub-Saharan Africa and Latin America [89-93]. With the overall impact of the *birth preparedness and complication readiness* strategy appearing uncertain, a recent systematic review and meta-analysis concluded that maternal and neonatal mortality could be reduced in low-resource settings [93]. While socio- demographic and economic factors, and access to a health facility have been identified as determinants for skilled care during childbirth, *birth preparedness and complication readiness* has been reported to have a significant impact on the utilisation of skilled care [94].

NEONATAL HEALTH

Neonatal deaths account for 44% of all childhood deaths, with 32% occurring in the early neonatal period (up to seven days postpartum) [95]. Many early neonatal deaths are due to preterm birth, pneumonia and birth related complications [96]. Globally there are an estimated 20 neonatal deaths per 1,000 live births [18]. As with maternal deaths, there is a wide discrepancy between high income countries and low-resource settings, with nine neonatal deaths per 1,000 livebirths in high income settings, compared to 35 per 1,000 livebirths in low income

settings [18]. In addition to the 2.7 million neonatal deaths that occur every year, a further 2.65 million infants are stillborn. Ninety eight percent (98%) of all stillbirths occur in low-resource settings; 1.2 million occur during labour [97]. Both early neonatal deaths and stillbirths are ultimately linked to the provision of essential care during pregnancy and childbirth, and into the postpartum period. In order to see a reduction in neonatal deaths requires interventions during the intrapartum period, followed by appropriate care of preterm and low birth weight infants [98].

SUMMARY

On a global level, strategies that are effective in reducing maternal mortality and the health-care solutions to prevent or manage complications are well known. The importance of essential antenatal care, with appropriate and timely prevention and intervention strategies and the need for skilled birth assistance are undeniably fundamental to improve maternal and newborn outcomes. Such interventions require a functioning health system, moreover they need to be accessible and available to all, in particular those most in need - those living in remote and rural locations. At the community level, implementation of key interventions supporting the importance of supervised births, such as the birth preparedness and complication readiness strategy matrix is crucial. However, such a strategy needs to be undertaken within a framework of ensuring those who do not reach a health facility are provided with a locally appropriate strategy, for example a TBA or clean birth kit.

The availability of global evidence for improving maternal outcomes in low-resource settings provides the impetus for developing locally appropriate, community based interventions for situations such as are evident in Papua New Guinea (PNG). However, before such interventions can be implemented there is a need to identify and address the local situation. The next chapter in this thesis outlines the background to the situation of maternal health in PNG, identifying the gaps in the knowledge base and literature relating to this neglected area of health in PNG.

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CHAPTER 3

MATERNAL HEALTH IN PAPUA NEW GUINEA: CONTEXT AND CHALLENGES

OVERVIEW

This chapter describes the setting and the context for the research undertaken for this thesis. A brief overview of the socio-cultural and geographical diversity is described along with a background to health care in Papua New Guinea. The last section of this chapter describes the situation of maternal health in Papua New Guinea and the Eastern Highlands Province, providing the background and context for this body of research.

BACKGROUND

Covering an area of 462,840 square kilometers, from the mountains and rain-forests of the highlands to the 600 remote islands scattered along the coastline, the 22 provinces in Papua New Guinea (PNG) are divided into four regions, that is, the Highlands, Momase, Morobe and New Guinea Highlands (Figure 3.1). Of the diverse population of 7.2 million people who live in PNG, 87% reside in rural and remote areas and belong to more than 800 distinct cultural groups, with different belief systems and languages [1].

The geographical and cultural diversity, together with poor infrastructure means there is limited or poor accessibility to many areas. Limited road networks due to mountainous terrain means much of the travel within and between provinces and districts is by aircraft or, for those living along the coast, by boat. Consequently, reaching people residing in rural areas, particularly those in the more remote areas, is logistically and financially challenging [2]. In addition, tribal conflict and accusations of sorcery between different communities or language groups remains common in PNG, and poor security affects access to services in many areas [2].

Despite the high proportion of Papua New Guineans residing in rural areas, 61% of the population report to be in paid employment, a figure that includes those growing and selling food, fishing, or making articles for own use or for sale, as well as those working for wages and salaries [2, 3]. Those living in rural areas are more likely to report being employed compared to

people in urban areas – 64.5% and 44.8% respectively for rural and urban residents. In rural areas, women are more likely to report being employed than men, primarily engaged in selling food crops [3]. Regional differences are noted with those living in the Highlands and Momase more likely to be employed (65%), compared with the other two regions (58%) [3].

The formal education system in PNG comprises elementary, primary and secondary school and tertiary education with education provided by Government, voluntary organisations (notably churches) and the private sector. The average level of formal education in PNG is low by Pacific and low resource-setting standards [3]. In 2010, the government abolished all school fees to improve access to primary education for all children. Despite this, school completion rates are low: 46% of children complete elementary school; 32% complete primary; 15% complete secondary school; and 7% complete tertiary education [3]. There are variations between rural and urban areas with those living in urban areas more likely to complete secondary and tertiary level education, compared to those residing in rural areas. Proportions for those attending primary and secondary school are similar for males and females in urban areas, but males are more likely to complete tertiary education compared to females (25% vs 18.5% respectively) [3].

HEALTH CARE

Despite the cultural diversity in PNG, there are a number of underlying concepts from which traditional beliefs and practices originate, particularly around health and illness [4]. Health and illness frequently originates around the unseen world of spirits, ghosts and sorcerers [5]. Spirits, which may be ancestral kin, are believed by many to be associated with causing illness and disease. The power of sorcery is widely believed, as is the belief in the importance of adherence to customary law, and the healing power of herbs and incantation [4]. While illness may occur due to a failure to observe social obligations, due to family disputes and social relations; likewise injury may occur due to a failure to observe specific customs [4]. In such situations, sorcerers, who are thought to be able to both cause and cure illness, may be called upon to facilitate a cure for the disease-causing spirit [4]. Although western medicine is widely accepted within PNG, traditional medicine and cures continue to be widely used [2] and it is not unusual for both types of medicine to be used - western medicine to treat an ailment and traditional means used to treat the cause [4]. The use of traditional medicine is acknowledged and endorsed by the government

of PNG, through the National Policy on Traditional Medicine, however the practice of sorcery is not permitted [4].

The majority of formal health services in PNG are provided through government and church health facilities, with church health services subsidised through the Government. Each province has one public hospital; the provincial hospital is the regional referral hospital. Port Moresby General Hospital, in the National Capital District, is the national referral hospital. In urban settings, after the provincial hospital, the next level of service provision is through urban clinics, which provide services to the population outside the immediate catchment area of a hospital or health centre. There are an estimated 69 urban clinics in PNG [6]. In rural areas, health services are provided through district or rural hospitals, the majority of which are managed by non-government agents, or through health centres which provide a range of curative and preventive services. Throughout PNG, 201 health centres and 428 sub-centres serve the rural and remote areas, along with 2,672 Aid Posts which serve the most remote areas [6].

Medical Officers, Health Extension Officers (HEOs), nurses, midwives and community health workers (CHWs) provide the backbone of services in all health facilities, along with various allied and support staff. There is a significant shortage of health care workers across the country. The current figure of 0.58 health workers per 1,000 population falls far below the recommended level of 2.28 health workers per 1,000 population - a recommendation made by the PNG national department of health as necessary to reach many of the MDGs, especially those linked to maternal and child health (MDG4 and MDG5) [7]. Community health workers comprise half (49%) of the medical and nursing workforce, with nurses and midwives contributing 42%. Doctors and HEOs make up the remaining 9% of the workforce. The majority (83%) of doctors are located in hospitals, and most (81%) HEOs are situated in rural health centres [6]. Rural health services frequently lack a sufficient health workforce and rural health services continue to weaken - nearly one third of all Aid Posts are currently closed [7].

Figure 3.1: Map and regions of Papua New Guinea



The current crisis within the PNG health workforce [8] is further compounded by a lack of capacity to train all cadres of health staff. An aging workforce [2] and a decline in coverage and quality of health system performance over the past two decades exacerbate the situation [7]. There has been a deterioration of general infrastructure and availability of life saving medical equipment and half of all health facilities in PNG report inadequate supplies to meet the needs of the population [7]. One measure of this deterioration relates to maternal health: 30-40 years ago, if a woman reached a rural facility, in obstructed labour, almost anywhere in PNG, she could be transferred and provided with quality emergency obstetric care. Sadly, today this is not the case [9]. Data and literature relating to maternal and newborn health outcomes will be further discussed later in this chapter.

THE HEALTH STATUS OF PAPUA NEW GUINEANS

The social and geographical diversity, together with poor infrastructure, including poor roads and transport links, poorly equipped health facilities, and minimal suitably trained health staff [9] can mean substantial barriers and constraints, especially in terms of provision of health care for many Papuan New Guineans. While accurate estimations of mortality and morbidity in PNG are hampered due to insufficient surveillance and reporting systems, particularly in the more remote areas [10], the overall health status of Papua New Guineans is reported to be the lowest in the Pacific Region [2, 9]. Preventable communicable and infectious diseases including malaria, tuberculosis (TB), vaccine-preventable diseases and water borne and diarrhoeal diseases account for a high burden of in-patient morbidity and mortality in hospitals and health centres [9]. Increasingly, the burden of non-communicable diseases, including diabetes and ischaemic heart disease is being recognised [11]. Thus, as with many other low-middle income settings, PNG is facing a double burden of disease, that is non-communicable and communicable diseases [12]. Preventable maternal-health related complications are also a cause for concern with a high incidence of sexually transmitted infections (STIs) and cervical cancer, in addition to pregnancy-related morbidity and mortality [9].

MATERNAL HEALTH IN PAPUA NEW GUINEA

The maternal health situation in PNG is highly challenging, a situation that has been present now for many decades. In an effort to stimulate discussion relating to maternal health in PNG, in 1990 Gillett [13] published the first report to describe health issues facing Papua New Guinean women. Twenty five years later, many of the issues and problems women face remain unchanged and maternal health indicators in PNG are among the poorest in the world [14, 15].

The contraceptive prevalence rate for modern methods of family planning in PNG is just 24%; and the unmet need for family planning is 27.4 % [16, 17]. The high total fertility rate of 4.4 children per woman, is little changed from 1985, when the figure was 5.4 children per woman [16]. Attendance for antenatal care and supervised births remains unchanged over the past 30 years: in 1987, 68% of women attended for antenatal care and 43% had a supervised, health facility birth; today 64% of women attend for any antenatal care and 43% have a supervised, health facility birth [18].

While national level data, collected through vital registration systems and demographic and health surveys is available in PNG, there is limited research relating specifically to maternal health. For example, a recent PubMed search identified 53 publications specifically relevant to maternal health in PNG, published between 1974 and 2015; 17 were published between 2010 and 2015. Of all 53 publications, 17 were published in international journals, nine in regional journals and 27 were published in the PNG Medical Journal. Much of the literature relates to reducing the burden of malaria during pregnancy, or is the result of research undertaken in the hospital setting, including antenatal clinics. Maternal mortality reviews from the 1970s and 1980s are also available. Anthropological studies provide some background to pregnancy and childbirth from highlands and coastal areas [19, 20]. One published report describes the differences between how women experience childbirth in the village and hospital environment [19]. The most recent publications, both from intervention studies undertaken in Milne Bay Province describe new approaches to maternal health in PNG, these are described in more detail further on in this chapter.

MATERNAL MORTALITY

In PNG, as in other settings, maternal mortality estimates are notoriously inaccurate and consideration needs to be given to the often inaccuracy of data collection. Vital registration is poor and frequently data collection relies on population-level surveys, such as the demographic and health surveys. The maternal mortality ratio (MMR) is based on estimates from mathematical modelling; the results have a wide margin of uncertainty; and they reflect a MMR for nine years retrospective to the time of data collection. Thus, while these methods do provide some estimate of the MMR at a national level, differences across the four regions are difficult to extrapolate. Differences between urban and rural settings and cultural ethnic groups remain unknown.

The recent publication of global maternal mortality figures [15, 21] has opened up much debate about the MMR in PNG, between what health care professionals in PNG believe it to be, and the estimates from the International bodies, such as the WHO and UNICEF [22]. The most recent estimates from the WHO, UNICEF, UNFPA and the World Bank group indicate a decline in the MMR in PNG, from 390 to 220 between 1990 and 2013 [23] - suggesting improvements in maternal health. In stark contrast, demographic health survey results indicated an increase in maternal deaths, from 372 to 733 for period 1996-2006 [16]. The estimate of 594 per 100,000 live births, indicated by the Global Burden of Disease study group [15], provide what many health professionals in PNG believe to be a more realistic figure. The figure is more in line not only with national data, as mentioned above, but also with independently analysed data from 2009 estimates indicating a MMR of 394 per 100,000 live births for facility based births; a MMR of 438 for National Health Information data and a MMR of 587 per 100,000 based on a community survey in one remote setting in PNG. Despite the differences in MMR, the ratio remains significantly higher than it should be.

In the light of global evidence for the importance of skilled professional care during childbirth [24]; and given the poor uptake of maternal health services, in particular supervised, health facility births it is reasonable to say that PNG has one of the highest MMRs in the world. With an MMR between 500-1,000 per 100,000 live births, PNG is one of just 16 countries (out of 188), with what is considered a “very high” MMR [15, 21].

CAUSES AND TIMING OF MATERNAL DEATHS

The exact nature and timing of maternal deaths in PNG is difficult to ascertain due to the high proportion of women who give birth outside of health facilities. Data collected through the National Health Information system includes only facility deaths; it does not include deaths that occur in the community. In 1968, obstetric causes was among the top fifteen leading causes of death in hospital, a ranking that remained unchanged in 1998 [25]. Since 1978, all health workers have been encouraged to report all maternal deaths through Maternal Mortality report forms [26], however in reality such formal documentation is rarely undertaken, and many maternal deaths remain unreported [27-29]. In her earlier work in 1990, Gillett [13] noticed the same causes of maternal death as are seen today, that is PPH and sepsis. However, she noted variation between highland and coastal regions. In the highlands women, primarily primiparous, were more likely to die from sepsis, while on the coast multiparous women died from PPH [13]. No recent work could be identified to corroborate if this remains the case today. A recent study within the settlements in Port Moresby, the Capital of PNG, identified childbirth as a leading cause of death (3/53; 5.7%). All maternal deaths were the result of poor transport systems [30]. Through a maternal mortality review in 2010, Kirby [29] linked maternal deaths in remote, rural areas of Milne Bay Province to the three delay framework, [31] described in Chapter Two of this thesis. Most of the delays were seen in delay one, deciding to seek care, with reaching a health facility (delay two) compounded by difficult terrain and distances [29].

UPTAKE OF HEALTH CARE DURING PREGNANCY AND CHILDBIRTH

ANTENATAL CARE

In PNG, 64% of women attend antenatal clinic at least once during their pregnancy, but there is wide variation in attendance between provinces and across the regions and a decline in attendance over the five year period 2008 to 2013 is evident (Table 3.1). Just over half of all women receive the recommended four antenatal visits [32]. Antenatal care remains an integral aspect of care for pregnant women and provides the opportunity not only for provision of the essential elements of antenatal care but is also a time to provide women with key messages and information relating to the importance of a supervised birth. With the majority of women attending for antenatal care only once, health care workers need to provide the optimal level of

care. The omission of interventions, for example tetanus toxoid vaccination [16], is a reflection of poor health service provision [9].

Reasons for poor uptake of antenatal care are sparsely documented within peer reviewed literature for PNG; many of the reasons highlighted as obstacles to antenatal care reflect the overall use of any facility-based health care. Factors relating to access, economics, cultural beliefs, social support, knowledge of and attitude towards antenatal care, including women's personal experiences are all described [33-39]. A recent study conducted in Wosera, Eastern Sepik, identified that primary level education and marriage are significantly associated with attendance at antenatal clinic [40]. In addition, the use of antenatal services strongly predicted the subsequent use of a health facility for childbirth [40].

SKILLED BIRTH ATTENDANTS

While the remoteness of many communities can make access to and uptake and availability of professional skilled health care during pregnancy and childbirth difficult [28, 29, 41], cultural and traditional beliefs and practices also impact on seeking and receiving care [29, 39, 41, 42]. Other reasons for lack of skilled care during childbirth are similar to those for attending antenatal care: socio-economic and financial, lack of transportation and poor attitude of health staff towards women presenting for health care are all described [28, 29, 39, 43].

As the international literature clearly outlines, if maternal outcomes are to be improved there is a need for skilled health professionals during pregnancy, childbirth and in the postpartum period. With only one midwife per 1,000 live births, PNG has a critical shortage of midwives [44]. While plans to fill the midwifery gap in the country are underway [44], by strengthening the midwifery education institutions, there remains a gap in provision of care at the community level. Currently new midwives are being trained; and nurses, midwives and doctors are being trained in emergency obstetric care. Community level health care is also being re-invigorated with the development and staffing of community health posts. But while women continue to give birth in the community they remain at risk [29]. Even with training, up skilling and deployment of trained health professionals skilled in midwifery and emergency obstetric care, women need access to health facilities, with staff working within an enabling environment [39, 45].

Table 3.1: Antenatal clinic attendance and supervised births by region, PNG 2008-2013 [18, 46]

Antenatal clinic attendance (1 st visit)							Supervised Births					
Region	2008	2009	2010	2011	2012	2013	2008	2009	2010	2011	2012	2013
Southern	77%	73%	67%	65%	70%	80%	58%	57%	60%	58%	63%	67%
Highlands	62%	50%	53%	54%	55%	57%	34%	28%	26%	30%	31%	33%
Momase	68%	64%	62%	65%	63%	51%	34%	36%	31%	29%	31%	23%
New Guinea Islands	96%	88%	86%	93%	94%	92%	66%	69%	67%	63%	73%	69%
National	71%	64%	62%	65%	66%	64%	43%	42%	40%	40%	44%	43%

As mentioned previously, the supervised birth rate has not improved in PNG since 1987, and it remains low at just 43% [46], with wide variations within provinces and across the four regions (Table 3.1). Despite the low level of supervised births, admissions to hospital for normal births did increase for the period 1998-2008 from 25%-30% [7]. But women living in rural areas are more likely to give birth in the village, than those living in urban areas [9, 13], with assistance frequently provided by a female relative; 4% are cared for by a traditional birth attendant and 7% of women giving birth alone [16].

While documented evidence for the poor uptake of supervised births in PNG is limited, reasons identified are similar to those for poor uptake of antenatal care (access, staff attitude, economical, decision making) [29, 33-38, 47]. Beliefs in, and fear of sorcerers, has been reported as a determinant for not attending for a health facility birth, with women afraid of meeting witches or sorcerers either at or on the way to the health facility [5, 19]. Focussing on women's experiences of giving birth at Port Moresby hospital, while also describing births in the village setting, Fiti-Sinclair [19] identified a number of features contrasting the two experiences. The findings included: loss of social support from female relatives; loss of autonomy; and loss of

individuality, with women unable to follow their rituals and customs, including the use of varied positions to give birth when giving birth in the hospital setting[19].

COMMUNITY-BASED INTERVENTIONS TO IMPROVE MATERNAL OUTCOMES

Unlike many societies, especially low resource countries, PNG does not have a strong culture of traditional birth attendants [48]. Despite this, the training of women in the village to assist women giving birth, referred to in PNG as village births attendants (VBA) has taken place throughout the country over many decades with government, non-government, faith based and international organisations providing training [48-50]. Typically the role of the VBA has included antenatal education and support during village births, nutrition and feeding support of infants and children and family planning. More recently, the role of the VBA has been merged into a wider concept of village health volunteers (VHV) following a National Forum and workshop, supported by the Family Health Unit of the National Department of Health. The influence of VBAs or VHVs in PNG on maternal health remains unknown. Review of a donor-funded community based project established to promote healthier lifestyles through education from VHVs noted improvements in maternal and child health related behaviours, including increased use of health services [10]. It has been suggested that a VBA program in a remote area in Milne Bay remains active to some extent [51], but there is little documented evidence from this or other areas in PNG. Furthermore, the training of such village based volunteers is scattered throughout the country, some with active and ongoing programs, while in other areas there are no such programs.

Considering the limited resources and geographical obstacles in PNG, in 2011 World Vision Australia, in collaboration with key partners [52] developed a summary report outlining key preventive and treatment options available at the community level to improve maternal, newborn and child health outcomes. Many of the interventions are suitable for implementation through village health volunteers. The report provides a breakdown of interventions, together with the evidence for their impact both globally and in PNG. Despite evidence at the global level, for many of the interventions relating to maternal and newborn health, there is no or limited evidence from PNG [52].

Two recent publications from Milne Bay Province provide some promising evidence for community-based initiatives. Through the provision of a mother and baby bundle, containing items such as baby linen and clothing, Kirby et al [45] report an increase in supervised births among pregnant women in remote and rural settings. Women are encouraged to attend the health facility to give birth, where they are presented with their “gift”. At the health facilities staff are provided with additional training in essential obstetric care, and are given a small incentive for undertaking supervised births. In the same province, an initiative to improve emergency obstetric care, through advice and timely referral as a result of an emergency childbirth phone service, is helping to improve outcomes for women [39]. Health care workers with access to a mobile phone network in remote and rural areas in Milne Bay have fee-free access to a 24-hour phone line to midwives and obstetricians in the Provincial hospital, allowing consultation and exchange of professional advice, reducing the delay in access to appropriate care.

GOVERNMENT RESPONSE TO THE MATERNAL HEALTH SITUATION

As described in Chapter One, in response to the poor and deteriorating state of maternal health in PNG, the past six years has seen a focus of attention towards improving maternal health outcomes. The seven key recommendations laid down by the Ministerial Maternal Health Taskforce [9] in 2009 encompass a broad approach to reproductive health, from building leadership at the Government and local level, to including sexual and reproductive health education within the school curriculum, and recommendations for the provision of comprehensive family planning and maternal health services at the facility level (Figure 3.2).

Other Government-led initiatives include a revision of the midwifery training program in PNG, an initiative funded by Australian Aid, in collaboration with the World Health Organization PNG, and supported by the University of Technology, Sydney in Australia. Through this initiative specifically recruited international midwives and obstetricians work alongside local counterparts in four universities to invigorate midwifery practice through training and provision of essential teaching resources. Professional registration of nurses and midwives is also supported. The newly formed Reproductive Health Training Unit, within the National Department of Health, is also currently undertaking training of nurses, midwives and doctors in emergency obstetric care. At the community level, health care is also being re-invigorated with the development and staffing of newly established community health posts. But while women

continue to give birth in the community without skilled birth attendants they remain at risk. Even with training, up skilling and deployment of trained health professionals skilled in midwifery and emergency obstetric care, women need access to health facilities, with staff practising within an enabling environment, that is, with the necessary equipment and mechanisms available to manage emergency situations, including referral onto the next level, should further assistance be required.

Five years into the PNG Development Strategic Plan (2010-2030), the commitment to improve maternal health, through the reduction of the MMR to less than 100 per 100,000 livebirths by 2030, remains the goal to strive towards. In recognising the need for research focussed towards maternal and newborn health [53], with a focus of attention to identifying the barriers and enablers to accessing supervised, health facility births [53] in this culturally and geographically challenging setting, the Government of PNG is demonstrating its commitment to this much neglected area of public health. With the review of global evidence for strategies and interventions that can have the biggest impact, PNG is potentially at a cross roads of reversing the trend in maternal mortality with interventions tailored to the specific needs of communities.

Figure 3.2: Key recommendations from the Ministerial Maternal Health Taskforce [9]

1	Secure major government, private sector and development partner investments to achieve the ambitious but necessary targets required to turn around the current status of maternal health in PNG.
2	Work with the Department of Education to strengthen the education system so that it is able to provide improved sexual and reproductive health education into the school curriculum; the removal of policies that prevent pregnant women from continuing their studies; and developing avenues for women to return to studies following pregnancy.
3	Build strength in the health system, enabling it to respond to the maternal health needs of Papua New Guinea's women.
4	Provide a comprehensive family planning service that has coverage to allow access by all Papua New Guineans.
5	Undertake workforce development to ensure that every woman in Papua New Guinea has access to a supervised birth by a trained health professional by 2030.
6	Develop standards for comprehensive obstetric care from the Aid Post level upwards
7	Implement a program to extend emergency obstetric care to all hospitals in Papua New Guinea and develop a system of referral that will ensure all women who require emergency obstetric care have access.

MATERNAL HEALTH IN THE EASTERN HIGHLANDS PROVINCE

Situated in the Highlands region, the Eastern Highlands Province (EHP) is the fourth most populous province in PNG with an estimated population of 600,000 [2]. While the Highlands highway and a network of smaller roads cover the north part of the province there is limited road access to a number of the eight districts, especially those in the south part of the province. The population is served by the Eastern Highlands Provincial hospital, situated in the Provincial capital, Goroka; 35 government and church-run health centres; and 90 Aid Posts. As in other settings in PNG, most health professionals (doctors, health extension officers and nurses) are based in the urban areas, while most community health workers (CHWs) are situated in the rural areas, where most of the population resides [7].

Maternal health indicators in the EHP are among the poorest in the region with declines in attendance for both antenatal care and supervised births over the past five years (Table 3.2). An estimated 18% of all births in the Province take place at the Eastern Highlands Provincial Hospital [54]. There are an estimated 150 maternal deaths every year in EHP [54].

Table 3.2: Antenatal clinic attendance (1 visit) and supervised births, EHP 2008-2013[18, 46]

	2008	2009	2010	2011	2012	2013
Antenatal attendance	63%	59%	61%	64%	68%	61%
Supervised births	38%	38%	26%	38%	38%	33%

With low uptake of antenatal care, a poor supervised birth rate and maternal deaths due primarily to postpartum haemorrhage and unsafe abortion, research to identify specific constraints and issues surrounding choices and the decision-making processes relating to uptake of care during pregnancy and childbirth was designed. Given the difficulties with access to, and availability and uptake of, professional skilled health care during pregnancy and childbirth in the province, interventions at the community level could provide an avenue for reaching women and their

families with health education messages and interventions in the struggle against maternal mortality and improved outcomes for mothers and their newborn.

SUMMARY

The availability of global evidence for improving maternal outcomes in low-resource settings provided the impetus for developing locally appropriate, community based interventions for PNG. In the absence of a functioning health system in PNG, particularly in the rural areas, there is a need to reach women in their communities with effective strategies to improve maternal health outcomes.

As this chapter highlights, there is a paucity of documented evidence relating to maternal health, in particular the factors that hinder access to maternal health care, including supervised births, and effective strategies to avoid maternal deaths in PNG. While there is increasingly recent evidence available to improve outcomes for women, given the high burden of maternal mortality, and the somewhat unknown burden of morbidity, there is an urgent need to focus and prioritise maternal health. Such recommendations are highlighted through key Government documents, including the 2010 PNG Development Strategic Plan (2010-2030) [55]; and the 2013 National Health and HIV research agenda in [53].

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CHAPTER 4

HOSPITAL ADMISSION FOLLOWING INDUCED ABORTION IN EASTERN HIGHLANDS PROVINCE, PAPUA NEW GUINEA: A DESCRIPTIVE STUDY

CONTEXT

As one of the leading causes of maternal mortality and morbidity in Papua New Guinea, abortion is an emotive topic in PNG, as in many settings. Earlier published studies by doctors at the Eastern Highlands Provincial Hospital identified abortion as a leading cause of hospital admission. However, this work did not describe the demographics of women presenting to hospital following both spontaneous and induced abortion, nor did it address the burden of the workload on an already strained health system.

Chapter Four is the first of two chapters addressing abortion in the Eastern Highlands Province in PNG. In this chapter I describe a mixed-methods approach to obtain clinical and qualitative data during a six month prospective study. The burden of hospital admissions as a result of spontaneous and induced abortion are described with a comparison of the demographics between these two groups of women.

This paper relates to Objective One: To explore the determinants and outcomes of women presenting for hospital level care following spontaneous and induced abortion; and to explore the reasons why and under what circumstances women in Eastern Highlands Province resort to unsafe, induced abortion.

PUBLICATION DETAILS

This work was published in Plos One in October 2014:

Vallely LM; Homiehombo P; Kelly-Hanku A; Kumbia A; Mola GDL; Whittaker A. **Hospital admission following induced, unsafe abortion in Eastern Highlands Province, Papua New Guinea - a descriptive study.** *Plos One* Oct 2014; 9 (10); e110791.

ABSTRACT

BACKGROUND

In Papua New Guinea abortion is restricted under the Criminal Code Act. While safe abortions should be available in certain situations, frequently they are not available to the majority of women. Sepsis from unsafe abortion is a leading cause of maternal mortality. The findings presented in this paper form part of a wider, mixed methods study designed to identify complications requiring hospital treatment for post abortion care and to explore the circumstances surrounding unsafe abortion.

METHOD

Through a six month prospective study we identified all women presenting to the Eastern Highlands Provincial Hospital following spontaneous and induced abortions. We undertook semi-structured and in-depth interviews with women following review of individual case notes, extracting demographic and clinical information.

FINDINGS

Case notes were reviewed for 56% (67/119) of women presenting for post abortion care. At least 24% (28/119) of these admissions were due to induced abortion. Women presenting following induced abortions were significantly more likely to be younger, single, in education at the time of the abortion and report that the baby was unplanned and unwanted, compared to those reporting spontaneous abortion. Obtained illegally, misoprostol was the method most frequently used to end the pregnancy. Physical and mechanical means and traditional herbs were also widely reported.

CONCLUSION

In a country with a low contraceptive prevalence rate and high unmet need for family planning, all women of reproductive age need access to contraceptive information and services to avoid, postpone or space pregnancies. In the absence of this, women are resorting to unsafe means to end an unwanted pregnancy, putting their lives at risk and putting an increased strain on an already struggling health system. Women in this setting need access to safe, effective means of abortion.

INTRODUCTION

Of the 44 million abortions that took place globally in 2008 nearly half were considered unsafe [1]. An important distinction between a safe and an unsafe abortion is that a safe induced abortion has few health consequences for the woman, whereas an unsafe abortion can pose a significant health threat, in terms of both morbidity and mortality [2, 3]. Forty per cent of women seeking induced abortion live in countries where it is legally restricted. But even where induced abortion is legal, access to such services is often poor [4]. The majority of unsafe abortions that take place every year occur in developing countries [5], frequently undertaken by individuals without the necessary skills to perform the procedure; alternatively they may be self-induced. The circumstances and environment in which unsafe abortion is performed may be aggravated by unhygienic conditions and interventions or incorrect administration of medication [5].

Unsafe, abortion procedures may involve the ingestion of harmful substances and physical means, such as insertion of a foreign object or substance through the cervix and into the uterus, or external force, such as squeezing the abdomen [5-7]. More recently, it is suggested that the increasing availability and use of the E1 prostaglandin analogue, misoprostol, is replacing many of these risky methods of unsafe abortion [6, 8, 9]. It has been suggested that in developing countries, even when used incorrectly, severe complications and maternal deaths are lower with the use of misoprostol when compared to physical means of unsafe abortion [10, 11].

Over the past few decades there has been a decline in maternal mortality [12] however, mortality from unsafe induced abortion has remained the same, accounting for approximately 15% of all maternal deaths [12]. The majority of maternal deaths attributable to unsafe abortion occur in developing countries, frequently linked to lack of access to care during an emergency [5]. In addition to maternal deaths, many women suffer both short and long term health consequences [1], including haemorrhage, sepsis and infertility [6].

Whether legal or not, induced abortion is a sensitive topic and is frequently stigmatized [1]. While this stigma may be perceived, or experienced, for those seeking both abortion and post abortion care, stigma is also reported in relation to service delivery and at the policy level [13, 14]. In countries where induced abortion is restricted or inaccessible due, for example, to legal socio-cultural or geographical barriers, seeking information on incidence, practices and

outcomes is difficult. When abortion occurs in clandestine situations, it may not be reported or may be declared as a spontaneous abortion [1]. Using estimates of indirect methods, for example information relating to complications treated in hospital, studies on conditions of unsafe abortions and women's reports through health and population surveys can provide some information [1]. However, these data need to be reviewed with caution and it can be reasonable to assume that they are an underestimate. Women living in rural areas with poor access to hospitals, which tend to be situated in urban areas, are unlikely or unable to obtain care if they have an abortion complication [4]. In addition, many women may have unsafe abortions, but no complications and therefore not present for hospital level care, therefore having no detectable encounter with the health system. Maternal deaths may also occur in the community setting and remain unrecognised or unreported as an abortion-related death.

As well as the health consequences for the individual woman, consequences of unsafe abortion result in increased costs to health systems: use of hospital beds, blood supplies, medication, operating theatres, anaesthesia and medical specialists all stretch a resource poor situation [4, 15]. Efforts to reduce unsafe abortion and to understand why and under what circumstances women resort to such abortions are crucial if maternal mortality due to unsafe abortion is to be reduced [16].

Papua New Guinea (PNG) has the highest maternal mortality ratio in the Oceania region and one of the highest in the world, with an estimated 594 maternal deaths per 100,000 live-births [12]. Sepsis due to unsafe abortion is reported as a leading cause of maternal mortality in PNG [17, 18]. The country has a low contraceptive prevalence rate for modern methods of family planning among married women (24%) and a high unmet need for family planning (27%) [19-21].

In PNG the legal framework surrounding abortion is contained within the Criminal Code Act of 1974 [22], which reproduces the 1899 Criminal Code Act of Queensland, adopted as the law of the colony of British New Guinea. Since 1993, following a request from the PNG Department of Health to the State Solicitor, an induced abortion may be undertaken to save a woman's life and/or to preserve the woman's physical and mental health, and can be legally performed by trained providers in safe conditions, provided there is agreement by two medical officers. However, in reality safe, induced abortions are not available for the majority of women in PNG; and induced abortion is not available in any public health facility in PNG [17]. Although in every urban setting a health practitioner (usually a doctor in private

practice) is willing to safely induce abortion, fees at private clinics are too expensive for the majority of Papua New Guineans [17].

As with many aspects of maternal health in PNG, there is a paucity of research relating to unsafe abortion. Work undertaken in the early 1990s and in 2011 relating to sexual and reproductive health indicates that women do seek and undertake illegal, unsafe, often self-induced abortion to end an unwanted pregnancy [23, 24]. To date no study has described women's experiences, including seeking care post abortion, clinical presentation and management at hospital.

The findings presented in this paper form part of a wider, mixed methods study. The overall aim of the study was to identify the types of complications that require hospital treatment as a result of spontaneous and induced abortion; and to explore the reasons why and under what circumstances women resort to induced abortion. Through a qualitative component, we explored the reasons why women resort to unsafe abortion, the techniques used, the events leading to hospital admission and the decision making processes relating to both the abortion and seeking post abortion care. The qualitative data relating to the wider study is presented elsewhere [25]. In this paper we present demographic and clinical information for women presenting for hospital level care as a result of self-reported spontaneous and induced abortion. We describe the socio-cultural differences, clinical presentation and outcomes between the two groups of women. Timing and methods used for unsafe abortion are also described.

METHODS

STUDY SITE

Situated in the Highlands region, the Eastern Highlands Province has an estimated population of 600,000; the majority live in rural areas. The Eastern Highlands Provincial Hospital in Goroka is the referral hospital for the province. In 2012 there were a total of 1,186 gynaecology admissions at the hospital and an estimated 15 births a day. In 2009, a retrospective study undertaken at the hospital identified puerperal sepsis and abortion related sepsis as leading causes of maternal mortality [17]. At the same hospital a prospective study, undertaken in 2011, identified misoprostol as the most widely used means to induce an abortion [26].

DATA COLLECTION

A prospective, mixed methods study of women presenting to the Eastern Highlands Provincial Hospital with complications following self-reported spontaneous and induced abortion was undertaken over a six month period. We sought to identify all women admitted to the hospital with suspected or confirmed abortion, including both spontaneous and induced abortion. All data collection was undertaken by one trained and experienced research midwife from the Papua New Guinea Institute of Medical Research (PNGIMR) and overseen by the principle investigator for the study.

Between May and November 2012, daily review of available admission records, including ward admission books, was undertaken by the research midwife at the emergency department, out-patient department, well woman clinic and the obstetric and gynaecology ward. We sought to identify any records as bleeding during pregnancy; reporting an induced, illegal abortion; reporting a spontaneous abortion; excessive vaginal bleeding; lower abdominal pain with vaginal discharge/bleeding; fever with vaginal bleeding/discharge; foreign body in uteri or pelvic injury. In line with the PNG National Department of Health guidelines, abortion was defined as vaginal bleeding before 20 weeks gestation or fetal weight of less than 500 grams.

SEMI STRUCTURED INTERVIEWS

Semi structured interviews were introduced during the second month of data collection (July 2012), following an amendment to the original research protocol and ethics approval. Semi

structured interviews were included to ensure all cases of unsafe abortion, not revealed as such at the time of admission or not identified on clinical examination, were identified. Following informed consent procedures, a semi structured interview guide (Appendix 1) was used to conduct interviews with women meeting the inclusion criteria. We sought to identify women's reasons for seeking hospital level care, their reaction to the pregnancy and their feelings in relation to the pregnancy loss.

CASE NOTE REVIEW

Following identification of women through the admission book, or following the semi structured interview, women identified reporting as either a spontaneous or induced abortion were approached and informed consent procedures completed. For women providing consent a piloted study specific case note record form (Appendix 2) was used to identify basic socio-demographic information, reproductive and obstetric history, presenting complaints, time between onset of symptoms and seeking care, diagnosis and clinical management received.

DATA MANAGEMENT

All clinical data were entered into a study specific Microsoft Access database by one member of the sexual and reproductive health team at the PNGIMR and was cleaned prior to analysis. All semi structured interviews were transcribed and translated by the research midwife. Transcripts were managed using NVivo 9 (QSR International Pty Ltd 2010), a qualitative data software programme.

DATA ANALYSIS

Statistical analyses were conducted in Stata 12.1 (StataCorp LP, Texas, USA) to compare socio-demographic, behavioural and clinical outcomes among women reporting spontaneous and induced abortion. Due to the modest sample size of the study, it was not possible to conduct multivariate analysis to examine independent risk factors. Semi structured interviews were reviewed and discussed between the principle investigator and the research midwife to identify additional cases of induced abortion not identified through the hospital admission records. Transcripts were reviewed to identify information relating to induced abortions, including gestation at abortion and abortion method used.

ETHICS STATEMENT

This research was approved by the Medical Research Advisory Committee (MRAC 11.32) PNG (December 2011); the Institutional Review Board of the Papua New Guinea Institute of Medical Research (IRB 1201) (February 2012); and the University of Queensland Human Research Ethics Committee in Australia (LV080312) (March 2012). An amendment to protocol was approved in July 2012. Written consent was obtained from all those who participated in the semi structured interviews and case note review. To ensure anonymity all participants were assigned a unique study identity number.

FINDINGS

Over the six-month study period we identified 129 women who met the inclusion criteria. All women were identified through the ward admission book at the obstetric and gynaecology ward. Of these 129 women, 92% (119/129) were identified as presenting with complications following a self-reported spontaneous or induced abortion (Figure 4.1). At least 24% (28/119) of all abortion related admissions were due to induced abortion.

SEMI STRUCTURED INTERVIEWS

Semi structured interviews were undertaken with 44 women out of a possible 79 recruited after the amendment to protocol, therefore the proportion of those consenting to participate in the semi structured interviews was 57% (44/79). Of these 44 semi structured interviews, 23 (52%) were conducted among women reporting spontaneous abortion and 21 (48%) were among women reporting induced abortion (Figure 4.1).

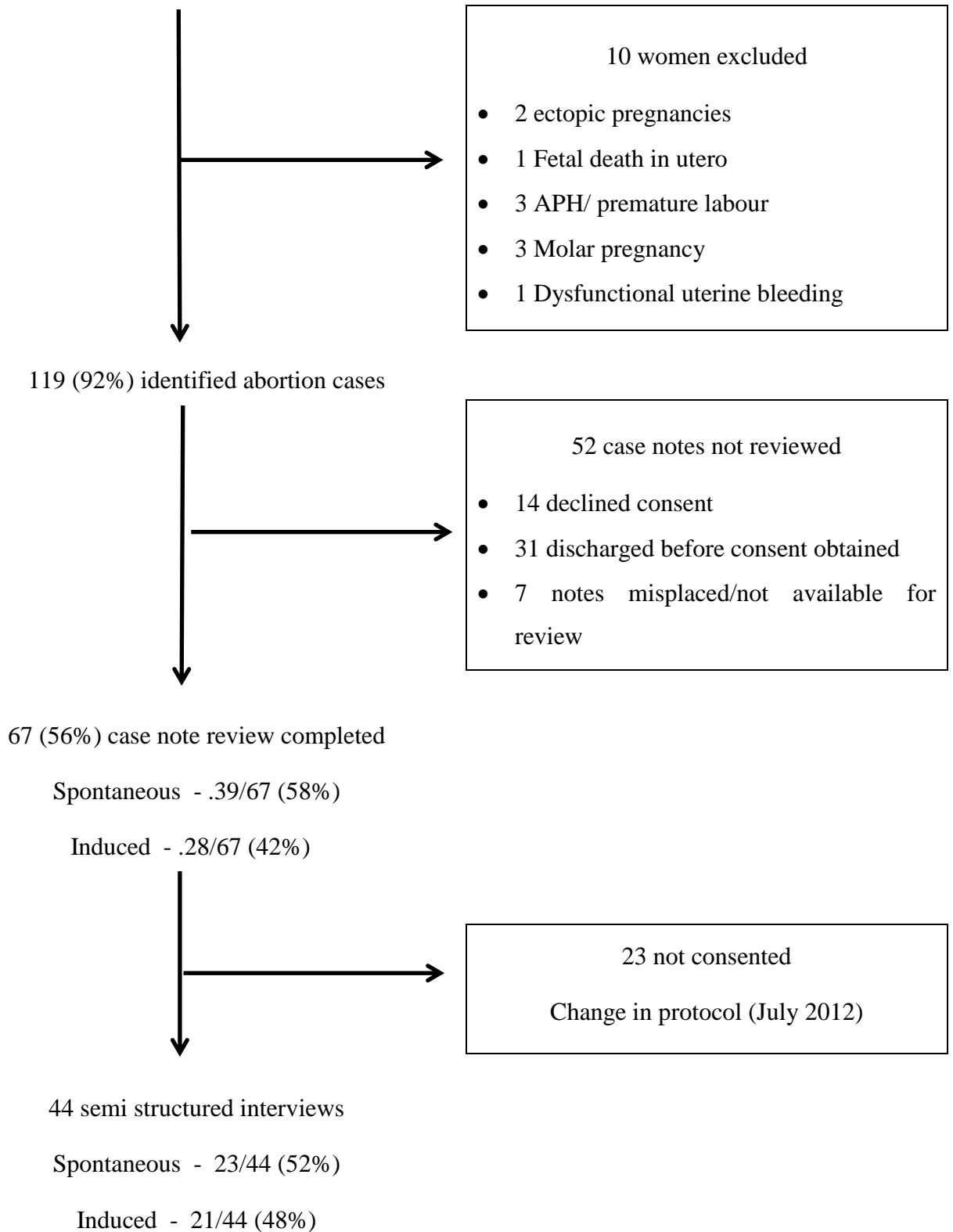
As a result of conducting semi structured interviews five women not reporting any interference with their pregnancy during the hospital admission process disclosed to the research midwife that they had interfered with their pregnancy. Of these five women, three were suspected as induced based on clinical examination; the remaining two had no report of clinical evidence that an induced abortion had taken place. Because of their disclosure during the semi structured interview they are reported here as induced abortion. One woman, who disclosed to the doctor at the time of admission that she had induced her abortion, reported a spontaneous abortion during her semi structured interview. Based on the clinical findings and her disclosure at admission, she remains classified for this study as an induced abortion.

CASE NOTE REVIEW

Case note review was undertaken for 56% (67/119) of all women identified. Case note review could not be undertaken for the remaining 46% (52/119) as consent was not obtained; 60% (31/52) were discharged home within 24 hours of admission (Figure 4.1). Of the 67 case notes reviewed, 39 (58%) women were identified as, or reported, a spontaneous abortion and 28 (42%) were identified as, or reported, an induced abortion (Figure 4.1). Seven women reporting induced abortion had their case notes reviewed before the introduction of the semi structured interviews.

Figure 4.1: Identification of women admitted to hospital following spontaneous and induced abortion

129 women identified through ward admission book



SOCIO-DEMOGRAPHIC CHARACTERISTICS

Social and demographic details for all 67 women are shown in table 4.1. More than half of the women (35/67; 52%) were aged 15-24 years and were residing in Goroka district at the time of admission (35/67; 52%). Nearly three quarters (49/67; 73%) reported to be married. More than half of the women (41/67; 61%) were educated beyond grade seven and 15% (10/67) had received a tertiary or university level education; 25% (17/67) of women were a student (at either secondary school or university) at the time of admission. Compared to women who reported spontaneous abortion, those who had an induced abortion were significantly more likely to be aged 15-24 years (71% vs 39%, $p=0.0078$); to be single (39% vs 3%, $p=0.0001$); and were a student at time of admission to hospital (43% vs 13%, $p=0.0053$).

PREGNANCY HISTORY

Just over one third of women (25/67; 37%) had never given birth before; 27% (18/67) had given birth once in the past. More than half of the women (35/67; 52%) reported to be in their second trimester at the time of the abortion. Almost half of the women (32/67; 48%) reported that the pregnancy had been planned; 28% (19/67) said that the pregnancy was unintended and not wanted (Table 4.2).

Parity and gestation at presentation to hospital was not significantly different between women reporting spontaneous abortion and those with induced abortion. Compared to women who reported spontaneous abortion, those who had experienced induced abortion were significantly more likely to report that the pregnancy was a mistake and the baby unwanted (64% vs 3%; $p<0.0001$).

CLINICAL PRESENTATION

Duration of symptoms before presentation varied between presenting the same day as onset of symptoms, up to four weeks. Most women (47/67; 70%) presented between 0-5days (Table 4.3). Vaginal bleeding with associated abdominal pain was the most widely reported presenting complaint, reported by 61% (41/67) of all women.

Table 4.1: Social and demographic characteristics, case note review

		All women n=67	Induced n=28	Spontaneous n=39	p-value
Age	15-24	35 (52%)	20(71%)	15 (38%)	p=0.0078
	25-34	26 (39%)	7 (25%)	19 (49%)	p=>0.05
	≥35	6 (9%)	1(4%)	5 (13%)	p=>0.05
Marital status	Married	49 (73%)	13 (46%)	36 (92%)	p=>0.05
	Single	12 (18%)	11(39%)	1 (3%)	p=0.0001
	Separated	6 (9%)	4 (14%)	2 (5%)	p=>0.05
Province of birth	Eastern Highlands	51(76%)	21 (75%)	30 (77%)	p=>0.05
	Other	15 (22%)	6 (21%)	9 (23%)	p=>0.05
	Not Known	1(2%)	1 (4%)	0 (0%)	p=>0.05
Current address	Goroka district	35 (52%)	18 (64%)	17 (44%)	p=>0.05
	Other districts in EHP	26 (39%)	9 (32%)	17 (44%)	p=>0.05
	Districts outside EHP	6 (9%)	1(4%)	5 (13%)	p=>0.05
Education level	University/tertiary	10 (15%)	4 (14%)	6 (15%)	p=>0.05
	Grade 11-12	6 (9%)	6 (21%)	0 (0%)	p=>0.05
	Grade 7-10	25 (32%)	8 (29%)	17 (44%)	p=>0.05
	Grade 4-6	12 (18%)	6 (21%)	6 (15%)	p=>0.05
	Grade 1-3	9 (13%)	3 (11%)	6 (15%)	p=>0.05
	No education	5 (7%)	1 (4%)	4 (10%)	p=>0.05
Employment	No paid job	4 (6%)	0 (0%)	4 (10%)	p=>0.05
	Subsistence farmer	26 (39%)	10 (36%)	16 (41%)	p=>0.05
	Housewife	10 (15%)	3 (11%)	7 (18%)	p=>0.05
	Teachers	2 (3%)	0 (0%)	2 (5%)	p=>0.05
	Student	17 (25%)	12 (43%)	5 (13%)	p=0.0053
	Other paid work	8 (12%)	3 (11%)	5 (13%)	p=>0.05

Table 4.2: Obstetric history

		All women n=67	Induced n=28	Spontaneous n=39	p-value
Parity	Nulliparous	25(37%)	13 (46%)	12(31%)	p=>0.05
	Para 1	18 (27%)	8 (29%)	10 (26%)	p=>0.05
	Para 2	9 (13%)	3 (11%)	6 (15%)	p=>0.05
	Para 3	9 (13%)	2 (7%)	7 (18%)	p=>0.05
	Para 4	3 (5%)	1 (4%)	2 (5%)	p=>0.05
	Para 5	3 (5%)	1 (4%)	2 (5%)	p=>0.05
Current pregnancy	Unplanned/unwanted	19 (28%)	18 (64%)	1 (3%)	p=<0.001
	Planned/wanted	32 (48%)	3 (11%)	29 (74%)	p=>0.05
	Unplanned/wanted	16 (24%)	7 (25%)	9 (23%)	p=>0.05
Reported gestation at admission	4-12 weeks	32 (48%)	11 (39%)	21(54%)	p=>0.05
	13-20 weeks	32 (48%)	15 (54%)	17 (44%)	p=>0.05
	21-24 weeks	3 (4%)	2(7%)	1(3%)	p=>0.05

There was no significant difference between onset of symptoms and presentation between the two groups of women. Compared to women who reported spontaneous abortion, those who had experienced induced abortion were significantly more likely to present with bleeding, pain and fever (36% vs 5%; p=0.0013). Women presenting following induced abortion were significantly more likely to present with signs of severe anaemia (27% vs 4%; P=<0.001). There was no significant difference between the two groups in terms of clinical signs of septic abortion (Table 4.3).

CLINICAL MANAGEMENT

97% (65/67) of women underwent a surgical procedure of whom 97% (63/65) had dilatation and curettage for retained products; two women had an exploratory laparotomy. Of the two

Table 4.3: Clinical presentation

		All women n=67	Induced n=28	Spontaneous n=39	p-value
Duration of symptoms before presenting	0-5 days	47 (70%)	17 (61%)	30 (77%)	p=>0.05
	6-10 days	11 (16%)	7 (25%)	4 (10%)	p=>0.05
	2-4 weeks	8 (12%)	4 (14%)	4 (10%)	p=>0.05
	Not known	1 (1%)	0 (0%)	1(3%)	p=<0.001
Pale complexion	Any pale complexion	38 (57%)	15 (54%)	23 (59%)	p=>0.05
	Severe	5(13%)	4 (27%)	1 (4%)	p=>0.05
	Moderate	20 (53%)	7 (47%)	13 (57%)	p=>0.05
	Mild	11(29%)	4 (26%)	7 (30%)	p=>0.05
	Not specified	2 (5%)	0 (0%)	2 (9%)	p=>0.05
Presenting complaint	Just PV* bleeding	10 (15%)	3 (11%)	7 (18%)	p=>0.05
	PV bleeding and abdominal pain	41(61%)	13 (46%)	28 (72%)	p=>0.05
	PV bleeding, abdominal pain, and fever	12 (5%)	10 (36%)	2 (5%)	p= 0.0013
	Other	4 (6%)	2 (7%)	2 (5%)	p=>0.05
Signs of septic abortion		19(28%)	11(39%)	8 (21%)	p=>0.05

*PV – Per vaginal

women who underwent laparotomy, one had inserted a stick into the vagina to induce an abortion three weeks earlier; she was found to have a pelvic abscess at laparotomy (Table 4.4). The other woman had a history of bleeding for two weeks prior to presentation and despite evidence of inflamed cervix and drainage of a pelvic abscess was identified as a spontaneous abortion.

The majority of procedures were conducted by the obstetric registrar (53/66; 80%) or the senior obstetrician (11/66; 17%); the resident medical officer under took two procedures (Table 4.5). One woman received misoprostol for incomplete abortion and one woman required no intervention due to a complete abortion. Most women (64/67; 96%) received

intravenous fluids, 61% (41/67) received blood or blood products. Those receiving blood or blood products were similar for both groups of women; 20 (49%) and 21 (51%) women respectively for induced and spontaneous cases.

Table 4.4: Duration of hospital stay and management

	All women n=67	Induced n= 28	Spontaneous n=39	p-value
Duration of hospital stay				
1-2 days	4 (6%)	1 (3.5%)	3 (8%)	p=>0.05
3-4 days	41 (61%)	18 (64%)	23(59%)	p=>0.05
5-6 days	16 (24%)	6 (21%)	10(26%)	p=>0.05
7-10 days	2 (3%)	1 (3.5%)	1(2%)	p=>0.05
>10 days *	4 (6%)	2 (7%)	2 (5%)	p=>0.05
Management				
Dilatation and curettage	63 (94%)	26 (93%)	37 (95%)	p=>0.05
Exploratory laparotomy/drainage of pelvic abscess	2 (3%)	1(3.5%)	1 (2.5%)	p=>0.05
Misoprostol	1 (1.5%)	1(3.5%)	0	p=>0.05
Nil treatment	1 (1.5%)	0	1 (2.5%)	p=>0.05
Received blood or blood products	41 (61%)	20 (71%)	21(54%)	p=>0.05

*2 women reporting spontaneous abortion stayed for 12 days; 2 women reporting induced abortion stayed for 20 and 21 days

Most women (41/67; 61%) had a hospital stay of between three and four days (Table 4.5). There were no significant differences relating to duration of hospital stay between the two groups of women.

Sixty three (63/119; 94%) women received a method of family planning prior to discharge home, of whom 62 received depo-provera; one opted for tubal ligation. Two women received family planning advice, one was referred onto a medical ward; family planning outcome was unknown for one woman.

There were no safe abortions undertaken at the hospital and no abortion related deaths recorded at the hospital during the six month study period.

Table 4.5: Doctor providing management/treatment

	All procedures n=66*	Dilatation & Curettage n=63	Laparotomy n=2	Misoprostol n=1
Consultant obstetrician	11 (17%)	10 (16%)	1	0
Obstetric registrar	53 (80%)	51 (81%)	1	1
Resident medical officer	2 (3%)	2 (3%)	0	0

*66/67 women had any intervention

UNSAFE, INDUCED ABORTIONS

Of the 119 women identified, 35 (29%) were identified through the ward admission book as having had an induced abortion. However, data is only presented for the 28 women consenting to case note review. Semi structured interview was undertaken with three quarters of these women (21/28; 75%). Most women (21/28; 75%) reported an induced abortion at the time of admission. Five women (5/28; 18%) had clinical signs that an induced abortion had taken place, although this was not disclosed at the time of admission; two of these women did disclose interference with the pregnancy during the semi structured interview. Two women (2/28; 7%) who disclosed during their semi structured interview that they had induced their abortion had no clinical signs that the abortion had been induced.

Of all 28 women with induced abortion identified, gestation at time of induction ranged between 7 and 24 weeks. More than half (17/28; 61%) took place in the second trimester, between 16 and 24 weeks gestation (Table 4.6).

Misoprostol was the most frequently reported method used to end pregnancy with 39% (11/28) of women reported using misoprostol. Both vaginal and oral routes of administration were mentioned with between two and five tablets taken (Table 4.6). Most women reported obtaining the misoprostol through a friend or relative working at a pharmacy; no women reported purchasing the misoprostol directly over the counter. Two women acquired the misoprostol through health care workers at hospitals outside of Goroka; another woman

reported buying the misoprostol with a prescription which she had acquired through a health care worker at a hospital.

Six women (6/28; 21%) used physical means to end the pregnancy, including squeezing or tying a rope around the abdomen, excessive exercise, falling onto the abdomen, hard physical work and insertion of a stick into the vagina. The use of traditional herbs, a concoction frequently consisting of herbs, leaves and ginger which is boiled up and drunk resulting in vomiting and abdominal cramps, was reported by three women (3/28; 11%). Two women reported that interference with the pregnancy had taken place through the use of witchcraft and evil spirits from another family member towards her (some areas of PNG have very strong cultural and spiritual belief relating to witchcraft, sorcery and evil spirits, especially in relation to understanding health and well-being). One woman reported receiving an injection from a health care worker at an undisclosed hospital. While she did not know what the injection was she stated that it was not a family planning injection. One woman mentioned that there had been some interference with the pregnancy due to physical violence from her husband and one described how she had drunk copious amount of strong instant coffee, bringing on vomiting and abdominal cramps (Table 4.6). None of the women reported trying or using more than one abortion method.

Table 4.6: Gestation and reported method of abortion

	All induced abortions n= 28	7-12 weeks gestation at abortion n= 11	16-24 weeks gestation at abortion n= 17
Misoprostol	14 (50%)	8 (73%)	6 (35%)
<i>PV misoprostol</i>	5 (36%)	2 (25%)	3 (50%)
<i>Oral misoprostol</i>	2 (14%)	2 (25%)	-
<i>PV & oral misoprostol</i>	4 (28%)	2 (25%)	2 (33%)
<i>Misoprostol, route unknown</i>	3 (21%)	2 (25%)	1 (17%)
Physical means	6 (22%)	1 (9%)	5 (29%)
Traditional herbs	3 (11%)	1 (9%)	2 (12%)
Cultural beliefs/sorcery	2 (7%)	-	2 (12%)
Insertion of stick vaginally	1 (3%)	1 (9%)	-
Received injection from health care worker	1 (3%)	-	1 (6%)
Coffee	1 (3%)	-	1 (6%)

DISCUSSION

At least 24% (28/119) of all abortion cases identified during the study period were due to induced abortion. Those identified as induced abortion were significantly more likely to be younger, single, in education at the time of the abortion, and reported that the pregnancy had been a mistake and was not wanted, compared to women reporting spontaneous abortion. Women presenting following an induced abortion were significantly more likely to present with abdominal pain, vaginal bleeding and fever, compared to those reporting a spontaneous abortion. They were also significantly more likely to be anaemic. Clinical management and outcome was similar for women in both groups with no significant differences in their management or duration of hospital stay.

Misoprostol to end an unwanted pregnancy is becoming increasingly used in both developed and developing countries [4, 8] and has been previously reported in the setting for this study [26]. Table 4.7 outlines correct regimes for the use of misoprostol-only induced abortion. Although misoprostol used alone is a safe means of medically induced abortion, it is most often safe to do so when factors of gestation and correct dose are followed [3, 27]. In the absence of adequate supervision from a skilled health worker the situation becomes riskier [3, 27]; and the use of sub-optimal misoprostol regimes may result in several days of hospitalisation [28]. Of the 14 women identified in our study who used misoprostol, 12 followed incorrect regimes and six were in their second trimester of pregnancy. The only two women in our study who received a dose of misoprostol appropriate for their gestation received the misoprostol from hospital based health care workers. Both of these women were in their second trimester. Most of the women in our study who used misoprostol to induce their abortion were at risk of complications due to incorrect use of misoprostol, and second trimester abortion. What is unknown in this setting is whether women are accessing misoprostol earlier in their pregnancy, and using it correctly and more safely to end a first trimester abortion, therefore having no need to present for hospital level care.

Clinical management varied very little between the two groups of women and there was no different clinical management for managing induced abortion- whether women had used misoprostol or other means to end the pregnancy. National guidelines for incomplete abortion in PNG specify that incomplete abortion should be treated with either manual vacuum aspiration (MVA) or misoprostol [29]. Since its addition to the WHO essential drug list in 2011, misoprostol is available in all hospitals in PNG for use in managing incomplete

abortions, induction of labour and prevention and treatment of postpartum haemorrhage. In this study only one woman was treated for incomplete abortion with misoprostol. The training and use of MVA techniques is still underway for many obstetricians in PNG, however dilatation and curettage is widely practiced, as identified in this study. Dilatation and curettage requires trained, skilled health personnel, management that may consequently place an additional burden on a struggling workforce. MVA, when undertaken in the first trimester, is quicker and associated with less blood loss when compared to dilatation and curettage [30]. In addition, it may be carried out successfully by specifically trained nurses and midwives [31, 32], thus reducing the clinical workload for doctors. Given the safety and effectiveness of both MVA and misoprostol in the first trimester [33, 34] it is possible that some women presenting for post abortion care could be managed without the need of senior medical staff.

Table 4.7: Recommended guidelines for Misoprostol-only medical abortion [3]

Gestation	Recommended Method
Pregnancies up to 12 weeks (84 days)	800mcg of misoprostol administered vaginally or sublingually. Repeat at 3 hourly intervals, but for no longer than 12 hours.
Pregnancies of gestational age over 12 weeks (84 days)	400mcg of misoprostol administered vaginally or sublingually. Repeat at 3 hours for up to five doses.
Pregnancies beyond 24 weeks	No specific dosing recommendations due to lack of clinical studies. But dose of misoprostol should be reduced, due to the greater sensitivity of the uterus to prostaglandins.

While grounds on which abortion can be legally performed has broadened in many developing countries, in countries where it remains illegal abortions frequently continue to take place in unsafe circumstances [35]. In many settings, the shift in legislative frameworks allowing for more legal abortions has resulted in a decline in the overall abortion rate, globally, however there has been little decline in unsafe abortions [36]. As with many developing countries, access to safe abortion in PNG is restricted due to the legal framework

and lack of availability of safe abortion services through the government system. While a safe abortion should be available if a woman's physical or mental health is at risk, in reality safe abortions rarely take place, through government or non-government health services [17]. Safe abortions available through private clinics are restricted to the few practitioners in the urban settings offering the service at a cost unaffordable to most Papua New Guineans. As such, access to safe abortion in PNG remains unavailable and inaccessible to the vast majority, due not only to socio-cultural, geographical and financial constraints but also a lack of understanding relating to the legality of abortion, many women, and health care workers in PNG believe abortion to be "illegal" [25]. This situation is similar to other countries with restrictive abortion laws and availability of safe abortions almost exclusively restricted to those who can afford it [37]. Many of the factors inhibiting access to safe abortion services also play a role in women accessing health services for post abortion care, with many afraid of repercussions from health staff and the legal framework surrounding unsafe abortion practices [5, 25, 36].

Global estimates indicate that for every woman presenting to a health facility for management of complications following an unsafe abortion, several other women do not reach a health facility for post abortion care services [1]. Given the poor uptake of maternal health services generally in PNG, for example the supervised birth rate is 53% and the contraceptive prevalence rate is 24% [18], it is reasonable to assume that our study only highlights a small proportion of women undertaking an unsafe abortion, with many more women never reaching a health facility and therefore never part of any official statistics. Given the wide use of misoprostol among our study participants it is a possibility that some women accessed misoprostol resulting in a safe, albeit illegal abortion and therefore not requiring hospital level care. There is also the possibility that some unsafe abortions result in the death of the woman, perhaps never being recognised as a maternal mortality or reported as an abortion related death. There were no abortion-related maternal deaths recorded at the hospital during the study period. While abortion related maternal deaths have previously been reported from the same study setting, the ten deaths, from a total of 29 recorded over a three year and five month period were recorded as deaths relating to haemorrhage and abortion-related sepsis; only three were confirmed as abortion related [17].

Despite its limitations, this is the first study from PNG that has attempted to capture both spontaneous and induced abortions presenting for hospital level care, highlighting the clinical

presentations and management of a vulnerable group of women. The data presented is from one hospital setting undertaken over a relatively short period of time. Despite our best efforts we were only able to review just over half of the case notes for women admitted following an abortion. Being unable to obtain informed consent was due to a number of reasons, including restricted access to the ward, doctors ward rounds and theatre lists and women being discharged home within a short time frame. The early discharge home of some of the women may indicate that these particular women may have presented with less complicated morbidity; some may have presented earlier following onset of symptoms or may have been in the earlier stages of pregnancy. The use of semi structured interviews was included during the study as we felt we were missing some of the induced cases. Following this amendment to study design we identified just an additional two cases of induced abortion that would otherwise have been missed. Most women presenting following an induced abortion did report as such at the time of admission. Others were identified based on their history and clinical examination. However, it is possible that we missed other women presenting following induced abortion due to the limited number of case notes reviewed. This study was limited by the amount of data we were able to collect and we recognise that a larger study and sample size would have allowed us to more fully develop the findings and describe patterns and differences between the two groups of women. As this was a hospital based study, we captured only women seeking specialist medical care.

Aside from the limitations this study highlights the burden on the hospital and hospital staff for clinical management of all women presenting following both spontaneous and induced abortion. It is hoped that the findings will help assist with policy and planning, particularly in relation to management of incomplete abortion and to reproductive health services for women.

CONCLUSION

As in many developing countries women in PNG are vulnerable to unplanned pregnancies and subsequently unsafe abortions. In a country with a low CPR and high unmet need for family planning, women of all ages need access to contraceptive information and services to avoid, postpone or space pregnancies. In the absence of this, women are resorting to unsafe means to end an unwanted pregnancy. In view of the proportion of women admitted to hospital following unsafe abortion, women need access to safe, effective means of abortion. In addition, the training of clinical staff in the use of MVA and misoprostol for incomplete abortions could reduce the burden on an already constrained health system. Knowledge of the legal framework on induced abortion in PNG needs to be improved in the community and among medical staff to improve access for those women eligible for a legal induced abortion. Improved access to safe abortion services together with the review of post abortion care services in PNG could help in reducing the burden of maternal mortality and morbidity from unsafe, induced abortions.

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CHAPTER 5

UNSAFE ABORTION REQUIRING HOSPITAL ADMISSION IN THE EASTERN HIGHLANDS OF PAPUA NEW GUINEA: A DESCRIPTIVE STUDY OF WOMEN'S AND HEALTH CARE WORKERS' EXPERIENCES

CONTEXT

Work published from the Eastern Highlands Provincial hospital in 2010 identified abortion as a leading cause of maternal mortality. In 2012, a second study from the same hospital identified the methods women used to end an unwanted pregnancy. Reasons behind the decision to end the pregnancy, and to seek care post abortion was not identified.

Chapter Five is the second of two papers addressing abortion in the Eastern Highlands region in PNG. In this chapter I focus on induced, unsafe abortion, describing women's reasons for resorting to an unsafe abortion, the techniques used, their decision to seek post abortion care and women's reflections post abortion.

This paper relates to Objective One: To explore the determinants and outcomes of women presenting for hospital care following spontaneous and induced abortion; and to explore the reasons why and under what circumstances women in Eastern Highlands Province resort to unsafe, induced abortion.

PUBLICATION DETAILS

This work was published in Reproductive Health as follows:

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ABSTRACT

BACKGROUND

In Papua New Guinea induced abortion is restricted under the Criminal Code Act. Unsafe abortions are known to be widely practiced and sepsis due to unsafe abortion is a leading cause of maternal mortality.

METHODS

We undertook a six month, prospective, mixed methods study at the Eastern Highlands Provincial Hospital. We undertook semi-structured and in depth interviews with women presenting following induced abortion. This paper describes the reasons why women resorted to unsafe abortion, the techniques used, decision to seek post abortion care and women's reflections post abortion.

FINDINGS

Twenty eight women were admitted to hospital following an induced abortion. Reasons for inducing an abortion included: wanting to continue with studies, relationship problems and socio-cultural factors. Misoprostol was the most frequently used method to end the pregnancy; physical and mechanical means, traditional herbs and spiritual beliefs were also reported. Women sought care post abortion due to excessive vaginal bleeding, and severe abdominal pain; some were afraid they would die if they did not seek help.

CONCLUSION

In the absence of contraceptive information and services to avoid, postpone or space pregnancies, women in this setting are resorting to unsafe means to end an unwanted pregnancy, putting their lives at risk. Women need access to safe, effective means of abortion.

INTRODUCTION

Of the 44 million abortions that took place globally in 2008 nearly half were considered unsafe [1], undertaken either by individuals without the necessary skills to perform the procedure, or were self-induced [2]. Forty percent of women seeking induced abortion live in countries where it is legally restricted. But even where induced abortion is legal, access to such services is often poor [3]. Most unsafe abortions occur in developing countries, in settings where standards of care are often poorer and legal restrictions are greater [2-4]. Every year an estimated 47,000 women die and five million women are hospitalized due to complications from unsafe abortions [2, 3].

Methods of unsafe abortion include: the ingestion of harmful substances, physical means such as insertion of a foreign object or substance through the cervix and into the uterus, and external force, such as squeezing or massaging the abdomen [2, 4-6]. It is suggested that the increasing availability and clandestine use of the E1 prostaglandin analogue, misoprostol is replacing many of these riskier methods of unsafe abortion in a number of countries [4, 7, 8]. In developing countries, severe complications and maternal deaths are lower with the use of misoprostol, even when used incorrectly, when compared to physical means of unsafe induced abortion [9, 10].

Induced abortion is a sensitive issue, attracting moral condemnation, with those implicated in its practice frequently stigmatised [11]. Stigma may be perceived or experienced for those seeking both abortion and post abortion care, as well as in relation to service delivery and at the policy level [12, 13]. In countries where induced abortion is restricted by criminal law or inaccessible due to socio-cultural or geographical barriers, seeking information on incidence, practices and outcomes related to induced abortion is difficult. When it occurs in clandestine situations, abortion may not be reported or declared as a spontaneous abortion, due to stigma or barriers such as fear of prosecution [12].

Papua New Guinea (PNG) is a low-middle income, developing country [14, 15] situated in the Asia-Pacific region. It is a country notable for its socio-cultural and linguistic diversity. Eighty seven percent (87%) of the population of 7.2 million reside in rural and remote areas, with poor availability and access to transportation. While 61% of the population are in paid employment, the majority of those residing in rural settings remain as subsistence farmers [16, 17]. Tribal conflict and accusations of sorcery between different communities or

language groups remains common in PNG and poor security affects access to services in many areas. High rates of domestic violence and rape are also reported [18-21].

Maternal health indicators in PNG are poor. The country has a low contraceptive prevalence rate for modern methods of family planning among married women (24%) and a high unmet need for family planning (27%) [22, 23]. The maternal mortality ratio is the highest in the Oceania region and one of the highest in the world, with an estimated 594 maternal deaths per 100,000 live-births [24]. Puerperal sepsis and sepsis due to unsafe abortion are reported as the second leading cause of maternal mortality, after post-partum haemorrhage [23, 25].

In PNG, induced abortion to save a woman's life or to preserve her physical and mental health may be granted on agreement by two medical officers. However, virtually no safe abortions take place in government facilities throughout the country. Abortion for socio-cultural reasons or on request remains illegal, under the Criminal Code Act [26]. Despite the criminal law surrounding abortion, induced, unsafe abortions are known to be practised, although documented evidence is limited. Traditional, herbal abortifacients and physical and mechanical means to end an unwanted pregnancy are described from a number of societies within PNG [19, 27, 28]. Self-starvation, self-poisoning, avoidance of antenatal care, and the use of traditional and modern contraceptives, such as the "morning after pill" to terminate an unwanted pregnancy are reported [19]. More recently, as part of a wider behavioural surveillance survey undertaken in Port Moresby, reports of unsafe abortion included the use of herbal medicines and "drinking tablets" [29]. The exact nature of the tablets was not reported.

Aside from earlier work surrounding sexual and reproductive health that highlighted women's experiences of induced abortion [19], no study has described women's experiences of induced abortion, specifically relating to the socio-cultural context within PNG. The overall aim of this paper is to describe, from one setting in PNG, the reasons why women resort to unsafe abortion, the techniques used, the consequences leading to hospital admission and the decision making processes relating to both the abortion and seeking post abortion care.

METHODS

As part of a prospective, mixed-methods study we undertook case note review, semi-structured and in-depth interviews with women admitted to hospital for post abortion care. We also undertook in depth, key informant interviews with health care professionals. Data collection took place over a six month period between May and November 2012 at the Eastern Highlands Provincial hospital, Goroka, Eastern Highlands Province, Papua New Guinea. All data collection, including clinical data and interviews was undertaken by a trained and experienced research midwife (PH) from the PNG Institute of Medical Research (PNGIMR) and overseen by the principle investigator for the study (LV).

The Eastern Highlands Provincial hospital is the referral hospital for the Eastern Highlands Province, which has an estimated population of 600,000. Two recent studies have been undertaken at the hospital: one identified that 60% of the 29 maternal deaths that occurred over a 40 month retrospective period were attributable to complications of unsafe abortion [25]; another identified that the majority of women presenting for post abortion care had used misoprostol to end unwanted pregnancies [28].

Over the six month study period we sought to identify all women admitted to the hospital with suspected or confirmed abortion, including both spontaneous and induced abortion. Women were identified through daily review of available admission records at the emergency department, out-patient department, well woman clinic and the obstetric and gynaecology ward. Inclusion criteria included women admitted with: excessive vaginal bleeding; lower abdominal pain with vaginal discharge/bleeding; fever with vaginal bleeding/discharge; foreign body in-uteri or pelvic injury. In line with the PNG National Department of Health guidelines, abortion was defined as vaginal bleeding before 20 weeks gestation or fetal weight of less than 500grams. Women presenting after 20 weeks gestation were included in the study if they specifically indicated interference with the pregnancy.

SEMI-STRUCTURED INTERVIEWS

Following identification of women meeting the inclusion criteria, women were approached by the research midwife who described the nature of the study. For those willing to participate, informed consent procedures were completed prior to completion of a study specific case note record form. Data from this aspect of the study is presented elsewhere [30]. During the consent procedure for the case record form, women were also asked if they

were prepared to participate in a semi structured interview (Appendix 1). For those willing to participate in an audio-recorded interview with the research midwife, separate consent was gained. Semi structured interviews were included to ensure all cases of induced abortion were identified, whether they had or had not they had been revealed as such to hospital staff at the time of admission.

We sought to identify women's reasons for seeking hospital level care, their reaction to the pregnancy and their feelings in relation to the pregnancy loss. Questions in the semi-structured interviews included:

- Can you tell me about why you came to the hospital?
- Can you tell me your story about how the pregnancy ended?
 - Do you know why that may have happened?
 - How did you feel when the pregnancy ended?

Forty four women participated in the semi structured interviews, of whom 21 had reported that they induced their abortion during the initial hospital admission consultation. As a result of conducting semi structured interviews an additional four women not reporting any interference with their pregnancy during the hospital admission process disclosed to the research midwife that they had interfered with their pregnancy.

IN-DEPTH INTERVIEWS

All women identified as having had an induced abortion, either through the case note review or semi structured interview, were invited by the research midwife to participate in a further in-depth interview to gain further insight into their individual experiences, including why and how they aborted, their reasons for the abortion and their experiences and perceptions of the health care they received following presentation to hospital. Following informed consent procedures, we used an interview guide (Appendix 3) to undertake eight in-depth interviews.

KEY INFORMANT INTERVIEWS

All key informants were health care workers and were purposively selected due to their position within their work place. They worked either at the hospital or at local non-government organizations providing sexual and reproductive health services. Despite initial interest in the study, four health care workers declined to participate. In depth interviews

were undertaken with eight key informants, using an interview guide (Appendix 4), during which they were asked open questions about their experiences of women accessing abortion and post abortion care services. Among the eight key informants, six were from the Eastern Highlands Provincial hospital; four from the ward and two from the accident and emergency department. The remaining two informants were from different non-government organisations based in Goroka. Seven of the informants were women and six were trained as midwives, including the one male informant. All informants had extensive experience working in both the government and church health services and non-government organisations for between 14 and 36 years.

Interviews with women were undertaken in either *Tok Pisin* (one of three national languages) or English, as preferred by the individual woman. All key informant interviews were undertaken in English. Both the semi-structured and in-depth interview guides were piloted prior to the start of the study. All interviews were undertaken by one research midwife who is trained and experienced in undertaking such interviews.

DATA ANALYSIS

All semi-structured interviews were transcribed and translated, where necessary, by the research midwife (PH) and reviewed and discussed with the principle investigator (LV) to identify additional cases of induced abortion not identified through the hospital admission records. In-depth interviews were transcribed and translated by one member of the research team at the PNGIMR. Transcripts were reviewed by two members of the research team (LV, AK-H) and through a qualitative content analysis approach [31] an initial coding framework was developed. During the course of analysis, this coding framework was developed and modified as new themes emerged. All transcripts were managed using NVivo9, a qualitative software management programme.

ETHICAL CONSIDERATIONS

This research was approved by the Institutional Review Board of the PNGIMR (IRB 1201); the Medical Research Advisory Committee (MRAC 11.32), PNG; and the University of Queensland Human Ethics Research Committee in Australia (LV080312). Written consent was obtained from all participants for case note review, semi-structured and in-depth interviews. To ensure anonymity all women participating in the semi structured and in-depth interviews were assigned a pseudonym. To ensure anonymity all key informants were

assigned a pseudonym and only their place of work (hospital or NGO) is noted, not their position.

FINDINGS

Over the six-month study period we identified 129 women who met the inclusion criteria. All women were identified through the ward admission book at the obstetric and gynaecology ward. Of these women, 119 (92%) were identified as spontaneous or induced abortion. Twenty eight women (28/119; 24%) were admitted following unsafe, induced abortion. Most women (21/28; 75%) reported an induced abortion at the time of admission. Five women (5/28; 18%) had clinical signs that an induced abortion had taken place, two of whom did disclose interference with the pregnancy during the semi structured interview. Two women (2/28; 7%) who disclosed during their semi structured interview that they had induced their abortion had no clinical signs that the abortion had been induced.

This paper describes themes that emerged during the analysis process. These have been grouped according to the following categories: reasons given for ending the pregnancy; abortion methods used; seeking post abortion care and reflections post abortion.

REASONS GIVEN FOR ENDING THE PREGNANCY

Women's reasons for deciding to end their pregnancy related to the notion of 'readiness' for a baby or related to family or relationship issues.

NOT READY: JEOPARDISING A WOMAN'S EDUCATION

Among younger and single women, many felt they were not 'ready' for a baby, in particular they did not want to interrupt their studies, as Nema explains:

"When I told him (boyfriend) ... he told [said] me that we were both mad and we are not ready to make a baby and we are not ready to get married... we both didn't want to leave school. We both didn't want to have a baby". Nema, single, 15-19 years, grade 8 student.

Education is highly valued in PNG and represents a considerable financial investment by a family. The opportunity for secondary education is considered as a means of social mobility. Most families support themselves through subsistence agriculture with few opportunities for wage earning. There is an expectation that children who receive secondary or higher education will be able to secure employment and help support their families and communities through their wages. For young women an education also means better marriage opportunities and increased bride-price (money paid to the woman's family upon marriage by

the groom and his family). In PNG, students studying at school or university are frequently advised by the educational institute to leave school during a pregnancy, with many educational facilities having policies which state a pregnant student cannot be in attendance. Pregnancy therefore threatens a woman's and her family's opportunity for social and economic advancement through education.

This sense of a lack of readiness and desire to continue their education was combined with fear and worry about disappointing their family and of bringing shame or embarrassment to their families for being pregnant while still a student or unmarried. Key informants also stated that young girls also feared their parents, as Jay mentions:

"...when they miss their periods they know that they are pregnant... they want it out as soon as possible so, how they go about to get this thing out of them, they go to the extreme...they are desperate to get it out, the young girls they are scared of their parents....". Jay, HCW, EHP hospital.

Partly, this fear arose out of knowledge of the financial outlay and sacrifices many families had made towards their education, as Noreen describes:

"As for myself, I thought I must not have this baby, I'm still in school....my family [have spent] a lot of money on school fees and I didn't think of this and I did that..... I want[ed] to remove it". Noreen, 20 years, grade 8 student.

In other cases health workers stated that parents actively sought terminations of pregnancy for their daughters so they could continue their studies. In such cases it was not always clear whether the parents were forcing the young woman to terminate the pregnancy, as Linda described:

"Parents come here and ask "Please is there any way [to end a pregnancy], my daughter is pregnant [and] she needs to continue on with her studies". Lilian, HCW, EHP hospital.

Although some women were certain that they wished to terminate their pregnancy, others described indecision, resorting to abortion due to fear of the perceived and actual reactions of their families, as Isabella explains:

“..... [I] thought about keeping the baby, however I considered my family, that my father will get cross with me.... I was afraid and [I] made my decision [to have an abortion]”. Isabella, 22 years, 3rd year university student

GENDER BASED VIOLENCE

There are high rates of gender based violence in PNG [32], but frequently it remains a secretive and shameful topic. One woman in our study presented to hospital reporting an induced abortion, the abortion occurring following physical violence from her husband. No women in our study reported their pregnancy being the result of forced sex, although we did not explicitly ask about this during the interviews. However, as in the case above, there were indications of coerced abortions. In one case, a housewife explained how she was excited at being pregnant again, however her husband did not want the baby and he took his wife to a health care worker himself to ensure an abortion was undertaken:

“My husband brought me to see a relative at the hospital....he did not want the baby so he brought me[to get an abortion]”. Mary, 30-34 years, household duties.

RELATIONSHIP PROBLEMS

The dynamics of power within their relationship with their husbands was another prominent theme in married women's discussion of the reasons for their induced abortions. In some cases women explained that their husbands were having extra marital affairs and hence they did not wish to bring another child into that relationship. The following woman undertook an abortion as a means of punishing her husband:

“I was happy that I was pregnant but realised my husband was having [an] affair with another woman so I tried ending pregnancy by squeezing my abdomen”. Rose, 25-29 years, household duties.

CULTURAL BELIEFS

In the Eastern Highlands Province, as in other settings in PNG, sexual abstinence during breast feeding is understood as a means to prolong breast feeding of the infant to ensure good nutrition for the infant [33]. To be breast feeding while pregnant reveals lack of adherence to this tradition and therefore brings shame to the couple, in addition to which it is felt that the breast milk is not as nutritious for the infant, due to the growing fetus, as Annemarie describes:

“...my child is still an infant and he’s still breastfeeding... if I breast feed him, he will be malnourished because there’s another baby in the womb so, I thought I must remove [abort] this baby, so I removed it”. Annemarie married, 20-24 years, household duties.

Sorcery, spiritual beliefs and witchcraft are widely believed and spoken about in terms of causes of illness in many cultures within PNG [34] and may be accepted in many communities as a credible explanation for such misfortunes as an abortion. An explanation of sorcery and witchcraft may reposition a woman who aborts from being defined as a perpetrator of a criminal act to a victim. Interference with the pregnancy as a result of witchcraft and evil spirits, directed towards them from another family member was identified during our study, as Elisabeth explains:

“.... I was lifted by spirits and thrown away outside the house by witches... two times...then I was hit on the back.... my husband found me outside with blood running like water....”. Elisabeth; 16 weeks gestation, planned pregnancy.

ASSISTANCE IN ACQUIRING AN ABORTION

Usually the person to whom the pregnancy was disclosed to was involved in helping to find the means to end the pregnancy. In some situations that person was the boyfriend, as Noreen describes:

“...he said to me, "I don't want you to do that (be pregnant), I have a lot of friends so I will get this Cytotec and come and give you and you will end this pregnancy” I was happy that he came and gave it to me and I ended this pregnancy..”. Noreen, 20 years, grade 8 student.

Other women however did not consult with anyone else and acted alone. Kate clearly identifies her agency in acquiring an induced abortion in her following statement:

“... I alone, I myself made my decision and I went and asked around and found it... my husband does not know... I went and got the medicine and I drank”. Kate, separated, 15-19 years, subsistence farmer.

Nema also describes how her boyfriend’s sister-in-law helped, wanting to protect the young couple from unnecessary gossip and information getting back to the young girl’s family:

“My thoughts were to abort it and forget...my boyfriend also said that...He said he would find a way for us and our people [family] would not know...she [boyfriend’s sister-in-law], told me, “We (the boyfriend and sister in law) will come to town... if our people saw both of you [Nema and her boyfriend] it wouldn’t be good...I will get [your boyfriend] and both of us will go and find a way to get help”. I stayed in the village, that woman [boyfriend’s sister-in-law] bought it [tablets from the pharmacy] and gave [it to] him [boyfriend] and he came and gave [it to] me”. Nema, single, 15-19 years, grade 8 student.

METHODS OF ABORTION USED

A range of methods to end the pregnancy were described, including traditional herbs and physical means, however most women used misoprostol. Key informants mentioned how traditional methods, including the use of herbs have been used for many years in the community setting. While some informants suggested that traditional herbs and physical means continue to be used, others described an increase in women presenting to hospital following the use of misoprostol. Some believe that health care workers are involved in ending an unwanted pregnancy, with women gaining access to misoprostol through prescriptions. There was also some feeling that health care workers in some health facilities were providing abortions, although the abortion methods and techniques were not discussed.

MISOPROSTOL

Women who reported using misoprostol to end their pregnancy took between two and five tablets and both oral and vaginal routes of administration were described. The misoprostol was obtained through a pharmacy and frequently a family member, friend or boyfriend was involved in procuring the tablets. The purchase was not always straight forward, as Nema explains:

“They themselves [chemist] have stopped selling to the public [meaning not displayed on the shelves]. But there are relatives...they gave it to her [referring to a friend]”.

Nema, single, 15-19 years, grade 8 student.

Lucinda explained how she has seen a change in abortion methods used with misoprostol becoming more widely recognised as a method of abortion:

“By my observation....it’s changed, now they are more to [using] Misoprostol... it’s easier than trying to use these irons and sticks, and normally people in the village too they come, they ask for this Misoprostol. Like the educated people living in the village, they’ve done their grade 10, grade 12 and they are in the village, they come and ask....female [relatives] for it. Like if a mother notices that her child is expecting, she’ll come and ask on behalf of her daughter”. Lucinda, HCW, EHP hospital.

Confirming the suspicions of some of the health care workers, there were reports of women obtaining misoprostol through health care workers at hospitals outside of Goroka (the capital of EHP), and through a prescription obtained from another hospital, as Monalisa and Tina explain:

“I took tablets. Women who used it told me, they bought it from this man [at a health facility] so I went and got it directly. He put it [in] and I came... I removed it [the fetus]”. Monalisa, separated, 32 years, household duties.

“I came to [the hospital] and I did a pregnancy test and it was positive so they prescribed a medicine for me to take, and I went to the chemist and I got the medicine...She [the nurse] said, “go to the pharmacy because at the hospital we do not supply this medicine....”. Tina, unmarried, 20 years, grade 11 student.

Women were able to recall quite clearly the instructions provided when buying the misoprostol, however, for many the instructions and advice was incorrect, as Kate describes:

“... I bought it ... they told me how to use it ... I went. I drank 2 [and] I inserted 2 in the vagina.... I waited and then I felt a bit alright and then, it [the fetus] came out”. Kate, separated, 19 years (induced at less than 12 weeks).

This incorrect messaging and consequences of incorrect dosage of misoprostol was highlighted by the key informants, as Jay describes:

“She went and she bought some drugs from somebody saying they were a doctor from the hospital [and] this girl said this guy gave her six tablets, and he instructed her to put it up her vagina and it will help her to contract and she will abort the baby. But this dose was too much for her, she came and she was in so much pain, she was screaming and she was yelling and we told [asked] her, “what did you do?” and then

she said, "oh someone gave me something and I put it [in] and this is what happened....". Jay, HCW, EHP hospital.

The only women who reported a dose and route correct for their gestation were those who received their misoprostol from health care workers.

For those women who reported the costs involved in purchasing the misoprostol, none expressed difficulty finding the money, even though many of the women were students or housewives with very little income. Monalisa describes how she had to find K200 (US\$ 75) to pay a health care worker for two tablets:

"....it's expensive, they usually charge for them a lot of money, but as for myself, I promised that I will pay half.... I went and gave him K40.00 together with a bilum [traditional woven bag of high value] ...I promised I will not hide, I will go and pay for [the rest of] it...". Monalisa, separated, 32 years, household duties.

Frequently the cost was met by family member's, or the boyfriend and could be negotiated, as Nema describes:

"...he told me that they charged K200.00 but that woman [boyfriend's sister-in-law] made friends with them and she said "they are school students who came to me with this problem," ...she said "I have K130.00" and they helped her". Nema single, 19 years, grade 8 student.

TRADITIONAL HERBS

The use of traditional herbs, in particular tree bark or grasses chewed up and swallowed or squeezed to make a juice were described by both women and key informants. Following their use women reported abdominal cramps and vomiting before expulsion of the uterine contents, as Velma describes:

"[I] ate some herbs- grass, put salt and ate [the] soft part, squeezed the green plant and put salt on and the water drip into [my] mouth and I swallowed it. [I was helped by] a woman in the village who knows that.... for K20.00. [I] felt pain generalized all over the body, headache, backache and then [I] gave birth to a baby boy- [fetus], and he made a little noise then [I] cut the cord". Velma, married, [induced abortion at 16 weeks].

Key informants also described traditional methods as an effective means of ending a pregnancy, as Katherine explains:

"When I interview them I find that they were using some tree barks, and some grass, which they locally use to induce abortion. Traditional methods... grass, they just pick the grass and chew it and swallow to induce the abortion, [same with] the bark of the tree". Katherine, HCW, NGO Goroka.

However, there was some concern among the key informants that these traditional methods can be ineffective, leaving women vulnerable to post abortion complications, as Frances explains:

"It takes 24 hours for this thing to work...in the past, those people that were using [preparing and administering] the bark of a tree were elderly men – that [is what] I've seen, where I come from. Some [women] they try those things and if it doesn't work, then they go for some [other] induced abortion...But I've witnessed that, the bark of a tree works. I've seen [it] ...it's very effective...it terminates the pregnancy but it doesn't clear the uterus, it doesn't expel everything out... there are chances that the mother will have complications from that". Frances, HCW, NGO, Goroka.

A few women combined the traditional methods of abortion with modern methods. Monalisa describes how she initially sought traditional abortifacients, but when these did not work she resorted to misoprostol. As in her case, trying various means to abort may result in delays, increasing the risks to women as the gestational age increases:

"I said I'll try in the village, get ginger and those things and help myself they usually plant it differently, the ginger ...for aborting babies... I gave him K10.00...he [the medicine man] spoke [some words over it] ...brought it, still talking and poking it [piercing the stem of ginger with a needle] but when he pulled it out it was strong, and he said... "it's strong"- it means that he is not able to remove it [fetus], so he said, "that's alright, leave it." I myself I don't believe much about this thing in the village, when I felt I did this... I saw it I said "ah stupid....". Those things to abort a child, tree bark or that kind of thing...I said I must go to the hospital...so I came". Monalisa, separated, 32 years, housewife [induced at 5 months with misoprostol].

PHYSICAL MEANS

Squeezing or tying a rope around the abdomen, undertaking excessive exercise, running over mountains and jumping over streams as a means to end the pregnancy were also described. Annemarie explained how she waited until she knew the pregnancy would be far enough progressed to enable her to exert enough force on her lower abdomen to interrupt the pregnancy:

“...I went past 3 months and I squeezed my abdomen and I killed one [the] baby boy and I removed it ... I used my hand, myself and squeezed my abdomen 3 times I tried to remove it [abort] and the 4th time I removed it. I allowed the baby to grow big then I squeezed it [abdomen] and removed it. If it was small and I removed [aborted] it will die inside the womb and it will fester [decay]inside so I was a little scared and I removed it.”. Annemarie, married, 16 weeks at abortion.

One young woman, widowed after a tribal fight in her community described how she turned to her sister for advice on ending her pregnancy, inserting a stick into her vagina to end the pregnancy at eight weeks gestation:

“[My] sister informed me about [using] the plant [stick] and I went to [the] bush and removed it [the fetus]”. Sue, 19 years, widow.

Reflecting many of the methods reported from women in this study, key informants revealed their experiences from both the community and professionally, having witnessed physical means to end a pregnancy, as Lilian and Okaps describe:

“....to induce the abortion, some they do it themselves [these] women...get rid of the pregnancy by themselves, they do all sorts of things...they push sharp instruments into the cervix or into the uterus, and we’ve witnessed and seen trauma, infected, they come in very septic and some...they take some herbs or they drink strong coffee or alcohol they go into all these [methods] they think they can consume this one to destroy the pregnancy, and some they step on their abdomen, step on their abdomen and do all these things to force the pregnancy out”. Lilian, HCW, EHP hospital.

“ I saw them, the mothers would sit down on top of the abdomen of the young girl and they crush and abort the baby”. Okaps, male HCW, EHP hospital.

SEEKING CARE POST ABORTION

Key informants spoke of the secrecy surrounding induced abortion, which contravenes social, cultural and Christian norms in PNG and evokes fear of prosecution among women. The issue of not wanting to disclose an induced abortion was highlighted by the key informants who recognised that often women presenting to hospital do not disclose having induced an abortion, which is identified only upon clinical examination, as Cinta mentioned:

“When women, from [their] history they present we collect information and at times when you are doing speculum examination, you can see that if it is criminal abortion like, you’ll see objects like stick or a piece of iron rod or something, you can see, the cervical os and the cervix inside is rough and rugged....and it’s bleeding from the tear, so you can tell that, it’s criminal abortion which has been induced with instruments....”. Cinta, HCW, EHP hospital.

Despite the implications involved and the stigma and secrecy surrounding abortion, the women in this study presented to hospital because they had concerns about complications and the consequent implications on their health, as Tina explains:

“I was a little scared because, I heard that this is illegal, it’s an illegal abortion. I was a little scared but I knew that if I came to the hospital I will get help ...”. Tina, unmarried, 20 years, grade 11 student.

However, frequently women delayed seeking care post abortion, many presenting for hospital level care between six days and up to four weeks after the abortion had taken place [30]. For many the delay was because the abortion had taken place without the knowledge of those who the women lived closely with, seeking care meant disclosing what had transpired, as Noreen describes:

“I thought that if I don’t come to the hospital and get help, I remain in the house I will get worse and die....I would get worse if I didn’t tell my family. That’s why when I told my family they helped me come to the hospital”. Noreen, 20 years, grade 8 student.

Women described a number of symptoms that triggered them to seek care at the hospital. While women expected to see vaginal bleeding, many became concerned when this went on for longer than they expected, they saw blood clots or when they experienced other symptoms such as feeling dizzy or abdominal and back pain. Some women felt their

symptoms were so severe they feared they may die if they did not receive health care. A few spoke of the need to come to the hospital in order to be “cleaned”, to ensure no products of conception remained. For many of the women, once they had disclosed their situation to the family a vehicle was hired or made available to bring the women into the hospital. Some arrived by a local bus, and others were brought in by ambulance after presenting to their nearest health facility.

REFLECTIONS POST ABORTION

A number of the women spoke about their feelings relating to ending their pregnancy. While most felt relieved that they were no longer pregnant, a few related feelings of grief and spoke of regret for what they had done. Annemarie describes feeling relieved, managing the situation as she felt appropriate:

“Hmm when he [the fetus] came out straight, I was thinking my [breast feeding] infant will drink good breast milk and will have more strength and he will be fine so I'm happy that I removed it.... We wrapped it [the fetus] with a napkin and I covered him then I buried him inside a hole”. Annemarie [aborted at 16 weeks].

In contrast Noreen – a young, single woman with no previous pregnancy history describes her feelings of guilt on aborting her fetus at 12 weeks gestation:

“I thought back again why [did] I abort this child and I wasn't happy. When I removed it, I noticed the child had formed already.... and I thought back again why did I abort it, I should have kept it”. Noreen, 20 years old, student.

For some women the grief and loss was made harder by a lack of empathy from the health care workers at the hospital:

“..I even felt sorry for the little innocent [fetus]...I felt shy, guilty...and even sorrow...he [the doctor] was really cross with me...”. Beth [aborted at 11 weeks].

DISCUSSION

We identified 28 women admitted to hospital following an induced abortion. Women's reasons for seeking an abortion related to a lack of "readiness" and poor timing of the pregnancy, especially with relation to women's education; not wanting to cause shame or embarrassment to themselves or their family; relationship problems and some cultural beliefs.

Poor timing of pregnancy, including being young and unmarried and wanting to space children is reported from a number of settings as a reason for ending an unplanned pregnancy [13, 35]. In addition to these reasons, out of a fear of a missed opportunity for education and all that that could mean for the individuals and their families, coupled with a fear of responses from the family, it is not perhaps surprising that the women in our study resorted to induced abortions. In PNG 5% of females finish education early because of pregnancy and marriage, in the Highlands region the rate is 9% [17]. As the average age of sexual debut in PNG is 18.7 years for females and the average age at the birth of a first child is 20.8 years [22], it is not unexpected that many school and tertiary students are experiencing unplanned pregnancies.

Many of the women reported the use of misoprostol to end the unwanted pregnancy, a medical method increasingly being used to end unwanted pregnancy in many developing countries [3, 7, 10, 28, 36, 37], including earlier reports from PNG [28]. While the use of misoprostol is associated with less severe outcomes and morbidity, compared to the use of substances and physical methods [4, 7, 8], it is only safer when factors of gestation and correct dose are followed [38, 39]. Lack of adequate supervision from a skilled health care person [38] and following a sub-optimal misoprostol regime, can lead to several days of hospitalisation [40]. Women in our study reporting the use of misoprostol described doses and regimes inaccurate for their stated gestation, and lack of supervision from an appropriate health care provider was noted. Given the availability of misoprostol in this setting, it is also possible that other women may have undertaken abortions in the first trimester with less severe or no complications, thus not requiring hospital level care and not identified in this study.

Highlighted by both the key informants and women participating in this study, the use of physical and mechanical methods to end an unwanted pregnancy are still used by some women. However the increasing availability of misoprostol is perhaps providing an

alternative method for women, findings identified elsewhere [4, 7, 8]. As reported from other settings [4, 35], women in our setting also reported the use of herbal remedies to induce abortion. The large evergreen tree, *Alstonia scholaris* is distributed throughout PNG and is recognised for a number of traditional uses, including chewing the leaves as an oral contraceptive, and ingestion of the dried bark sap to induce abortion [41]. While in some communities in PNG there is a general knowledge of plant preparations, in some situations there may be the need to enlist the more specialized knowledge of a traditional healer or, in some situations a sorcerer. In our study some of the women using traditional, herbal methods to end their pregnancy enlisted the help of older village women; seeking assistance from a “medicine man” who used sorcery in an attempt to interrupt an unwanted pregnancy.

While grounds on which abortion can be legally performed has broadened in many developing countries, in countries where it remains illegal, abortions frequently continue to take place in unsafe circumstances [6]. In PNG, as in other settings, the factors that hinder access to safe abortion also play a role in women accessing health services for post abortion care, following an unsafe abortion [2, 42]. This study highlights that women fear repercussions from both health care workers and the legal framework surrounding abortion practices, findings reflected in other settings [2, 7]. Also noted through this study was the use by health care workers of the term “criminal abortion” to describe an induced abortion, perhaps highlighting the attitude of health care workers towards abortion in this setting. The fear of presenting for hospital level care led to delays in seeking assistance, both from family members and the formal health systems with many women only seeking health care when they felt their lives were at risk.

As described elsewhere, where induced abortion is restricted or inaccessible, identifying and reporting abortion is difficult [2, 11]. Even in settings where abortion is legal, it may be under reported or reported as spontaneous, especially when it has occurred outside of a legal framework [2]. While most women reported interference with their pregnancy at their admission consultation, some only identified as an induced abortion during their semi structured interview.

This study describes only women presenting for hospital level care. One limitation of such a hospital based study is that it only captures those women able to access a health facility or with a morbidity so severe that they present for hospital level care. Frequently the young, the poor and those living in the more remote areas are at greatest risk of not reaching health

services for post abortion care [7, 42, 43]. In addition, women experiencing a complete abortion, those with less severe morbidity, women unable to reach a health facility and those who undertake an abortion resulting in a maternal death remain unaccounted for in the community, therefore never forming part of any official statistics. Only capturing those who reach the hospital only represent a sub-population of all women in this setting undertaking an induced abortion.

CONCLUSION

This descriptive study provides insight into an area of maternal health not previously explored in PNG. As in many developing countries, women in PNG are vulnerable to unplanned pregnancies. In the absence of adequate family planning services, particularly for the young and those still in education, women are resorting to unsafe means to end an unwanted pregnancy. In addition their lives are put further at risk from delayed health care seeking due to fear of repercussions from both their family, health care workers and the legal framework surrounding abortion. Review of and improved access to safe abortion services together with and dissemination of the legality of induced abortion in PNG could help in reducing the burden of maternal mortality and morbidity from unsafe, induced abortions in this setting.

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CHAPTER 6

EXPLORING WOMEN’S PERSPECTIVES OF ACCESS TO CARE DURING PREGNANCY AND CHILDBIRTH: A QUALITATIVE STUDY FROM RURAL PAPUA NEW GUINEA

CONTEXT

Reasons behind the data relating to lack of antenatal care and skilled birth attendance are not completely clear and the experiences and views of women who live in rural villages and remain at home to give birth without skilled attendance remain largely unknown. It is unusual for women’s views in these settings to be explored in relation to the reasons for their decisions. We undertook a qualitative study to explore women’s perceptions and experiences of pregnancy and childbirth in a rural community in Papua New Guinea and to identify strategies to improve outcomes for women and their newborn infants.

Chapter Six is the first of two papers relating to pregnancy and childbirth in a rural, Eastern Highlands setting. In this chapter I describe women’s experiences of access to care at local health facilities.

This paper relates to Objective Two: To explore women’s choices and decisions regarding place of birth; and to explore perceptions, beliefs and health seeking behaviour surrounding pregnancy, childbirth and the postpartum period in Upper Bena, Unggai Bena District, Eastern Highlands Province, Papua New Guinea.

PUBLICATION DETAILS

This work was published in *Midwifery* as follows:

Vallely LM; Homiehombo P; Kelly-Hanku A; Vallely A; Homer CSE; Whittaker A. **Exploring women’s perspectives of access to care during pregnancy and childbirth: A qualitative study from rural Papua New Guinea.** *Midwifery* 29 (2013) 1222–1229

ABSTRACT

BACKGROUND

A number of factors can influence the decision to seek and access care during childbirth, including decision making, cultural and customary beliefs, geographical, structural and health facility barriers and economic and social constraints. In PNG less than half of all pregnant women have a supervised, health facility birth. Reasons relating to lack supervised births are not completely clear and the experiences and views of women who live in rural villages and remain at home to give birth without skilled attendance remain largely unknown.

METHODS

Through a qualitative study comprising focus group discussions (FGDs) and in depth interviews in a rural community in Eastern Highlands Province, PNG, we explored women's perceptions and experiences of pregnancy and childbirth. Fifty one women participated in seven focus group discussions. In depth interviews were undertaken with 21 women, including women recruited at the antenatal clinic, women purposively selected in the community and three key informants in the community.

FINDINGS

The majority of women mentioned the benefits of receiving antenatal care at the health facility and the importance of a supervised, facility birth. Women faced numerous challenges with regards to accessing these services, including geographical, financial and language barriers. Cultural and customary beliefs surrounding childbirth and lack of decision making powers also impacted on whether women had a supervised birth.

CONCLUSION

Distance, terrain and transport as well as decision making processes and customary beliefs influenced whether a woman did or did not reach a health facility to give birth. While the wider issue of availability and location of health services and health system strengthening is addressed shorter term, community based interventions could be of benefit. These interventions should include safe motherhood and birth preparedness messages disseminated to women, men and key family and community members.

INTRODUCTION

The majority of the 287,000 maternal deaths that take place every year occur in developing countries [1]. Rural areas in the poorest and most remote locations bear the burden of these deaths [2]. Lack of access to and low uptake of skilled attendance during childbirth is a major factor associated with maternal deaths [3]. Globally, only 62% of women giving birth do so with a skilled attendant [4]. In the least developed countries, the rate is as low as 39% [4].

Lack of skilled assistance during childbirth may not necessarily be a decision of choice but one of circumstances. Delay or an inability to access care is a major factor. In their conceptual framework, Thaddeus and Maine [5] described three delays in women accessing maternity care: delay in the decision to seek care; delay in the arrival at a health facility and delay in the provision of adequate care. Within each of these delays many contributing factors further hinder access to skilled care, including lack of decision making powers, lack of transport and lack of supplies at the facility [5].

In many developing countries, the decision to seek and access care frequently rests with family members, including the husband, mother, mother-in-law and grandmother and, in some situations, traditional birth attendants and village-based health care workers [6-12]. Other influencing factors include cultural and customary beliefs, geographical, structural and health facility barriers as well as economic and social constraints [11].

Papua New Guinea (PNG), a developing country [13] within the Asia-Pacific region is rich in geography, social and cultural and linguistic diversity. The majority (87%) of the 7.2 million people in PNG reside in rural areas. Infrastructure in PNG is poor and the past several decades has seen a decline in health system performance, in terms of both coverage and quality and in many areas rural health services continue to weaken [14].

The maternal mortality ratio (MMR) in PNG is the second highest in the Asia-Pacific Region and one of the highest in the world [15] with an estimated 733 maternal deaths per 100,000 live-births. Only 37 to 53% of women receive skilled care during childbirth [15, 16]. Women living in rural areas are more likely than their urban counterparts to give birth without skilled attendance. Despite this low uptake of supervised births, between 60% and 78% of women receive antenatal care from a health provider at least once during their pregnancy [14, 16].

Reasons behind the data relating to lack of antenatal care and skilled birth attendance are not completely clear and the experiences and views of women who live in rural villages and remain at home to give birth without skilled attendance remain largely unknown. It is unusual for women's views in these settings to be explored in relation to the reasons for their decisions. Therefore, we undertook a qualitative study to explore women's perceptions and experiences of pregnancy and childbirth in a rural community in PNG; and to identify strategies to improve outcomes for women and their newborn infants. This paper reports one aspect of the study, that is, access to care during pregnancy and childbirth.

METHODS

A qualitative, descriptive study [17] comprising focus group discussions (FGDs) and in depth interviews was undertaken. This study took place following a community participatory workshop designed to engage the community in the research and facilitate the study.

STUDY SITE

The Eastern Highlands Province (EHP) is the fourth most populous province in PNG with an estimated population of 538,227, predominately in rural areas. Maternal health indicators in the province are poor: 57% of women attend once for antenatal care; the supervised birth rate is 37% [14]. The majority of maternal deaths in the province are due to postpartum haemorrhage and consequences of induced abortions [18].

The study was undertaken in one of eight districts in the EHP. The rural area of Upper Bena in Unggai Bena district is a one hour drive from Goroka, the provincial capital. Access to the area is by an unsurfaced road frequently requiring grading due to heavy rain. Many villages are accessible only by bush tracks leading into mountains. Two government health facilities serve the area, Sigerehe health centre and Megabo day clinic. There are two village birth attendants (VBAs) practising in this area, each attended a two week training programme in 2004.

COMMUNITY PARTICIPATORY WORKSHOP

Up to one hundred women participated in a community participatory workshop, undertaken prior to the commencement of data collection in order to facilitate the study. Experienced Papua New Guinean social science researchers trained in participatory activities facilitated the group work. Women were eligible to participate regardless of their own personal experience of pregnancy or childbirth. Thirty women joined a group of older women (>35 years) and 60-70 women joined in the younger group (18-35 years). Women in the younger group were further split into seven groups of up to ten, ensuring all participants had the opportunity to fully participate. Using spider diagrams [19], women were asked to consider: *“What are the issues women face as a result of pregnancy and childbirth in your community”* (Figure 6.1). This method of data collection obtained a free flow of responses from women, allowing a quick and easy means of collecting data from all participants, whether they were

literate or illiterate. These responses enabled the research team to identify key themes and issues around pregnancy and childbirth and provided key terms and vocabulary for use in the FGDs and interviews (Figure 6.2).

Figure 6.1: Community workshop group, older women



FOCUS GROUP DISCUSSIONS

Women participating in the FGDs were grouped according to their age – older women (>35 years) and younger women (18-35 years). Women unsure of their age were invited to participate in whichever group they felt most comfortable. Seven FGDs with a total of 51 women took place in three different locations in the Upper Bena area. There were three groups of older women, three groups of younger women and one group of village midwives, that is, untrained women who have assisted women to give birth in the village. Women participating in the FGDs were identified during the community participatory workshop or were recruited directly from the community.

IN DEPTH INTERVIEWS

Women aged over 18 years were eligible to participate in the in depth interviews. In depth interviews were undertaken with 21 women. Eleven women were recruited at the antenatal clinic following a brief information session and seven were identified during the community participatory workshop and FGDs, thus were purposively selected. The remaining three women were key informants from the community. Two had experience of assisting mothers to give birth in the community and one was a village birth attendant (VBA).

Each of the (11) women recruited at the antenatal clinic were asked if they would be willing to meet with the research nurse again after they had given birth. All women agreed and after confirming they had access to a mobile phone were provided with phone credit, and asked to inform the research nurse after giving birth. Only five women were followed up postnatally. All postnatal interviews were undertaken in the community, except for one which took place at Goroka Hospital.

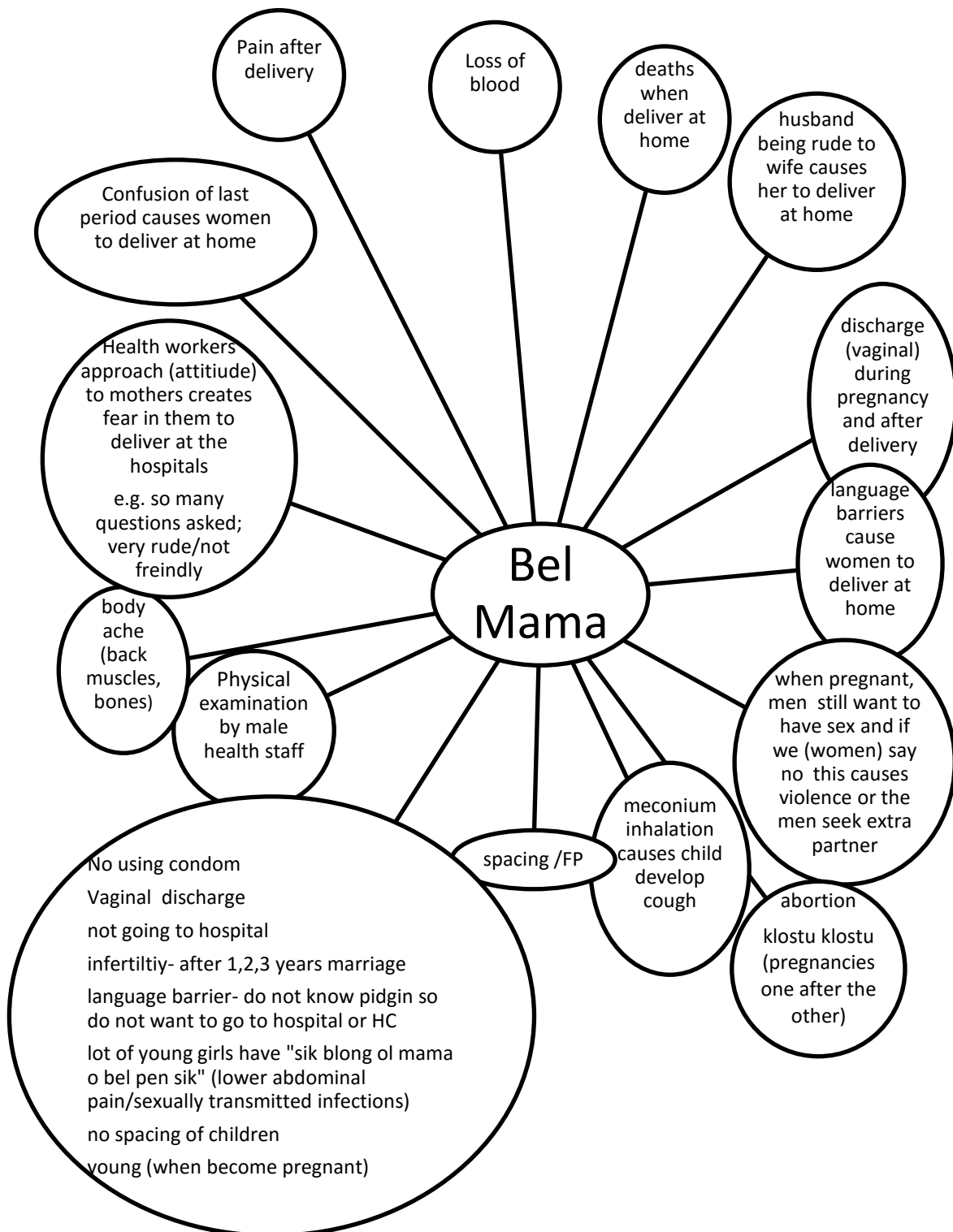
DATA COLLECTION

The community participatory workshop and FGDs took place primarily in pidgin, one of three main languages used in PNG. When tok-ples (local language, in this case, Bena language) was used translation to pidgin was undertaken by one locally identified interpreter. All in depth interviews took place in pidgin, with the exception of one which was conducted in tok-ples, for whom a local village health volunteer assisted as a translator.

Interview guides, developed following the community workshop, provided a series of broad questions allowing the researcher to explore and probe throughout the FGDs (Appendix 5) and in-depth interviews (Appendix 6) [20].

A trained field researcher and trained research midwife were responsible for the FGDs; the same midwife undertook all the in-depth interviews. The FGDs took place in a private location in the village. Interviews were undertaken in a private office space at the health facility or in a private location close to the woman's home. One postnatal interview took place at the hospital. FGDs and in-depth interviews lasted between 40 minutes and two hours.

Figure 6.2: Findings from community workshop, younger women



The FGDs and in-depth interviews sought to identify women's experiences relating to health seeking behaviour and problems faced during pregnancy and childbirth. For those enrolled at the antenatal clinic, women were asked about their plans for place of childbirth. This information was used during the postnatal follow up interview.

Data collection took place over a six month period between November 2011 and April 2012. All FGDs and in-depth interviews were digitally recorded with the consent of participants. Interviews were transcribed verbatim and translated into English by members of the sexual and reproductive health research team at the PNGIMR. Prior to data entry and management, all transcripts were cross-checked by one member of the study team.

DATA ANALYSIS

The data were discussed among members of the research team who had participated in the field work and data collection. Responses and general observations from the field were discussed for meaning and local interpretation, especially for local terms and pidgin.

Through a qualitative content analysis approach [17], all transcripts were reviewed and an initial coding framework developed. Throughout the coding process this framework was developed and modified as new themes emerged. During the course of analysis, coding categories were further refined and merged into themes and sub-themes. NVIVO v.9 was used for data management.

ETHICAL CONSIDERATIONS

This research was approved by the Institutional Review Board of the PNG Institute of Medical Research, the Medical Research Advisory Committee, PNG and by the University of Queensland Human Ethics Committee in Australia. Following informed consent procedures, verbal consent was obtained for those involved in the FGDs; written consent was obtained for all women participating in the in depth interviews. To ensure anonymity all participants were assigned a pseudonym.

FINDINGS

The majority of women who participated in the FGDs and in-depth interviews had limited or no formal education. Socio-demographic details and obstetric history for the 18 women who participated in the in depth interviews are presented in Table 6.1. There were 59 pregnancies between the 18 women with 42 live births. Twelve women were pregnant at the time of interview; three had a history of miscarriage and two had experienced stillbirths (Table 6.1).

All women who participated in the in-depth interviews reported that they had received at least one antenatal assessment during each of their pregnancies. All but one of the 16 multiparous women had given birth in the community. Some had given birth both in the village and in health facilities. Village births took place either at the riverside or in a secluded area where they would not risk being seen by others, in keeping with traditional customs. Two women had given birth alone without any assistance.

Two of the five women followed up in the postnatal period had a supervised birth, despite all stating at the antenatal interview that they would seek one. One woman was primigravid, the other had previously experienced a hospital birth. Two of the remaining three women gave birth at the riverside. One went directly to the riverside when she was in labour, giving birth alone using clean birthing kit items provided by a health care worker at the antenatal clinic. One woman gave birth in the coffee garden supported by her mother and daughter-in-law. The third woman laboured overnight at the riverside, supported by her mother and gave birth before the ambulance arrived to transfer her to the health facility.

Women's reasons for accessing or not accessing health care during pregnancy and childbirth encompassed a broad range of reasons and perceptions from physical access to a facility to cultural and customary beliefs, as well as individual experiences. Many women, from both the FGDs and in depth interviews recognised the benefits of receiving antenatal care. They reported the importance of attending the antenatal clinic to ensure the well-being of the baby and to receive advice, health education and treatment during the pregnancy. Emma explained why she attended the antenatal clinic:

“They gave me medications, they ask if the baby is moving or not...They check the baby's head to see if he is positioned correctly... they helped me [with advice]...”

Emma, para 1

Table 6.1: Socio demographic details and obstetric history, in depth interviews (n=18)

Age	Marital status	Gravidity	Parity	Live births	Stillbirth/ Perinatal/ neonatal deaths	Infant/ child deaths	Age of last born child	Highest education level
25-29	M	4	3	2	1	1	N/A	Nil
N/K	M	5	3	3	0	0	6-10 years	Nil
30-34	M	6	4	4	0	1	10-15 years	Gr 1-3
25-29	M	3	2	1	1	0	N/A	Gr 4-6
20-24	M	2	1	0	1	0	N/A	Gr 7-10
20-24	M	2	1	1	-	0	2-4 years	Gr 4-6
20-24	M	1	0	-	-	-	N/A	Gr 1-3
25-29	M	1	0	-	-	-	N/A	Nil
25-29	M	2	1	1	0	0	1-2 years	Nil
20-24	M	2	1	1	0	0	1-2 years	Gr 4-6
30-34	M	4	4	4	0	0	1-2 years	Nil
20-24	Sep.	2	1	1	0	0	1-2 years	Gr 7-10
35-39	M	1	1	1	0	0	10-15 years	Nil
>44	M	9	9	9	N/K	3	> 15 years	Nil
25-29	M	4	4	4	0	0	1-2 years	Gr 4-6
35-39	M	4	4	4	0	0	4-6 years	N/K
25-29	M	3	3	3	0	0	6-10 years	Gr 7-10
20-24	M	3	2	2	0	0	1-2 years	Other

UNDERSTANDING THE BENEFITS OF ANTENATAL CARE

Despite the time and expense of transport, a few women in the in depth interviews were prepared to travel to the Provincial hospital to attend antenatal clinic as they felt they received better care. Lily mentioned:

“...we have a clinic here but I thought that I must go to Goroka hospital and get better medical help so I went to Goroka clinic and the bus fare from there to here is 4 kina but I pay and I come”. Lily, para 4.

RECOGNISING THE BENEFITS OF HEALTH FACILITY BIRTHS

Women with experience of assisting mothers to give birth in the village spoke of the importance of a supervised birth for nulliparous women. Rosy explained the difficulties women may face:

“when it’s your first time [and] you might have difficulties... there are no doctors and nurses [in the village] so you must go to the hospital. Sometimes when it’s your first child you can be in labour for a long time, the doctor [nurse] must be close to you to help you, and sometimes when the baby is stuck it can be difficult, you might die together with the child...” Rosy, village midwife.

The benefits of a health facility birth were also emphasised by women in the in depth interviews. Some women described past experiences which were managed by the health care workers, ensuring a safe outcome for both mother and baby. This influenced their decision to attend a health facility in future births, as explained by Pele:

“...either myself or my baby could have died but I was lucky I came to the bigger hospital where I delivered safely my child and saved myself...if I come to the hospital and give birth it will be better....” Pele, para 2

Again, reflecting on previous experiences and perceptions of supervised, health facility births, many women saw the benefits of returning to a health facility to give birth. As Sefe explained:

“I did not go through any problems when I gave birth at the hospital, but it was difficult for me in the village so I went to the health facility and delivered”.

Sefe, para 4.

Others saw the benefit of a supervised birth during prolonged labour or if labour became too painful. As Nelly explained:

“I’m thinking of delivering at the hospital. I called my husband and said I go through so much pain delivering in the village so now I want to go to the hospital and deliver”. Nelly, para 4, gravida 6.

The importance of being close to the health facility for easy access for a supervised birth was also recognised, as Elly explained:

“...they will help me to deliver...I must give birth properly. If I deliver in the village I might face some problems....so I came and am staying nearby so that they will help me’. Elly, para 0.

CHALLENGES AND BARRIERS TO HEALTH FACILITY BIRTHS

TERRAIN AND TRANSPORT

Most participants in both FGDs and in depth interviews referred to the distances and terrain as major barriers to reaching a health facility, especially to give birth. Many women spoke of a preference to give birth in a facility but felt unable to reach the facility in time, consequently giving birth in the village or on the way to the facility. One of the village midwives said:

“....some walk to [the health centre] and if they don’t reach Sigerehe in time they give birth along the way then turn and go back, it’s hard to change....”. Linda, village midwife.

Failure to reach the facility was due to quick labours, the long distance from the village to the health facility and the weather associated with seasonal change. As Sara discussed, access

was more difficult in the wet season when roads could be washed out and rivers flooded and too high to cross:

“It’s quite a walking distance and I don’t want to walk so if there is low current [and I can pass through river] I will go to Goroka town”. Sara, para 1

In some situations, although women had planned to attend a health facility to give birth, the sudden onset of labour left them feeling unable to walk the distance or with insufficient time to seek transport resulting in a village birth. Lily described a delay in getting transport:

“ I thought of going to the hospital so my brother and our father came to get the vehicle at Sigerehe clinic..... they went to get the vehicle but when they got to the village it was too late I’d given birth already’. Lily, para 4

According to Rosy, a village midwife, reaching a health facility was particularly problematic during the night, especially when there were delays in finding transport:

“.....a lot of them when they give birth during the night it is difficult for them to go to the Aidpost [health facility]”. Rosy, village midwife.

Depending on the proximity of the village to the nearest health facility some women felt that while they were not situated far from a health facility and could easily reach it in time to give birth, others felt it was easier to take a vehicle into Goroka town to give birth at the hospital, rather than walk the distance to the health facility, despite the additional cost. Women’s perceptions of what was considered close by was highlighted by Pele, explaining that she lived nearby the health facility:

“Yes it’s near the village. If I start walking in the morning I should arrive by afternoon and sleep there and deliver and go back the next day’. Pele, para 2

A number of women in the in depth interviews spoke of a wish to reach the health facility but were discouraged from doing so because of the fear of giving birth on the way. Finding transport could be problematic and giving birth in a vehicle was feared due to cultural beliefs relating to blood associated with menstruation and childbirth which is understood to pollute.

This issue of pollution relates particularly to men who fear the contamination with genital blood which is believed to drain their virility and even poison them [21]. Having made a decision to attend the health facility, women still expressed apprehension about what would happen if they gave birth on the way, as Moka explains:

“...if it happens in the night then it’s going to be a problem because it’s quite difficult to come to the hospital at night to deliver. If we are still on the road on our way to the hospital and the water breaks then we definitely know we should be in the hospital... but what I worry about is what if I hadn’t gone yet and the water breaks because it’s easier [to give birth] in the hospital”. Moka, para 3

Lack of services, especially in the more remote areas and the ongoing issue of tribal fighting in the area were also mentioned as deterrents to reaching health facilities and receiving care during both pregnancy and childbirth.

FEAR OF HEALTH FACILITY STAFF

The attitude of health facility staff towards the women, including scolding women because they do not know their age or when their last menstrual period was and for not bringing along the appropriate items necessary for when they give birth (nappies, bucket) was mentioned during the FGDs and interviews with key informants. They explained how women felt ashamed and fearful of the health staff. These feelings extended to customary beliefs of women not being seen by or cared for by men, especially during the process of giving birth. They went onto mention that these attitudes were a deterrent to women attending health facilities for both antenatal care and for supervised birth. One village midwife explained:

“...a lot of them feel ashamed because he is a man, if there was a woman nurse available there that will be alright, they are villagers and most of them feel ashamed”.
Rosy, village midwife.

During the in depth interviews only one woman mentioned being afraid to attend the health facility because of the attitude of the staff. Her unfounded fear was that she would be refused a supervised birth without an antenatal record book. Having attended antenatal clinic in town, but losing her record book when crossing the river to her village, she was attending the local

antenatal clinic as a new attender. Despite being afraid of being scolded for losing her record book, she wanted to ensure she could attend to give birth after recently witnessing a friend who died while giving birth in the village. Afraid of giving birth in the village herself, Sara decided to attend the local antenatal clinic at Sigerehe.

“The river took the book [ante natal record] ...Even if she went to the hospital [to give birth] they would have said no to serve her because they would want to see the book so she stayed back and died.... I thought I too am in the village so I must start going to the clinic now”. Sara, para 1

LANGUAGE BARRIERS

The issue of language as a barrier to attending the health facility was mentioned by two of the focus groups and one of the women included in the in depth interviews. While women not from Upper Bena and therefore not able speak the local language could be isolated. For those who could not speak pidgin this could also be problematic:

“.... We are village mothers, many of us are not educated and so we find it difficult to speak pidgin with the workers so that’s why we don’t always go to the hospital”.

FGD, village midwives.

FINANCIAL CONSTRAINTS

The issue of finances related to a number of barriers in terms of both attending the antenatal clinic and for a facility birth and was mentioned by the majority of women. While an ambulance was available to bring women into the health facility during labour many women mentioned that the 20kina (US\$10) cost was prohibitive and beyond their means. Other community-based vehicles were also noted to be cost prohibitive, as Mimi explained:

“I was thinking of going to the hospital but we didn’t have any money and the vehicle we would need to get on to go to the hospital is a PMV [local bus]and the bed at the clinic that’s going to cost around 6 kina and the card is another 3 kina it all adds up to 10 kina. So the other mother said you are going to give birth [here] so that’ I stayed back and gave birth [at the riverside]”. Mimi, para 1.

In addition, at the facility, women are required to pay a bed fee, in addition to arriving at the facilities with specific baby and personal items e.g. nappies, bucket. One village midwife explained:

“It’s sad a lot of mothers have their babies in the village. Some because they don’t have enough money to buy nappies for the baby....when they come to the hospital the nurses and doctors will get angry at them. Sometimes they don’t have enough money for them to stay, sometimes problems with not having relatives in town or at Sigerehe if they want to come, they get scared to come that’s why they give birth in the village”. Linda, village midwife.

The availability of money to attend health facilities was also dependent on the season. For example, during the coffee season there is more money available in the family so bed fees and transport can more easily be met.

CUSTOMARY AND CULTURAL BELIEFS

There were strong cultural and customary beliefs surrounding childbirth. While a female family member (mother, aunty, sister) may assist a woman to give birth without any customary payment, when another woman assists a labouring mother customary practice dictates the need to provide a feast or gift for this non-family member. The village midwives explained how the system worked:

“... concerning making the birth assistants happy, the important thing in our custom you would not go and touch another person’s dirt [blood], you won’t touch it or get rid of it but the midwives [birth assistants] do that so to make them happy we must always cook food and give them, we at least spend around 500 kina to cook food to give those people who looked after us when we gave birth...because she was also wise, the baby should have died or the mother should have died but both of them are still alive....” FGD, village midwives

These costly practices are followed to ensure the assistant is cleansed of any contamination of blood or body fluids as a result of assisting the woman during childbirth. For women not

living nearby female biological relatives, a health facility birth or giving birth alone allowed them to avoid the expense of following this village custom. Pele explained her situation:

“I have no relatives on my side especially female to assist me...I have my in-laws [female] to help but if they assist me in delivering they’ll be asking me for compensation in the form of a feast or money...I got everything I need to assist me so I didn’t bother telling anyone I was ready to deliver. I delivered [alone] in my coffee garden.....” Pele, para 2.

All the participants in the FGDs discussed the importance of preparing a birthing house, a small customary house erected in a semi-secluded area where women would stay until all postpartum bleeding has stopped. Husbands were involved in the preparations:

“When we are pregnant and it is close to our due date, for us in the village...we tell our husbands and they prepare the small house and we prepare the firewood ourselves and also prepare everything for our baby’s’ to use after the baby is born... to cut the umbilical cord and such, we have ready the razor or scissors or bamboo sharpened and ready, and when the time comes to deliver the baby, we would not run around looking for these things, everything must be set....that’s what we do in the village, prepare the birthing house....”. FGD 5, younger women.

LACK OF DECISION MAKING AND POWER

Many of the women in the depth interviews spoke of the decision making process relating to seeking and reaching a health facility to give birth. Frequently the final decision was not the decision of the woman herself. Despite expressing a preference to give birth in a health facility, the decision often rested with the birth assistant or the woman’s husband. For example, Megan’s mother made the decision for her:

“I thought about going to the health centre but it was close to time of birthing and others told me that if I travel on a vehicle I will give birth there and it was not possible...my mother told me to stay back and not go to the health centre....” .

Megan, para 1.

For some women the decision to attend or not attend a health facility to give birth was due to family and community-related factors. For example, a number of multiparous women remained in the village to give birth because they had other children to take care of. Having given birth in the past without complications they did not see the need to attend a health facility.

“...and mothers who have more than one child, some of them have difficulty with bus fare, or reaching the hospital, hospital fees, it’s things like that cause them to say, “We know what to do, we can give birth”, so that’s why they stay back, it depends on each of them’. Rosy, village midwife

DISCUSSION

The majority of women who participated in this study had experienced giving birth in the community. Factors that related to whether women accessed care during pregnancy and childbirth included geographical access, social and cultural aspects and financial constraints. Although many women understood the advantages of antenatal care and supervised births, accessing these services was problematic.

In PNG, as in many developing countries, uptake of antenatal services is higher than for supervised births [14]. Utilisation of antenatal services for advice and to ensure all is well with the pregnancy is one of the major reasons for attending such services, in both PNG and elsewhere [12, 22].

Lack of access to health facilities due to distance between villages and the health facility, poor roads, lack and high cost of transport were identified as deterrents for not attending a health facility to give birth. These findings are similar to many developing countries, including Laos [23], Pakistan [24], Nigeria [25], Uganda [26], Tanzania [12], Burkina Faso [27] and Indonesia [28].

In some settings women choose not to access a health facility during labour for fear of giving birth on the way, especially when there is a sudden onset of labour, or when labour starts at night [6, 26, 29]. In these situations, reaching a health facility was inconvenient or impossible, leaving home or village births as the only choice [26, 29]. Our study identified similar perceptions among the women. Fear of giving birth on the way, lack of transport, poor condition of the roads were all mentioned as a reason to remain in the village to give birth. In addition, cultural and customary beliefs made women fear the social and economic repercussions if they gave birth by the roadside or in a public vehicle which could result in costly outlays to compensate for contamination of the vehicle.

Choosing to give birth at home may relate to a previous experience in which the woman experienced a quick, straight forward labour and childbirth [27, 30]. The choice may be due to the need to care for other children and need to complete household chores [8]. Both of these findings were mentioned by women in our study. In terms of convenience, traditional birth attendants in some settings may be preferable because of their availability [28, 30],

affordability [6] and because their presence allows for traditional customs and practices to be followed [27, 31].

While some women in our study mentioned the high costs associated with a health facility birth, other women reported their preference for such a supervised birth due to the high cost of paying compensation to non-blood related birth assistants in the village. While studies from other countries mention health facility costs, including delivery fees and medicines, in addition to transport fees as a deterrent to women attending for a supervised birth, women also mentioned that a village birth was more favorable because of the lower cost as well as the convenience of being in the home [30].

In our study, participants in the FGDs mentioned male health care workers were a deterrent to women attending for supervised births, which is similar to perceptions identified elsewhere [8, 27]. However, this was not reflected during the in depth interviews. On the contrary, women expressed a wish for a supervised, facility birth based on their perceptions of being well cared for previously.

In line with work from many other developing countries relating to women's lack of autonomy and decision making [7-11], our study identified that in some cases women were unable to access care even if they wanted to because the decision to seek care rested with other family members. In some situations our study identified this lack of access was due to traditional and cultural beliefs.

This paper offers an insight into factors that determine whether a woman reaches a health facility to give birth, from the women's perspectives. Because women were purposively selected or voluntarily came forward to participate in this study it could be argued that the findings may only reflect women who felt they had a story to tell, perhaps because they had a previous poor experience. However, this first community based study in PNG into women's perspectives of access to care during childbirth and the barriers they face provides important information for developing further work in this rural location.

CONCLUSION

In this rural community accessing a health facility to give birth was frequently not prioritised, a decision not necessarily that of the pregnant or birthing woman but of her carers at the time of childbirth. Geographical and transport barriers were recognised as key factors in reaching or not reaching a health facility, consequently health facility services for supervised births remained underutilised in this study location.

Many of the issues relating to access to the health facility in this rural location remain out of the direct control of the community. While the issue of availability and location of health facilities together with health system strengthening, especially in the more remote areas is addressed there is a need for other, shorter term community based factors such as safe motherhood education and birth preparedness that could be of benefit. Interventions need to include men and key family members- mothers, mother in laws as well as other women in the community. Improving birthing services in this rural location could improve outcomes for women and their newborn infants.

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CHAPTER 7

CHILDBIRTH IN A RURAL HIGHLANDS COMMUNITY IN PAPUA NEW GUINEA: A DESCRIPTIVE STUDY

CONTEXT

In Papua New Guinea the experiences and views of why women living in rural settings, and stay in the community to give birth remains largely unknown. A qualitative study was undertaken to explore women's and men's perceptions and experiences of pregnancy and childbirth in a rural community in Papua New Guinea, and to identify strategies to improve outcomes for women and their newborn infants.

Chapter Seven is the second of two papers relating to pregnancy and childbirth in a rural, Eastern Highlands setting. In this chapter I describe women's experiences of giving birth in the community.

This paper relates to Objective Two: To explore women's choices and decisions regarding place of birth; and to explore perceptions, beliefs and health seeking behaviour surrounding pregnancy, childbirth and the postpartum period in Upper Bena, Unggai Bena District, Eastern Highlands Province, Papua New Guinea.

PUBLICATION DETAILS

This work was published in *Midwifery*:

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ABSTRACT

BACKGROUND

In Papua New Guinea the remoteness and geographical difficulties can make access to skilled health care during childbirth difficult. As part of a wider study exploring women's experiences of pregnancy and childbirth in a rural Eastern Highlands community we described access to care during pregnancy and childbirth from women's perspectives. In this paper we describe women's experiences of childbirth in the community setting; and cultural beliefs and practices that influence practices during childbirth.

METHODS

Through a qualitative study, comprising focus group discussions and in depth interviews, in a rural community in the Eastern Highlands Province we explored women's and men's experiences, beliefs and practices surrounding childbirth. Fifty one women and 26 men participated in 11 focus group discussions. Key informant and in depth interviews were undertaken with 21 women and five men.

FINDINGS

Both women and men recognised the importance of health facility births, linking village births with maternal and newborn deaths. Despite this, many women chose to give birth in the community in circumstances influenced by cultural and customary beliefs and practices. Women giving birth in the community frequently gave birth in an isolated location. Traditional beliefs surrounding reasons for difficult births, including spiritual beliefs were reported along with the use of traditional methods used to help prolonged and difficult births.

CONCLUSION

While the importance of health facility births is recognised in this rural community many women continue to give birth in the village. Identifying and understanding local customs, beliefs and practices, particularly those that may be harmful to women and their newborn infants, is critical to the development of locally-appropriate community-based strategies for improving maternal and infant health in rural communities in Papua New Guinea and other resource-limited, high burden settings.

INTRODUCTION

Globally 34% of women give birth without the support of a skilled attendant [1]. Lack of supervision during childbirth is a leading factor associated with maternal deaths [2]. Reasons for lack of supervision during childbirth are widely documented and include decision making, inadequate availability and uptake of health care, geographical, structural and health facility barriers, economic and social constraints and cultural and customary beliefs [3-9].

Papua New Guinea (PNG) is a developing country situated in the Pacific region. It is a country rich in geography, social, cultural and linguistic diversity with over 800 languages spoken by the 7.2 million inhabitants. The majority of Papua New Guineans (87%) live in rural areas.

Papua New Guinea has one of the highest maternal mortality ratios (MMR) in the world, with an estimated 594 maternal deaths per 100,000 live-births [10]. Only 32% of women receive skilled care during childbirth [11]. Women living in rural areas are more likely to give birth at home than those living in urban areas [12]. The most recent demographic health survey indicates that nearly one-third of women give birth in the village, assisted by a female relative; and 7% give birth alone [13]. The remoteness and geographical difficulties of the locations of many communities can make access to and uptake and availability of professional skilled health care during pregnancy and childbirth difficult. Cultural and traditional beliefs and practices also impact on seeking and receiving care [14-16].

As part of a wider study exploring women's experiences of pregnancy and childbirth in a rural Eastern Highlands community we described access to care during pregnancy and childbirth from women's perspectives [15]. However, experiences and practices surrounding childbirth in this community remain largely unexplored. The overall aim of this paper is to describe women's experiences of childbirth in the community setting; and to describe cultural beliefs and practices that influence practices during childbirth.

METHODS

A qualitative, descriptive study [17] was undertaken, comprising focus group discussions (FGDs), key informant and in depth interviews. The study took place following a community participatory workshop designed to engage the community in the research and facilitate the study [15].

STUDY SITE

The Eastern Highlands Province (EHP) is the fourth most populous province in PNG with an estimated population of 600,000, living predominately in rural areas. Maternal health indicators in the province are poor: 74% of women attend once for antenatal care and 44% give birth in a health facility [11]. There are an estimated 150 maternal deaths every year in the province [18]; postpartum haemorrhage and sepsis are the leading causes of maternal mortality [18].

This study was undertaken in one of eight districts in the province. Upper Bena, in rural Unggai Bena District, is an hour's drive from Goroka, the provincial capital. Access to the area is by an unsurfaced road which becomes washed away or impassable during heavy rain. Many villages are accessible only by bush tracks leading into steep mountain areas. Four government health facilities serve the area, and are situated along the roadside; access to these facilities frequently involves crossing mountain ranges and rivers from the villages. Distances from the villages to the road and onto a health facility varies from a few minutes, up to 6 or 8 hours walk. While an ambulance is available, as are other private motor vehicles, access to the more remote villages is dependent on the weather and state of the road. In addition, local tribal fighting in the area can often mean the road is blocked, denying access to services, such as a health facility.

Each of the four health facilities offer a range of curative and preventative health care, including antenatal and well-baby clinics. As in many parts of PNG nurses are trained to carry out routine antenatal care and manage normal births. Antenatal clinics are undertaken on a weekly basis at each of the health facilities, with support from one midwife, who is the officer in charge at one health facility. Two of the four facilities are equipped to manage normal births.

SAMPLE AND RECRUITMENT

All women and men in the community were eligible to participate in this study. The majority of participants volunteered to join the study, a few were purposively selected following the community participatory workshop or directly from the community. Key informants were identified based on their knowledge or experience of assisting women giving birth in the community. All those purposively selected by the research team to join the study agreed to participate. At the antenatal clinic women were invited to join the study following an explanation of what their participation would mean.

DATA COLLECTION

Interview guides (Appendices 5-7), developed following the community workshop, provided a series of broad questions allowing the researcher to explore and probe throughout FGDs, key informant and in-depth interviews [19]. FGDs were used to identify problems that women experience as a result of pregnancy and childbirth and to explore traditional and customary beliefs surrounding childbirth. Key informant and in depth interviews were undertaken to investigate personal experiences and perspectives relating to childbirth in the community.

Many of the FGDs took place in the local language or *tok-ples*, in this case Bena language, a few took place in *tok-pisin*, one of three main languages used in PNG. Each FGD was facilitated by trained and experienced researchers from the research institute; men facilitated the men's groups and women facilitated the women's groups.

Key informant and in depth interviews took place primarily in *tok-pisin*; the exceptions were two key informant interviews, undertaken in English, and one in depth interview conducted in *tok-ples*, for whom a local village health volunteer assisted as an interpreter. All interview guides were piloted and reviewed prior to the start of the study.

All FGDs and interviews were undertaken or overseen by one trained and experienced research midwife. FGDs, key informant and in depth interviews were undertaken in a private location in the community or in a private office space at the health facility. FGDs and interviews lasted between 40 minutes and two hours.

Data collection took place over a six month period between November 2011 and April 2012. All FGDs and interviews were digitally audio-recorded with the consent of participants.

Interviews were transcribed verbatim and translated into English by members of the sexual and reproductive health research team at the research institute. Prior to data entry and management, transcripts were cross-checked by one member of the study team. To ensure anonymity, all those participating in the key informant and in depth interviews were assigned a pseudonym at the time of transcription.

Eleven FGDs with 51 women and 26 men took place in three different villages. Women and men participating were grouped according to gender and age (Figure 7.1). Participants unsure of their age were invited to participate in which ever group they felt most comfortable. One group of older women consisted of women referring to themselves as “village midwives”. These women considered themselves “village midwives’ based on their experience of assisting mothers giving birth in the community. They had received no formal training and while their experience varied many had assisted at no more than a few births. In keeping with tradition, all had given birth themselves.

In depth interviews were undertaken with 18 women from 14 different villages, including the three villages where the FGDs took place. Eleven women were recruited at the antenatal clinic and seven were purposively selected following the community FGDs (Figure 7.1).

Three women and five men participated in the key informant interviews (Figure 7.1). The three women were interviewed based on their experience of assisting mothers to give birth in the community; one had received a short training programme to become a traditional birth attendant; two were considered “village midwives”. The five men were interviewed based on their knowledge and experience with supporting mothers who give birth in the community; two were health care workers; one was an ambulance driver and two were from the community - one was trained as a traditional birth attendant and the other supports his wife when she assists women giving birth in the village.

Throughout the field work observations were made and field notes taken to document information that could provide additional insight relating to maternal health at both the health facility and in the community.

Figure 7.1: FGDs, Key Informant and in depth interviews

Interview Type	Number of interviews	Participants per group	Total Number of Participants
FGDs	11	-	77
FGD Younger men (18-35 years)	2	7, 8	15
FGD Older men (>35 years)	2	3, 8	11
FGD Younger women (18-35 years)	3	7, 10, 4	21
FGD Older women (>35 years)	3	10, 8, 8	26
FGD Village “midwives”	1	4	4
Key Informant Interviews	8	-	-
Women	3	-	-
Men	5	-	-
In depth interviews	18	-	-
Women recruited at ANC	11	-	-
Women in community	7	-	-

DATA ANALYSIS

All data, including FGDs, key informant and in depth interviews were discussed among members of the research team who had participated in the field work and data collection. Responses and general observations from the field were discussed for meaning and local interpretation, especially for local terms and pidgin.

Through a qualitative content analysis approach [17], all transcripts were reviewed and an initial coding framework developed by the principle investigator and lead author. Throughout the coding process the framework was developed and modified as new themes emerged. During the course of analysis, coding categories were further refined and merged into themes

and sub-themes. NVivo v.9 (QSL International 2010), a qualitative software data package was used for data management.

ETHICAL CONSIDERATIONS

This research was approved by the Institutional Review Board of the PNG Institute of Medical Research; the Medical Research Advisory Committee, PNG; and by the University of Queensland Human Research Ethics Committee in Australia. Following informed consent procedures, verbal consent was obtained from all those who participated in FGDs. Written consent was obtained for all those participating in the in-depth interviews and key informant interviews.

FINDINGS

Of the 18 women participating in the in depth interviews, all had given birth at least once (three women had given birth only once; one had given birth nine times). There were 42 live births and two stillbirths reported among the 18 women; 16 women had experienced giving birth in the community. All but one woman were married.

A range of knowledge, experiences, beliefs and practices surrounding childbirth were identified. Much of the knowledge among the men and women was gained through observations and experience; the practices followed were linked to strong cultural and customary beliefs.

PERSPECTIVES AND KNOWLEDGE OF CHILDBIRTH

Both men and women described complications and difficulties that could occur during village births, mentioning long labour, retained placenta and heavy bleeding, and recognised the importance of women giving birth at a health facility. Men linked village births with maternal and newborn deaths, as highlighted by one older man in a FGD:

“Delivering in the village is difficult and the mother will also find it difficult and the baby may die or the mother may die...it would be better if they go to the hospital”.

As in many rural areas in PNG, the reality of reaching a health facility to give birth can be particularly difficult. Financial barriers, geographical and logistical constraints and the decision making process for seeking health care were all mentioned as barriers to a woman reaching a health facility to give birth. Younger men articulated this in a FGD:

“.... some will cross the river to go to the hospital [but] where the river took away the bridge, they find it difficult so they stay back...When the mothers are about to give birth their husbands usually send them to the hospital, when we have money, and when there is no money, they give birth in the village.... When the husband makes the decision for his wife to go to the hospital, then she will go to the hospital and if he doesn't then she will stay back in the village and deliver the baby...”.

Both men and women explained why long labours and difficult births could occur. Many of the explanations related to traditional beliefs and are discussed below, however, women too

young (under-18 years) and those considered “old” (aged over 35) were thought to be at increased risk, as described by one older woman in a FGD:

“She [older woman] will find it difficult to give birth because she’s weak, because her physical strength is decreasing that’s why she will be weak to give birth and even to look after [the child] will be difficult for her.The woman who is too young, not at the age of having baby”.

Women recognised that giving birth to a big baby could be difficult for some, especially if the mother was young, describing how big babies could become stuck in the birth canal and result in a newborn death. During a FGD one older woman described her experience:

“...there was a young girl who delivered her baby.... (the head) came out and she was not able to give birth so I got a piece of cloth held it on the baby’s head and pulled it out....”

Women made the association between long and difficult labours and stillbirths. In a FGD one older woman explained that labour was difficult because the baby had already died (in utero), when it is possible that the delay in labour led to the stillbirth:

“The baby must be dead inside that’s why it is doing that [taking so long to be born]”.

Retained placenta and excessive bleeding was recognised by men and women as a serious and dangerous problem in this setting. Women described how they would squeeze and rub their abdomen to try and release the placenta and recognised the importance of needing to attend the health facility for assistance, especially when the retained placenta was coupled with heavy bleeding, as described by younger women in a FGD:

“If the placenta is not coming out, they used to say “squeeze your tummy,” or you push it will come...and sometimes they remove it, when it is hard the only thought they have is the hospital, so they are quick and take her to the hospital”.

CUSTOMARY BELIEFS AND PRACTICES

MENSTRUAL AND POSTPARTUM BLOOD

Both women and men in this community discussed beliefs surrounding contact with vaginal blood. Coming into contact with such blood was thought to cause sickness, poor health and even premature death. In view of this belief, menstruating and postpartum women are frequently secluded, as highlighted by Rosy, a traditional birth attendant:

“It is our custom...[if] they just gave birth to a newborn baby [they] lost blood..., so it’s normal for all the women, when we have our period we live separately, so it’s the same when they go to deliver their babies, they lose blood.....they must stay away from the rest of family, away from the fathers and children, they must keep their distance... that’s the way of our custom..., if we live and eat with them they [the family] will get sick, that’s why we separate”.

In addition to living separately, menstruating and postpartum women are not allowed to prepare or offer food to the family, tend to crops in the garden or collect water from the river, for fear they may contaminate food or the water source. During a key informant interview Jack, the husband of a village midwife described the situation:

“...when a woman has her period she must not offer us food, she must keep to herself, remain in her [menstrual] house...if she offers food to us, we’ll get sick or lose weight, things like that... It’s the same when a woman gives birth...”.

MEN’S INVOLVEMENT IN PREPARING FOR THE BIRTH

Many of the informants discussed preparations for the birth of the infant. Men and women spoke of the husband’s involvement in preparing for the birth, ensuring a birth hut was ready, firewood was chopped and essential items required for the newborn baby were prepared. Aside from assisting in preparing the birth hut, men typically have no involvement in supporting their wives during childbirth, a practice dictated by custom and explained by Jack, a key informant:

“... in relation to them giving birth, men are not allowed to go close to them, custom is very strong. [We] build little houses that’s all we do, because, if there are men around and if we go and help...it will look bad...but the doctor [male health care worker] he can go and do that”.

SECLUSION DURING CHILDBIRTH

The importance of births taking place in secluded locations was mentioned by all informants in both the FGD and individual interviews. This could be a coffee garden (a plot of land where coffee is grown and harvested) or the riverside, the importance of being hidden from others being paramount. A number of informants described childbirth as being secretive; women would feel ashamed if they were seen while giving birth, as discussed by the village midwives:

“.... when mothers are about to give birth in the village the men will not be there to watch because it is shameful for the women that’s why they hide and have their babies...”

Many of the women spoke of giving birth in a secluded area at the riverside. In addition to ensuring their privacy, women were able to easily wash following childbirth, ridding themselves of the unclean blood associated with childbirth. In an in depth interview, Lily described her reason for giving birth at the riverside:

“In my opinion to give birth in the village is not proper so I thought it was better if I go to the river and give birth so I could bathe and clean myself up before I come back the village that’s why I went there to deliver the baby.”

The customary birth hut, typically referred to as the *“liklik haus”* (small house), was erected in a semi-secluded area, often on the edge of the village (Figure 7.2a and 7.2b). The use of birth huts was mentioned by many of the men and women, and discussed at some length by the village midwives:

“that’s our custom when we are having our period or when we give birth.... We stay in that little house until this dirty... in the past they said dirt but currently its different but we are still following our custom, so we stay in the little house or go to the river or at the back of the house or put a canvas around under the house, they leave us there until we are dry, our period or that dirty blood dries up and then we go into the house and sleep or go to the garden”

Despite the references to the birth huts by women, one group of older men mentioned that the use of the birth huts was a thing of the past; however they did describe the importance of a secluded location to give birth:

“There are only a few still there [birth huts].... but mostly [women] go where men don't go, such as caves, [behind the] bark [trunk] of a big tree or a land slide site, where you [men] will not go. These are special places where babies are delivered’.

Through the discussions surrounding birth huts there was consensus that typically, they are used during the postpartum period until the woman is able to return to her family home, as one group of older women in a FGD describe:

“...we come and stay inside the small house for 1 and a half months and then we come to the village and touch and prepare food”.

Because of its association with vaginal blood, appropriate disposal of the placenta was important and typically the responsibility of the postpartum mother. In keeping with the belief that the placenta could cause poor health through contamination, women described burying the placenta, throwing it in the river or burning it, as described by one group of younger women:

“... they usually dig the ground up and bury it but now a days we take it and discard it [afterbirth] into the river or we burn it in the fire”.

In keeping with the custom of seclusion and isolation, following childbirth women bathe in the river and then enter the birth hut for a period of seclusion. The period of seclusion varied, from a few days to a week or up to one month, the importance being that all postpartum bleeding had to have ceased before they re-entered the family home. During her in depth interview Gaga explained her time in the birth hut:

“...when I was in the little house, my in-laws cooked and brought the food to me.... I was in the little house for 2 ½ months ... I have many sons [nephews from husbands side of the family] so [if I] cook food and give them, they might have cough or flu and they will get cross with me, they will say you just gave birth and you cooked and gave the children, they will get cross so I just stayed. That's their traditional custom”.

Figure 7.2a: Birthing House on the edge of the village, Eastern Highlands Province



Figure 2b: Inside a Birthing Hut, Eastern Highlands Province



Some of the key informants described changes to some of these cultural practices noting the shift in practice with the influence of Christianity. They went on to describe how through the influence of the church they have challenged some of their traditional beliefs, as Jack mentioned during his key informant interview:

“...the custom ways are still practised strongly according to stories told by our fathers and mothers, which discourage a lot of our young people..... according to custom when a girl gets her menstruation, she is not allowed to handle food, not to go gardening, not allowed to collect firewood, not allowed to walk in and out of the house in the presence of a man....and when they have babies, the babies must be two or three months before they can handle food or walk in and out of the house in the presence of a man... now I preach the ‘Good News’ [Christianity] and tell them this is not right, they are God’s creation and what we do makes them suffer and from there a lot of problems arise when we do that, from my preaching I stopped some of the customs ways practised in the village...”

While the belief that contamination with such blood is of greatest danger to men, women assisting others during childbirth are also considered to be at risk of contamination, particularly when the assistant is a non-biological female relative, as the older women described:

“If our mother [in law] and sister in law, if they looked after us they held [touched] our waste so we cook and give them [an offering]so we do this and we make them happy [acknowledge them], it’s our custom in the village.

For women not living nearby their female relatives the customary practice of acknowledging and thanking non-biological female relatives, in order to cleanse them of any contamination, could make the difference between women seeking assistance during childbirth or giving birth alone. During an in depth interview, Pele described her birth experience as a woman married into the community with no support during childbirth (Figure 7.3).

PROLONGED LABOUR AND DIFFICULT BIRTHS

In a setting with strong customs and traditions, reasons for difficult births, along with customary practices to remedy them were frequently discussed by both the men and women. Disputes between the labouring woman and her husband, or grudges against the labouring

woman, frequently linked to social transgressions, were said to cause prolonged labour or a difficult birth. *Sanguma*, that is spiritual powers that can cause harm in individuals, were also reported as a cause for difficult births. In such circumstances, customs and rituals usually involving the husband or the woman suspected of causing the *sanguma* had to be followed.

During her in depth interview, Eva described a number of rituals from her community that could be used to release *Sanguma*:

“... some of us that stay in the village [to give birth], it is difficult because the spirits are thereWhen things like that happen [difficult labour], they [the husband and his family] buy pigs [create a feast] and bring witchcraft people in to help release the Sanguma ...they mix it [the food] with ginger and offer it to the spirits...When they do that it helps the mother to deliver. [Other times] they take water containers around them (in a ritualistic manner). They [the labouring woman] open their mouth and drink and then they (the labouring woman) tell them about what they did previously [confess] that could have hurt those possessed women in some way, they take the water container to the [possessed] women to touch and take it back to the pregnant women to drink or they pour over the head and they deliver ...”

Men also described their role in assisting with difficult labour and births. Husbands would be called by the attending relatives to help appease any grudges from family members that may be preventing the baby from being born, as the older men described in their focus group:

“When the mother is in labour and it’s time for her to deliver but she does not, some mothers who are helping...they usually come to the father (woman’s husband) and ask [for help]. They [the husbands] get bamboo and if the family members are not happy with her [the labouring mother], they touch this bamboo and when it’s cooked over a fire and it pops then the baby comes out. Another way is that when it’s prolonged, the father of the baby says some magic words to the ginger and gives it to the pregnant women and when she chews the ginger, the baby comes out”.

Figure 7.3: Pele's story

Myself, I took the broken [old] mattress and went down to the riverside. I saw the trunk of a coffee tree that I used as support to cling to and push. When I was ready I moved the stones to the side and made a bed [clear area on the floor] for the baby. At one o'clock the baby's water broke and the baby came and I started delivering her. When I felt the head was coming down I was holding strong onto a coffee tree nearby to support myself and started pushing and pushing and she came. At that time she came my entire joint become loose but I closed my mouth and gritted my teeth (clamped down) and I stayed and then baby's head popped out so I held her head and sat down. I started pushing and she came out and slipped right onto the bed. So when she slipped on this bed I quickly lifted her. I cut her umbilical cord and tied the cord and wrapped her in a napkin, then I put her to one side.

Then I removed the afterbirth (My [female] in laws) told me not to lift it [the placenta] up and throw into the big river. [They said] the fish and the bad insects might come and give problem to the baby. I brought the little spade down to the river. So I dug the ground - just like digging a grave I dug the ground. Then I tied up the placenta inside the bundle of skirt and laplap I used to sit on and give birth to the baby, plus other used clothes that I used for delivery, I wrapped them up and buried them.

Then I washed myself and bathed the baby. I took her and we went up to the house but my husband said no (for baby and me to stay home) that it is custom that both of us were not allowed to stay in the home and he took us to the garden house and left us there to stay. He took us and left both of us...it was Saturday I gave birth and stayed there. Monday I stayed, Tuesday, Wednesday I stayed and my father in law sent the word for both of us to return and stay at home. That's how I got my little girl.

I come from an isolated community in Okapa (Eastern Highlands Province). We don't have customs like they have here. If I deliver or my sister delivers we cook and eat together, hold our children and stay together. [But here] I went into the small house after delivery - they brought a plate of food served on a leaf and called and when I put my head out they gave me the plate (leaf) of food and I thought how dare they gave me food on a leaf? This is one of the ways they treated me. Another time they brought food on a plate and they said bring your plate out and don't touch this plate (their plate) and they poured the food from that plate to my plate and left. My mother and father came to see me there and really cried for the way they've treated me and they said please we are from an isolated area but we don't practice this sort of custom they have here and were really heart-broken for the way they've treated me. They said next time if you are ever going to deliver again please don't stay here you must come home and deliver.

DISCUSSION

In this setting both men and women demonstrated an understanding of some danger signs relating to childbirth, including prolonged labour, retained placenta and postpartum haemorrhage. They recognised the importance of health facility births, linking village births with maternal and newborn deaths. Despite this knowledge, women in this setting frequently give birth in the community. The reasons are multi-factorial including financial, geographical, socio-cultural factors and decision making. In our study women giving birth in the community described a number of practices to be followed and adhered to, for fear of causing personal shame or harm to family members, especially the men. The importance of isolation during and following childbirth and cleanliness and appropriate disposal of fluids associated with childbirth was emphasised.

Despite the cultural diversity in PNG, there are some underlying beliefs from which traditional practices originate [20]. While there may be similarities from province to province, some practices and beliefs can be diverse between cultural groups living within the same province [21]. Fear of contamination from menstrual blood and following childbirth, the use of birth huts, and lack of male involvement at the time of birth have been identified in a number of settings, particularly across the highlands of PNG [16, 22-24]. Solitary isolation and absence of men during childbirth is also reported from coastal areas [22, 25-27].

Similar to findings in other settings in both PNG and the Asia-Pacific region, [28, 29] our study identified that blood associated with menstruation and childbirth is considered unclean and feared. Fearful that contamination with vaginal blood will drain men's virility and even poison them, menstruating women may be confined for a period of seclusion [24, 28-30], and avoid gardening and other domestic chores during menstruation for fear of causing ill-health through contamination [23, 31]. Similarly, women are frequently isolated during and following childbirth [23, 28-32] and may birth alone or with minimal support [22, 24, 26]. Even when giving birth in the presence of an "assistant", such as a family member, little or nothing may be done to assist the birthing woman for fear of contamination. As well as being left to tie and cut the umbilical cord [16, 22, 24, 30] women are frequently responsible for disposing of the placenta and other "polluted" items [24, 32]. The blood, liquor and afterbirth associated with the birth of a newborn infant are all feared as dangerous contaminants that may cause illness or death in men [16, 23]. In view of this the importance of appropriate disposal of blood associated with menstruation and childbirth, including the placenta, is

reported from different settings in the Pacific region [24, 28, 29, 32] and was highlighted during our study.

In a number of settings in the Pacific, seclusion during menstruation and childbirth is typically in separate dwellings - in menstruation or birth huts, often located at the edge of settlements or deep in the forest [23, 24, 28, 29, 32]. While it has been suggested that in some parts of the Pacific seclusion during menstruation and childbirth is a thing of the past [29], this does not appear to be the case in many settings in PNG, including the setting for our study. However, much of the literature discussing menstrual and birth huts mentions the use of birth huts, with less emphasis given to menstrual huts [24, 28], with the exception of work reported from Western Province [23]. While some of the men in our study felt that birth huts were no longer used, this was in contradiction to the majority of men and women who mentioned the continuing use of birth huts, particularly in the postpartum period. In PNG, birth huts are usually situated on the edge of the village [16, 23, 28] and while in some settings, women give birth in the birth hut, in others women opt to give birth outside, in an open but hidden place, away from the community [16, 28]. Whether or not women give birth in the hut, it is a place of seclusion to rest and wait until postpartum bleeding has ceased at which time the mother and her baby will be welcomed back into the family home.

Papua New Guinean women are typically assisted during labour and birth by one or more close female relative, such as her mother, sister, or her mother's or father's sister [23, 27, 28]. In strongly patrilineal societies, or when women marry away from their village, support typically comes from close relatives of her husband - his mother or sister, or his father's sister or brother's wife [28]. However, in some settings, whether by choice or circumstances, women give birth alone [15, 22, 24, 26, 33]. Some of the women identified during our study chose to give birth alone in the community. They recognised the high costs involved having a non-biological relative assist them during childbirth. Traditionally, it is the responsibility of the woman and her husband to provide a small feast to thank the assistant and to cleanse them of contamination. This expense could mean the difference between birthing alone or with assistance, as was the case with Pele. Similarly, in other settings where childbirth is associated with pollution and with no option to attend a health facility, women may be left to give birth alone while assistants (family members) simply observe and offer advice [30].

In PNG, typically men are not present at the time of birth [22, 23, 25, 28], although they are often close by [27] and may be called to seek assistance if required. The exception to men's

presence is when assistance is required due to a long or difficult labour, when a traditional healer (typically men) may be called on or when a male health care worker is available [25, 26, 34].

Throughout PNG, particularly in the remote areas, health and illness are considered to originate in the unseen world of spirits, ghosts and sorcerers [35]. Across all provinces spirits, which may be ancestral kin, are associated with causing illness and disease [20]. Illness may occur due to a failure to observe social obligations or due to family disputes and social relations, and failing to observe customs may give rise to injury or complications during childbirth [20]. In many instances these causes of illness are facilitated or effected by spirits whose role is to preserve traditions and social harmony [20]. Identified during our study were a number of circumstances where wrong doing in relation to social discord was thought to be the cause of a difficult labour and childbirth, with traditional remedies sought to rectify the wrong-doing. Traditional practices used to rectify this social disharmony are used widely throughout PNG in many situations where *sanguma* is felt to be the cause of the illness or difficulty [20, 28]. In our study, in such circumstances men were frequently involved, either the husbands or traditional healers (in this setting typically men) to undertake a ritual in order to appease the spirits allowing the woman to give birth safely.

Fear of evil spirits, spiritual danger and witchcraft causing difficult births are described from a number of settings in both the Asia-Pacific region and in Africa [30, 32, 36, 37]. In such instances, traditional cures are frequently relied upon to protect the woman and to assist the birth of the infant. From rural Bangladesh, Rozario [30] describes the use of birth huts and how typically they are hidden to keep evil spirits away. She goes on to mention how rituals involving the use of sanctified water are conducted during difficult births to protect the woman from evil spirits [30]. While spirits, referred to as *sanguma*, were frequently spoken about during our study and are mentioned from other settings in PNG [20, 22, 23, 28, 35], they are more often spoken about as a cause of difficulties with labour and childbirth, for which traditional remedies would generally be used, rather than as a feared event. However, in other settings in PNG, fear of sorcerers has been reported as a determinant for not attending for a health facility birth, with women fearing meeting witches or sorcerers at or en-route to the facility [28].

The men and women who participated in this study were approached or offered their availability to share their stories and experiences. Thus, they may not necessarily represent

the wider community. However, the information and discussions undertaken do provide a unique insight into the practices and difficulties facing women in this rural highlands community.

In the light of the findings from this study a subsequent study has been completed in this study site. Using locally developed educational visual aids through community workshops and information sessions, both men and women have received information relating to maternal and newborn danger signs and the importance of supervised, health facility births. Women recruited into a study through the antenatal clinic have received clean birth kits, including gloves, plastic sheet, cotton cord ties and a clean razor blade for use if they are unable to reach the health facility to give birth. Results from this intervention will be available in the next few months.

CONCLUSION

While the importance of health facility births is recognised in this rural community many women continue to give birth in the village. Identifying and understanding local customs, beliefs and practices, particularly those that may be harmful to women and their newborn infants, is critical to the development of locally-appropriate community-based strategies for improving maternal and infant health in rural communities in PNG and other resource-limited, high burden settings.

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CHAPTER 8

FEASIBILITY AND ACCEPTABILITY OF CLEAN BIRTH KITS AND SELF-ADMINISTERED MISOPROSTOL FOR THE PREVENTION OF POSTPARTUM HAEMORRHAGE IN RURAL PAPUA NEW GUINEA

CONTEXT

Following the findings from the studies presented in Chapters Six and Seven, I designed a pilot feasibility study to improve maternal health outcomes through a package of evidence-based interventions. The package of community-based interventions included health education messages relating to supervised births, distribution of clean birth kits to promote a cleaner birth and misoprostol tablets, for self-administration, to prevent postpartum haemorrhage.

In Chapter Eight I describe the feasibility and acceptability of this community-based intervention.

This paper relates to Objective Three: *To investigate the acceptability, adherence to and uptake of an evidence-based package of interventions to improve maternal and neonatal health in Upper Bena, Unggai Bena District, Eastern Highlands Province, Papua New Guinea.*

PUBLICATION DETAILS

This paper is currently under review.

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ABSTRACT

BACKGROUND

Misoprostol has been identified as a suitable substitute to oxytocin to prevent postpartum haemorrhage in low-resource settings and is recommended for inclusion into effective, locally-appropriate and comprehensive community-based interventions to improve maternal health. We undertook the first field evaluation of the feasibility and acceptability of clean birth kits containing self-administered misoprostol for the prevention of postpartum haemorrhage in low-resource settings.

METHODS

Following information sessions regarding supervised births and postpartum haemorrhage in communities and antenatal clinics in the study site, 200 women attending antenatal clinic and in their last trimester of pregnancy were invited to join a prospective study. After individual instruction, women were provided with a clean birth kit, which included 600mcg misoprostol for oral self-administration following an unsupervised birth. All women were followed-up postpartum when data relating to the acceptability of the intervention were collected using a study specific questionnaire.

FINDINGS

53% (106/200) of women gave birth unsupervised in the community, of whom 93% (99/106) used the clean birth kit and 92% (98/106) self-administered misoprostol. The clean birth kit and misoprostol were highly acceptable; all women who used the clean birth and took the misoprostol stated that they would use it again, and would recommend it to others.

CONCLUSION

Provision of a clean birth kit and misoprostol in this setting was feasible and highly acceptable. This study strengthens the case for community-based self-administered misoprostol for the prevention of postpartum haemorrhage in remote and rural communities.

INTRODUCTION

Most maternal deaths occur in low-resource settings, primarily in remote and rural communities [1]. Postpartum haemorrhage (PPH) is the leading cause of maternal mortality; puerperal sepsis is also a major contributor to maternal mortality and morbidity [1]. Frequently occurring suddenly and unpredictably, particularly among women giving birth unsupervised, many deaths could be avoided if known, preventative measures and adequate care was available.

The World Health Organization (WHO) recommends the use of uterotonic agents to prevent PPH [2]. Oxytocin is the preferred choice, but currently can only be administered intramuscularly or intravenously by a trained health-worker, requires refrigerated storage, and needs to be protected from light to prevent degradation. These factors restrict its effective storage and safe administration in many low-resource settings, and mean that this potentially lifesaving intervention is out of reach for women giving birth outside of health facilities.

Misoprostol is a cheap, heat stable, substitute to oxytocin for the prevention of PPH in low-resource settings [3, 4]. Administered orally, 600 micrograms of misoprostol has been shown to be safe and effective to prevent PPH when administered by trained community health care workers (CHWs), [3, 5-7] traditional birth attendants (TBAs), [8, 9] or when self-administered [9-12] in the community setting. Distributed through CHWs and TBAs, there are well documented approaches for education in recognising PPH, correct use of misoprostol, and maternal danger signs [3, 6, 9, 13]. Likewise, women receiving misoprostol directly for self-administration are usually educated regarding the correct timing and use of misoprostol and possible side effects [9-11, 14]. Provision of information relating to maternal danger signs and the importance of birth preparedness (Figure 8.1) to women and their families is less well documented.

Figure 8.1: Birth Preparedness

The concept of birth-preparedness is to promote active preparation and decision making relating to childbirth by pregnant women and their families. While planning for a supervised birth, the strategy includes knowledge of danger signs, and organizing appropriate transportation and support in case of an obstetric emergency.

The WHO added misoprostol to their Model List for Essential Medicines in 2011 [15], followed by recommendations that misoprostol be provided by CHWs and lay health workers, for the prevention of PPH, in settings where neither skilled birth attendants or oxytocin are available [2]. Subsequently, recognising the limited available evidence, the WHO and the International Federation of Gynaecology and Obstetrics (FIGO) called for new research to evaluate the feasibility, acceptability and potential impact of self-administered misoprostol for the prevention of PPH in low-resource settings [16].

The use of clean birth kits (CBKs), typically containing disposable items such as soap, a plastic sheet, cord ties and a blade, to support hygienic birth practices, has been identified in several low-resource countries and the potential benefits of including additional items, such as misoprostol, has been suggested [17], although this has not been formally evaluated in a low-resource setting

Papua New Guinea (PNG), is a low-middle income country in the Asia-Pacific region with a socio-culturally and linguistically diverse population of 7.2 million, of whom 87% live in rural areas [18]. Access to skilled health care is limited due to geographical, infrastructure and logistical challenges: poor roads and transport links; minimally equipped health facilities; and a lack of suitably trained health staff [19]. PNG has one of the highest maternal mortality ratios in the world, with 594-733 maternal deaths per 100,000 livebirths [1, 20]; PPH and sepsis are the leading causes of maternal mortality [21]. Although 78% of pregnant women attend antenatal clinic in PNG, only 43% of births are supervised in a health facility [22]. Unsupervised home births take place alone or assisted by an untrained family member [20].

In this paper we describe the first field evaluation of the feasibility and acceptability of a clean birth kit containing misoprostol for self-administration for the prevention of PPH in a low-resource setting.

METHODS

STUDY SITE

Unggai Bena is one of eight administrative districts in the Eastern Highlands Province (EHP), the fourth most populous province in PNG with a population of 600,000, predominantly rural, residents. Maternal health indicators in EHP are poor: 68% of pregnant women attend antenatal clinic at least once; 38% have a supervised, health facility birth [22].

Access to the study site, Upper Bena, within Unggai Bena district, is by a single unsurfaced road, often impassable after heavy rain. Many of the villages in the area are located in steep mountainous terrain and accessible only by bush tracks. Four government health facilities - three aid posts and one health centre - serve Upper Bena (Figure 8.2). Each health facility offers a range of preventative and curative services, including weekly antenatal clinics. The health centre, a one hour drive from Goroka, the provincial capital, is equipped to manage normal births, which are conducted primarily by nursing staff.

Review of health facility data, undertaken by the research team prior to and during the study period (2012-2013) noted that, during the two year period, 386 women attended antenatal clinic as new attenders, and there were 83 supervised, health facility births. The proportion of women who attend the provincial hospital, or other facilities, for a supervised birth is not systematically recorded, but earlier research suggests that the majority of women give birth unsupervised in the community [20, 23].

RECRUITMENT, INTERVENTION AND DATA COLLECTION

A prospective, community-based intervention study took place between April 2013 and October 2014. The research team comprised a health extension officer (a trained health worker who has completed four years of training), a midwife, and two community liaison officers, supported by the principal investigator. All had prior experience and training in conducting community-based field research.

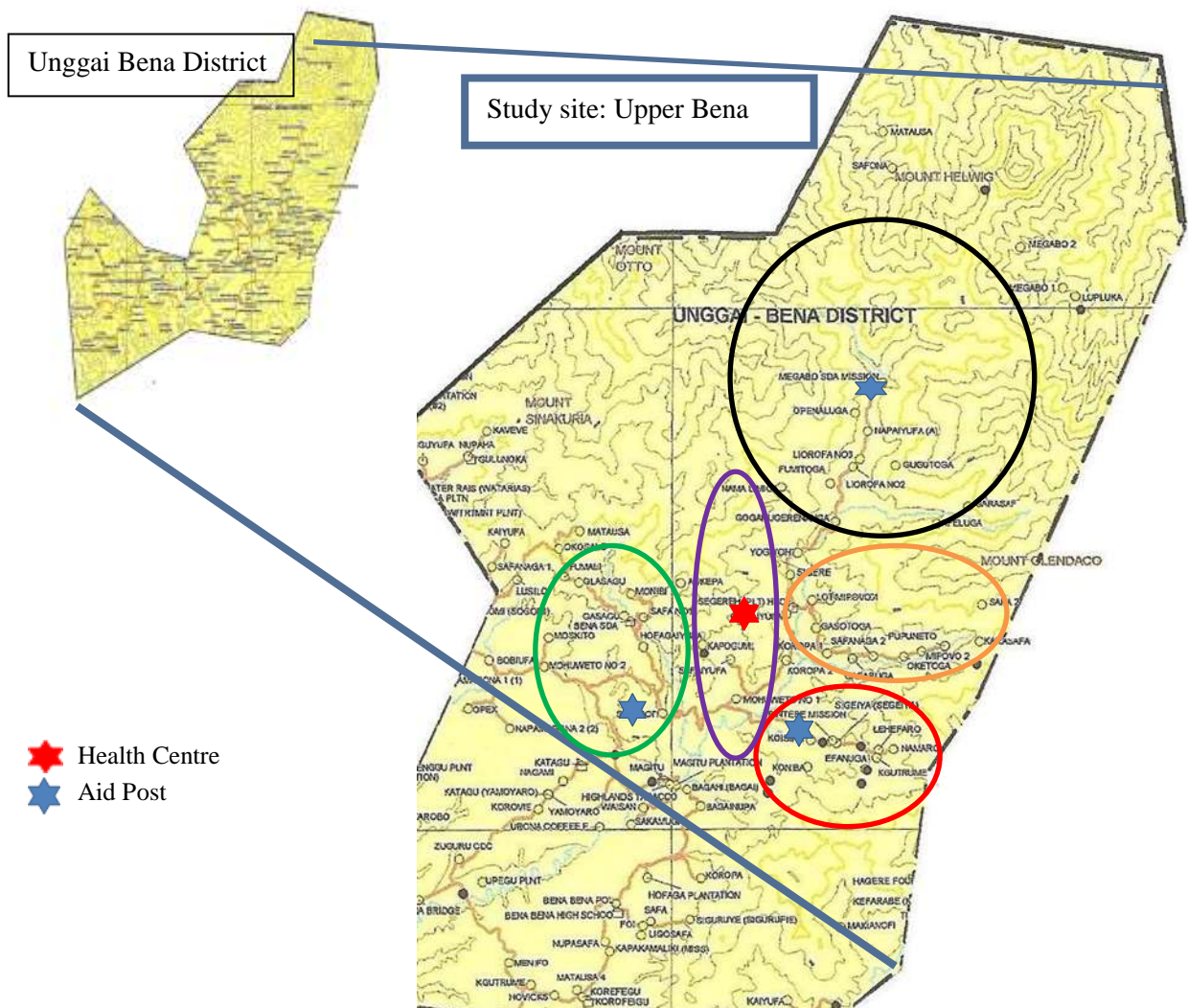
Visual teaching aids were designed and piloted by the research team relating to birth preparedness, maternal danger signs, the importance of antenatal care and supervised, health facility births (Figure 8.3). These key messages were delivered through community information sessions at informal and formal gatherings, including village markets, following church services and at participating antenatal clinics by the research team.

Women attending antenatal clinics in Upper Bena and in their last trimester of pregnancy, based on clinical assessment, were eligible to participate in the study. This eligibility criterion was used to limit the time between receiving the study intervention, and their estimated birth date. Women were invited to join the study and recruited following completion of written, informed consent procedures. Women were assigned a unique study identity number.

Socio-demographic data and obstetric history were collected using a study-specific case record form (Appendix 8), previously tested in our earlier research in this setting. Locator information was collected to enable the study team to visit participants in their villages, to communicate key messages to their community, and to facilitate postnatal follow-up.

At enrolment, all participants received one-to-one information about the study from the health extension officer (HEO) or research midwife prior to being provided with the intervention package. This took place using specifically designed and piloted pictorial flipcharts relating to the CBK intervention (Figure 8.4). Each CBK contained a piece of soap, a plastic sheet, a scalpel blade, two cord ties and a sealed packet containing three misoprostol tablets (600 micrograms in total), to be taken orally. Prior to their inclusion in the CBK, misoprostol tablets were re-packaged by the study team and labelled “safer afterbirth” tablets, to comply with a requirement from the ethics committee, due to concern that misoprostol could be used inappropriately, for example, to induce abortion. Women were advised about the risks of taking the tablets too soon (for example, before the baby was born), and about common minor side-effects. Using a study-specific check list, women were required to demonstrate their understanding of the correct use of each item in the CBK before the kit was provided. A pictorial insert on how to use each item (Figure 8.5), and a birth notification card, with the study identity number (to be returned to the health facility or study team as soon as possible after giving birth, enabling postpartum follow up), were also included in the CBK. Study participants were visited postpartum in the community by members of the research team and information relating to woman’s birth experience, including the use of each item in the CBK, was collected using a semi-structured questionnaire (Appendix 9). Probing was used where necessary. Unused CBKs, including misoprostol tablets, were collected by the study team and disposed of in accordance with study-specific standard operating procedures.

Figure 8.2: Upper Bena, Unggai Bena district with location of supervised and unsupervised births.



	Zone	Supervised births	Unsupervised births	Total no. women
■	A	23	24	47
■	B	36	30	66
■	C	16	22	38
■	D	16	27	43
■	E	3	3	6
	Total	94	106	200

Figure 8.3: Key messages included during community information sessions

Part 1		Part 2	
Normal process of safe childbirth		Danger signs in mothers and newborns	
1	Childbirth can be dangerous	1	Know the danger signs and act quickly
2	Planning for safe childbirth	2	Danger signs in labour
3	Recognise the signs of labour	3	Danger signs in mother after baby is born
4	Help a woman when she is in labour	4	Danger signs in the newborn
5	Recognise when the baby is ready to be born	5	Be prepared and plan for a supervised birth
6	Care for the mother immediately after baby is born		
7	Care of the mother and baby from birth to 6 weeks		
8	Plan for and space children		

Figure 8.4: Providing one to one education relating to taking the misoprostol, using locally produced pictures



All individual antenatal information sessions and postpartum interviews took place in quiet, private areas, at the health facility or in the woman's home, unless the woman requested otherwise. All community information sessions and individual interviews were conducted in *tok pisin*, one of three official national languages in PNG.

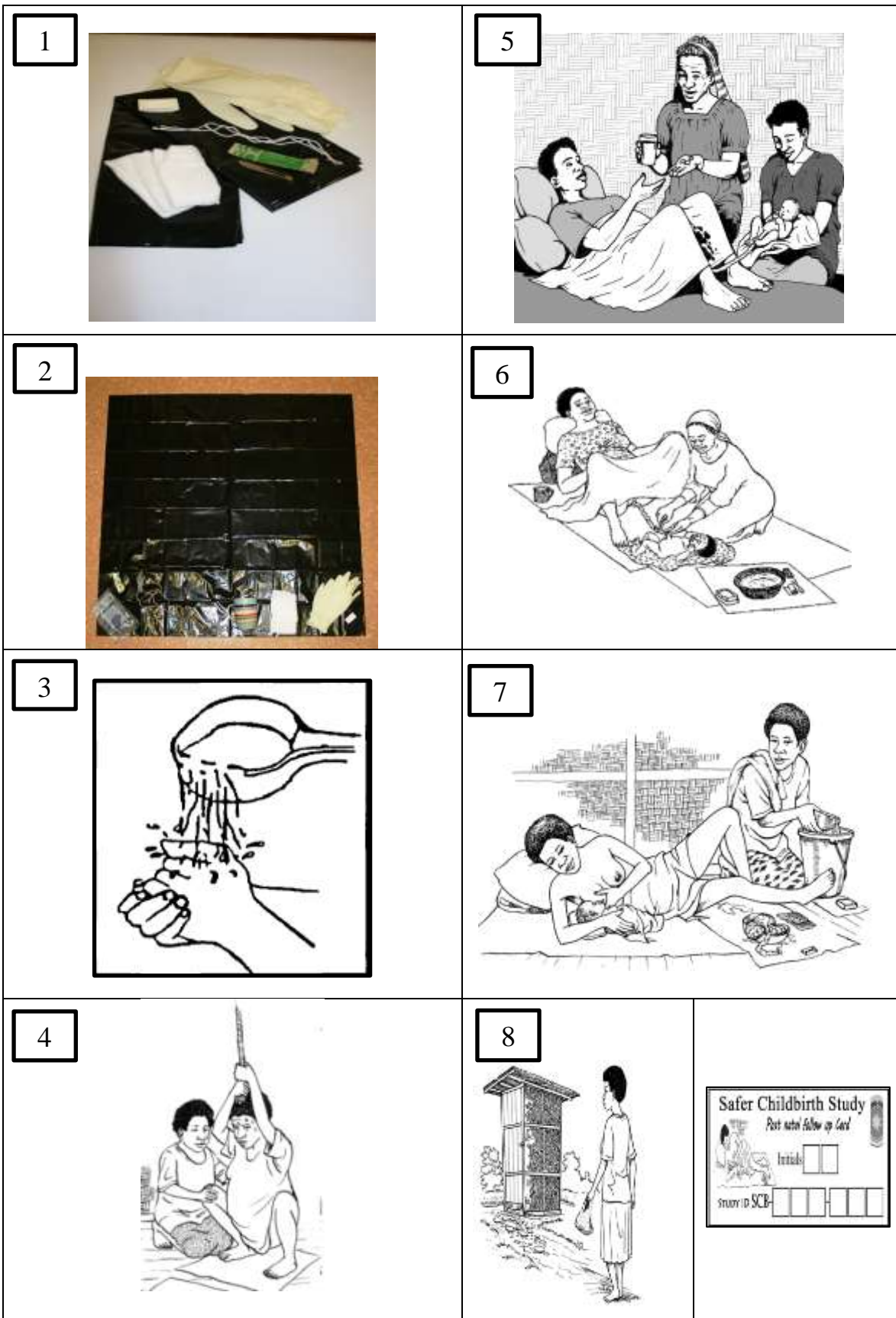
ETHICAL CONSIDERATIONS

Ethics approval was provided by the Institutional Review Board, PNG Institute of Medical Research; the Medical Research Advisory Committee, PNG National Department of Health; and from the Human Research Ethics Committee, University of Queensland, Australia.

DATA ANALYSIS

All women enrolled in the study were included regardless of whether they received the intervention package. Data were summarised as frequencies and percentages. Bivariate analysis and chi-square tests were performed to test associations between the outcome variable (i.e. unsupervised versus supervised birth) and socio-demographic and obstetric history. When small numbers were present, Fisher's exact test was used to compare differences in proportions. The p-value was set at 0.05 for significance at this stage. Data were analysed using STATA v10.0 (StataCorp Ltd, TX, USA).

Figure 8.5: Clean birth kit insert



FINDINGS

Two hundred (200) women were recruited and all were followed up postpartum. Every village from which a woman was enrolled was visited at least once by the research team to deliver the key messages.

Of those enrolled, 47% (94/200) had a supervised birth (Table 8.1). Of the 106 (106/200;53%) women who had an unsupervised birth, 21% (23/106) chose to give birth in the community because they had given birth there previously, and 19% (20/106) reported being told by their husbands to give birth at home (data not shown).

USE OF THE CLEAN BIRTH KIT

Almost all those enrolled (195/200; 97.5%) received a clean birth kit. Five women were not issued with a CBK because they were unable to demonstrate knowledge of the safe use of the items at enrolment, and did not re-attend antenatal clinic as requested prior to giving birth (Figure 8.6).

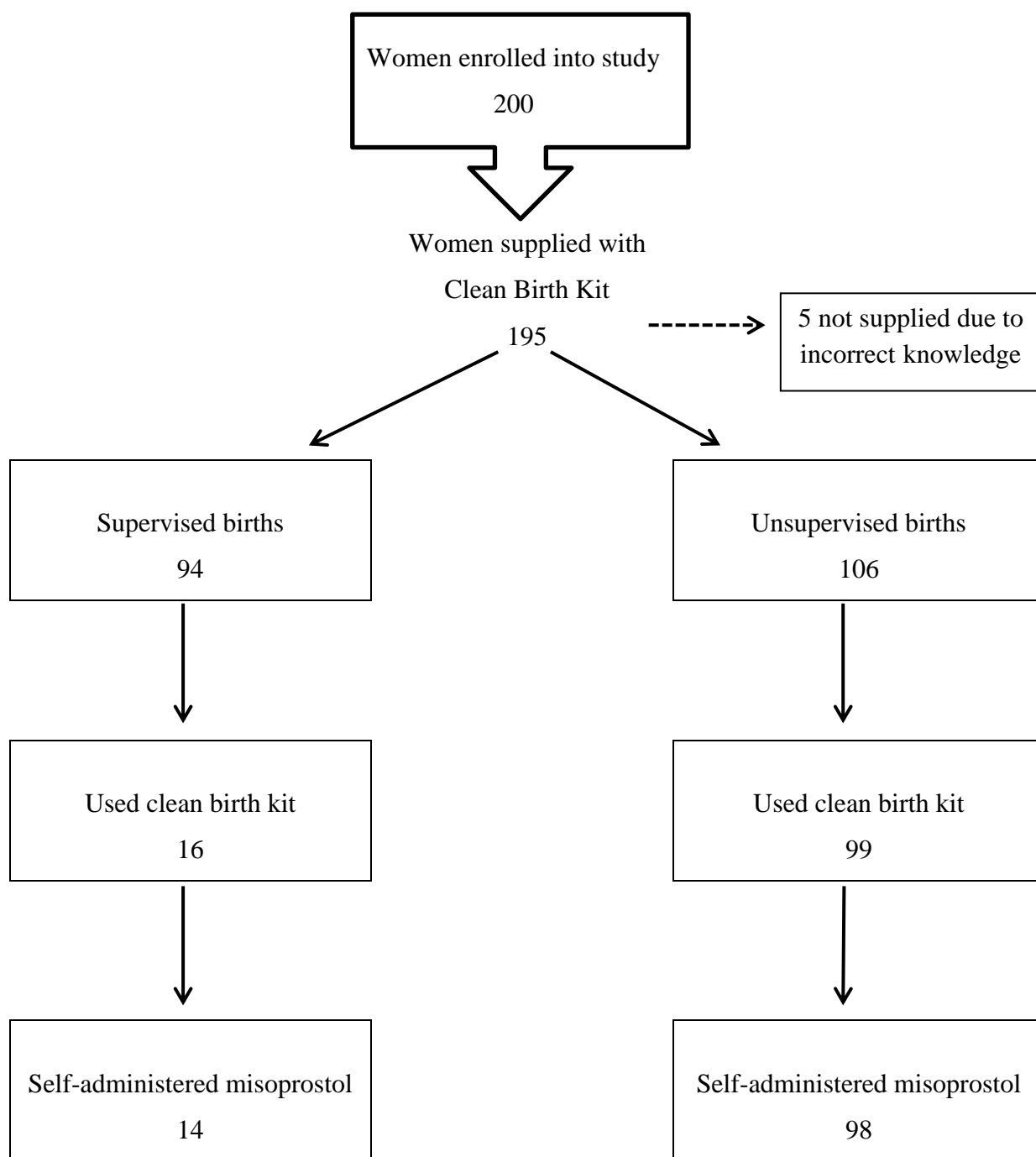
More than half (115/195; 59%) of those who received a CBK reported using it, of whom 86% (99/115) had an unsupervised birth; 14% (16/115) of those who used the CBK did so in a health facility. Two women (2/106; 2%) who had an unsupervised birth did not use a CBK because they did not have it with them when they went into labour. Of the 115 women who used their CBK, 112 (97%) self-administered misoprostol (Table 8.1).

Among the women who had an unsupervised birth and used their CBK (99/106), most used the items as instructed. All women used the scalpel blade to cut the umbilical cord, except one who used scissors, saying that she had forgotten that the scalpel was provided (Table 8.1). Among those who had an unsupervised birth and took misoprostol (98/106), almost all (96/98; 98%) took all three tablets. Most women (80/98; 82%) took the misoprostol immediately following the birth of the infant, as instructed; 15% (15/98) took misoprostol after delivery of the placenta; and one woman took misoprostol the following day (Table 8.1). Only one woman did not take her misoprostol, stating that she did not believe she was bleeding “too much”.

Table 8.1: Location of birth, use of clean birth kit, self-administration of misoprostol and acceptability of intervention

	All women N=200 (%)	Unsupervised N= 106 (%)	Supervised N = 94 (%)	p-value
Location of last birth				
Birthing house	19 (9.5)	19 (17.9)	-	N/A
Bush/Garden	3 (1.5)	3 (2.8)	-	
Riverside	15 (7.5)	15 (14.2)	-	
Road side	3 (1.5)	3 (2.8)	-	
Coffee garden	7 (3.5)	7 (6.6)	-	
Garden house	3 (1.5)	3 (2.8)	-	
Own home	51 (25.5)	51 (48.1)	-	
Others home	1 (0.5)	1 (0.9)	-	
Other/missing	4 (2)	4 (3.7)	-	
Health Centre	56 (28)	-	56 (59.6)	
Hospital	38 (19)	-	38 (40.4)	
Clean birth kit use				
Used clean birth kit	115 (57.5)	99 (93.4)	16 (17)	<0.001
Didn't use clean birth kit	85 (42.5)	7 (6.6)	78 (83)	
Of those who used CBK, women mentioned:				
Washing of hands	109 (94.8)	96 (96.7)	13 (81.2)	<0.001
Washing hands with soap	109 (94.8)	97 (97.8)	12 (75)	<0.001
Used gloves at birth	115 (100)	99 (100)	16 (100)	<0.001
Used plastic sheet as delivery mat	114 (99)	99 (100)	15 (93.7)	<0.001
Baby born onto plastic sheet	115 (100)	99 (100)	16 (100)	<0.001
Cord ties used	107 (93)	99 (100)	8 (50)	<0.001
<i>1 cord tie used</i>	3 (2.8)	3 (3)	-	-
<i>2 cord ties used</i>	104 (97.2)	96 (96.7)	8 (50)	-
Used scalpel blade to cut the cord	106 (92)	98 (98.9)	8 (50)	<0.001
Self- administered misoprostol				
Took misoprostol tablets	112 (97.4)	98 (98.9)	14(87.5)	<0.001
Took misoprostol <i>immediately following</i> birth of baby	89 (79.5)	80 (81.6)	9 (64)	
Took misoprostol <i>after expulsion</i> of placenta	18 (16.1)	15 (15.3)	3 (21)	
Took misoprostol after wash/rest	2 (1.9)	2 (2)	-	
Took misoprostol the next day	1 (0.9)	1 (1)	-	
Not specified when misoprostol taken	2 (1.8)	-	2 (14.3)	
Acceptability of intervention				
CBK	115 (57.5)	99 (93.4)	16 (17)	
Would use a clean birth kit again	111 (96.5)	99 (100)	12 (75)	<0.001
Missing data	4 (3.5)	-	4 (25)	
Would recommend CBK to others	111 (96.5)	99 (100)	12 (75)	<0.001
Missing data	4 (3.5)	-	4 (25)	
Misoprostol	112 (97.4)	98 (98.9)	14(87.5)	
Would take misoprostol again	109 (97.3)	98 (100)	11(78.6)	<0.001
Missing data	3 (2.6)	-	3 (21.4)	
Would recommend misoprostol to others	109 (97.3)	98 (100)	11(78.6)	<0.001
Missing data	3 (2.6)	-	3 (21.4)	

Figure 8.6: Clean birth kit use, supervised and unsupervised births



ACCEPTABILITY OF THE CLEAN BIRTH KIT AND SELF-ADMINISTERED MISOPROSTOL

All women who had a CBK available to them at the time of an unsupervised birth (99/106) and used it; all said they would use a CBK again; and all would recommend the use to others (Table 8.1). In addition, 17% (16/94) of women who had a supervised, health facility birth also used part or all of their CBK, including the misoprostol (Table 8.1). Overall, 97% (109/112) of women who self-administered misoprostol said that they would take it again,

and the same proportion said that they would recommend it to other women in their community.

REPORTED IMMEDIATE POSTPARTUM PROBLEMS

All women were asked about problems experienced postpartum, in particular six symptoms that have been associated with the use of misoprostol: shivering, fever, nausea, dizziness, vomiting, and diarrhoea. Overall, 82% (164/200) reported experiencing at least one of these, with shivering the most common symptom among both those who took misoprostol (70/112; 63%) and those who did not (57/88; 65%, Table 8.2). There was no statistically significant difference in reports of shivering, nausea or dizziness among those who took misoprostol compared with those who did not. No women reported any vomiting or diarrhoea.

Almost one third of women reported that they felt they had experienced “too much” bleeding (expressed as more than two cups of blood) following childbirth (48/164; 29%). Women who took misoprostol were significantly less likely to report excessive postpartum bleeding than those who did not (15/112, 13% vs. 33/88, 38%; $p>0.001$).

Table 8.2: Reported problems experienced immediately following the birth of the infant

Reported symptoms (postpartum)	All women N=200 (%)	Took misoprostol N=112 (%)	Didn't take misoprostol N=88 (%)	p-value
Women reporting ANY problem	164 (82)	90 (80.3)	74 (84.1)	0.495
Shivering	127 (63.5)	70 (62.5)	57 (64.8)	0.740
Nausea	13 (6.5)	7 (6.25)	6 (6.8)	0.871
Dizziness	30 (15)	14 (12.5)	16 (18.1)	0.264
Fever	17 (8.5)	11(9.8)	6 (6.8)	0.450
Excessive bleeding (self-reported)	48 (24)	15 (13.3)	33 (37.5)	<0.001

SOCIO-DEMOGRAPHIC CHARACTERISTICS

Table 8.3 provides socio-demographic characteristics for all 200 women. Most women (185/200; 93%) lived within two hours walking distance of their nearest health facility.

Women who had an unsupervised birth were more likely to have no or limited formal education compared to those who had a supervised birth (94/106; 89% vs 68/94; 72%; $p=0.017$). There were no statistically significant differences in age, employment status or religious denomination between women who had an unsupervised or a supervised birth.

OBSTETRIC HISTORY AND BIRTH OUTCOMES

At enrolment, 26% (52/200) of women were pregnant for the first time; 55% (110/200) had given birth one to three times previously (Table 8.4). At postpartum follow up, primiparous women were significantly more likely to have had a supervised birth than an unsupervised birth (34/52; 65% vs 18/52; 35%; $p=0.002$). Primiparous women were also significantly more likely to have had a supervised birth compared to multiparous women (34/52 vs 60/148; $p=0.002$). There were no maternal deaths among study participants. Two infants were stillborn; one born at the health centre, the other at the hospital (Table 8.4).

Table 8.3: Socio-demographic characteristics by location of birth

	All women N=200 (%)	Unsupervised birth N= 106 (%)	Supervised birth N= 94 (%)	p-value
Age				0.329
<20	33 (16.5)	10 (9.4)	23 (24.5)	
20-24	65 (32.5)	38 (35.9)	27 (28.7)	
25-29	43 (21.5)	24 (22.6)	19 (20.2)	
30-34	40 (20)	25 (23.6)	15 (15.9)	
35-39	15 (7.5)	7 (6.6)	8 (8.5)	
40 +	4 (2)	2 (1.9)	2 (2.1)	
Marital status				0.037
Not married	7 (3.5)	1 (0.9)	6 (6.4)	
Married	193 (96.5)	105 (99)	88 (93.6)	
Employment status				0.150
Household duties/ farmer	192 (96)	104 (98.1)	88 (93.6)	
Employed/ student	8 (4)	2 (1.8)	6 (6.3)	
Education level				0.017
No formal education	84 (42)	49 (46.2)	35 (37)	
Grades 1-6	78 (39)	45 (42.5)	33 (35.1)	
Grade 7-12	31 (15.5)	12 (11.3)	19 (20.2)	
Higher than grade 12	5 (2.5)	-	5 (5.3)	
Unknown	2 (1)	-	2 (2.1)	
Religion				0.219
SDA	123 (61.5)	71 (66.9)	52 (55.3)	
Four square	42 (21)	20 (18.8)	22 (23.4)	
Other	35 (17.5)	15 (14.2)	20 (21.3)	

Table 8.4: Obstetric and pregnancy history by location of birth

	All women N=200 (%)	Unsupervised N= 106 (%)	Supervised N = 94 (%)	p-value
Planned Pregnancy				0.190
Yes	149 (74.5)	83 (78.3)	66 (70.2)	
No	51 (25.5)	23 (21.7)	28 (29.8)	
Using family planning method				0.560
Yes	64 (32)	32 (30.2)	32 (34.1)	
No	136 (68)	74 (69.8)	62 (65.9)	
Parity				0.002
0	52 (26)	18 (16.9)	34 (36.2)	
1	45 (22.5)	26 (24.5)	19 (20.2)	
2	35 (17.5)	21 (19.8)	14 (14.9)	
3	30 (15)	20 (18.9)	10 (10.6)	
4	28 (14)	15 (14.1)	13 (13.8)	
5+	10 (5)	6 (5.6)	4 (4.3)	
Gestation first ANC				0.918
Less than 26 weeks	50 (25)	27 (25.5)	23 (23.2)	
26 – 32 weeks	74 (37)	37 (34.9)	37 (39.3)	
32 – 36 weeks	52 (26)	30 (28.3)	22 (26.8)	
> 36 weeks	24 (12)	12 (11.3)	12 (10.7)	
Total ANC visits				0.583
1 visit	72 (36)	37 (34.9)	35 (41.1)	
2 visits	61 (30.5)	38 (35.8)	23 (21.4)	
3 visits	38 (19)	18 (16.9)	20 (19.6)	
4 or more visits	29 (14.5)	13 (12.3)	16 (17.9)	
Gestation at enrolment				0.366
<26 weeks	13 (6.5)	8 (7.5)	5 (7.1)	
≥26 - <32 weeks	90 (45)	44 (41.5)	46 (44.6)	
≥32 - <36 weeks	45 (22)	29 (27.4)	16 (21.4)	
≥ 36 weeks	52 (26)	25 (23.6)	27 (26.8)	
Outcome of last birth				0.131
Live birth	198 (99)	106 (100)	92 (97.9)	
Stillbirth	2 (1)	-	2 (2.1)	

DISCUSSION

Our findings suggest that when distributed under specific conditions, a clean birth kit containing misoprostol for self-administration is acceptable, appropriately used, and feasible for implementation through rural health care facilities in low-resource settings. High acceptability and adherence have previously been reported in other settings when women self-administered misoprostol [8, 10, 12, 14], but to our knowledge, this is the first time such a package of interventions has been evaluated for the prevention of PPH in a rural low-resource context.

Of the small number of women in this study with unsupervised births who did not use a clean birth kit, nearly all were not provided with a kit because they failed our knowledge assessment regarding its safe usage.

As in other low-resource settings, uptake of antenatal services in PNG is higher than for supervised birth [22, 24]. In providing communities and women attending antenatal clinic with key messages relating to birth preparedness, including the importance of supervised births, we sought to increase the proportion of women having supervised births, while providing women with a more hygienic and safer birth. Providing our intervention within this broad community-based health education framework, our study demonstrated an increase in supervised health facility births and importantly, did not lead to an increase in unsupervised home births, which had been a significant concern among some stakeholders. Many women in our study gave birth in the village due to difficulties with transport, distance and decision making, reasons identified in our earlier work in this location [23], and similar to findings reported elsewhere [24, 25]. Due to limitations with data collection we cannot say with certainty what the supervised birth rate for all pregnant women in the study area was, however, review of health facility data for the period 2012 to 2014 indicates a steady increase in new attenders for antenatal care and supervised births. This increase could reflect the study intervention, be the result of an earlier pregnancy-related study in this area by our team, or due to external factors. Our findings highlight the importance of using antenatal clinic visits to provide women with birth preparedness messages [26], including promotion of supervised births [27], and to make available CBKs for those who, despite this encouragement, will have unsupervised births because of sociocultural and structural constraints within which they live.

There is a growing body of evidence demonstrating the effectiveness of misoprostol for prevention of PPH in community settings when delivered through CHWs and lay health workers such as TBAs [28]. Despite limited evidence for a reduction in PPH following self-administered misoprostol [29], programs using self-administration have achieved higher uptake compared to those in which misoprostol is administered by community-based or lay health workers [30].

Our study sought to provide women with misoprostol for self-administration through a package of community-based interventions. Knowing that misoprostol is available at all health centres and hospitals in PNG, this study was designed to assess its use in an out-of-hospital setting among women with limited access to supervised births [23]. We included several safeguards to help ensure misoprostol was used as intended. Firstly, by only enrolling women in late pregnancy, as others have done to reduce the chance that it is misused in early pregnancy [30]; secondly by re-labelling and packaging with a very specific indication; and thirdly, by only distributing clean birth kits, including misoprostol to women who could correctly recall key messages on usage. This last safeguard did result in five women giving birth in the community unsupervised without a clean birth kit. Fortunately, these five women had a safe outcome. In addition, packing the misoprostol within the clean birth kit helped ensure the safe storage and management of the tablets, noting that our postnatal follow-up visits enabled collection of any unused misoprostol tablets, minimising the risk of inappropriate use.

While there remains limited evidence that the use of clean birth kits reduces maternal sepsis [17], earlier work in this same location highlighted that many women give birth in extremely unclean circumstances (e.g. in coffee gardens; on riverbanks), and hence promoting cleaner, more hygienic births in this setting was considered a priority.

Although our study was not designed to evaluate the effectiveness of misoprostol for the prevention of PPH, we found that women who took misoprostol were significantly less likely to report excessive bleeding compared to those who did not.

This study is the first of its kind to describe the distribution and utilisation of a CBK containing misoprostol for self-administration, through a package of interventions that included community-based health education to increase knowledge of birth preparedness. Despite a number of limitations, given the high number of unsupervised births and the high

MMR in PNG, this study provides evidence for an interim strategy that could run concurrently with other health system strengthening activities designed to improve the quality and accessibility of maternal health care in first-line health care facilities in this setting.

CONCLUSION

Provision of a clean birth kit and misoprostol in this setting was feasible and highly acceptable. This study strengthens the case for community-based self-administered misoprostol for the prevention of postpartum haemorrhage in remote and rural communities.

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CHAPTER 9

DISCUSSION AND CONCLUSION: IMPLICATIONS FOR ADVANCING MATERNAL HEALTH IN PAPUA NEW GUINEA

INTRODUCTION

Papua New Guinea (PNG) has one of the highest maternal mortality ratios in the world [1]. The major causes of maternal mortality are the same in PNG as in many other low-resource settings - postpartum haemorrhage and sepsis due to childbirth and unsafe abortion [1-4]. The rate of unsupervised births in PNG is high, with an estimated 60% of women giving birth unsupervised. Despite global evidence for strategies and interventions to improve maternal and newborn outcomes, and to reduce maternal mortality [5-10], there is limited data available from PNG.

The overall aim of this study was *to describe women's perceptions and experiences of pregnancy and childbirth from the Eastern Highlands of Papua New Guinea; and to describe a community-based intervention to improve maternal health outcomes*. Presented under the two themes of unsafe abortion and women's experiences of pregnancy and childbirth, in this chapter I provide an overview of the key findings from Chapters Four to Eight. Following a reflection of the key findings from each of these chapters I discuss the key factor identified across all five chapters, that is, the issue of access to health care services. The significance of access to care is described and discussed with reference to the implications for the future of maternal health within the broader context of sexual and reproductive health. Study limitations are outlined, followed by the conclusion.

SUMMARY OF MAIN FINDINGS

THEME 1: UNSAFE ABORTION

Chapters Four and Five relate to Objective One: *To explore the determinants and outcomes of women presenting for hospital care following spontaneous and induced abortion; and to explore the reasons why and under what circumstances women in the Eastern Highlands Province, Papua New Guinea resort to unsafe, induced abortion.*

Chapter Four: *Hospital admission following induced abortion in Eastern Highlands Province, Papua New Guinea - a descriptive study.*

In Chapter Four I described the socio-demographic characteristics, presenting signs and symptoms and the clinical management of women presenting to hospital following both spontaneous and induced abortions.

Hospital admissions, as a result of both spontaneous and induced abortions, accounted for nearly one third of all gynaecological admissions to the Eastern Highlands Provincial Hospital during the six month study period. The average length of stay for all women was three to four days, with most women receiving surgical intervention, typically dilatation and curettage, requiring skilled care from senior medical staff.

Induced abortion accounted for one quarter of all abortion-related admissions. Women admitted to hospital following an induced abortion were significantly more likely ($p < 0.05$) to be younger, single and a student, compared with those reporting spontaneous abortion. Following an induced abortion, women were significantly more likely to present with bleeding, pain, fever and signs of severe anaemia compared with those presenting following spontaneous abortion. These symptoms were likely the result of late, second trimester abortion - more than half of the induced abortions took place in the second trimester.

Misoprostol was the most frequently reported method used to end pregnancy. The use of traditional herbs and interference with the pregnancy through witchcraft and evil spirits were also mentioned, among other methods.

Chapter Five: *Unsafe abortion requiring hospital admission in the Eastern Highlands of Papua New Guinea – a descriptive study of women's and health care workers experiences*

Following on from Chapter Four, in Chapter Five I provided a narrative of women's reasons for ending their pregnancy, including how they induced the abortion; reasons for seeking health care and their thoughts post abortion. Professional experiences of health care workers caring for these women were also explored.

Younger women ended their pregnancy because they felt they were “not ready” to have a baby, some felt too young, while others did not want to disrupt their studies. In addition to the financial sacrifices made by their families for their education, young women were afraid they would bring shame or embarrassment on their family for being pregnant outside of marriage.

Among older and married women, some ended the pregnancy as a means of punishing their husbands. Other women resorted to abortion to avoid facing shame within their community. They were afraid of the repercussions of not considering cultural and traditional beliefs, for example sexual abstinence during breast feeding.

The widespread use of misoprostol to end a pregnancy was validated by the health care workers, who explained how this method of abortion is replacing some of the more traditional methods, including the use of herbs and physical means.

Women frequently procured misoprostol from the local pharmacies, generally through knowing a friend or family member who was able to access it. Two women who did acquire misoprostol through health care workers were the only ones to receive the correct route of administration and correct dose of misoprostol for their gestation.

Disclosure that an abortion had taken place often only occurred when women realised they needed support to reach a health facility, or because they became afraid. Reasons for seeking health care included experiencing excessive vaginal bleeding; the presence of blood clots; or symptoms such as feeling dizzy or excessive abdominal and back pain.

Following induced abortion, many women expressed feelings of relief, but some described feelings of grief and spoke of regret for what they had done.

THEME 2: COMMUNITY EXPERIENCES AND PERCEPTIONS OF PREGNANCY AND CHILDBIRTH

Chapters Six and Seven relate to Objective Two: *To explore women's choices and decisions regarding place of birth; and to explore perceptions, beliefs and health seeking behaviour surrounding pregnancy, childbirth and the postpartum period in Upper Bena, Unggai Bena District, Eastern Highlands Province, Papua New Guinea.*

Chapter Six: *Exploring women's perspectives of access to care during pregnancy and childbirth: a qualitative study from rural Papua New Guinea.*

In this published Chapter I presented findings from focus group discussions and individual interviews with women in the Upper Bena area of Unggai Bena district.

Women's reasons for accessing or not accessing care during pregnancy and childbirth encompassed a broad range of reasons and perceptions many of which are described from other settings. The importance of attending for antenatal care, to ensure the well-being of the baby and to receive advice, health education and treatment during the pregnancy was well recognised.

Despite recognising the benefits of a health facility birth, most women had given birth unsupervised in the community. Challenges and barriers to reaching a health facility included: terrain and transport; fear of health facility staff; language barriers; financial constraints; customary and cultural beliefs and a lack of decision making, as well as individual experiences.

Chapter Seven: *Childbirth in a rural Highlands community in Papua New Guinea: A descriptive study.*

In this second Chapter relating to women's experiences of pregnancy and childbirth, I described the knowledge, experiences, beliefs and practices surrounding childbirth in Upper Bena. Both men and women described unsupervised births, and offered their insights and experiences describing practices linked to cultural and customary beliefs during childbirth.

Recognising complications such as long labour, retained placenta and heavy bleeding following childbirth, both men and women acknowledged the importance of supervised, health facility births. Managing a retained placenta by squeezing and rubbing the abdomen to release the placenta was described by women; and the importance of reaching a health facility for assistance in such a situation, especially when there was also heavy bleeding, was recognised.

A number of cultural beliefs and practices remain entrenched in this setting, including:

- The belief that contact with any vaginal blood will cause sickness, poor health and even premature death. Subsequently, menstruating and postpartum women are frequently secluded during these times. They are not allowed to prepare or offer food to the family, tend to crops in the garden or collect water from the river, for fear they may contaminate food or the water source. Appropriate disposal of the placenta and any blood stained items after childbirth was also important.

- The importance of births taking place in secluded locations, such as the coffee garden or the riverside. Being hidden from others is paramount.
- The use of a customary birth hut, particularly used during the postpartum period.
- The practice of acknowledging and thanking non-biological female relatives, cleansing them of any contamination following their assistance during childbirth.
- Difficult and prolonged births are thought to be due to disputes between the labouring woman and her husband; or due to grudges against the labouring woman, frequently linked to social transgressions. Sorcery and witchcraft were also reported as a cause for difficult births, requiring specific customs and rituals to be followed to release the spell.

Chapter Eight relates to Objective Three: *To investigate the acceptability, adherence to and uptake of an evidence-based package of interventions to improve maternal and neonatal health in Upper Bena, Unggai Bena District, Eastern Highlands Province, Papua New Guinea.*

Chapter Eight: *Feasibility and acceptability of clean birth kits and self-administered misoprostol for the prevention of postpartum haemorrhage in rural Papua New Guinea.*

In Chapter Eight I provided evidence for a community-based intervention which included health education messages relating to supervised births and the distribution of clean birth kits and misoprostol, to improve maternal health outcomes in Upper Bena, Unggai Bena district.

Almost half of 200 (96/200; 47%) women enrolled into the study had a supervised birth. The majority of women (97%) who had unsupervised births in the community, used their clean birth kit and used it appropriately; and 82% of the women took the misoprostol tablets as instructed. The clean birth kit and misoprostol was a highly acceptable intervention within this setting. Women who remained in the village to give birth did so due to their own preference, or due to a lack of decision making, frequently being told to remain in the village by their husbands.

The next section of this chapter discusses the significance of these findings, highlighting the prominent issue of access to care in this setting. The findings are discussed in relation to

international and national literature surrounding access to health care. In the light of the findings from this study, implications for maternal health in PNG are discussed, with maternal health considered within the broader context of sexual and reproductive health and rights. A strategy for the future direction of maternal health in PNG is outlined, including the potential wider use of misoprostol to improve maternal health outcomes.

The key findings identified in Chapters Four to Eight reflect women's experiences of pregnancy and childbirth in one highlands setting in PNG. The findings in this study highlight the vulnerability of two groups of women: women with poorly timed pregnancies; and women during pregnancy and childbirth.

The key factor identified throughout this thesis is the issue of access to health care. Although there are aspects of the cultural setting unique to this area, the findings relating to access of health care are similar to other resource constrained settings, including financial, decision making, recognising the importance of needing skilled health care and physical access, including transportation [11-18]. In this setting, the presence of strong traditional beliefs and customs, particularly as they relate to childbirth create additional barriers to timely health care.

ACCESS AND DELAYS IN SEEKING HEALTH CARE

Most findings identified in this thesis relate to the decision to seek health care and reaching a health facility, with a strong focus on delays in reaching health care. Less emphasis is noticed towards receiving appropriate care, a reflection of the overall aim of this thesis which was to identify and describe women's experiences, and improve maternal health outcomes through a community-based approach, rather than to review current practice regarding care received. Outside the scope of this thesis is to discuss whether women were managed appropriately in hospital following an incomplete abortion (Chapter Four), however, the management of women experiencing incomplete abortion is considered, in the light of global guidelines, later on in this chapter.

Described in Chapter Two, the three delays framework relates factors of access to health care in relation to decision making, reaching a health facility and receiving appropriate care [19]. The three delays framework has recently been used in the analysis of qualitative data elsewhere in PNG [20], including a maternal mortality review [21] in Milne Bay Province.

Outlined in Chapter Three, PNG is geographically challenging with poor infrastructure. In Chapter Six, a number of barriers in relation to access to health care, including geographical location (mountainous terrain and rivers) and distances were mentioned as constraints, influencing both the decision to seek and to reach health care. Although such findings, together with many others described in this thesis (financial, recognising problems, transport) fit easily within the three delays framework [19], some findings were complex and inter-woven, with decision making and socio-cultural practices and beliefs influencing access to care. In Chapters Six and Seven I describe how fear of giving birth in a vehicle, which would challenge two cultural beliefs - the causing of contamination and lack of isolation, could also influence a decision to seek a supervised birth. While such issues may relate to the decision to seek care, delays could also occur in reaching a health facility after a problem was recognised. For example, prolonged labour was thought to be due to the result of a social indiscretion. In such a situation, the need to undertake a traditional ritual, perhaps involving a local sorcerer, may be required to appease an ancestral spirit before progressing to seeking and reaching skilled health care, as highlighted in Chapter Seven. Also highlighted is the ongoing issue of tribal fighting between communities, resulting in women being unable to access health care during pregnancy and childbirth. Decision making and financial constraints were also described by men in the community - if money was available, women would go to the health centre to give birth, if there was no money then the woman would remain in the village.

Identified in Chapter Five of this thesis, a young woman who resorts to an induced abortion may delay seeking assistance due to fear not only of disclosure of the abortion to her family, to assist her in reaching a health facility, but also fear of the legal framework surrounding abortion.

The importance of identifying issues and factors associated with women's access to care, and delay in seeking care, is essential in order to develop appropriate interventions, including community-based approaches [22]. A set of factors identified in my work is the role of sorcery, witchcraft and spiritual beliefs, which could delay decisions to seek and reach care. These beliefs continue to be widely ascribed to and spoken about, highlighted in Chapters Five to Seven of this thesis, and from other settings throughout PNG [20, 23]. Sorcery and witchcraft were identified as the cause of an abortion and was also thought to be the cause of prolonged labour. Discussed in Chapter Seven, and mentioned above the use of a sorcerer or

traditional means to manage a situation continues to be widely used in this setting. This customary practice leads to a delay in decision making process, and in reaching a health facility. Delaying the decision to seek care during childbirth, due to traditional beliefs and customs has also been identified in Milne Bay, Morobe region [20].

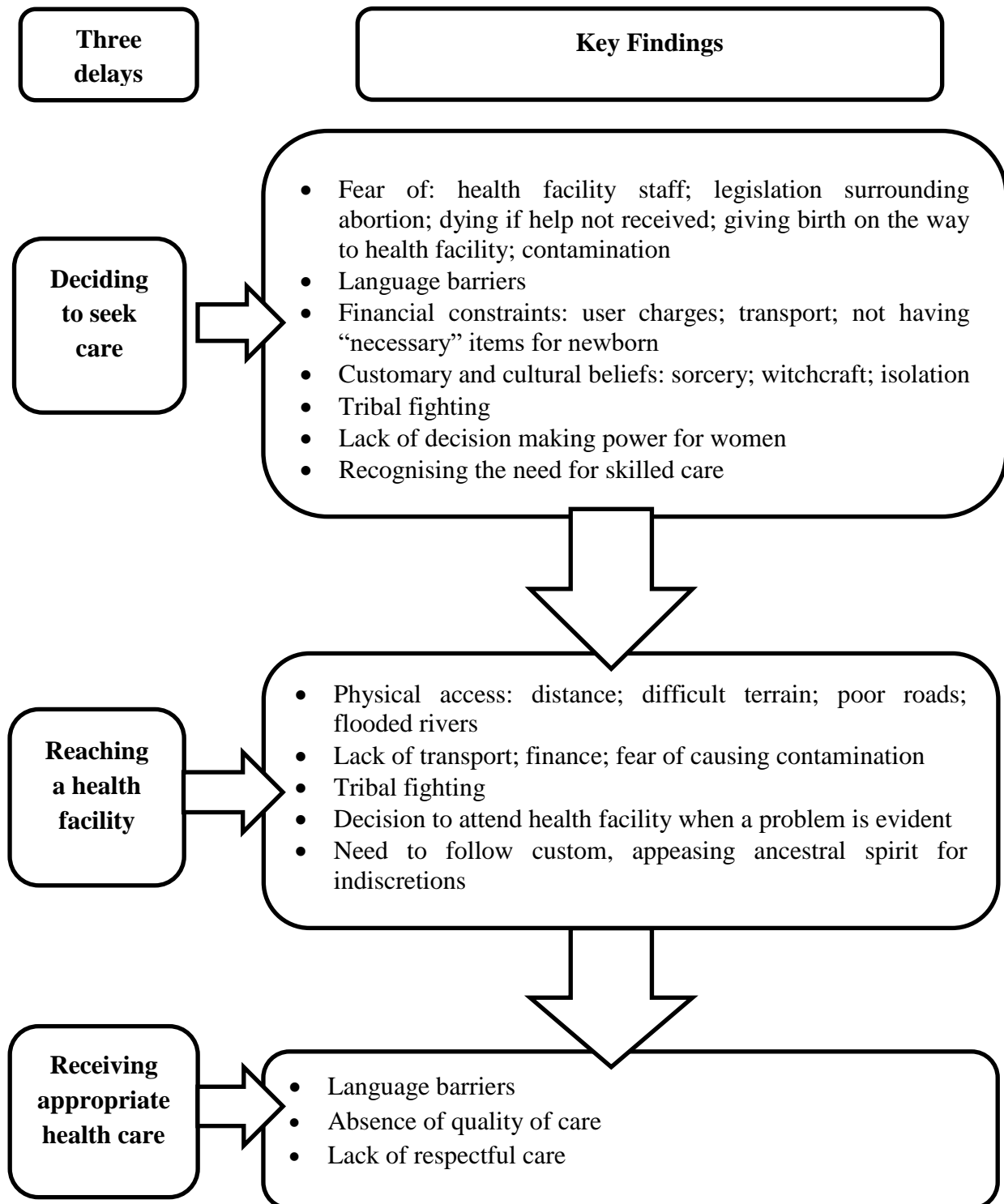
Although the three delays framework [19] typically relates to access to health care when a problem is recognised, the findings in this thesis raise the importance of the avoidance of unwanted pregnancies. Access to seeking reliable contraception is important not only to delay first or subsequent pregnancies, but to reduce the risk of unsafe abortion [24, 25]. As mentioned in Chapter Three, the contraceptive prevalence in PNG is low [4], with poor uptake of family planning, particularly among young and unmarried women, resulting in women being vulnerable to unplanned pregnancies [26, 27]. In PNG, National Health Policy states that family planning should be available for any adult without additional consent from husbands or other family members [28]. The exception is adolescents, aged under-16 years, for whom parental consent is required. However, in PNG, as in many low and middle countries [29], reaching those most in need of information and services remains problematic. In the absence of access to contraceptive information and services women resort to unsafe means to end an unwanted pregnancy [30], as highlighted in Chapters Four and Five of this thesis.

Furthermore, the legislation surrounding abortion in PNG is restrictive, and misunderstood by both women and health care workers, as described in Chapter Five. The influence of Christianity among health care workers, and faith-based organisations within the health sector means that health staff are reluctant to undertake safe induced abortion, even within the legislative guidelines [31]. The expense and accessibility of obtaining a safe abortion through the private sector [3], means access to safe abortion is problematic and beyond the means of most women in this setting.

Referring to the three delays framework [19], the key findings highlighted above and identified throughout Chapters Four to Eight are outlined in Figure 9.1. Although many of the findings identified within this thesis can be linked to the three delays framework [19], other key areas relating to maternal health also require consideration. In 2010, Awofeso and Rammohan identified seven key reasons behind the deteriorating maternal mortality situation in PNG: low female literacy; violence and ethnic conflict; general and maternal health care provision; unsafe abortion; teenage pregnancy; geography, demography and rural

infrastructure; and governance [31]. Many of these reasons relate to the three delays framework, and the findings within this thesis, and are reflected on in the next section of this chapter, outlining the future direction for maternal health in PNG.

Figure 9.1: Summary of findings identified in this study and their relationship to the three delays framework [19]



FUTURE DIRECTION FOR IMPROVING MATERNAL HEALTH IN PAPUA NEW GUINEA

This thesis presents findings relating to maternal health in the Eastern Highlands Province and provides a descriptive insight into the plight of women in this predominantly rural highlands setting. Unwanted pregnancies and unsupervised births place a huge burden on the health of women in this setting and the findings in this thesis provide a platform for further discussion relating to health facility and community based interventions and research.

Maternal health is just one component relating to sexual and reproductive health [32, 33]. In the next part of this Chapter, I discuss maternal health within this broader context, highlighting the importance of sexual and reproductive health services and discussing the absence of such services in relation to women's rights. This is followed by a discussion of the potential for the implementation of evidence based interventions and strategies that could improve outcomes for women, and their newborn infants, in the Highlands setting and other regions in PNG.

SEXUAL AND REPRODUCTIVE HEALTH AND RIGHTS

Maternal mortality is an indicator of the overall well-being of a country's health indicators with a high MMR linked to gender inequities and overall health system dysfunction [34, 35]. In resource-constrained settings, maternal deaths are often the outcome of the cumulative denial of women's human rights [36]. The right to life is central to women's human rights, recognised in international human rights treaties and national laws [37]. Failure of governments to apply their resources adequately to address, respect, and protect this right violates the law of human rights [38]. Putting their lives at risk to give life, women are entitled to have their own right to life and health protected [36, 39].

My thesis highlights the absence of critical sexual and reproductive health services in PNG, a violation of women's rights. Sexual and reproductive health comprises five components, outlined in Figure 9.2. Three of these components: family planning, unsafe abortion and maternal and newborn health relate to the findings identified throughout this thesis. Despite their importance in relation to maternal and newborn health, the remaining two components of sexual and reproductive health are not discussed as they were not within the scope of this study.

Figure 9.2: Five core components of sexual and reproductive health [32]

Family planning	Provision of high quality family planning services, including infertility services
Unsafe abortion	Elimination of unsafe abortion
Maternal and Newborn Health	Improvement of antenatal, intrapartum, postpartum and newborn care
Sexually transmitted infections	Prevention and treatment of STIs, including HIV, reproductive tract infections and cervical cancer
Promoting sexual health	Provision of appropriate information and counselling

A recent report from the World Health Organization on the state of inequality [40] highlights a number of inequalities that persist in relation to reproductive and maternal health at a global level. Gaps in coverage are noted between the richest and poorest women; the most and the least educated women; and between urban and rural areas in relation to supervised births and coverage of antenatal care, particularly for four ante natal visits. The use of modern contraceptive methods is at least twice as high among women with secondary level education, compared to women with no education [40]. Globally, adolescents also face a substantial burden of inequalities in access to sexual and reproductive health services, education and information [30, 41].

FAMILY PLANNING

Family planning is not just about preventing unwanted pregnancies. It is about choice; deciding how many children to have and when to have them. All couples and individuals have the right to determine the number and timing of their children; they also have the right to access reproductive health services, free of discrimination, coercion and violence [33]. Fewer births and unwanted pregnancies and a lower proportion of high risk births contributes towards improved maternal health outcomes and lower maternal mortality and morbidity [42]. Recent estimates indicate that through family planning interventions, 57% of maternal deaths could be avoided due to reduced fertility and fewer pregnancies [43].

Highlighted in Chapter Three, the educational status of many Papua New Guineans, particularly women is relatively low [44] and geographical diversity and rural communities

[45] can mean the most vulnerable and in need are the most difficult to reach [41]. A recent report among women attending antenatal clinic in Port Moresby indicated that half of all the pregnancies were unintended [26]. Most of the pregnancies were among women aged under-20 years, who were unmarried and had either used no contraceptive or used it inconsistently [26]. In their earlier work in the Eastern Highlands, Asa et al [27] identified that the majority of women admitted to hospital following induced abortion had not previously used contraceptives. Moreover, most women were unmarried, students and pregnant for the first time. Both of these findings are relevant to those identified in Chapters Four and Five of this thesis.

UNSAFE ABORTION

When performed correctly by qualified health workers, an induced abortion is a relatively safe procedure [46]. However, in unsafe conditions death and disability may occur [47]. Reasons for seeking an abortion vary and may be due to contraceptive failure, poor access to contraception, a mistimed pregnancy, health risk to the woman, rape or incest, or socio-economic reasons [48]. As outlined in Chapter Four, induced abortion in PNG is restricted under the Criminal Code Act [49]. Due in part to this legislation, but also to the religious convictions of many Papua New Guinean health care workers, virtually no abortions take place within public health facilities [3]. The result is the practice of unsafe abortion. Furthermore, women's lives are being placed at increased risk due to fear of accessing post-abortion care, afraid of the legal ramifications. Along with improved access to family planning, where indicated, improved access to safe abortion services together with review of post-abortion care services in PNG could help in reducing the burden of maternal mortality and morbidity from unsafe, induced abortions. Moreover it will ensure a woman's right within the sexual and reproductive health and rights paradigm [29].

MATERNAL AND NEWBORN HEALTH

Key factors associated with maternal deaths are the absence of skilled health professionals during childbirth, lack of services to provide emergency obstetric care and deal with complications of unsafe abortion, and ineffective referral systems [50]. Most maternal deaths occur during the intrapartum and postpartum period with nearly half of all postpartum deaths occurring in the first 24 hours postpartum [51, 52]. The outcome of the newborn is inextricably linked to maternal health outcome and intrapartum events. The three main causes of neonatal deaths are due to intrapartum events, preterm complications, and neonatal sepsis

[53, 54], many of which could be reduced through increased care around the time of birth. Thus, a focus of attention on improving maternal health outcomes can also have a positive influence on the outcome of the newborn [55, 56].

Identified in Chapters Six to Eight, accessing a health facility to give birth was frequently not prioritised with geographical and socio-cultural barriers key factors in reaching or not reaching a health facility. Women's perspectives of access to care during childbirth and the barriers they face provide important information for developing further work in this rural location. While the importance of health facility births is recognised in this rural community many women continue to give birth in the village. Identifying and understanding local customs, beliefs and practices, particularly those that may be harmful to women and their newborn infants, is critical to the development of locally-appropriate community-based strategies for improving maternal and infant health in rural communities in PNG and other resource-limited settings.

While geographical issues relating to access to the health facility in this rural location remains out of the direct control of the community, other community-based strategies and interventions could provide short term benefit while the wider issue of supervised births for all remains out of reach. The importance of supervised, health facility births must be encouraged but women giving birth at home, either through choice or circumstances, cannot be ignored. In the absence of community-based health care providers, and with poor access to health facilities, a community-based package of interventions could reach both men and women with key health education messages relating to birth preparedness. While providing essential information of the importance of supervised births, women could be provided with an independent means to protect themselves, and their newborn infant from adverse outcomes through the use of clean birth kits and self-administered misoprostol. Additionally, providing clean birth kits and misoprostol directly to women will facilitate a clean birth and protection from postpartum haemorrhage should they reach a health facility that may be inadequately equipped to manage a clean birth, and without access to injectable oxytocics.

Recently available recommendations from the World Health Organization highlight key health promotion interventions for maternal and newborn health [57]. Despite the low evidence for most recommendations, eight are strongly recommended for adoption into policy in most situations, due to the positive effects noted when the interventions are

implemented [57]. Additional recommendations, which may be applicable in certain situations are also suggested, however consultation with key local stakeholders is advised prior to their implementation into policy. Two final recommendations are highlighted as research areas due to the limited availability of evidence. These 12 recommendations are outlined in Figure 9.3.

Figure 9.3: Recommended health promotion interventions for maternal and newborn health [57].

Strongly recommended interventions
<ol style="list-style-type: none"> 1. Birth preparedness and complication readiness interventions 2. Male involvement interventions 3. Partnership with Tradition Birth Attendants 4. Providing culturally appropriate skilled maternity care 5. Continuous companionship during labour and birth/companion of choice 6. Community mobilization through facilitated participatory learning and action cycles with women’s groups 7. Community participation in quality improvement processes 8. Community participation in program planning and implementation
Conditional recommendations
<ol style="list-style-type: none"> 9. Maternity waiting homes 10. Community-organized transport schemes
Research recommendations
<ol style="list-style-type: none"> 11. Interventions to promote awareness of human, sexual and reproductive rights and the right to access quality skilled care 12. Community participation in Maternal Death Surveillance and Response

SEXUAL AND REPRODUCTIVE HEALTH IN PAPUA NEW GUINEA: THE WAY FORWARD?

As discussed in Chapter Two, through a continuum of care approach [58], many maternal and neonatal deaths could be avoided in PNG through the availability of access to family planning, post abortion care, and improved care throughout the antenatal, intrapartum and postpartum period. Furthermore, the implementation of programs and policies that support women's access to such services through community and health facility based training and education and information could have positive benefits for both women and their newborn infants.

In line with the MDGs, the PNG National Health Plan 2011-2020 [59] clearly lays out the Government's commitment to maternal and child health, through Key Result Area Four: Improve Child Survival and Key Result Area Five: Improve Maternal Health. Despite some improvements in child health, the neonatal mortality ratio remains high in PNG, inextricably linked to the maternal mortality ratio.

Reflecting on the findings in this thesis, and considering family planning, unsafe abortion and maternal and newborn health, a number of interventions could be considered for wider implementation, working within available policy guidelines in PNG. Given the paucity of data available for this challenging setting, undertaking the interventions in one setting, within a robust research framework could provide evidence for replicating the interventions in other settings throughout the country. Referring to the recently available WHO recommendations for health promotion interventions for maternal and newborn health [57], Figure 9.4 outlines interventions, that could be considered in PNG as we strive to improve maternal and newborn outcomes. Many of these interventions could be implemented at the community level through existing opportunities, for example, messages relating to birth preparedness could be incorporated into the health information sessions provided during routine antenatal clinics. Women could be encouraged to bring along a birth partner to assist them during labour, providing social support and translation when required.

As outlined in Chapter Two in order to improve maternal outcomes there is a need for skilled health professionals throughout the pregnancy and childbirth period. The ongoing training and support of midwives, nurses, HEOs and doctors trained in essential obstetric care is essential alongside any health promotion interventions relating to maternal and sexual and

reproductive health interventions. As described in Chapter Three, the training of midwives is currently ongoing in PNG through a revitalised midwifery training program. Given the shortage of midwives in PNG, the midwifery training program is taking place alongside the government led training of nurses, midwives and doctors in emergency obstetric care. In addition to training in essential and emergency obstetric care, all cadres of trained health care workers need to be educated in the appropriate use of available commodities, such as misoprostol for post abortion care and prevention and treatment of postpartum haemorrhage. This is of particular importance within the rural settings. In addition, health care workers need to be made aware of the importance of respectful and culturally appropriate care, encouraging women to make use of available services.

Figure 9.4: Interventions and rationale for maternal and newborn health in Papua New Guinea

Intervention	Rationale
Birth preparedness and complication readiness	<p>Provides information at the community level relating to the importance of supervised births.</p> <p>Provides key messages relating to maternal and newborn danger signs</p> <p>Enables the family and community to prepare for transport</p> <p>Supports decision making</p> <p>Potential to increase skilled care during birth</p> <p>Could reduce the delay in deciding to access and reach health care</p>
Male involvement	<p>Includes men in the key messages necessary to facilitate supervised births.</p> <p>Could minimise delay in deciding to access and reach health care.</p>
Culturally appropriate skilled care during childbirth	<p>Identifying cultural practices within communities helps in developing culturally appropriate care for women and their newborn.</p> <p>Could reduce the delay in deciding to access health care.</p>
Continuous companionship during labour and birth/ companion of choice	<p>Improves women’s satisfaction with services.</p> <p>Women may feel more comfortable accessing health care, minimising delay in reaching health care.</p>
Community participation	<p>Dialogue with the community, including village elders and village leaders, allows for jointly identifying and assessing quality of care from health services.</p> <p>Perspectives from the women, communities and health care providers can be identified.</p> <p>Could help minimise the delay in deciding to access health care.</p>
Maternity waiting homes	<p>Limited evidence but could be beneficial in some settings, particularly remote areas or areas with limited access to services.</p> <p>Delay in reaching a health facility would be minimal.</p>
Community-organized transport schemes	<p>May be a short term answer but may not be sustainable in long term.</p> <p>Could help reduce the delay in reaching a health facility.</p>
Promote awareness of human, sexual and reproductive rights and the right to access quality skilled care	<p>Inclusion of SRH messages and information in schools and tertiary education, and to women attending maternal health services about their right to health, including access to family planning and post abortion care services; and their right to access quality skilled care.</p> <p>Could reduce the risk of unwanted pregnancies and minimise delay in accessing health care.</p>

In the light of the findings identified in this thesis, the interventions described and outlined in Figure 9.4, should be considered for use within PNG, in the effort toward improving maternal and newborn outcomes. However, even with such interventions, unsafe abortions and unsupervised, either by choice or circumstances, will continue and while unsafe abortions and unsupervised births take place, women remain at risk. The need to reach women in the community and across the continuum of reproductive health care remains a challenge.

Acknowledging such interventions as those outlined in Figure 9.4 requires considerable time, planning and resources. In the short term, strategies need to be identified and developed in the light of available national and international evidence. The importance of dissemination of information, including research findings such as those highlighted within this thesis are key to opening dialogue and discussion, particularly in relation to emotive issues such as unsafe abortion. Ongoing throughout the four year period of study relating to this thesis, every opportunity was taken to disseminate findings at both the local and national level. Findings relating to Chapters Four to Seven have been presented at national conferences; the findings relating to Chapter Eight will be presented at the PNG annual medical symposium in September 2015. Further appropriate steps to begin the implementation of findings within this thesis could begin with dissemination of key information within current obstetric care guidelines, for example the appropriate use of misoprostol, as discussed in more detail in the next section of this Chapter.

MISOPROSTOL: THE POTENTIAL TO IMPROVE MATERNAL HEALTH OUTCOMES IN PAPUA NEW GUINEA?

Misoprostol is effective in preventing two of the main causes of maternal mortality – unsafe abortion and postpartum haemorrhage [60, 61]. A cheap, heat-stable tablet available in more than 80 countries across the globe [60], it is particularly useful in resource-poor settings. In relation to maternal health, guidelines are available for its use in the induction of labour, prevention and treatment of postpartum haemorrhage, and management of spontaneous and induced abortion [60, 62]. Since its addition to the World Health Organization’s Essential Medicines List in 2011 [63], misoprostol is available in all hospitals and health centres in PNG with standard guidelines describing its use in managing incomplete abortions, induction of labour and prevention and treatment of postpartum haemorrhage [28].

MISOPROSTOL FOR ABORTION

The use of misoprostol in managing unwanted pregnancies was first discovered in the 1980s [61]. Since then it has been increasingly used across the globe, particularly in settings with restrictive abortion law with women gaining access to it without the need to seek care or advice from a health care provider [27, 47, 64-66], as identified in Chapters Four and Five of this thesis. While it is suggested that induced abortion is safer with misoprostol than other unsafe methods to end an unwanted pregnancy, appropriate administration and gestation are important [65] and second trimester unsafe abortions frequently result in more serious complications, including maternal deaths [67] compared with first trimester abortion.

Following an incomplete abortion, the World Health Organization and the International Federation of Gynecology and Obstetrics (FIGO), recommend management with the use of misoprostol or manual vacuum aspiration, rather than sharp curettage. However, evidence-based guidelines for the management with these two approaches typically only include women up to the end of the first trimester [46, 68]. In settings with restrictive abortion law, women frequently present or access care later in the pregnancy, often in the second trimester [69], as identified in Chapters Four and Five of this thesis. In the light of the limited evidence-base for post abortion care in the second trimester, in 2015 Mark et al [69] undertook a systematic review to establish recommendations for second trimester post abortion care. The overriding conclusion indicates that misoprostol is effective in managing women presenting for second trimester post abortion care [69].

Despite standard guidelines indicating the use of manual vacuum aspiration or misoprostol in incomplete abortion [28], as discussed in Chapter Four of this thesis, only one woman received misoprostol for incomplete abortion. The remaining women were managed primarily by dilatation and curettage. The need for surgical intervention places an increased burden on an already over-stretched health system.

MISOPROSTOL FOR PREVENTING POSTPARTUM HAEMORRHAGE

The growing body of evidence demonstrating the effectiveness of misoprostol for prevention of postpartum haemorrhage in community settings [70-76] provided the impetus behind the study presented in Chapter Eight. Given the geographical and social constraints under which many people live in PNG, providing women with the means to improve their chance of a safer outcome, for both themselves and their newborn infant, the provision of misoprostol

within an intervention package proved to be a successful intervention. While the importance of supervised births for all women continues to be supported in PNG this last paper provides evidence for a community-based intervention as an interim strategy to support and strive for supervised births, while reducing the risk of maternal death from postpartum haemorrhage.

The use of misoprostol to prevent and treat postpartum haemorrhage is within national standard guidelines in PNG [28]. However, the actual use of misoprostol is limited, with many health care workers believing it can only be used by doctors and health extension officers. Despite this belief, misoprostol is available at all hospitals and health centres throughout PNG. Efforts need to be made to ensure appropriate access to this life-saving commodity, particularly in the rural setting. During the design stage for the paper presented in Chapter Eight, a number of stakeholders in PNG, including nurses, midwives, doctors and members of the ethics committee, were concerned that through distributing misoprostol in the community, it could be inappropriately used. Their primary concern was that it could be used by other members of the community to end an unwanted pregnancy, rather than for its intended purpose of preventing postpartum haemorrhage. As this thesis describes, misoprostol is already used by women seeking to end an unwanted pregnancy, frequently available through unsafe means and in uncontrolled situations. When provided to women for abortion from a trained health worker, women did receive appropriate instruction, even though the outcome was still potentially life-threatening.

My thesis shows that by providing misoprostol within a community-based package of interventions, with misoprostol provided within national guidelines e.g. prescribed and provided by a skilled nursing officer or midwife, women were able to correctly administer this life-saving intervention when unable to access a supervised birth. Additionally, some women who had a supervised, health facility birth self-administered their misoprostol believing they had not received an injectable oxytocic to prevent PPH, or afraid because they felt they were bleeding too much. The potential to extend the use of misoprostol, through community-based initiatives, including women self-administering these life-saving tablets in the absence of a supervised birth warrants further exploration in PNG.

STUDY LIMITATIONS

This program of research has a number of limitations, not least of which are the sampling methods used to identify respondents. Because women were recruited primarily within the

health facility settings - hospital wards and antenatal clinics, the experiences of those not reaching or attending these facilities have not been identified. As such, it is likely that a number of women experiencing abortion without complications requiring hospital level care, or resulting in maternal deaths have not been captured. In addition, women not attending antenatal clinic or those deciding not to join, or unable to enrol into any of the studies were missed. Considering this, the opportunity may have been missed to gain insights from women with either positive or negative experiences relating to pregnancy and childbirth. This limitation was partly addressed through the work undertaken and presented in Chapters Six and Seven, through which attendance at antenatal clinic was not a pre-requisite for joining focus groups or in depth interviews. In addition, to provide a broader insight into maternal health in the study setting, men were included as informants through both focus group and individual interviews in (Chapter Seven).

All women and men who participated in this study offered their willingness and availability to share their stories and experiences, or were purposively approached. While it could be argued that the findings presented within this thesis reflect only those who felt they had a story to tell, and while the findings may therefore not necessarily represent the wider community, the discussions undertaken and information gained does provide a unique insight into the traditional beliefs, practices and difficulties facing women in this rural highlands setting.

In considering the methodology used throughout this thesis, further limitations warrant consideration. The overall aim of this thesis was to describe women's experiences of pregnancy and childbirth. As such, I chose to take a very broad descriptive approach that allowed me to describe both quantitative and qualitative data. Within the space limitations of this thesis I have not been able to include more detailed discussion of the methods and findings, for example the use of the spider-diagram to gain a broad understanding from the community perspective. Instead I chose to keep close to the surface of the data in order to present a broader understanding as told by the study participants, and intend to publish separately in the future on research techniques.

Given the diversity of languages in PNG, we were fortunate to be able to use either English or tok-pisin during most of the interviews. For the few interviews that took place in a local language, we were able to enlist the help of trained social-science researchers from the PNGIMR to assist in interviewing and translating. In view of the difficulties in translating

qualitative data we sought to ensure translation was undertaken for meaning and connotation of the text through the identification of three individuals, all trained and skilled in transcribing and translating, to undertake all transcribing and translation. All transcripts were reviewed by myself and the research midwife. When additional clarity for a translation was felt necessary, a second and third opinion was sought from other members of the PNGIMR research team, including a social anthropologist fluent in tok-pisin, and a co-investigator for each of the studies within this thesis. For interviews undertaken in local languages, translation was undertaken by the person who had conducted the interview. As with translations from tok-pisin to English, the opinion of a second person fluent in the local language was sought to clarify translations.

The members of the research team who supported the studies included within this thesis were specifically selected, trained and closely supervised by myself as the principle investigator. The same research midwife was involved in all three studies. She was an experienced researcher trained to conduct the semi structured and in depth interviews for each of the studies; she also supported clinical data collection. Her involvement in all of the studies was essential to ensure interviews and data collection was undertaken in a systematic manner with study guidelines and procedures followed. Through close liaison with myself, as the principle investigator, and review of data collection on a daily basis we were able to identify any discuss any problems.

While it is recognised that the findings relate to one specific setting, a number of strategies and program implementations can be identified from the findings. Some strategies reflect implications at the health facility level, including the training of skilled health workers, while others could be implemented at the community level to identify and improve knowledge and practice in the community setting, promoting positive outcomes for women and their newborn infants. Despite the cultural diversity throughout PNG, these strategies and interventions could be widely implemented and trialled within a robust framework.

Despite the limitations, given the high number of unsupervised births and the high MMR in PNG, the final paper presented in this thesis provides evidence for an interim strategy that could run concurrently with other health system strengthening activities designed to improve the quality and accessibility of maternal health care in first-line health care facilities in this setting. Moreover, through locally appropriate interventions supervised births may be

increased while also providing women with a safer childbirth experience through the use of clean birth kits and prevention of PPH with self-administered misoprostol.

CONCLUSION

Maternal health in Papua New Guinea is in crisis. The high maternal mortality ratio is not only an indicator of poor access to essential health services at a critical time in a woman's life, but a violation of women's rights. Constrained by numerous socio-cultural and geographical barriers and a deteriorating and poorly functioning health system, this thesis demonstrates a body of work with indicators to improve outcomes for women and their newborn infants in one setting in PNG. Evidence from this study provides an example of how locally appropriate programs and strategies can be used to address two key causes of maternal mortality in PNG. Community based strategies and interventions may provide a short term solution to improve maternal health outcomes while wider issues of health system strengthening, including developing a health workforce that includes midwives, abortion law reforms and the revitalisation of essential maternal health services are addressed.

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APPENDICES

- Appendix 1: Semi structured interview guide (Chapters 4 and 5)**
- Appendix 2: Case note record form (Chapter 4)**
- Appendix 3: In depth interview Guide, women (Chapter 5)**
- Appendix 4: In depth interview guide, health care workers (Chapter 5)**
- Appendix 5: Interview guide, focus group discussions (Chapters 6 and 7)**
- Appendix 6: In depth interview guide (interviews with women) (Chapter 7)**
- Appendix 7: Key informant interview guide (Chapter 7)**
- Appendix 8: Case note record/basic demographic form (Chapter 8)**
- Appendix 9: Semi structured questionnaire for postnatal follow up (Chapter 8)**

APPENDIX 1
SEMI STRUCTURED INTERVIEW GUIDE
(CHAPTERS 4 & 5)

Semi structured interviews with women: Pregnancy loss study

Experience in hospital - Pregnancy loss experience

How did you get to the hospital?

- Who came with you?

Can you tell me about why you came to the hospital?

- What was the problem that you were experiencing?
- Do you know why that may have happened?
- Has this ever happened to you before?

What happened to you when you got here?

- How were the staff towards you?

When you first realised that you had missed your monthly bleeding, how did you feel?

- When did you first realize that you might be pregnant

Can you tell me your story about how the pregnancy ended?

- Do you know why that may have happened?
- How did you feel when the pregnancy ended?

In the hospital do you feel that your privacy was respected?

- Could you talk about how you were feeling?

APPENDIX 2
CASE NOTE RECORD FORM
(CHAPTER 4)

Case Record Form Pregnancy Loss Study

Study ID: -

Date / /

Note to research assistant: This form should be completed for **every** case admitted to hospital following any abortion, including miscarriage during the 6month study period **ONLY** if the woman has completed informed consent procedures. Please complete ALL sections of the form and return to the site coordinator at the end of each week (Lisa Vallely/Primrose Homiehombo for GGH and Professor Mola for PMGH)

Section A. Socio-demographic information

1. Age	15-19 <input type="checkbox"/>	30-34 <input type="checkbox"/>	40-44 <input type="checkbox"/>
	20-24 <input type="checkbox"/>	35-39 <input type="checkbox"/>	Not known <input type="checkbox"/>
	25-29 <input type="checkbox"/>		

2. Marital status	Married <input type="checkbox"/>	Co-habiting <input type="checkbox"/>	Widow <input type="checkbox"/>
	Single <input type="checkbox"/>	Separated <input type="checkbox"/>	Other (specify) <input type="checkbox"/>

3. Province of birth (home province)	Eastern Highlands <input type="checkbox"/>	East Sepik <input type="checkbox"/>	East New Britain <input type="checkbox"/>
	Western Highlands <input type="checkbox"/>	West Sepik <input type="checkbox"/>	West New Britain <input type="checkbox"/>
	Southern Highlands <input type="checkbox"/>	Madang <input type="checkbox"/>	New Ireland <input type="checkbox"/>
	Simbu (Chimbu) <input type="checkbox"/>	Milne Bay <input type="checkbox"/>	Western (Fly) <input type="checkbox"/>
	Enga <input type="checkbox"/>	Oro (Northern) <input type="checkbox"/>	National Capital District <input type="checkbox"/>
	Central <input type="checkbox"/>	Bougainville <input type="checkbox"/>	Other (specify) <input type="checkbox"/>
	Gulf <input type="checkbox"/>	Manus <input type="checkbox"/>	

4. Name of the place where you currently live	District: _____	Village: _____
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5. Employment <i>Tick all that apply</i>	I do not have a paid job <input type="checkbox"/>	Student <input type="checkbox"/>	Sex worker <input type="checkbox"/>
	I work in the garden only (farmer) <input type="checkbox"/>	Police / Defence / Prison force <input type="checkbox"/>	NOT KNOWN <input type="checkbox"/>
	I carry out house duties <input type="checkbox"/>	Health care worker <input type="checkbox"/>	OTHER (SPECIFY) <input type="checkbox"/> _____
	Teacher <input type="checkbox"/>	Security guard <input type="checkbox"/>	
6. Religion	Catholic <input type="checkbox"/>	SDA <input type="checkbox"/>	Evangelical Alliance <input type="checkbox"/>
	Lutheran <input type="checkbox"/>	Pentecostal <input type="checkbox"/>	Other (specify) <input type="checkbox"/> _____
	United Church <input type="checkbox"/>	Anglican <input type="checkbox"/>	
7. Educational level	No formal education <input type="checkbox"/>	Gr.7-10 <input type="checkbox"/>	Don't know <input type="checkbox"/>
	Gr.1-3 <input type="checkbox"/>	Gr.11-12 <input type="checkbox"/>	Other (specify) <input type="checkbox"/> _____
	Gr.4-6 <input type="checkbox"/>		

Section B. Reproductive history of client

8	Was this a planned pregnancy?	Planned/ wanted <input type="checkbox"/>	Result of unwanted sex		
		Not planned but wanted	(rape) <input type="checkbox"/>		
		when got used to idea <input type="checkbox"/>	Don't know <input type="checkbox"/>		
		Mistake/not wanted <input type="checkbox"/>	Other (state) <input type="checkbox"/> _____		
9	Total number of previous births (live and stillborn)	<input type="text"/> <input type="text"/>	<input type="text"/> <input type="text"/>	<input type="text"/> <input type="text"/>	<input type="text"/>
		All births	Live births	Still births	Not applicable
10	Total number of previous spontaneous miscarriages	<input type="text"/> <input type="text"/>			
11	Previous history of induced abortion? (excluding the current admission)	No <input type="checkbox"/>	Yes <input type="checkbox"/>	If yes, number of times <input type="text"/>	

Section C. Clinical history and vital signs on arrival at the hospital for the current care

12 **Date of 1st visit to any health worker or facility to seek care** // (day/month/year)

13 **First Health facility or health worker attended** _____ (name of HF)

14 **Date of arrival at this hospital for treatment** // (day/month/year)

15 **Way or means by which the patient got to hospital**

Self-referral Referral from health centre or clinic (state name of HF)

Family member/ wantok brought her (state who) _____

Not known

Other means (state) _____

16 **Presenting complaints/history on admission**

(Mark ALL responses and add free text)

Bleeding only Bleeding, pain, fever, unwell

Bleeding and abdominal pain Other (state) _____

17 **No of days of symptoms before seeking health care** (days) / (weeks)

18 **Reported last normal menstrual period** _____ (month) Not known

19 **Reported gestation (patient's own view of how many months pregnant she was before the miscarriage)** (weeks) OR (months)

Not known

20 **Does the woman admit to a history of interference with the pregnancy?** Yes No

20a **If yes: When did that occur?** / / OR _____

(Days ago) (Weeks ago) (Date)

21 **Vital signs on admission**

Please record the following vital signs for the woman on her **arrival at the hospital**: Not available

21a	Temperature	__ __ . __ °C
21b	Pulse rate	__ __ __ per minute
21c	Respiratory rate	__ __ __ per minute
21d	Blood pressure	__ __ __ mmHg

Section D. Clinical examination on arrival at the hospital for the current care

22 Initial physical examination (Tick ALL that apply)

22a	Painful/tender abdomen	Yes <input type="checkbox"/>	No <input type="checkbox"/>	If YES	Generalised <input type="checkbox"/>	Localised <input type="checkbox"/>	
22b	Pale	Yes <input type="checkbox"/>	No <input type="checkbox"/>	If YES	Mild <input type="checkbox"/>	Moderate <input type="checkbox"/>	Severe <input type="checkbox"/>
22c	Signs of Interference with the pregnancy	Yes <input type="checkbox"/>	No <input type="checkbox"/>	If YES	(specify details)		
22d	Signs of Sepsis	Yes <input type="checkbox"/>	No <input type="checkbox"/>	If YES	(specify details)		

22e	Other e.g. Signs of tetanus (specify)	Yes <input type="checkbox"/>	No <input type="checkbox"/>	If YES	(specify details)
-----	---------------------------------------	------------------------------	-----------------------------	---------------	-------------------

23 Vaginal examination (Tick ALL that apply)

23a	Evidence of foreign body in vagina	Yes <input type="checkbox"/>	No <input type="checkbox"/>	
23b	Evidence of foreign body in cervix	Yes <input type="checkbox"/>	No <input type="checkbox"/>	
23c	Evidence of foreign body in uterus	Yes <input type="checkbox"/>	No <input type="checkbox"/>	
23d	Evidence of any trauma to any part of the genital tract	Yes <input type="checkbox"/>	No <input type="checkbox"/>	If YES (specify details)

24	On examination, which of the following were detected?	Products of conception in cervical os <input type="checkbox"/> Vaginal or cervical tears or lacerations <input type="checkbox"/>	Injury/perforation of uterus <input type="checkbox"/> Intra-abdominal injury <input type="checkbox"/> Nil <input type="checkbox"/>
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26	Which of the following signs were identified on admission?	Endometritis (fever /tender uterus only) <input type="checkbox"/> Pelvic abscess <input type="checkbox"/> Pelvic peritonitis <input type="checkbox"/> Generalized peritonitis <input type="checkbox"/> Uterine perforation <input type="checkbox"/>	Gangrenous uterus <input type="checkbox"/> Gangrenous bowel <input type="checkbox"/> Tetanus <input type="checkbox"/> No sign of infection <input type="checkbox"/> Other (specify) <input type="checkbox"/>
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25	On vaginal examination, were any offensive or foul smelling products of conception noted?	Yes <input type="checkbox"/>	No <input type="checkbox"/> Not Known <input type="checkbox"/>
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27	Which of the following signs of organ/system failure were noted on admission examination?	Adult Respiratory distress syndrome <input type="checkbox"/> Renal failure <input type="checkbox"/> Liver failure <input type="checkbox"/> Cardiac failure <input type="checkbox"/>	Coma <input type="checkbox"/> Coagulation defect (DIC) <input type="checkbox"/> No organ/system failure noted <input type="checkbox"/> Others (specify) <input type="checkbox"/>
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28	Estimated gestation at time of admission	≤ 12 weeks <input type="checkbox"/>	> 12 weeks <input type="checkbox"/> Not known <input type="checkbox"/>
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Section E. Diagnosis on admission to hospital

29 Clinical stage of abortion (the diagnosis)

Threatened abortion <input type="checkbox"/>	Missed abortion <input type="checkbox"/>
Inevitable abortion <input type="checkbox"/>	Complete abortion <input type="checkbox"/>
Incomplete abortion <input type="checkbox"/>	Other (<i>specify</i>) <input type="checkbox"/>

30 Was the clinical stage of abortion also septic? Yes No

31 Based on your overall assessment of the client, was there any attempt made to induce the abortion? Yes No
Don't know

Section F. Laboratory investigations conducted for the current care

32 Which of the following investigations were carried out?
Note: Tick all that apply

Haemoglobin/Hematocrit <input type="checkbox"/>	HIV/VCT <input type="checkbox"/>
WBC <input type="checkbox"/>	None <input type="checkbox"/>
Blood grouping <input type="checkbox"/>	Blood culture <input type="checkbox"/>
Platelets <input type="checkbox"/>	Others (<i>specify</i>) <input type="checkbox"/>
VDRL <input type="checkbox"/>	_____

Section G. Clinical management

33 Was any uterine evacuation procedure performed to treat the client for her presenting problem? Yes No
If NO go to Q35

33a What procedure took place

Evacuation and curettage (EOU) <input type="checkbox"/>	Insertion of Misoprostol tablets <input type="checkbox"/>
Dilation of cervix and curettage (D&C) <input type="checkbox"/>	Others (<i>specify</i>) <input type="checkbox"/>
Manual vacuum aspiration (MVA) <input type="checkbox"/>	_____

33b	Who performed the procedure?	SMO Ob/Gyn <input type="checkbox"/>	Resident <input type="checkbox"/>
		Registrar <input type="checkbox"/>	Midwife/nurse <input type="checkbox"/>
		Health Extension Officer <input type="checkbox"/>	Others (<i>specify</i>) <input type="checkbox"/>

34	Was the client provided any pain medication during the evacuation procedure?	Yes <input type="checkbox"/>	No <input type="checkbox"/>
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34a	What did the client receive?	General anesthesia <input type="checkbox"/>	Valium/pethidine
		Para cervical block <input type="checkbox"/>	type sedation <input type="checkbox"/>
			Others (<i>specify</i>) <input type="checkbox"/>

35	Which other procedures were carried out?	Removal of POC from cervical os <input type="checkbox"/>	Laparotomy (exploratory only) <input type="checkbox"/>
		Abscess drainage <input type="checkbox"/>	None <input type="checkbox"/>
		Hysterectomy <input type="checkbox"/>	Other (<i>specify</i>) <input type="checkbox"/>
		Repair of cervical tear <input type="checkbox"/>	_____
		Repair of uterine/bowel perforation <input type="checkbox"/>	

36	Was the client given antibiotics during her admission?	Yes <input type="checkbox"/>	No <input type="checkbox"/>
-----------	---	------------------------------	-----------------------------

36a	What did she receive?	Oral antibiotics only <input type="checkbox"/>	Combined (oral and parenteral antibiotics) <input type="checkbox"/>
		Parenteral antibiotics only <input type="checkbox"/>	

37	Was the client given intravenous fluids during her admission?	Yes <input type="checkbox"/>	No <input type="checkbox"/>
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38	Was the client given blood or blood products during her admission?	Yes <input type="checkbox"/>	No <input type="checkbox"/>
-----------	---	------------------------------	-----------------------------

39	Was the client given oxytocics (oxytocin or ergometrine or misoprostol) after the uterine evacuation procedure?	Yes <input type="checkbox"/>	No <input type="checkbox"/>
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40

How long did the client stay in the hospital for care?

Less the 24 hours

More than 24 hours

(specify no. of days)

Section H. Outcome of clinical management of current care

42

Date of discharge/death/absconded/referral of client: //

43

If discharged well, any advice given/treatment provided

(Tick ALL that apply)

Antibiotics to continue at home

FP advice only given

FP method actually provided

(specify method)

OPD follow up appointment given

Not applicable

Not known

Other (Specify)

Completed by:		Date: ___/___/___
Print Name		
Position		

APPENDIX 3
IN DEPTH INTERVIEW GUIDE, WOMEN
FOLLOWING INDUCED ABORTION
(CHAPTER 5)

Background/basic demography

- Age, marital status, education, village, pregnancies

Current state of health

- How are you feeling now?
- How is that compared to when you first came to hospital?
- Have you discussed this with the staff? / What did they say?

Presentation to hospital

- Why came to hospital
- What happened
- How long had you been experiencing this problem?

Pre- hospital care/treatment

- Who did you talk you / why that person/ what did they advise/ did you follow that advice?
- Help from another person/health facility?
- Why/ where/when/what did they do?

Decision to come to hospital

- Who decided you should come/ why did they decide that?
- How did you get here?
- How did you feel about coming to the hospital?
 - Do you think it's a good thing that you came?
 - Did somebody come with you? Who/why?

Pregnancy

- How did you react when you did not see monthly bleeding?
- Did you tell anybody? / Who did you tell?
- Story of pregnancy
 - Months of pregnancy
 - Who did you tell / What did they say?
 - What thoughts did you have about actually having the baby?
- Did you always have those thoughts? (ie. Did something happen and you changed your mind)

Deciding not to have the baby

- Why didn't you want to have the baby?
- Did you discuss your feelings to end the pregnancy with anybody?

- Who did you tell? / what did they advise?
- How was the decision made to end the pregnancy?
 - Who made that decision
- Did you want to do that?
- Who told you/ What do you know/ where can women go/what can women do to end a pregnancy?

Story of ending pregnancy

- How many months pregnant were you when ended pregnancy?
- Where did you go/ who did you go with?
- Who helped you? /What did they do?/ what questions did they ask you? What advice did they give?
- How much did it cost you?
- How did you find the money for that?

Complications after ending the pregnancy

- What happened?
- When did that problem start?
- What were your thoughts about that?
- Why do you think that thing happened?
- Who did you talk to? / why? / what did they advise?
- How did you feel (emotionally, physically...)

Arriving at hospital

- How did you feel/ where did you go?
- How have been treated by the staff?
- Did the nurses or doctors explain to you about what happened?

Follow up care

- Care after discharge
- Knowledge for pregnancy prevention
- Advice/ support from staff
- What advice would you share with other women in similar situations

APPENDIX 4

IN DEPTH INTERVIEW GUIDE, HEALTH CARE WORKERS

(CHAPTER 5)

Background

Can you tell me about your background

- When did you graduate, where did you study, how long have you worked here.....
 - Position at Health Facility
 - No. of years since graduating
 - No. of years in this facility
 - Post basic training – what/where

Abortion cases at this hospital

- In your experience what are the types of problems women experience after a spontaneous abortion?
- In your experience what are the types of problems women experience after an induced abortion?
- What are the typical kinds of women who present with abortion?
- How many cases of unsafe abortion do you see in an average month?
- What are the conditions of them women on admission?
 - Early admissions/ late referrals in
 - Women come from home or via health centre?
- What do you think are the main methods women use to induce an abortion?
- In your experience have the methods and means that women use to induce an abortion changed over time (recently)?
- Are women open about disclosing what has happened?
- How do they indicate to you that they may have interfered with the pregnancy?
- What do you think are the longer term problems women face after experiencing an abortion complication?

Abortion services

- Can you tell me what you understand about the abortion law in PNG?
 - Are women who want to terminate their pregnancy able to do so?
 - How?/ Where?/ Do women know about it?
- Who do you think women turn to in the community when confronted with an unplanned pregnancy?
 - for advice,?
 - for assistance to terminate the pregnancy?
- Do the majority of women try and induce themselves or with help from another person?
- Who usually is that person?

APPENDIX 5

INTERVIEW GUIDE, FOCUS GROUP DISCUSSIONS

(CHAPTERS 6 & 7)

Focus Group Discussion Guide - Women

Pregnancy

- What is a good age for a woman to be pregnant?
 - For the first time?
 - What is a good age to stop having children?
 - What can happen if a woman is pregnant when she is too young or too old?
- Should women be married before they become pregnant?
 - What happens if they aren't?
 - What can a woman do if she is pregnant when she does not want to be?
 - What do women do if they give birth to baby they do not want to take care of it?
 - What can a woman do to avoid pregnancy?
 - What happens if a married woman doesn't become pregnant?
- Are there any special practices or certain tasks expected of pregnant women?
 - Foods eaten/avoided?
 - Work in the garden/ around the house?
 - What can happen if a woman doesn't adhere to these practices?
- Are there certain things that pregnant women should or shouldn't do?
 - Places she should/shouldn't go to?
 - Any special preparations for the delivery?
 - What can happen if a woman doesn't adhere to these practices?
 - Sexual relationship during pregnancy?
- Are there any specific things men should/shouldn't be doing when their wife is pregnant?
 - What can happen if they [the men] do not adhere to these?
- Can you tell me about the types of problems pregnant women may experience?
 - What can she do to avoid these problems?
 - Who can help her?

Childbirth

- How does a woman know when it is time for her to give birth?
 - What does she do and who does she tell?
 - Where does she go?
 - Why does she go there?
 - How does she get there?
 - Is there any special place in the community where a woman may go to give birth?
 - Why does she go there?
 - Who helps women when they give birth?

- How long should it take from when a woman has her first [labour] pains until she gives birth?
 - Why might it be taking too long?
 - What can happen if it is taking too long?
 - Who can help her?
 - What can she do [or the person caring for do] to help the baby to come?
- Can you tell me about some problems women can experience when they are giving birth?
 - Why does that [those] problem happen?
 - What can be done to help that woman?

Postnatal

- After the mother gives birth who takes care of her (immediately following birth)?
 - What do they do/ how do they help her?
- Is there anything special that needs to be done to help the mother?
 - Are there any special practices following birth [hygiene/foods to eat or avoid]
- After women have given birth do they experience any problems?
 - Why do you think these problems happen?
 - What could a woman do to stop this [these] problems happening?
 - Where can she get help for that problem?
- Who takes care of the newborn baby?
 - How can you tell if the newborn baby is OK [well]?
 - Do you know any danger signs that the baby needs some help?
 - What do you know?
 - Is there anything special care of the baby immediately following birth?
 - How soon after birth is the baby breast fed?
 - Is baby given any other drinks before breast milk?

Focus Group Discussion Guide - Men

Pregnancy

- What is a good age for a woman to be pregnant?
 - For the first time?
 - What is a good age to stop having children?
 - What can happen if a woman is pregnant when she is too young or too old?
- Should women be married before they become pregnant?
 - What happens if they aren't?
 - What can a woman do if she is pregnant when she does not want to be?
 - What can a woman do to avoid pregnancy?
 - What happens if a married woman doesn't become pregnant?
- Do you know of any special practices or certain tasks expected of pregnant women?
 - Foods eaten/avoided?

- Work in the garden/ around the house?
- What can happen to a woman if she doesn't adhere to these practices?
- Are there certain things that pregnant women should or shouldn't do?
 - Places she should/shouldn't go to?
 - Any special preparations for the delivery?
 - What can happen if a woman doesn't adhere to these practices?
 - Sexual relationships pregnancy?
- Are there any specific things you [as men] should/shouldn't be doing when your wife is pregnant?
 - What can happen if you do not adhere to these?
- Can you tell me about the types of problems pregnant women may experience?
 - What can she do to avoid these problems?
 - Who can help her?

Childbirth

- How does a woman know when it is time for her to give birth?
 - What does she do and who does she tell?
 - Where does she go?
 - Why does she go there?
 - How does she get there?
 - Is there any special place in the community where a woman may go to give birth?
 - Why does she go there?
 - Who helps women when they give birth?
- How long should it take from when a woman has her first [labour] pains until she gives birth?
 - Why might it be taking too long?
 - What can happen if it is taking too long?
 - Who can help her?
 - What can she do [or the person caring for do] to help the baby to come?
- Can you tell me about some problems women can experience when they are giving birth?
 - Why does that [those] problem happen?
 - What can be done to help that woman?

Postnatal

- After the mother gives birth who takes care of her (immediately following birth)?
 - What do they do/ how do they help her?
- Is there anything special that needs to be done to help the mother?
 - Are there any special practices following birth [hygiene/foods to eat or avoid]
- After women have given birth do they experience any problems?
 - Why do you think these problems happen?
 - What could a woman do to stop this [these] problems happening?
 - Where can she get help for that problem?
- Who takes care of the newborn baby?

- Do you know any danger signs that the baby needs some help?
 - What do you know?
- Is there anything special care of the baby immediately following birth?
 - How soon after birth is the baby breast fed?
 - Is baby given any other drinks before breast milk?

APPENDIX 6

IN DEPTH INTERVIEW GUIDE (INTERVIEWS WITH WOMEN)

(CHAPTER 7)

Background

Please can you tell me a little bit about your background?

(Include): Age, marital status, village, parity, number of children alive, education, work.

Pregnancy history

- Can you tell me about any pregnancies that you have had:
 - How many times have you been pregnant?
 - How many times have you ever given birth to a baby?
 - What was your experience in each of those pregnancies?
 - Can you tell me about the last time you were pregnant ?

NOTE: It might be easier to do a reproductive time line to help remember each pregnancy

- How did you know you were pregnant?
 - What were the signs that made you realize you were pregnant?
 - Did you plan for that pregnancy?
- Did you have any problems (sickness, things that happened) in any of your pregnancies?
 - What were they?
 - What did you do
 - Where did you go?
 - What happen after this problem
- Can you tell me about anybody else you know who has had this problem
 - What did they do?
 - Where did they go?
 - What happened to them?

Danger signs in pregnancy

- Can you tell me about any things you know that may indicate there is a problem in pregnancy (danger signs in pregnancy) (Wanem sampela mak bilong em)
 - What are they?
 - How do you know these?
 - What do you think you should do if these happen?
 - Does your husband know any of these things?
 - Why does/doesn't he know about these things
 - What do you think he would do if YOU had one of these problems?

Delivery

- Can you tell me about when your children were born (Ask for each child in turn, start with the last born and work backwards- use the RH timeline to help you)
 - When was [last born] born
 - Wet season/dry season
 - Where was he/she born

- Why was he/she born there?
 - Who was with you when he/she was born
 - How did that person help you?
 - Did you give birth normally?
- Can you tell me any problems you had when you gave birth
 - What were they?
 - What did you do?
 - Where did you go?
 - Who helped you get there?
 - Who made the decision for you to go there?

Postpartum period

- Can you tell me about how you felt after you gave birth (to each child)
 - Did you experience any problems?
 - What were they?
 - Where did you go?
 - What did you do?

The infant

- Can you tell me about how [last born] was after he/she was born?
 - Did he/she have any problems?
 - What were they?
 - What did you do?
 - Where did you go?
 - Who helped you?
 - How old was [name] when he/she first drank susu
 - Did he/she have anything else before that?
 - What did he/she have?
 - Who gave that?
 - Why did they give that?

Family Planning

- Can you tell me what you know about family planning
 - How did you learn about family planning?
 - Have you ever used family planning?
 - Are you currently on FP?
 - Would you like to be on FP?
 - What are the things that stop you from getting FP?
- Do you think you would like to have another baby?
 - When do you think you would like to have another one?
 - What will you do to stop you becoming pregnant again?
- Do you know anything about what a woman can do if she finds she is pregnant when she doesn't want to be?
 - Do you know anybody who has done that?
 - Who can help women in this situation?

APPENDIX 7

KEY INFORMANT INTERVIEW GUIDE

(CHAPTER 7)

Background information

Can you tell me a little bit about your background, where you work, what your roles and responsibilities are?

- Position at HF
- No. of years since graduating
- No. of years in this facility
- Post basic training – what/where
- Staffing levels at this HF

Ante natal clinic

Can you tell me about the antenatal clinic:

- Numbers of women who attend weekly
 - New enrolments/re-attenders
 - What things hinder women from re-attending?
 - Husbands involvement
 - Transport
 - Road system
 - Wet/dry seasons?
- Gestation at enrolment
 - Why do they come then (late)?
- Health education messages
- Services you provide
 - Syphilis/HIV testing
 - Type of test
 - Pre/post test counseling
 - Hb screening
 - Treatments provided
 - What
 - Frequency
 - TT/iron meds

Health facility births

- Numbers of births (weekly/monthly)
 - Which women attend to give birth
 - primips/multips
 - many unbooked mothers?
 - Distance/proximity to HF
- what do you see as the barriers to women attending for supervised delivery?
 - Partners involvement
 - Money
 - transport
- When do women present

- early/late 1st stage/ 2nd stage
 - why then?

Can you tell me about women who present because they faced a problem in the village during labour

- Who brings these mothers in?
 - VBAs/village midwives/family members
 - Why do they bring the mothers in?
 - Who makes the decision about bringing them in?
- Problems presenting to the HF
 - What stage of labour?
 - Booked/unbooked mothers
- What resources do you have to manage the problems here?

Postpartum problems

- In your experience what are the types of problems women experience after delivery?
 - What causes or influences these problems
- What are the most common pp problems you see (manage) at this HF?
- Resources to manage complications?
 - Adequate?
 - Training?
- Referrals to GGH
 - No. of referrals every month
 - Referral process
 - Conditions you refer
 - Difficulties with referrals

VBAs

- In your experience are there women working in the community who assist mothers to give birth in the village?
 - Thoughts regarding VBA training and how VBAs work in the community
 - How are they working in the village
 - Referrals from VBAs
 - What conditions do they refer

Are you skilled to take of these referrals?

Positive aspects of your work

What do you enjoy about your work?

Any challenges do you face?

APPENDIX 8
CASE NOTE RECORD/BASIC DEMOGRAPHIC FORM
(CHAPTER 8)



BASIC DEMOGRAPHIC FORM

Study ID /

Initials

Date //

1. Province of birth
- | | | | | | |
|--------------------|--------------------------|----------------|--------------------------|---------------------------|--------------------------|
| Eastern Highlands | <input type="checkbox"/> | East Sepik | <input type="checkbox"/> | East New Britain | <input type="checkbox"/> |
| Western Highlands | <input type="checkbox"/> | West Sepik | <input type="checkbox"/> | West New Britain | <input type="checkbox"/> |
| Southern Highlands | <input type="checkbox"/> | Madang | <input type="checkbox"/> | New Ireland | <input type="checkbox"/> |
| Simbu (Chimbu) | <input type="checkbox"/> | Milne Bay | <input type="checkbox"/> | Western (Fly) | <input type="checkbox"/> |
| Enga | <input type="checkbox"/> | Oro (Northern) | <input type="checkbox"/> | National Capital District | <input type="checkbox"/> |
| Central | <input type="checkbox"/> | Bougainville | <input type="checkbox"/> | Other (specify) | <input type="checkbox"/> |
| Gulf | <input type="checkbox"/> | Manus | <input type="checkbox"/> | _____ | |

2. Current address

District: _____ Village: _____

3. Age
- | | | | | | | | |
|-------|--------------------------|-------|--------------------------|-------|--------------------------|-----------|--------------------------|
| 15-19 | <input type="checkbox"/> | 25-29 | <input type="checkbox"/> | 35-39 | <input type="checkbox"/> | Not known | <input type="checkbox"/> |
| 20-24 | <input type="checkbox"/> | 30-34 | <input type="checkbox"/> | 40-44 | <input type="checkbox"/> | | |

4. Marital status
- | | | | | | |
|---------|--------------------------|-------------|--------------------------|-----------------|--------------------------|
| Married | <input type="checkbox"/> | Co-habiting | <input type="checkbox"/> | Widow | <input type="checkbox"/> |
| Single | <input type="checkbox"/> | Separated | <input type="checkbox"/> | Other (specify) | <input type="checkbox"/> |

5. Employment
- Do not have a paid job Student Sex worker
- Tick all that apply
- | | | | | | |
|-----------------------------|--------------------------|---------------------------------|--------------------------|-----------------|--------------------------|
| Work in the garden (farmer) | <input type="checkbox"/> | Police / Defence / Prison force | <input type="checkbox"/> | Other (specify) | <input type="checkbox"/> |
| Carry out household duties | <input type="checkbox"/> | Security guard | <input type="checkbox"/> | _____ | |
| Teacher | <input type="checkbox"/> | Health care worker | <input type="checkbox"/> | | |

6. Religion
- | | | | | | |
|---------------|--------------------------|-----------------------|--------------------------|----------------------|--------------------------|
| Catholic | <input type="checkbox"/> | Seventh Day Adventist | <input type="checkbox"/> | Evangelical Alliance | <input type="checkbox"/> |
| Lutheran | <input type="checkbox"/> | Pentecostal | <input type="checkbox"/> | Four square | <input type="checkbox"/> |
| United Church | <input type="checkbox"/> | Anglican | <input type="checkbox"/> | Other (specify) | <input type="checkbox"/> |

Study ID

/

Initials

Date //

7. Educational level

No formal education	<input type="checkbox"/>	Gr.7-10	<input type="checkbox"/>	Don't know	<input type="checkbox"/>
Gr.1-3	<input type="checkbox"/>	Gr.11-12	<input type="checkbox"/>	Other (specify)	<input type="checkbox"/>
Gr.4-6	<input type="checkbox"/>	Vocational,technical, tertiary college	<input type="checkbox"/>		

8. Current pregnancy

Gestation Estimated Due date _____

9. Total number of times attended ANC this pregnancy

10. Gestation at first visit to ANC

Less than 12 weeks	<input type="checkbox"/>	26 up to 32 weeks	<input type="checkbox"/>	More than 36 weeks	<input type="checkbox"/>
12 up to 26 weeks	<input type="checkbox"/>	32 up to 36 weeks	<input type="checkbox"/>	Don't know	<input type="checkbox"/>

11. How many times have you ever been pregnant (including this pregnancy, if pregnant)?

Write number here (if unsure write '77')

12. How many babies have you given birth to (live and still births)?

Write number here (if unsure write '77')

See next page and complete

Study ID

Initials

Date

Previous pregnancies and births

Q12A	Name of child/DoB	Place of delivery	Type of delivery	Sex		Born alive or stillborn		If born alive, alive now?		Age / cause of death	Antenatal care that pregnancy		Complications in pregnancy or childbirth (e.g. PPH, prolonged labour, retained placenta, breech)
				M <input type="checkbox"/>	F <input type="checkbox"/>	Alive <input type="checkbox"/>	SB <input type="checkbox"/>	Y <input type="checkbox"/>	N <input type="checkbox"/>		Y <input type="checkbox"/>	N <input type="checkbox"/>	
1		Hosp or HC <input type="checkbox"/> Village <input type="checkbox"/> Other (specify) <input type="checkbox"/> _____	Vaginal <input type="checkbox"/> C section <input type="checkbox"/> Other (specify) <input type="checkbox"/> _____	M <input type="checkbox"/>	F <input type="checkbox"/>	Alive <input type="checkbox"/>	SB <input type="checkbox"/>	Y <input type="checkbox"/>	N <input type="checkbox"/>	Age died: Cause:	Y <input type="checkbox"/>	N <input type="checkbox"/>	
2		Hosp or HC <input type="checkbox"/> Village <input type="checkbox"/> Other (specify) <input type="checkbox"/> _____	Vaginal <input type="checkbox"/> C section <input type="checkbox"/> Other (specify) <input type="checkbox"/> _____	M <input type="checkbox"/>	F <input type="checkbox"/>	Alive <input type="checkbox"/>	SB <input type="checkbox"/>	Y <input type="checkbox"/>	N <input type="checkbox"/>	Age died: Cause:	Y <input type="checkbox"/>	N <input type="checkbox"/>	
3		Hosp or HC <input type="checkbox"/> Village <input type="checkbox"/> Other (specify) <input type="checkbox"/> _____	Vaginal <input type="checkbox"/> C section <input type="checkbox"/> Other (specify) <input type="checkbox"/> _____	M <input type="checkbox"/>	F <input type="checkbox"/>	Alive <input type="checkbox"/>	SB <input type="checkbox"/>	Y <input type="checkbox"/>	N <input type="checkbox"/>	Age died: Cause:	Y <input type="checkbox"/>	N <input type="checkbox"/>	
4		Hosp or HC <input type="checkbox"/> Village <input type="checkbox"/> Other (specify) <input type="checkbox"/> _____	Vaginal <input type="checkbox"/> C section <input type="checkbox"/> Other (specify) <input type="checkbox"/> _____	M <input type="checkbox"/>	F <input type="checkbox"/>	Alive <input type="checkbox"/>	SB <input type="checkbox"/>	Y <input type="checkbox"/>	N <input type="checkbox"/>	Age died: Cause:	Y <input type="checkbox"/>	N <input type="checkbox"/>	
5		Hosp or HC <input type="checkbox"/> Village <input type="checkbox"/> Other (specify) <input type="checkbox"/> _____	Vaginal <input type="checkbox"/> C section <input type="checkbox"/> Other (specify) <input type="checkbox"/> _____	M <input type="checkbox"/>	F <input type="checkbox"/>	Alive <input type="checkbox"/>	SB <input type="checkbox"/>	Y <input type="checkbox"/>	N <input type="checkbox"/>	Age died: Cause:	Y <input type="checkbox"/>	N <input type="checkbox"/>	

APPENDIX 9
SEMI STRUCTURED QUESTIONNAIRE
POSTNATAL FOLLOW UP
(CHAPTER 8)



POSTNATAL INTERVIEW QUESTIONNAIRE

Study ID /

Initials

Date //

COMPLETE SHADED SECTION BEFORE YOU BEGIN THE INTERVIEW

OUTCOME INFANT: LIVE BIRTH <input type="checkbox"/> STILLBIRTH <input type="checkbox"/>	NUMBER OF DAYS POSTPARTUM
NB. IF INFANT WAS STILLBORN DO NOT ASK QUESTIONS 19-20 (INFANT FEEDING).	<input type="text"/> <input type="text"/>

1. WHEN WAS [NAME OF INFANT] BORN // (DATE)

2. WHERE DID YOU GIVE BIRTH TO [NAME OF INFANT]

HEALTH CENTRE <input type="checkbox"/>	BUSH/GARDEN <input type="checkbox"/>	BY THE ROADSIDE <input type="checkbox"/>
OWN HOME <input type="checkbox"/>	GARDEN HOUSE <input type="checkbox"/>	BY THE ROADSIDE <input type="checkbox"/>
OTHERS HOME <input type="checkbox"/>	LIKLIK HOUSE <input type="checkbox"/>	OTHER (SPECIFY) <input type="checkbox"/>

3. WHY DID YOU GIVE BIRTH THERE?

MARK ALL RESPONSES

I WANTED TO (PREFERRED PLACE) <input type="checkbox"/>	THE BABY CAME QUICKLY / NO TIME TO GET TO HEALTH CENTRE <input type="checkbox"/>
HEALTH WORKER AT ANC ADVISED ME TO <input type="checkbox"/>	THERE WAS NO TRANSPORT TO GET TO THE HEALTH FACILITY <input type="checkbox"/>
I WAS ADVISED BY ANOTHER PERSON (SPECIFY WHO) _____ <input type="checkbox"/>	I HAD NO MONEY FOR TRANSPORT <input type="checkbox"/>
MY HUSBAND TOLD ME TO <input type="checkbox"/>	I HAD NO MONEY FOR THE HEALTH CENTRE <input type="checkbox"/>
	OTHER (SPECIFY) <input type="checkbox"/>

4. WHO WAS WITH YOU WHEN YOU GAVE BIRTH

NURSE AT THE HEALTH CENTRE

MOTHER

HUSBAND

MOTHER IN LAW

BY MYSELF

VILLAGE MIDWIFE

AUNTY/SISTER/ OTHER (SPECIFY)

VILLAGE BIRTH ATTENDANT

FRIEND

MARK ALL RESPONSES

5. WHAT DID THEY DO TO ASSIST YOU WHEN YOU WERE GIVING BIRTH?

NOTHING (JUST WAITED)

EXPLAINED THINGS TO ME/TOLD ME WHAT WAS HAPPENING

GAVE ME DRINKS /FOOD

RUBBED MY BACK

TOLD ME WHEN TO PUSH THE BABY OUT

TOLD ME WHAT I HAD TO DO

TOLD ME TO WALK AROUND

GAVE ME VILLAGE HERBS/MEDICINE

OTHER (SPECIFY)

MARK ALL RESPONSES

I NOW WANT TO ASK YOU ABOUT THE CLEAN BIRTH KIT (CBK)

6. WHEN YOU GAVE BIRTH DID YOU OR THE PERSON ASSISTING YOU USE YOUR CBK?

YES

NO

CANNOT REMEMBER

IF NO: WHY DID YOU NOT USE IT?

I GAVE BIRTH AT THE HEALTH FACILITY AND THEY DIDN'T NEED TO USE IT

I GAVE BIRTH AT THE HEALTH FACILITY AND DIDN'T TAKE IT WITH ME

I FORGOT TO USE IT

I DIDN'T HAVE IT WITH ME

I DIDN'T KNOW WHAT TO DO WITH IT/THE ITEMS IN IT

OTHER (SPECIFY)

7. CAN YOU TELL ME ABOUT HOW EACH ITEM IN THE CBK WAS USED?

7.A HAND HYGIENE	MENTIONS WASHING HANDS	YES <input type="checkbox"/>	NO <input type="checkbox"/>
	MENTIONS USING SOAP TO WASH HANDS	YES <input type="checkbox"/>	NO <input type="checkbox"/>
	MENTIONS USING GLOVES	YES <input type="checkbox"/>	NO <input type="checkbox"/>
7.B. PLASTIC SHEET	MENTIONS LAYING SHEET ON FLOOR	YES <input type="checkbox"/>	NO <input type="checkbox"/>
	MENTIONS BABY BEING BORN ONTO THE CLEAN SHEET	YES <input type="checkbox"/>	NO <input type="checkbox"/>
7.C. CORD TIES	USED CORD TIES	YES <input type="checkbox"/>	NO <input type="checkbox"/>

7.D. SCALPEL	USED SCALPEL TO CUT THE CORD	YES <input type="checkbox"/>	NO <input type="checkbox"/>
--------------	------------------------------	------------------------------	-----------------------------

If the participant responds "no" to any of the above, please PROBE: ask why?

8.DID YOU DRINK THE SAFER AFTERBIRTH TABLETS?	Yes <input type="checkbox"/>	No <input type="checkbox"/>	CANNOT REMEMBER <input type="checkbox"/>
---	------------------------------	-----------------------------	--

8.A HOW MANY DID YOU DRINK?	3 <input type="checkbox"/>	2 <input type="checkbox"/>	1 <input type="checkbox"/>	CANNOT REMEMBER <input type="checkbox"/>
-----------------------------	----------------------------	----------------------------	----------------------------	--

8.B IF DID NOT DRINK 3 TABLETS, PROBE: ASK WHY?

8.C.WHEN DID YOU DRINK THE TABLETS??	AS SOON AS BABY WAS BORN <input type="checkbox"/>	THE NEXT DAY AFTER BABY WAS BORN <input type="checkbox"/>
	AFTER THE PLACENTA CAME OUT <input type="checkbox"/>	CANNOT REMEMBER <input type="checkbox"/>
	AFTER I HAD TAKEN A WASH/REST <input type="checkbox"/>	I DIDN'T TAKE THEM <input type="checkbox"/>

9.A. PROBE: WHY DID YOU TAKE THEM THEN? (FREE RESPONSE)

10. CAN YOU TELL ME ABOUT YOU FELT AFTER YOU GAVE BIRTH TO [NAME OF INFANT] (FREE RESPONSE)

11. CAN YOU TELL ME IF YOU EXPERIENCED ANY OF THE FOLLOWING AFTER YOU GAVE BIRTH?	NAUSEA <input type="checkbox"/>	FEVER <input type="checkbox"/>
	DIZZYNESS <input type="checkbox"/>	TOO MUCH BLEEDING <input type="checkbox"/>
	SHIVERING <input type="checkbox"/>	

11.A PROBE: IF STATES TOO MUCH BLEEDING, AS HER IF SHE CAN DESCRIBE HOW MUCH (FREE RESPONSE)

12. WHY DO YOU THINK THAT HAPPENED?	BECAUSE I WAS SO TIRED <input type="checkbox"/>	IT WAS THE TABLETS <input type="checkbox"/>
(MARK ALL RESPONSES)	IT IS USUAL AFTER GIVING BIRTH <input type="checkbox"/>	OTHER (SPECIFY) <input type="checkbox"/>

13. WHAT DID YOU DO ABOUT THAT (THOSE) PROBLEM(S)?	NOTHING <input type="checkbox"/>	FAMILY TOOK ME TO THE HEALTH CENTRE <input type="checkbox"/>
	IHAD A REST THEN FELT BETTER <input type="checkbox"/>	OTHER (SPECIFY) <input type="checkbox"/>
	TOOK VILLAGE MEDICINE/HERBS <input type="checkbox"/>	

14. WHAT DID YOU DO WITH THE ITEMS FROM THE CBK AFTER YOU GAVE BIRTH

BURIED THEM CANNOT REMEMBER
THREW THEM AWAY OTHER (SPECIFY)
THREW THEM IN THE RIVER _____

15. WOULD YOU USE A CBK AGAIN ?

YES NO DON'T KNOW

(THE NEXT TIME YOU HAVE A BABY)

16. WOULD YOU DRINK THE SAFER AFTERBIRTH TABLETS AGAIN?

YES NO DON'T KNOW

(THE NEXT TIME YOU HAVE A BABY)

17. WOULD YOU RECOMMEND TO A FRIEND OR SISTER THAT THEY USE A CBK IN THE FUTURE?

YES NO DON'T KNOW

18. WOULD YOU RECOMMEND TO A FRIEND OR SISTER THAT SHE TAKE THE SAFER AFTERBIRTH TABLETS IN THE FUTURE??

YES NO DON'T KNOW

18.A. IF NO TO ANY OF THE ABOVE (Q15-18) PROBE : "WHY"

19. HOW SOON AFTER [NAME OF INFANT] WAS BORN DID YOU BREAST FEED HIM/HER?

IMMEDIATELY AFTER HE/SHE WAS WASHED/DRESSED
AFTER THE PLACENTA CAME OUT CANNOT REMEMBER
AFTER I HAD TAKEN A WASH/REST OTHER (SPECIFY)

20. DID HE/SHE HAVE ANYTHING ELSE TO DRINK BEFORE THE FIRST BREAST FEED?

YES NO CANNOT REMEMBER

20.A. IF YES: WHAT DID HE/SHE HAVE

CLEAN WATER WATER THAT WAS BOILED AND COOLED CANNOT REMEMBER
