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INNOVATIVE PARTNERSHIPS FOR SAFE MOTHERHOOD

participation and transdisciplinary collaboration as
tools towards increasing skilled birth attendance



Yadira Roggeveen

Innovative partnerships for Safe Motherhood:

participation and transdisciplinary collaboration as tools
towards increasing skilled birth attendance

Yadira Roggeveen

Innovative partnerships for Safe Motherhood: participation and transdisciplinary collaboration as tools towards increasing skilled birth attendance
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VRIJE UNIVERSITEIT

Innovative partnerships for Safe Motherhood:
participation and transdisciplinary collaboration as tools towards increasing skilled birth attendance

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Yadira Roggeveen

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promotoren: prof.dr. J.J.M. van Roosmalen
prof.dr. F. Scheele
copromotoren: prof.dr. M.B.M. Zweekhorst
dr. J.M. Hatfield

To those who care

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General Introduction

1

The first time I saw Endulen Hospital in Tanzania was from the air.

The pilot that would fly the outreach clinics brought us along from Arusha into the Ngorongoro highlands. The birds' eye perspective showed the hospital grounds started where the gravelled road ended though many dirt roads and paths formed a web into the area beyond. The ambulance driver was struggling through the mud to get to where the plane would land. We flew over the airstrip to clear it from zebras.

The aerial view from the highlands into the Serengeti plains was breathtaking.

Tourists paid 50 dollars a day to visit this "paradise".

"Not if this is the landscape to travel if needing maternity care", I thought.

On the ground, it was a busy day: The out patient department and hospital wards were crowded. "Almost market day... plenty of transport available", my colleague explained during my introduction tour of the hospital premises.

We got to the labour ward. "What are you missing?" she asked.

I looked; the space was very clean and at a glance properly supplied.

"The patient" she said, "Now... that needs some work, doctor".

Y. Roggeveen

Safe Motherhood

Motherhood is far from safe in various contexts and settings. The World Health Organization (WHO) reports from 2017 show that maternal mortality is still unacceptably high.¹ In that year, around 295 000 women died during pregnancy, childbirth and puerperium. Sub-Saharan Africa and Asia together formed 86% of the global maternal mortality in 2017 and Sub-Saharan Africa accounted for about two-thirds, which equals 196 000 maternal deaths. Most maternal deaths (94%) took place in low-income countries. The WHO 2017 comparison of maternal mortality ratios (MMR) showed MMRs of 462 maternal deaths per 100 000 live births in low-income countries versus 11 per 100 000 live births in high-income countries. Sadly, most deaths could have been prevented.¹

From 2000 to 2017, huge progress has been made to reduce maternal mortality, with an overall decline of 50%.¹ Sub-Saharan Africa reached a substantial reduction of its MMR with 40%.² Numbers of countries and contexts between and within countries vary widely, however. High MMRs hold a staggering association with poverty and differences in numbers often indicate gaps between the rich and the poor, culminating in different access to quality maternity care.² Higher parity in low income countries amplifies the lifetime risk of women dying from maternal causes to 1 in 45, compared to 1 in 5400 in high income countries.¹

Three quarters of maternal deaths are caused by complications during pregnancy and childbirth, such as severe haemorrhage, sepsis, hypertensive disorders of pregnancy, complications from childbirth and unsafe abortion.¹ Because most of these complications are preventable, it is equally true that women die of a mismatch between the care they need and the care they get, either “too little, too late or too much, too soon”.^{3,4}

Strategies

Making motherhood safer has been on the political agenda since the Safe Motherhood Initiative in 1987, the Millennium Development Goals (MDGs) in 2000 and the Sustainable Development Goals (SDGs) since 2015.^{5,6} The 2030 Agenda for SDGs mentioned that significant progress was made towards reaching MDGs, but those related to maternal, newborn and child health and to reproductive health (MDG 4 & 5) - particularly lagged behind.⁵ New goals for maternal and neonatal health have been set: SDG 3 includes to reduce global MMR to less than 70 per 100,000 live births, end preventable deaths of newborns, with all countries aiming to reduce neonatal mortality to at least as low as 12 per 1,000 live births and ensure universal access to sexual and reproductive healthcare, including family planning, information and education and integration of reproductive health into national strategies and programs.⁵ Considering MMRs in reality, much needs to be achieved to meet SDGs by the year 2030. We enter the “decade of action to transform our world”.⁷

To bring down MMRs, there is a need for action, to “getting on with what works”.⁸ Although this sounds as oversimplifying strategic choices, it is recognized that swift improvements in maternal health can be made when focusing on intrapartum care, where skilled birth attendants (SBAs) are connected to comprehensive emergency obstetric and neonatal care (CEmONC), work within a functioning health system and link to local communities. For that reason, skilled attendance at birth is central in global strategies as “spider in the web”, connecting to many other single interventions, of which none is able to improve maternal health on its own, but which make a difference when provided connected to other services or in packages.⁸⁻¹² It is often challenging to classify childbirth with an SBA, as childbirth care configurations vary widely among and within country contexts and moreover, as not all SBAs have the necessary skills in place- such as the ability to communicate in a caring, respectful manner, plus the knowledge and technical skills to give appropriate, well-timed care.¹³ Taking these limitations into account, if MMRs are to be improved, areas with low skilled birth attendance require analysis.²

Following the broader and more inclusive definition of implementation research by Theobald et al¹⁴: “to study the act of carrying an intention into effect”, the failure of implementation of skilled birth attendance in specific contexts can also be studied as such, applying a variety of research methods and multidisciplinary approaches, preferably in real-world experiences and programmatic changes.¹⁵ This thesis addresses two knowledge gaps in low skilled birth attendance taking two approaches, which are specified below.

Low utilization of skilled birth attendants is often studied by applying the Three Delays Model,¹⁶ developed by Thaddeus and Maine, which recognizes that various factors affect utilization and outcome, resulting in three phases of delay: first phase delay in seeking care, second in reaching care and third in receiving adequate care when reaching health facilities (Figure 1).¹⁶ Delay in one phase or another is known to amplify the effect on seeking care, the most important example being when maternity care is of better quality, women decide to use it quicker and vice versa, women with negative medical care experiences have larger first phase delays.¹⁶

Skilled birth attendance could be increased by tackling the predictable elements of the three phases of delay, which can be anticipated and prepared for by making plans ahead. The **Birth Preparedness and Complication Readiness (BP/CR)** matrix by the Johns Hopkins Program for International Education in Gynaecology and Obstetrics (JHPIEGO) describes this process of planning for birth and anticipating actions needed for childbirth, especially in case of emergencies.^{17,18} It makes the roles explicit of women, families, communities, maternity care providers, facility managers and policymakers – to ensure women and newborns receive timely, effective, and appropriate care.¹⁷

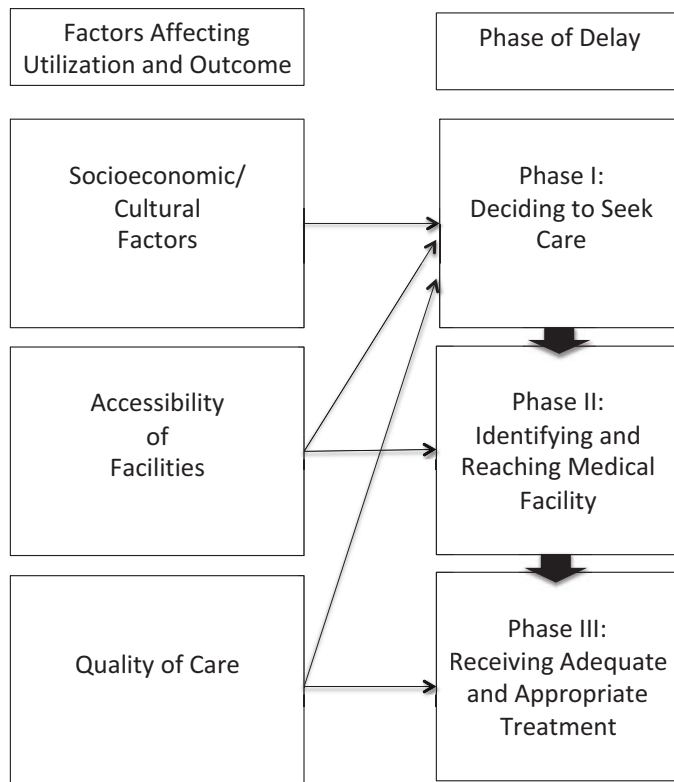


Figure 1. The Three Delays Model, Thaddeus and Maine (1994).¹⁶

When BP/CR concepts are implemented with a focus on communities, families and individuals, at least the first two phases of delay can be reduced. A complete operational BP/CR matrix also includes care providers, health facilities, care and policy makers to support births and complications personally and systematically, thus contributing to reduced third phase delay.^{17,19}

Because antenatal clinic visits have a very high coverage generally, BP/CR was implemented as an essential part of focused antenatal care before evidence of the effects of BP/CR was clear. Education on BP/CR is included in the WHO model for antenatal care and various countries have adjusted the concept to fit their local contexts.²⁰⁻²⁴ Although a systematic review showed that BP/CR interventions can reduce maternal and neonatal mortality, the effect on skilled birth attendance was not clear.²⁵ This knowledge gap is the first we address in this thesis.

Context and complexity in maternal healthcare

The huge gap between women needing and receiving skilled maternity care, is amplified in low resource settings and within marginalized groups.¹¹ How to bring quality maternity care to those groups in various contexts, deserves special attention, as “the lowest quintiles are not going away and the situation may become relatively worse for them”.²⁶ Although international forces demand globally applicable interventions through “evidence based” strategies – in this case skilled birth attendance - this does not equal successful implementation of strategies in the variety of contexts that exist. Simultaneously, pregnancy related illnesses hold various associations with other areas, as clearly illustrated in Figure 2.

Poor reproductive, maternal and neonatal health not only impacts women and families physically, but has enormous psychological, social and economic consequences; for example in impaired productivity as a person or family as a whole. Another example is how pregnancy and childbirth complications can lead to impaired fertility. Taking these multiple dimensions into consideration, as well as the diversity of (in) country contexts, the complexity of providing maternity care becomes apparent.⁸

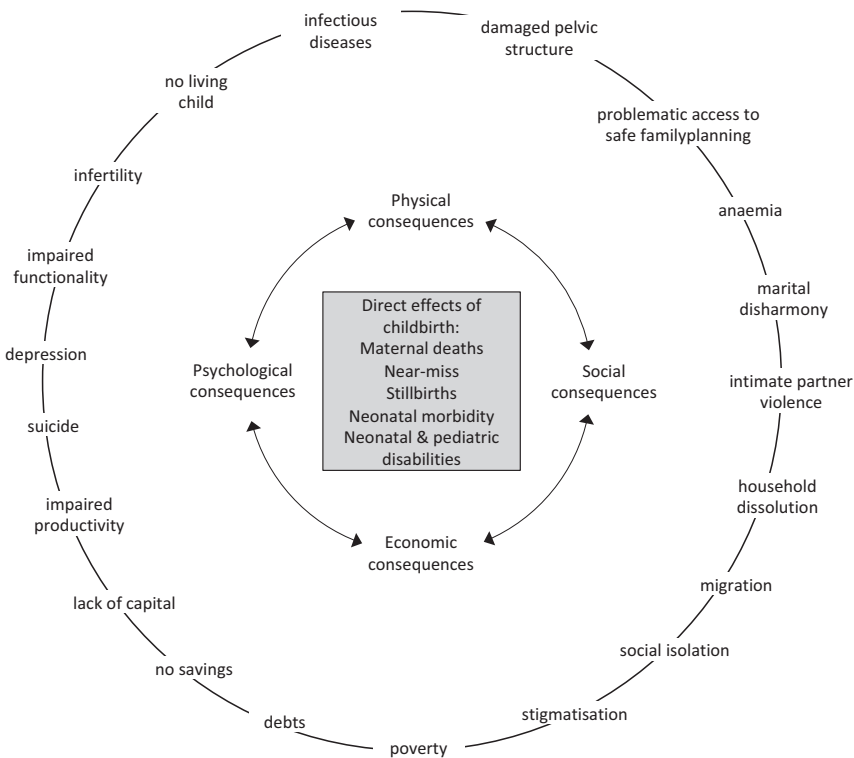


Figure 2. Pregnancy-related illnesses and their consequences, adapted from Filippi et al (2006).²⁷

Creation of contextualized solutions is needed, but has been marginalized historically.²⁸ Maternal health experts confirmed that more knowledge is needed on *how* to improve availability, accessibility, acceptability and quality of institutional care during pregnancy and childbirth, while accounting for different contexts and health systems in which maternity care is embedded.²⁶ Maternity care research could apply methods from other research disciplines, such as social sciences and transdisciplinary research to generate this knowledge.^{14,15,29} As Kendall and Langer stated in their gap analysis of maternal health research and the knowledge agenda: “a prominent role for implementation science, evidence for policy advocacy, and interdisciplinary collaboration were identified as critical areas for knowledge generation to improve maternal health in the post-2015 era”.²⁶

We argue that “how to provide context specific maternity care that is available, accessible, acceptable and of good quality” through skilled birth attendance is a complex or ‘unstructured’ problem. Let us reflect on the characteristics of this type of problem, as originally described in policy science and examine how this perspective could be helpful.^{30,31} Many parties are interconnected in the maternity care pathway, as the BP/CR model clearly illustrates. This means that not one of these parties has a high “achievement power”; none can solve any problem on their own.³⁰ Along the continuum of care, collaboration seems hampered. The various actors have their own perceptions of the problems they are challenged with, depending on their position in the maternity care pathway (e.g. the groups in the BP/CR matrix). When actors stick to their own perspectives, knowledge integration does not happen. An association then follows between predetermined solutions (birth with skilled attendants) and long negotiated goals (MDGs,SDGs). These agendas are pushed to be realized locally often without supportive health systems.³² Low resource settings equal a space with limited health resources. If we follow this line of thought further, low utilization of SBAs not only is a complex problem, but even a persistent or wicked problem. Persistent problems are complex problems that are deeply entrenched in history and institutions and which are amplified by repeating common actions.^{30,33} Provision of maternity care in low-resource settings very much looks like a persistent problem.³²

The way forward?

Top down problem solving is known to be counterproductive in dealing with persistent problems. Rather, forms of deliberative governance or participatory approaches are applied as methods, in which all stakeholders participate to analyze problems and solutions in an open debate.³⁰ Freedman suggests that other concepts and frameworks are useful analytic starting points to overcome many years of persistent implementation failure: by casting health systems as “complex adaptive systems” and interventions as “innovations” comprising not just novel technical elements, but whole packages of “new ideas, practices, objects,

or institutional arrangements”, frameworks will surface many of the hidden challenges in systems that have experienced long years of persistent implementation failure.^{32,34}

Participatory approaches have also been strongly recommended in maternal health research with the goal to improve maternal health, especially in settings where access to health care is low. They should focus on creating space for discussion where women are able “to identify priority problems and advocate for local solutions for maternal and neonatal health”.³⁵ Besides mechanisms such as women’s groups and community-based approaches of follow-up with community health workers, little research is published on innovative mechanisms to facilitate community participation and mobilization in maternal and neonatal health.³⁶ “Public participation” that has been exercised in the health sector, often consults people, but does not involve them in problem solving, mainly following Arnsteins “ladder of participation”, with increased involvement and power sharing of those participating among each step of the ladder.³⁷

A participatory approach that not only informs or advocates local solutions, but also creates solutions while applying them, is Participatory Action Research (PAR), using both quantitative and qualitative methods. PAR originated in other disciplines such as agriculture, politics and education, but is increasingly applied in health research.³⁸ Desired outcome in participatory research processes is intended change and social learning is its mechanism, in which a variety of stakeholders co-create new and actionable knowledge.^{38,39} This process of direct engagement, co-generating knowledge through collaborative communication between researchers and co-researchers is called co-generative inquiry.³⁹ New knowledge about investigated phenomena is discovered through converging knowledge and experiences of researchers and co-researchers, which is critically appraised in an iterative process and includes translation of new knowledge into new practice.⁴⁰ When PAR is used to improve health care systems to act upon needs for marginalized people, often all patients who are cared for, benefit from the adapted care and lessons learnt.³⁸ How maternal health benefits from PAR, specifically on addressing low utilization of skilled birth attendance, deserves further study.^{41,42} This is the second gap we will address in this thesis.

AIM AND RESEARCH QUESTIONS

This thesis explores low utilization of skilled birth attendants and context in two ways. The first aim is to analyze the effect of BP/CR programs on skilled birth attendance. The second aim is to understand how skilled birth attendance could be improved when taking a contextual perspective and participatory action approach.

For the first aim the following research questions are addressed:

1. How does application of BP/CR programs affect skilled birth attendance in low resource settings?
2. Which contextual factors are to be considered when implementing BP/CR programs in low resource settings?

For the second:

3. What does motherhood entail from a local perspective and how does this influence health care needs and demands locally?
4. Which contextual factors contribute to low skilled birth attendance in a specific low resource setting?
5. With respect to these contextual factors, which local solutions could increase skilled birth attendance in this low resource setting?
6. How does implementation of locally identified solutions affect the identified problems? Does it increase skilled birth attendance in this low resource setting?

To address these research questions, this thesis took two different approaches. First we performed, a Systematic Review and contextual analysis of BP/CR interventions. To address the second aim, we qualitatively studied a local low-resource context where skilled birth attendance was chronically low, with more details provided below.

RESEARCH SETTING PART TWO OF THE THESIS: ENDULEN, NORTHERN TANZANIA

PAR was performed in and around Endulen Hospital, located in the Ngorongoro Conservation Area (NCA), Arusha District in northern Tanzania. The author of this thesis worked as Medical Officer in Endulen Hospital from the beginning of 2008 to July 2010, the last six months as acting medical officer in charge. Upon arrival the very low number of hospital births surprised her. As clinician with special attention for maternal and paediatric care she started to learn and act upon why. At the same time she became a clinical advisor and co-researcher in PAR. From her growing role in the latter, the second part of this thesis was developed.

Tanzania

Although progress is made in Tanzania, reduction of maternal and neonatal mortality lags behind compared to the under-5 mortality after the first month of life.⁴³ In 2017, MMR was estimated at 524 per 100.000 live births (uncertainty interval 399-712), a reduction of 39% compared to 854 in 2000.⁴⁴ Even so, MMR is estimated by Demographic and Health Surveys (DHS) in which data quality is poor, challenging interpretation of trends over time.⁴⁵ A systematic review on Tanzanian MMR studies identified different local MMRs ranging from 184-1099 per 100.000 live births.⁴⁵ High MMRs are attributed to poorly functioning

health systems, data management and leadership, shortage of staff and resources, lack of implementation of maternal and neonatal health policies, although political will is strong,⁴⁶ decreased attention for family planning and donor relations that do not match the needed long term strategies.^{43,45,47}

The 2016 DHS reports skilled birth attendance at 63%.⁴⁸ Many regions, however, stagnated below 50% facility birth rates⁴⁷ and despite antenatal care coverage rates of around 94% (single visit), skilled birth attendance can be as low as 30%, especially in rural areas.⁴⁹ Kruk and Mbaruku argue that explanations given for high MMR do not fully explain this and stress that the role of men, (older) women, communities and traditional birth attendants (TBAs) need to be further understood, for which subnational analyses are needed.⁴⁷

Ngorongoro Conservation Area

One of the many ethnic minorities in Tanzania are the Maasai, semi-nomadic pastoralists defined by distinct social and developmental phases according to age-gender sets who live within Kenya and Tanzania, in the latter in an area known as “Maasailand”, which includes Ngorongoro and Monduli Districts in Arusha region of northern Tanzania.⁵⁰ Ngorongoro Conservation Area (NCA) is part of the larger Ngorongoro District and was formed in 1959 as a multiple land use area after Maasai and their cattle were evicted from and prohibited entrance into the area that later became the Serengeti, aiming to take both wildlife and the needs of Maasai people into consideration.^{51–54} The area is a World Heritage Site for natural criteria since 1979 and for cultural criteria since 2010 and consequently certain rules and regulations are applied to living within NCA. Since 2018 NCA is also part of the UNESCO Global Geopark, a larger area in Northern Tanzania with landscapes and sites of international geological importance and among others containing one of the oldest human footprints.⁵⁵ Formation of NCA included promises on the provision of essential services, among which health services are important.⁵⁶ Restrictions on agriculture in the area, combined with pastoral grazing restrictions to protect flora and fauna pose significant challenges to residing and make the local population dependent on food assistance from the Ngorongoro Conservation Area Authority (NCAA), who also supports medical services in NCA, which includes Endulen Hospital.^{54,55}

Endulen hospital

Endulen hospital is located on the plains of the highlands of NCA at an altitude of 1900 meters. It was founded in 1976 by dr. Herbert Watschinger, an Austrian missionary doctor, who worked in Endulen and Wasso, originally supported by the Austrian government and the Archdiocese of Linz. Endulen hospital lays separate from Endulen village, as it started as tuberculosis treatment center. From this, it developed into a 72-bed-hospital in 2008, serving a population of 77,580 dispersed over an area of 8292 km² of savannah, woodlands

and forests.⁵⁷⁻⁵⁹ It is owned by the Catholic Archdiocese of Arusha and by reason of persistent (human) resource shortages, supported by the Ministry of Health, NCAA and various NGOs, the latter mostly through personal connections with the history or care in the hospital. Hospital care still includes tuberculosis treatment, but also the full spectrum of medical care, laboratory, pharmacy, ultrasound and X-ray. Maternity care is provided through antenatal clinics, labour wards and theatre (CEmONC available). The hospital runs an extensive outreach program by car and for even harder to reach areas, by plane (supported by the Flying Medical Service from Arusha).

MMR was locally estimated at 642 per 100.000 live births (CI 329-955), which confirms maternity as major cause of death in pastoralist women.⁵⁸⁻⁶⁰ Although ANC attendance was over 90%, skilled birth attendance reached only 7%.^{61,62} In the hospital's catchment area approximately 3351 births are expected yearly (based on population and crude birth rate of 43.2).⁶³ Assuming that not all these births need hospital care, at least an estimated 500 women, who would need CEmONC, would be expected to arrive in Endulen Hospital.⁶⁴ Though CEmONC and Prevention of Mother-to-child HIV Transmission (PMTCT) were offered, in 2008 only 47 hospital births occurred, demonstrating severe underutilization of hospital-based SBAs. In 2008, 62 hospital admissions (10% of all 603 females) illustrated local maternal morbidity: prolonged labour (5), post partum haemorrhage/sepsis after home births (20), complications of abortion (11) and indirect maternal morbidity (26), mostly malaria. In addition to maternal risks, homebirths were suggested to hinder full provision of PMTCT and increased risk of HIV infection for all involved.⁶⁵ Negative attitudes of health care providers and limited time and human resources to educate women on birth preparedness and complication readiness during ANC has been linked to low utilization of SBAs in Ngorongoro.^{49,61} Hospital maternity care, however, was not included in previous studies.^{49,61}

PAR

NCA has a long research history with universities from Tanzania and abroad, capturing a variety of topics ranging from archaeology to animal and human health. More recently study teams created a pastoralist-centered approach, being aware of historical coercive power imbalances by outsiders.^{54,65,66} PAR was part of this pastoralist-centered approach. Among others, studies addressed how health services could be improved to fit the local Maasai context regarding HIV prevention, education and health care with a local rising HIV-prevalence of 2.12 % among those voluntary tested.⁶⁵ Risk moments for acquiring HIV included childbirth.⁶⁵ TBAs were the preferred caretakers and utilization of hospital maternity services was low.⁶⁵ The author of this thesis became a co-researcher in PAR under supervision of the University of Calgary and Bugando Medical Centre. Together with other co-researchers, she stressed the low utilization of SBAs in the hospital. Inherent to PAR, research topics followed local relevance, which aside gender perspectives on HIV and motherhood, led to

increased explicit knowledge and action on childbirth practices, both by SBAs and TBAs. This PhD thesis was developed in hindsight, based on the fact that all co-researchers in PAR can learn from the data gathered, with additional supervision of VU University in the Netherlands. Part One of this thesis was performed later in time than Part Two, but for readability reasons is presented first.

TRIAL REGISTRATION, ETHICAL APPROVAL AND INFORMED CONSENT

The Systematic Review on BP/CR interventions was registered under PROSPERO registration no.: CRD42012003124. For the part of this thesis that took part in Tanzania, the Tanzanian Commission for Science and Technology (COSTECH) and the National Institute for Medical Research (NIMR) (NIMR/HQ/R.8a/VolX./876), University of Calgary and VU Medical Centre provided ethical approval. Local approval from the hospital, village leaders, village and ward council and NCAA was obtained. Informed verbal consent was obtained from study participants.

DISCLOSURE

During her work in Endulen Hospital, the author received support by Tweega Medica Foundation. She acknowledges support for writing this thesis by the Otto Kranendonk Foundation. The Bill and Melinda Gates foundation provided a travel grand to present at a conference.

OUTLINE OF THE THESIS

In the introduction the complexity of maternal ill health and low skilled birth attendance is described and put in a historical perspective. Low skilled birth attendance is recognized as a persistent or wicked problem. This thesis exists of two parts. Part One consists of two chapters. In **chapter 2** we addressed research question 1 is addressed by performing a Systematic Review on the impact of BP/CR interventions on skilled birth attendance. In **chapter 3** we addressed research question 2 utilizing a qualitative approach to analyse the contextual factors influencing implementation of BP/CR interventions. In Part Two research questions 3 to 6 are tackled through PAR in Northern Tanzania. In **chapter 4** is presented what motherhood entails from a Maasai perspective, especially in relation to HIV and fertility, and how this influences health care needs and demands. In **chapter 5** a contextual analysis and possible solutions of low utilization of SBAs in NCA is addressed following the Three Delay Model. In **chapter 6** collaboration with illiterate Maasai TBAs is described which led to the development of the Pictorial Sisterhood Method - a Quantitative Participatory Method (QPM),

which we pilot tested in NCA. In **chapter 7** we refer to how the results of Chapter 5 led to changes in obstetric practices in Endulen Hospital and evaluate how these were perceived from the perspectives of women, traditional birth attendants and hospital staff. The thesis is closed with a summary of the findings from chapter 2 to 7, where the research questions will be answered, the limitations addressed and findings discussed in a broader context. In conclusion, guidance is provided for further research to address these challenging issues.

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PART ONE

Birth Preparedness and Complication

Readiness Interventions

Impact on skilled birth attendance

Contextual factors



2

Impact of Birth Preparedness and Complication Readiness Interventions on Birth with a Skilled Attendant: A Systematic Review

Yadira Roggeveen, Andrea Solnes Miltenburg (shared first authorship)
Laura Shields, Marianne van Elteren, Jos van Roosmalen,
Jelle Stekelenburg, Anayda Portela

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ABSTRACT

Background: Increased preparedness for birth and complications is an essential part of antenatal care and has the potential to increase birth with a skilled attendant. We conducted a systematic review of studies to assess the effect of birth preparedness and complication readiness interventions on increasing birth with a skilled attendant.

Methods: PubMed, Embase, CINAHL and grey literature were searched for studies from 2000 to 2012 using a broad range of search terms. Studies were included with diverse designs and intervention strategies that contained an element of birth preparedness and complication readiness. Data extracted included population, setting, study design, outcomes, intervention description, type of intervention strategy and funding sources. Quality of the studies was assessed. The studies varied in BP/CR interventions, design, use of control groups, data collection methods, and outcome measures. We therefore deemed meta-analysis was not appropriate and conducted a narrative synthesis of the findings.

Results: Thirty-three references encompassing 20 different intervention programmes were included, of which one programmatic element was birth preparedness and complication readiness. Implementation strategies were diverse and included facility-, community-, or home-based services. Thirteen studies resulted in an increase in birth with a skilled attendant or facility birth. The majority of authors reported an increase in knowledge on birth preparedness and complication readiness.

Conclusion: Birth Preparedness and Complication Readiness interventions can increase knowledge of preparations for birth and complications; however this does not always correspond to an increase in the use of a skilled attendant at birth.

BACKGROUND

The presence of a skilled attendant at birth (SBA) is promoted as a key strategy to prevent the leading causes of maternal and neonatal mortality and morbidity.¹⁻³ Despite a global increase in the number of births attended by SBAs, coverage in sub-Saharan Africa remains low.⁴ This is the result of a combination of socio-economic, cultural and health system factors that cause delay in deciding to seek care (phase 1 delay), reaching maternal health care facilities (phase 2 delay) and receiving adequate care (phase 3 delay).⁵ Despite poor functioning health systems in low-and middle income countries^{4,6,7} increased preparedness for birth and complications would allow women and their families to anticipate potential delays and ensure timely use of skilled care for birth and arrival at the appropriate facility for complications.⁸ Implementation of birth preparedness and complication readiness (BP/CR) interventions that focus on individuals, families and communities are intended to reduce at least the first two delays.⁸ It is equally important that health facilities and referral systems are prepared to deliver essential childbirth care and are able to manage complications, which would contribute to reduction of the third delay.^{9,10}

BP/CR is a process of planning for birth and anticipating actions to take in case of obstetric complications.¹⁰ The concept of BP/CR emerged almost two decades ago and was later included by the World Health Organization (WHO) as an essential part of the antenatal care package.^{11,12} According to WHO, BP/CR plans contain the following elements: desired place of birth; preferred birth attendant; location of the closest facility for birth and in case of complications; funds for any expenses; supplies and materials to bring to the facility; an identified labour and birth companion; an identified support person to look after other children at home; identified transport to a facility for birth or in case of complications; and identification of compatible blood donors if needed.¹³ Acknowledging that not only women, but also families, communities, health care providers and policy makers need to be birth prepared, JHPIEGO developed a BP/CR matrix which conceptualizes multi-stakeholder preparedness (Supplement 1).^{9,10,14}

A recent systematic review of randomized controlled trials (RCTs) showed that BP/CR strategies can reduce maternal and neonatal mortality.¹⁵ However, seven out of the twelve included studies implemented BP/CR through action-learning cycles with women's groups, a specific intervention and methodology, which reported improvements to maternal and newborn health outcomes.^{16,17} As the primary objective of BP/CR is to increase care seeking, mortality reduction also depends on accessibility and availability of services being provided. This makes the contributing effect of the BP/CR interventions on mortality less clear. In addition, change in mortality rates over time is difficult to assess and figures are often unreliable.¹⁸ Therefore

we set out to systematically review the literature, including qualitative studies, for the effect of BP/CR on increasing SBA.¹⁹

The aim of this systematic review is to review the literature of BP/CR interventions and assess its effect on increasing SBA.¹⁹

As there are several ways to implement and evaluate BP/CR interventions, we formulated the following key research questions to guide our review:

1. To what extent does BP/CR result in increasing skilled birth attendance?
2. What strategies are used to implement BP/CR?
3. What methodologies are used to measure the effectiveness of BP/CR?

Findings in this paper are also included in the WHO recommendations on health promotion interventions for maternal and newborn health 2015.²⁰

METHODS

In order to systematically synthesize the body of evidence, we followed the guidelines for systematic reviews of the Cochrane Handbook for Systematic Reviews of Interventions²¹, the PRISMA statement²² and the guidelines published by the National Health Service (NHS) Center for Reviews and Dissemination.²³ Details on the specific review methodology can be found in a prior publication (Supplement 2).¹⁹ The study protocol was registered at PROSPERO (no: CRD42012003124). Additional methodological considerations not mentioned in the study protocol or which were adjusted during the review process are described below.

Literature search and selection process

We developed a search strategy (Supplement 3) for three electronic databases: PubMed, Embase and CINAHL. A wide range of search terms was used for high sensitivity as we anticipated that BP/CR terminology had only recently been used in publications. Originally we searched articles published between January 1987 and October 2012. However, this resulted in many irrelevant articles, in which concepts and interventions related to BP/CR were difficult to identify. We therefore excluded studies published before January 2000 and limited our search to the English language. We also manually searched grey literature and reviewed a database that included results of a systematic mapping of research on maternal health in low- and middle-income countries published from 2000 to 2012.^{24,25} The latter was limited to Arabic, English, French, Spanish, Japanese and Portuguese.

Inclusion criteria

Studies were included if they were RCTs, quasi-experimental studies or comparative cohort studies which met the following criteria:

- Study population: pregnant women, women who recently gave birth, husbands of pregnant women or of women who recently gave birth, health care providers, traditional birth attendants (TBAs), all adults in the community (in low- and middle-income countries)
- Interventions: including BP/CR components, which could be facility-based, community-based or home-based implemented both as single intervention or as a package of interventions.
- Comparison: outcome reported must be compared with the outcome in any comparison group,
- Outcomes: birth with SBAs or facility births, maternal and neonatal mortality and morbidity, ANC with a skilled provider and knowledge of danger signs, implementation of BP/CR plan elements such as saving necessary funds, transport arrangements, etc.

We excluded interventions that focused on increasing the quality of ANC provision and studies on facility training without the objective of increasing BP/CR. We also excluded descriptive studies on BP/CR, which did not evaluate any BP/CR intervention, but merely described barriers to BP/CR or use of SBAs.

Study selection

Our search yielded 5552 records, of which 3665 remained after removal of duplicates (Fig. 1). All abstracts and titles were searched and screened in duplicate and independently by ASM, YR and MvE. Of the 3665 records, 2991 were found not relevant or published before 2000. Remaining records (n = 674) and additional records identified (n = 12) were compared against JHPIEGO's BP/CR matrix¹⁰ to determine whether the study's conceptualization aligned with the definition of BP/CR used in this review. Two reviewers reviewed the remaining 171 full text records independently for inclusion (ASM, YR, MvE or LS). Reference lists of the included records (n = 21) were hand searched for potentially relevant sources, yielding 9 additional records. Three additional studies were identified after presentation of our preliminary results at the WHO Technical Consultation on health promotion interventions for maternal and newborn health.²⁶ Disagreements on inclusion of studies were resolved by discussions with third parties (JS, JvR and AP). Included were 33 records covering 20 separate intervention programmes (e.g. some interventions or studies produced multiple articles).

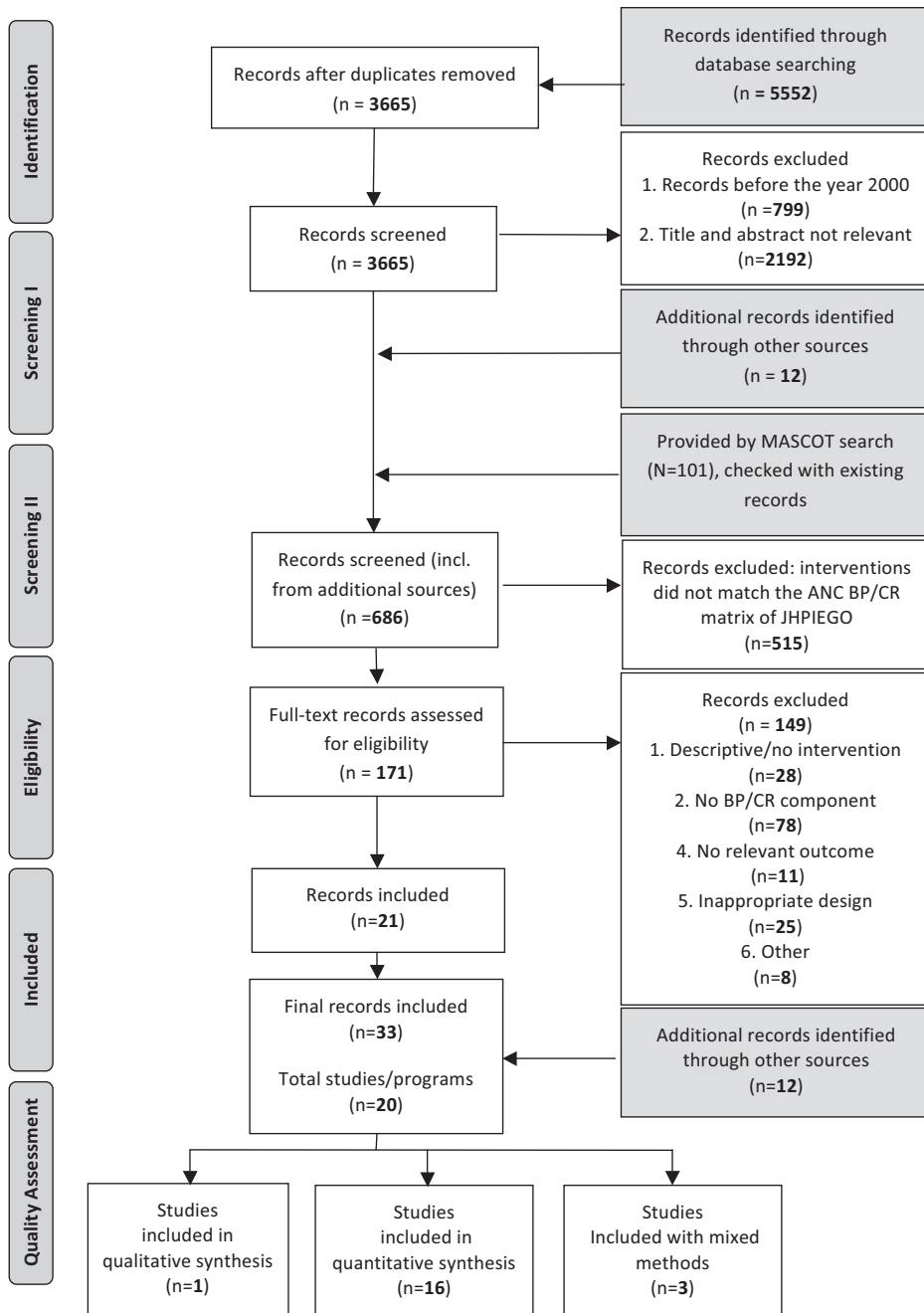


Figure 1. Prisma Flow Diagram.²²

Data extraction

We tailored the NHS Center for Reviews and Dissemination data extraction table to fit our research questions.²³ Data extracted included setting, study design, outcomes, funding sources and intervention description. Data extraction by ASM was checked for accuracy and completeness by YR and LS. If additional data was needed, reports or data files were acquired by contacting authors and / or searching for study reports online.

Quality assessment

ASM, YR, MvE and LS independently assessed the quality of the studies. Risk of bias for quantitative studies was assessed using the Effective Public Health Practice Project (EPHPP) quality assessment tool.²⁷ The quality of qualitative studies was assessed using the eight criteria developed by Walsh and Downe (2006).²⁸

Data analysis

Quantitative results were summarised in summary of evidence tables. The studies varied in BP/CR interventions, design, use of control groups, data collection methods, and outcome measures. We therefore deemed meta-analysis was not appropriate and conducted a narrative synthesis of the findings.²⁹

RESULTS

All 20 programmes consisted of interventions wherein BP/CR comprised one element, either as a component (e.g. of ANC education), a sub-intervention (e.g. of a behavioural change strategy) or a primary intervention (e.g. administering a BP/CR package). Table 1 and 2 show the characteristics of the included studies. The study designs include one RCT, three cluster RCTs, seven pre and post comparative studies with a control group, one pre and post study without control, seven one group before and after evaluations and one qualitative study. Three quantitative studies also had a qualitative component. Five of the 19 studies with a quantitative component received a moderate and 14 a weak rating. Assessment of four qualitative studies resulted in one moderate and three weak ratings (S-Table 1).

Table 1. Study details for BP/CR interventions aiming to increase SBA for uncomplicated birth.

Study	Study Design	Description of intervention	Study population	No of participants	Programme name/ NGO
Brazier et al, 2009, ³⁰ Hounton et al, 2008, ³¹ Graham et al, 2008; ³² Hounton et al, 2008; ³³ Newlands, 2008, ³⁴ Graham et al, 2008. ³⁵ (Burkina Faso)	Pre-post with control	Behaviour change and community mobilization through participatory theatre and songs. Upgrading of health facilities and improving the referral system. Control district was also provided with facility upgrades but not the behavioural change component.	Women aged 15-49 who had experienced a pregnancy outcome between January 2002 and March 2006	Control 1,311/1,973, Intervention 1,178/1,159	FCI, Skilled Birth Initiative
Family Care International Kenya, 2007; ³⁶ Moor et al, 2002; ³⁷ Family Care International Kenya, 2003. ³⁸ (Kenya)	Pre-post with control	Behaviour change campaign to increase use of skilled care before, during, and after childbirth making use of printed materials including BP messages through drama and meetings as well as supplied materials to HCW as well as facility upgrade and improving provider skills. Control district received only facility intervention.	Women who had given birth two years prior to the survey.	Baseline: 5,332 Endline 6,331 Women endline: 5,371 Husbands endline: 2,617	CHANGE PROJECT; Family Care International Skilled Care Initiative
Family Care International Tanzania, 2007. ³⁹ (Tanzania)	Pre-post with control	Behaviour change communication and mobilization efforts to encourage health-seeking behaviours and build community support for the use of skilled care through participatory meetings at village level and theatre and performing arts. Improving the availability and quality of maternity care through strengthening physical infrastructure, improve provider skills. Control district received no intervention.	Women who had given birth two years prior to the survey.	Household: baseline: 4,262 endline: 4,804 Women endline: 5,585 Husbands endline: 3,145	FCI, Skilled Birth Initiative Minister of Health and Social Welfare (MOHSW)
Sood et al, 2004. ⁴⁰ (Nepal)	One group before after	A multi level behavioural change strategy with standardized safe motherhood messages incorporated into IEC/BCC materials such as posters, billboards etc. In addition mass media (Birth Preparedness Package) was developed to mobilize communities.	Women (pregnant), women (with live birth), husbands, family members and community leaders	Baseline 1,194 Endline 1,208	MNH Program; SUMATA initiative; JHU/CCP; CEDPA; JHPIEGO; PATH; NHEICC of the Department of Health Services and the MoH

Table 1. (Continued)

Study	Study Design	Description of intervention	Study population	No of participants	Programme name/ NGO
Sood et al, 2004. ⁴¹ (Indonesia)	Pre-post with control	Encourage and promote birth preparedness on each level directly targeting husbands, villages and communities through several (media) campaigns. In addition midwives received skills training both clinically as in communicating the basics of BP/CR to their clients during ANC.	Women who had a life birth in the past 15 months, the husband of every third woman, midwives and community influential	Baseline 2,269 Endline 1,782	MNH Program; JHU/CCP; UNFPA; Ministry of Women Empowerment.
Fonseca-Becker et al, 2004. ⁴² (Guatemala)	One group before after	Service delivery improvements making use of Performance and Quality Improvement (PQI) and accreditation model and trained health care providers (through train the trainer approach) and Behaviour Change Interventions focused on organizing communities to effectively respond to obstetric emergencies and creating demand for the improved services through the use of radio and printed materials	Women who recently delivered (<12 months) prior to both baseline and endline, and husbands.	Women: baseline 325 endline 787 Men: baseline 512 endline 546	MNH Program; JHU/CCP; Guatemalan MoH
Moran et al, 2006; ⁴³ Baya et al, 2004. ⁴⁴ (Burkina Faso)	One group before after	Community and facility based HCW and TBAs provided one-on-one counselling with pregnant women and families on key messages focused on birth preparedness and complication readiness using a flip chart. These messages were reinforced through district-based radio messages and theatre plays. In addition facilities were upgraded and HCW were provided with additional training.	Pregnant women and women who recently delivered (<12 months)	Recently delivered women: 180 Pregnant women 180	MNH Program; PLAN; UNICEF Mwaganza Action

Table 1. (Continued)

Study	Study Design	Description of intervention	Study population	No of participants	Programme name/ NGO
Mullany et al, 2007. ⁴⁵ (Nepal)	RCT	Intervention group consisted of couples and women alone who received health education (two sessions) provided by health educators. The curriculum covered a number of maternal health topics (Pregnancy care and birth preparedness, labour and delivery/postpartum period (12 and 17 topics within each session, respectively including complication readiness). Control group received no education, only a brief flyer designed to resemble and standardize the health education of normal care provided;	Pregnant women	Couples: 145 Women alone: 148 Control: 149	NA
Mushi et al, 2010. ⁴⁶ (Tanzania)	One group before after	Training of safe motherhood promoters to educate and raise awareness on maternal health aspects for pregnant women, husbands and community members through home visits.	Female (pregnant, nursing mothers, and mothers) as well as male (husbands of the same) aged 18 years or above.	Baseline 238 Endline: 242	NA
McPherson et al, 2006. ⁴⁷ (Nepal)	One group before after	CHWs through a Birth Preparedness Package use flipcharts and administer key chains to pregnant women, containing birth preparedness messages through monthly discussions in women's groups. Facility-based CHWs counselled women who use facility-based services.	Mothers of live infants aged less than one year at the time of the survey.	Respondents per survey: 300	Saving Newborn Lives (SNL); Save the Children-USA District Health Office, Family Health Division of Minister of Health and Population.
Turan et al, 2011. ⁴⁸ (Eritrea)	Pre-post with control	Training of community members to become Maternal Health Volunteers (women and men) and lead participatory education sessions making use of materials developed. Training included BP/CR. Also skills training for health care providers.	Recently delivered women (<12 months)	Baseline: 466 Endline: 378	Eritrean MoH, UNFPA; Campaign to End Fistula, and the Stanford Eritrean Women's Health Project.

Table 1. (Continued)

Study	Study Design	Description of intervention	Study population	No of participants	Programme name/ NGO
Skinner et al, 2009. ⁴⁹ (Cambodia)	Qualitative	Community development approach towards birth preparedness through dissemination and discussion of visual aids on danger signs and birth preparedness with families and communities	Midwives, village volunteers, TBAs, village chiefs, and mothers through	40 focus group discussions with a total of 327 participants.	NA
Hodgins et al, 2009; ⁵⁰ Valley Research Group 2007 (Nepal)	One group before after	Home based antenatal counselling on birth preparedness and complication readiness to pregnant women and family members making use of pictorial hand-outs by female community health volunteers.	Women who had delivered a live or stillborn child during the year before the interview date	1,740 across two districts	Nepal Family Health Program (NFHP); Maternal Newborn Health Project
Sinha et al, 2008. ⁵¹ (India)	One group before after	The intervention sought to make maternal health a public concern through mobilizing communities. Home visits and through group meetings, family members were informed of how to take special care of pregnant women and help them access health care services. Awareness was raised among pregnant women about pregnancy-related care, antenatal care, institutional delivery and risk factors, and empowered them to access appropriate care.	All women who had delivered in the 12 months prior to the survey	Baseline: 319 Endline: 501	NA

Table 2. Study details for BP/CR interventions aiming to increase SBA in case of an emergency.

Study	Study Design	Description of intervention	Study population	No of participants	Program name/ NGO	Level of evidence
Kumar et al, 2012, ⁵² Kumar et al, 2008. ⁵³ (India)	Cluster-RCT	Intervention package inc home visits, community meetings and folk-song meetings, maternal and newborn health stakeholder meetings, and meetings for community volunteers. Control clusters received standard care;	Women who delivered during study period	Intervention: 26 clusters, n=2,681 Control: 13 clusters, n=1129	Essential Newborn Care (ENC)	1c
Darmstadt et al, 2010. ⁵⁴ (Bangladesh)	Cluster-RCT	Birth and newborn care preparedness (BNCP) was promoted by trained CHWs through two antenatal home visits. CHWs conducted three additional postnatal visits to promote preventive newborn care practices and to identify and refer sick neonates. The control group received usual care services provided by the local and national government	Recently delivered women (within last 3 years before the survey).	Women of reproductive age: Intervention: 9,987 Control: 11,153.	NA	1c
Midhet et al, 2010. ⁵⁵ (Pakistan)	Cluster-RCT	Facilitators were trained to use booklets with pictures supported by a cassette with messages including birth preparedness messages. Intervention group consisted of a woman's only and couples group. In addition TBAs were trained for clean home delivery, owners of local vehicles were trained for referral. Healthcare providers in intervention and control arm received clinical training.	All ever-married women under 50 years of age; recently delivered woman (within 12 months before the survey).	Control: 1,022 Women: 836 Couples: 703	NA	1c
Ahluwalia et al, 2003, ⁵⁶ Kaharuza, 2001, ⁵⁷ Ahluwalia et al, 2010. ⁵⁸ (Tanzania)	Pre-post no control	The VHWs were trained to educate pregnant women and their families on maternal and newborn health including to perform birth-planning counselling. In addition TBAs were trained to recognize danger signs, facilities were upgraded and facility staff trained. A community surveillance system for pregnancies as set up.	Recently delivered woman (within 24 months before the survey)	Approximately 860 respondents for follow up survey.	Community Based Reproductive Health Project (CBRRHP); CARE; CDC; MoH Tanzania	-

Table 2. (Continued)

Study	Study Design	Description of intervention	Study population	No of participants	Program name/ NGO	Level of evidence
Hossain et al, 2006, ⁵⁹ Barbey et al, 2001. ⁶⁰ (Bangladesh)	Pre-post with control	TBA's, fieldworkers, and village doctors were trained to disseminate BP messages incorporated into a variety of visual aids during home visits, group discussions at clinics, and village meetings. In addition development of community support systems and improvement of quality of care through a participatory approach and training of staff took place. Comparison district received facility upgrade but no community intervention, control district received no intervention.	Women, husbands, decision maker, newborn care takers and community agents	Intervention: 420, Comparison: 400, Control: 400	Dinajpur Safe Mother Initiative; CARE; UNICEF; Government Bangladesh	4
Baqui et al. 2008. ⁶¹ (India)	Pre-post with control	Home visits by auxiliary nurse midwives or aganwasi worker and change agents to provide counselling on preventive care, nutrition, and preparedness for childbirth, and health-care utilization for complications. Encourage families to call auxiliary nurse-midwife or trained traditional birth attendant to attend delivery. Postnatal visit by community-based worker as soon as possible after birth to provide counselling on breastfeeding, essential newborn care, maternal and newborn danger signs and health-care utilization.	Women who had had a live birth or stillbirth within the past 2 years.	Comparison: 6,196/6,014 Intervention 8,756/7,812	Integrated Nutrition and Health Programme (INHPP) CARE-India, with the Indian government and local NGOs.	4

The studies were conducted in sub-Saharan Africa (n = 7), South East Asia (n = 12) and Central America (n = 1). The Maternal Neonatal Health (MNH) programme supported by the Johns Hopkins University Centre for Communication Programs (JHU/CCP) in Guatemala, Nepal, Indonesia and Burkina Faso and the Skilled Care Initiative of Family Care International in Burkina Faso, Kenya and Tanzania were multi-country programmes.

Results of studies are presented in table 3 and 4. We distinguished between BP/CR programs that aim to increase SBA for all births and those promoting SBA in case of complications. The latter took place in contexts with extremely low SBA and where the majority of births take place at home; consequently BP/CR messages are different and focused on care seeking for complications and the intervention also contributed to ensure safe birth practices at home.

Table 3. BP/CR interventions aiming to increase SBA for birth: Relevant outcomes and characteristics per study.

Study	Relevant improvement seen on primary outcome (SBA or FB)	Relevant improvement seen on secondary outcomes
Brazier et al, 2009, ³⁰ Hounton et al, 2008. ³¹ (Burkina Faso)	Yes. SBA in the intervention district increased from 24% at baseline to 56% at endline (p<0.001) (p value from Chi ² test). This was similar for FB. In the control district a slight increase of birth with a SBA was seen from 32% to 36% (p<0.05) (p value from Breslow-Day Test of Homogeneity of Odds Ratios)	No: In the period 2002–2003, the pregnancy-related mortality risk was 5.8 per 1000 pregnancies in Diapaga, 3.7 per 1,000 in the Ouargaye non SCI-intervention area and 4.9 per 1,000 in the SCI-intervention area: with no significant differences between the areas. The pregnancy-related mortality risk declined over time in the SCI intervention area (34% reduction, p=0.074), but the speed of decline was not significantly different from that seen in the non-SCI area (2% reduction, p=0.933) or in Diapaga (10% reduction, p=0.488).
Family Care International Kenya, 2007, ³⁶ (Kenya)	No. In the intervention area SBA increased from 27% at baseline to 28% at endline (p-value not provided, authors report non significant). In the control area there was higher increase from 30% at baseline to 37% at endline (p<0.05)	Marginally: ANC visit at least 1 increased in the intervention group from 85% at baseline Intervention: baseline: 85% endline: 89% P<0.01. ANC visit >2 in the intervention group increased from 67% at baseline to 73% at endline p<0.01. Similar changes were seen in control district. Birth preparedness counseling and information provided at ANC in the intervention group increased from 35% at baseline to 84% at endline (p<0.001). However an increase was also seen in the control area from baseline: 29% to endline: 81% (p<0.001)
Family Care International Tanzania, 2007, ³⁹ (Tanzania)	Yes. In the intervention area SBA increased from 48% at baseline to 54% at endline (p=0.01) compared to the control area with a decline from 38% at baseline to 31% at endline (p-value not provided, authors report non significant)	Yes. Significant increase in exposed group (no significant change in unexposed area) for earlier ANC visit mean decreased from 7.0 to 6.1 months (p=0.05) and ANC visit at least 1 increased from 88% at Baseline to 95% at endline (p<0.001). Improvements were seen in endline counseling in BP/CR (Increase from 18% to 35% in the intervention district p<0.001) and from 24 to 32% in the control district (p<0.01). Advice on where to give birth increased in the intervention district (44% to 57%, p<0.001) but declined in control district (48% to 42%, p<0.01).
Sood et al, 2004. ⁴⁰ (Nepal)	No. Birth assisted by a doctor increased from 11.6% at baseline to 34.4% at endline. However, this was higher for the unexposed group (42%) compared to the exposed group (29.3%). Births attended by a nurse decreased from 0.8% at baseline to 0.0% at endline.	Partially. For knowledge there was a significant increase in exposed compared to unexposed for: vaginal bleeding as danger sign during pregnancy. An increase, but no significant difference between exposed/unexposed mentioned for severe post partum vaginal bleeding, high post partum fever, awareness of community schemes for transport and funds. A reduction was seen in Knowledge of prolonged labour as danger sign both in all groups (due to inconsistent terminology used). No effect was seen for retained placenta as danger sign. For practice, >4 ANC clinics attended in all groups, effect of intervention: ns. Arrangements for safe childbirth increased in all groups. effect of intervention: ns

Table 3. (Continued)

Study	Relevant improvement seen on primary outcome (SBA or FB)	Relevant improvement seen on secondary outcomes
Sood et al, 2004. ⁴¹ (Indonesia)	Marginal. Woman's reported use of a SBA at birth decreased from 64.4% and baseline to 58.9% at endline. This decline was mainly due to lower reported use of health facility midwives (18% to 7.6%). There appeared to be an increase in birth with a SBA among the exposed group with significant difference between exposed and unexposed groups. Hospital birth did increase from 7.1% at baseline to 9.0% at endline (p<0.05) This was higher for the exposed group (11.4%) than the unexposed group (5.7%) (p<0.000)	Yes. Significantly higher awareness of vaginal bleeding as danger sign in pregnancy in all respondent categories, (e.g. women: 40.7% exposed group compared to 16.4% in unexposed group) and of vaginal bleeding during labour only in women (30.8% exposed to 12.3% unexposed), for postpartum bleeding significantly in all groups exposed compared to the unexposed. Significantly higher awareness of community assistance schemes in exposed group compared to unexposed. Emergency transport schemes were used more often by the unexposed. Knowledge of fever as danger sign decreased. For ANC visits there was no baseline data available for comparison
Fonseca-Becker et al, 2004. ⁴² (Guatemala)	Yes. FB increased from baseline (30.5%) to endline in the unexposed group to 31.2% and in the exposed group to 54.7%. p<0.01 between baseline and follow up p<0.01 between exposed and unexposed	Yes. Knowledge (of danger signs and community plans for transport and funds) increased significantly (between p<0.01 and p<0.05 for testing difference between exposed and unexposed), except for fever as danger sign. Seeking care for ANC visits in second trimester increased significantly among those exposed (34.4%) compared to baseline (29.8%) p<0.05. Women who arranged finances for transport increased from baseline: 7.1% to endline (exposed) 62.2% to (unexposed) 26.2% p<0.01
Moran et al, 2006. ⁴³ (Burkina Faso)	Yes. FB increased from 46.1% at baseline to 59.5% at endline. This was similar for SBA with an increase from 38.9% at baseline to 57.8% at endline. For auxiliary midwives there was an increase from 15.6% at baseline to 41.7% at endline (p<0.05) higher for the exposed group (43.5%) versus the unexposed group (37.5%)	Yes. ANC visit >4 increased from 21.1% at baseline to 44.4% at endline (p<0.05). Similar improvements were seen for: timing of ANC >4 months (69.5% to 41.6% p<0.05); PNC 2x (20.5% to 50.6% p<0.01); For a birth plan made (pregnant woman reported): Preparations for transport increased from 37.3% at baseline to 51.1% at endline (ns), financial preparations increased from 45.6% to 61.1% (p<0.05). Identified a Skilled provider increased from 66.7% to 70.6% (ns). For a birth plan made (recently delivered women reported): preparations for transport an increase from 2.8% at baseline to 46.1% at endline, financial preparations from 0.6% to 83.3% (p<0.05), discussed facility birth with husband increased from 18.5% to 52.2% (p<0.01) and the BP score >3 increased from 35.5% at baseline to 61% at endline.

Table 3. (Continued)

Study	Relevant improvement seen on primary outcome (SBA or FB)	Relevant improvement seen on secondary outcomes
Mullany et al, 2007. ⁴⁵ (Nepal)	No. SBA in the different groups was 90.2% for the couples group, 89.6% for women only and 82.8% for the control group. Comparison for relative risk (RR) with 95% Confidence Interval was: couples vs. control: RR 1.09 (95% CI 0.99 - 1.20), woman vs. control: RR 1.08 (95% CI 0.98 - 1.19), couples vs. woman: RR 1.00 (95% CI 0.93 - 1.09) ns.	Marginally, Making > 3 birth preparations differed significantly for education of husbands and women when not living with the mother-in-law, in comparison to controls: 23% versus 4%. Comparison for relative risk (RR) with 95% CI was: RR 5.19 (95% CI 1.86 - 14.53) and significantly for women – not living with their mother-in-law - receiving education alone in comparison to controls: RR 4.44 (95% CI 1.56 - 12.69). Other group comparisons for birth preparedness ns. Women in couples group we more likely than women in control group to attend post-partum visit in facility with 61% versus 47%, RR 1.29 (95% CI 1.04 - 1.60) or woman-alone group 61% versus 49%, RR 1.25 (95% CI 1.01- 1.54). No effect on ANC visits.
Mushi et al, 2010. ⁴⁶ (Tanzania)	Yes. Compared to 34.1% at baseline, post-intervention SBA increased to 51.4% (p < 0.05). Similar trend for FB (baseline 33.3%; post-intervention 49.8%), p-value not provided	Marginally, ANC visits in primigravida <20 wk increased from 18.7% at baseline to 56.9% post-intervention (p<0.01). Frequency of ANC visits and knowledge of danger signs was ns.
McPherson et al, 2006. ⁴⁷ (Nepal)	No. SBA increased from 16% at baseline to 17% at endline (p=0.55)	Yes. ANC 1+ visit increased from 60% at baseline to 84% at endline (p=0.000), ANC 2+ visit increased from 49% at baseline to 73% at endline (p=0.001). PNC within 6w increased from 17% to 34% at endline (p=0.02), PNC within 1w from 11% to 25% at endline (p=0.01). The BP index increased from 33% at baseline to 54% at endline. Financial preparations from 45% to 72% (p=0.000) and transportation preparations from 9% at baseline to 28% at endline (p=0.000)
Turan et al, 2011. ⁴⁸ (Eritrea)	Yes. FB in the intervention group increased from 3.2% at baseline to 46.8% at endline (OR 26.24 95% CI 11.42 – 60.27) compared to from 3.6% at baseline in the control group to 15.2% at endline (OR 4.80 95% CI 2.23 – 10.34) p=0.003 (p value from Breslow-Day Test of Homogeneity of Odds Ratios)	Yes. Significant for four or more ANC visits with increase from 18.5% at baseline to 79.5% at endline in the intervention group with Odds Ratio (OR) 17.09 (95% CI 9.85–29.66) and decrease in the control group from 53.2 at baseline to 47.4 at endline with OR 0.79 (95% CI 0.56–1.13) (p<0.001). The 1 st visit in 1 st trimester increased from 7.4% at baseline to 8.6% at endline with OR 6.72 (95% CI 3.34–13.52) compared to control group with slight increase from 8.5% at baseline to 8.8% at endline with OR 1.01 (95% CI 0.53–1.93) (p=0.001). For birth preparedness there was a significant difference in women who talked with a trained health worker (p=0.015), other indicators were ns. Knowledge of danger signs was high in the control area at baseline, which did not improve further, the intervention area showed significant improvements from baseline to endline.

Table 3. (Continued)

Study	Relevant improvement seen on primary outcome (SBA or FB)	Relevant improvement seen on secondary outcomes
Skinner et al, 2009. ⁴⁹ (Cambodia)	Marginal. There was no baseline data collection in the intervention areas. Outcome data were extrapolated from existing data sources. Routine health facility data of the 10 facilities in the intervention area showed a 32% increase in the number of women giving birth with a midwife (2005 n=271 and 2006 n=357). The national average also increased in this period with 13%	No. There was no baseline data collection in the intervention areas. Antenatal care visits increased to 2.2% according to existing data of the facilities.
Hodgins et al, 2009. ⁵⁰ (Nepal)	Marginal. Percentage of respondents who delivered in a health facility (among respondents with live birth) increased from 24.0% to 28.4% (OR 1.31 95% CI 1.10–1.57). In Banke the proportion rose markedly but in Jhapa, where the baseline rate was already high, there was little change.	Yes. Neonatal mortality decreased from 20/1000 (95% CI: 14 to 27) to 8/1000 (95% CI: 4 to 13) at endline. Adjusting for literacy and wealth differences between baseline and endline survey, as well as the cluster design, this yields an OR of 0.42 (95% CI: 0.24 to 0.72). Positive changes were seen in household practices for birth preparation. Setting aside money increased from 34.8% at baseline to 81.9% at endline (OR 9.78 6.93–13.80). Where 11.5% made arrangements for health facility delivery before birth at baseline, this increased to 19.9% at endline (OR 2.10 1.62–2.71).
Sinha et al, 2008. ⁵¹ (India)	Yes. Home birth decreased from 54.1% at baseline to 38.4% at endline (p<0.001). For facility birth, there was an increase from 7.9% to 16.0% in primary health facilities (p<0.001) and from 15.4% to 26.6% in the government hospital (p<0.001).	Yes. Care seeking for ANC increased for one antenatal check-up from 90.3% - 95.8% (p<0.001), for more than three ANC visits from 87.2%-95.5% (p<0.001) and for ANC visit during 1 st trimester from 45.3% - 54.9% (p<0.001). For birth preparedness an increase was seen in decision to deliver in an institution from 67.1% to 78.6% (p<0.001), identification of hospital/facility for delivery from 40.2% to 65.3% (p<0.001), identification and decision on transport from 28% to 52.1% (p<0.001), discussed birth related plans with close family members from 33.5% to 67.7% (p<0.001). Decrease was seen in identification of a birth attendant from 44.5% at baseline to 35.5% at endline.

Table 4. BP/CR interventions aiming to increase use of EmONC: Relevant outcomes and characteristics per study.

Study	Relevant improvement seen on primary outcome (SBA or FB)	Relevant improvement seen on secondary outcomes
Kumar et al, 2012. ⁵² (India)	No. Births attended by a SBA increased from 14.3% to 26.9% in the intervention group compared to from 13.5% to 19.7% in the control group. Relative Risk:1.37 95% Confidence interval (0.92–2.03) p=0.06	Yes, significant increase in intervention group compared to control in: 1). Recognition of danger signs in pregnancy: Swelling in hands and feet (p=0.0001), Anemia (p=0.0001), Fever (p=0.05), Headache (p=0.035), Fits/convulsions (p=0.01) 2). Some, but not all, during labour: Problems in placental expulsion (p>0.99), Obstructed labor (p>0.99), Breech presentation (p=0.56), Transverse/oblique presentation (p=0.0001), Excessive bleeding after delivery (p=0.0007), Prolonged labor (p=0.0001), Premature rupture of membrane (p=0.0014) 3). Birth preparedness practice: Preparation of room of confinement (p=0.006), Prior identification of health facility (p=0.0001), Prior identification of birth attendant (p=0.048), Prior identification of delivery supervisor (p=0.0006) Prior arrangement of money (p=0.018) Prior arrangement of clean mattress (p=0.0006). Unadjusted and adjusted neonatal and perinatal mortality rates showed significant reductions in both intervention arms.
Darmstadt et al, 2010. ⁵⁴ (Bangladesh)	Yes. In the intervention area FB increased from 12.1% at baseline to 20.2% at endline In the control area there was an increase from 12.5 at baseline to 16.5% at endline (p<0,05)	Marginally. Increased knowledge in intervention compared to control was seen for: danger signs antenatal with an increase from 1.0% at baseline to 2.2% at endline in the intervention group to 1.1% at baseline to 2.9% at endline (p<0.05). For danger signs during labor/delivery the intervention group increased to 1.9% at endline from 1.1% at baseline. Comparison showed an increase from 1.2% at baseline to 3.4% at endline (p<0.05). Danger signs post partum increased in intervention from nil at baseline to 2.0% at endline. Comparison from 1.0% at baseline to 2.5% at endline (p<0.05). Neonatal danger signs from 2.3% at baseline in intervention group to 2.4% at endline. Comparison from 2.3% at baseline to 2.8% at endline (p<0.05). Increase in practice was seen for >1 ANC visit with skilled provider in intervention area: increase from 47.7% at baseline to 68.8% at endline, and in control area a slight increase from 47.8% at baseline to 49.1% at endline (p<0.05). No significant differences in NMR estimates over time and study arm.

Table 4. (Continued)

Study	Relevant improvement seen on primary outcome (SBA or FB)	Relevant improvement seen on secondary outcomes
Midhett et al, 2010. ⁵⁵ (Pakistan)	Yes. Both intervention groups: couples (4.1%) and women only (3.9%) showed higher percentage of FB in the District Hospital than the control group (2.9%) (p<0.05). AOR for women's only group 1.3 (95% CI: 0.7- 2.5) and for couples 1.3 (95% CI: 0.6- 2.7).	Yes. Perinatal mortality and early neonatal mortality were significantly lower in intervention group. Perinatal mortality was 95.6% in control, 48.7% in women's only and 67.2% in couples group (p<0.05). Early neonatal mortality: was 39.1% in the control 24.3% in the women only and 17.7% in the couples group (p<0.05). Neonatal mortality was 48.0% in the control group, 32.4% in the women only and 30.5% in the couples group (ns). Significantly more women had a prenatal check up in 1st /2nd trimester both in women's (31.6%) and in couples group (38.2%) compared to the control group (12.4%)
Ahluwalia et al, 2003. ⁵⁶ (Tanzania)	No. Delivery assisted by a health provider decreased from 56% in 1997 at the start of the study to 49% in 2001.	Yes. Household with a pregnant woman who had a birth plan in place increased from 0 at baseline to 48% at endline. Pregnant women who were able to identify 2 or more danger signs during pregnancy and delivery increased from 10% to 56% at endline. Obstetric complications attended at the district hospital increased from 4% to 15% at endline. A total of 44 of 52 communities had descriptions of action plans for transporting people with health emergencies to health facilities, and 12 (23%) had a specific system in place to implement the transport system (e.g. had collected funds)
Hossain et al, 2006. ⁵⁹ (Bangladesh)	Yes. The intervention area had an 8.1% increase of FB p<0.01 (95%CI 7.2-9.0). (From 2.4% pre-intervention to 10.5% post intervention). Both control and comparison area had higher pre-intervention FB but significant less increase post-intervention: 0.5% in the control area (from 4.5% to 5.0%) and 5.3% in the comparison area (from 7.2% to 12.5%)	Yes. The intervention area had a 23.8% increase of met need for EmONC (16.0%-39.8%) compared to the comparison area that had a 13% increase (12.5-25.5%) and the control area with a 1% increase (11.1-12.1%). Knowledge of >3 danger signs was higher in the intervention area (45%) compared with 4% in comparison and 6% in control. Knowledge of birth planning messages was also higher in the intervention area. For more than 3 messages 20% compared to 2% and 1% in comparison and control. For 1 or 2 messages 45% compared to 26% and 19% in comparison and control.
Baqui et al. 2008. ⁶¹ (India)	Yes. Delivered in a health facility or at home with a SBA increased from 16.3% at baseline to 22.5% at endline in the intervention district. Similar increase was seen in the control district from 17.5% to 21.8% (p <0.009, P-value for difference-in-difference test adjusted for age, education, parity, religion and standard-of-living score)	Yes. Improvements were seen in behavioral change towards increase in >1 and >3 ANC visits With an increase in >1 ANC visits from 16.6% at baseline to 35.5% at endline in the intervention site compared to 24.5% at baseline to 27.5% at endline in the control district (p<0.001). Similar changes were seen for birth planning. In the intervention site saving money for childbirth increased from 14.8% to 50.4% compared to 12.2% - 29.9% in the control site (p<0.001). No effect was seen on neonatal mortality rate.

Effect on birth with a skilled attendant

Across multi-country programmes, i.e. Skilled Care Initiative and the MNH programme, results varied. The Skilled Care Initiative found increases in SBA in Burkina Faso and Tanzania, but not in Kenya.^{30,36,39} Exposure to BP/CR interventions in Tanzania correlated with increased likelihood of seeking skilled care during childbirth. Of respondents exposed to ANC counselling on BP/CR 74% sought skilled care versus 64% of those unexposed ($p < 0.05$).³⁹

The MNH programme resulted in an increase in facility births or birth with SBAs in Burkina Faso and Guatemala.^{42,43} No improvements were found in Nepal and Indonesia.^{40,41} In Burkina Faso improvements were mainly due to an increase in births assisted by auxiliary midwives from baseline to endline (15.6% to 41.7%, $p < 0.05$), which was higher for the exposed group. All authors of the MNH programmes reported an increase in knowledge of BP/CR and increase in BP/CR actions, however, this did not necessarily increase seeking skilled care.⁴³

In Tanzania, an intervention package, comprising training of Safe Motherhood Promoters and education on the importance of a birth preparedness plan through home visits, showed an increase of 51.4% in SBA post-intervention compared to 34.1% at baseline ($P < 0.05$).⁴⁶ Turan et al. (2011) trained community members (women and men) as Maternal Health Volunteers to lead participatory education sessions (including BP/CR) using visual aids. Facility births in the intervention group increased (3.2% to 46.8%, (OR 26.2, 95% CI 11.4–60.3), while the facility births in the control group increased from 4% to 15%. In India, a birth preparedness intervention geared towards families and communities resulted in an increase in births at primary care facilities ($p < 0.001$) and government hospitals ($p < 0.001$).⁵¹

Of the six studies of interventions aiming to increase access to care for complications, three resulted in increased facility births.^{54,59,55} Hossain et al (2006) implemented a multi-stakeholder intervention consisting of facility-based interventions (facility upgrades and improvements in quality of care) and community interventions addressing birth planning and community mobilization to ensure timely recognition and referral of obstetric emergencies. The intervention site received all interventions, the comparison site only a facility upgrade and the control site received none. The intervention area showed an 8.1% increase in facility births ($p < 0.01$ 95% CI 7.2–9.0); however, both the control and comparison area had a higher pre-intervention facility birth rate. Darmstadt et al (2010) found a significant increase of facility births in the intervention area (from 12.1% at baseline to 20.2% at endline) compared to the control area (increase from 12.5% at baseline to 16.5% at endline— $P < 0.05$).⁵⁴

Most authors reported a statistically significant improvement in knowledge on BP/CR (table 4). Mullany et al (2007) showed that couple counselling significantly improved knowledge compared to individual counselling and they suggested that immediate conversations

between spouses might enhance knowledge retention.⁴⁵ Knowledge acquired was not always consistently related to the intervention as was shown by Sood et al (2004), who found that knowledge of danger signs was higher in the control group.⁴⁰

ANC attendance was not evaluated in all BP/CR studies. Study results varied from a significant increase in ANC attendance^{36,39,42,43,47,48,54}, earlier booking dates^{46,48} to not any effect.^{40,45} Different outcome measures and cut-off points for frequency or timing of ANC visits were used.

Of the five studies reporting on neonatal mortality, Kumar et al (2012) report significantly lower neonatal mortality in the BP intervention group⁵² and Hodgins et al (2009) showed fewer neonatal deaths over time.⁵⁰ No significant difference was found in other studies.

Strategies to implement BP/CR

After reviewing the studies on strategies used for BP/CR implementation, we grouped strategies into five categories. Some interventions used multiple strategies: education through home visits by volunteers or community health workers^{43,46,49-52,54,56,59,61}, BP/CR messages integrated into ANC education at facility level^{41,42,43,45}, visual aids with BP/CR messages such as booklets or flipcharts^{36,39-43,47,49,50,55,59}, participatory community mobilization activities including drama, songs and dance^{30,36,39-41,43,46,48,49,55,59} and media campaigns (e.g. radio spots, jingles or television dramas).⁴⁰⁻⁴³ The majority of studies were published between 2004 and 2012 suggesting increased interest in BP/CR and using the label of BP/CR after introduction by JHPIEGO.

Methodologies to measure effectiveness

Definitions of BP/CR varied from identifying a place of birth and preferred SBA, to preparing funds for complications, to arranging for (emergency) transport and knowledge of danger signs. Focus was either solely on the mother, or on both the mother and newborn. Across studies, household surveys were most frequently employed to evaluate programme effectiveness. Although interventions targeted different study populations (women, husbands and mothers in law), authors almost exclusively evaluated women's behaviour as primary outcome.⁶²⁻⁶⁸ The study population was heterogeneous across studies, ranging from pregnant women who gave birth during the study period^{45,52} to women who had 'recently' given birth. A number of multi-country programmes had outcome measures at family or health worker level. Some authors measured facility birth as an indicator for SBA. Methods to assess if women were birth prepared and complication ready differed greatly across studies, due to varying scales and index criteria used.

DISCUSSION

Heterogeneity of study designs and BP/CR interventions, and lack of high quality evidence prevents making a pooled analysis. Although BP/CR interventions can increase knowledge of danger signs and preparations for birth and complications, this did not always correspond to an increased use in SBA at birth. Where an increase in SBA or facility birth was reported, BP/CR interventions were primarily part of a package of multiple interventions and involved multiple stakeholders, making it difficult to attribute the effect to the BP/CR component alone.

Interventions where BP/CR was a primary component can be better assessed in terms of causality, but what these results mean in a complex reality is unclear^{45,46,69}. Many variables influence both programme interventions and outcomes such as female education and policy changes.^{48,70} Active involvement of policy makers in BP/CR interventions facilitated implementation at the national level in some countries.^{30,40-43} We will analyse this further in a separate publication.⁷⁰ Increased use of SBA in BP/CR programmes within a package of interventions could be due to facility or infrastructure improvements, community-based behavioural change interventions, other factors, or due to interactions between all.³⁰

Although the JHPIEGO BP/CR matrix includes preparedness of facilities and health providers, BP/CR studies rarely focus on the supply side of skilled care.¹⁰ Ensuring that services are equipped to meet the increased demand likely to be generated by BP/CR interventions is crucial. Advising community members to prepare for facility birth, while health services or health providers are not birth prepared or complication ready, or while local health systems are not ready for an increased caseload, can lead to an increase of in-facility complications or maltreatment. Consequently, negative in-facility experiences can increase delay in care seeking⁵ and should be avoided as much as possible. Also, negatively contributing factors at ANC need to be addressed for proper BP/CR counselling such as insufficient human resources and time constraints.^{69,71,72}

Although most studies report increased knowledge of BP/CR, not all clarify whether this resulted in plans or actions. Knowledge alone does not equate to an increase in care-seeking behaviour, especially for maternity care services, often due to financial, structural, geographical or cultural factors.^{73,74} Studies that focussed on 'knowledge on danger signs' and 'preparing transport and funds in the event of an emergency' predominantly aimed to increase access to Emergency Obstetric and Neonatal Care (EmONC) in case of complications. However, most births start uncomplicated and risk identification is unreliable.⁷⁵ Delays in reaching skilled care are partially caused by delayed recognition of signs and symptoms of labour onset.^{76,77} We argue that BP/CR programmes should follow Safe Motherhood

programmes in their shift towards the promotion of skilled care for all births and include education on the signs of uncomplicated labour to ensure timely preparations.⁷⁸

The strength of this review lies in its broad literature base, including published and unpublished studies (e.g. reports from NGOs). Although we limited our initial search to English language, the systematic mapping of maternal health research did not have this limitation. It is likely that we included all relevant studies by crosschecking our search results with this broad database and by being open for inclusion of additional articles at the WHO Technical Consultation.²⁶ Facility birth in many studies was used as an indicator for birth with SBAs, this must be interpreted with caution as many facilities may lack the availability or presence of SBAs.³⁵ Similarly only four studies presented their definition of an SBA and it is unclear if in the other studies a SBA was defined according to our definition. Despite wide spread promotion of BP/CR through the JHPIEGO and WHO publications, definitions and indicators of BP/CR varied greatly across studies, therefore comparing studies was challenging which also prevented the possibility of conducting a meta-analysis.

CONCLUSION

Although BP/CR in theory is compelling as a strategy to increase birth with a SBA, robust evidence of the effect of BP/CR in itself on increasing birth with a skilled attendant remains limited. This review does suggest that BP/CR interventions in combination with other interventions have the potential to increase use of SBAs and to increase timely use of facility care for birth and obstetric and newborn complications. We argue that BP/CR interventions seem as strong as the weakest link in the continuum of maternal care pathway.

RECOMMENDATIONS

Clarification of definitions of BP/CR is needed to guide future programme implementation and evaluation. Expert meetings and internationally-agreed upon definitions and indicators for BP/CR could help. However as specific actions and messages required to prepare for birth and complications are highly context specific, it seems undesirable to aim for uniformity. Creating a flexible BP/CR definition that allows local adaptation is a step forward. Collaboration between target groups is a crucial step, and requires further study. An excellent way to locally define and implement BP/CR programmes would be to develop and study local BP/CR pathways collaboratively with target groups from community to policy level. The JHPIEGO matrix is a helpful tool to start this process. Study of this process and outcomes, should include mixed methods by transdisciplinary research teams.⁷⁹

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Supplementary files

Supplement 1 - Birth Preparedness and Complication Readiness Matrix (adapted from MNHP)¹⁰

 Policymaker	 Facility	 Provider	 Community	 Family	 Woman
<p>Creates and environment that ensures evidence based skilled ANC, adequate resources; encourages participation in policy making by communities, families, individuals, integrates BP/CR into programs.</p>	<p>Is equipped, staffed and managed to provide skilled ANC with essential drugs and equipment for ANC, follows guidelines, has functional emergency systems, ensures skilled care 24/7, is gender and culturally sensitive, involves communities and reviews cases.</p>	<p>Provides skilled ANC both technical (prevention, screening and treatment of disease) and educational (counseling and education on danger signs, health promotion), assists and promotes formulation of birth plans, respects community expectations and educates on BP/CR.</p>	<p>Pregnancy Advocates for skilled ANC, facilitates BP/CR actions through education of community members on BP/CR. Has a functional (financial, practical) system, acts according to plans and advocates through dialogue with providers and policy makers.</p>		
			<p>Labour and childbirth Provides skilled care during labour and childbirth (use of partograph, emotional and physical support, clean and safe delivery, recognizes complications, referral when indicated), supports and respects community expectations and educates on BP/CR.</p>		
<p>Promotes improved care during labour, ensures evidence based skilled care policies, supports policies for management of complications, ensures adequate levels of resources and protocols, encourages participation.</p>	<p>Has essential drugs and equipment, follows guidelines on appropriate management of labour, has appropriate space for delivery, functional emergency system, ensures skilled care 24/7, is gender and culturally sensitive, involves communities and reviews cases.</p>	<p>Provides skilled provider at birth, makes sure woman has labour support, assists in transportation, recognizes danger signs, supports mother/baby friendly decision making, is in dialogue with and supports facility.</p>	<p>Recognizes normal labour, advocates for skilled care, facilitates BP/CR plans, supports decision for transport or referral, had access to (financial, practical) systems, purchases necessary medicines and materials.</p>		
			<p>Postpartum and newborn Advocates for skilled provider in postpartum period, makes sure woman is not alone in postpartum period, recognizes danger signs, supports transportation, functioning blood donation system, educates on BP/CR, is in dialogue with facilities.</p>		
<p>Promotes improved care during postpartum and newborn care, ensures evidence based skilled care policies, supports policies for management of complications, ensures adequate levels of resources and protocols, encourages participation.</p>	<p>Has essential equipment and drugs; follows guidelines on postpartum and newborn care, functional emergency system, ensures 24/7 care, is gender and culturally sensitive, involves communities and reviews cases.</p>	<p>Provides skilled postpartum and newborn care (recognizes complications, promotes health and prevents disease in women and newborn, provides counselling and education, referral if needed), supports and respects community expectations and educates on BP/CR.</p>	<p>Supports use of postpartum care, recognizes danger signs, agrees with woman on a decision making process, knows transportation systems, supports provider and woman in referral, has knowledge on available (financial, practical) systems and knows how to access them.</p>		
			<p>Seeks postpartum and newborn care at least twice, recognizes danger signs, has knowledge on available (financial, practical) systems, recognizes danger signs and acts according to the plan.</p>		

Supplement 2 - Protocol for the Systematic Review

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PROTOCOL

Open Access

A protocol for a systematic review of birth preparedness and complication readiness programs

Andrea Solnes Miltenburg^{1*}, Yadira Roggeveen¹, Marianne van Elteren², Laura Shields¹, Joske Bunders¹, Jos van Roosmalen² and Jelle Stekelenburg³

Abstract

Background: One of the effective strategies for reducing the number of maternal deaths is delivery by a skilled birth attendant. Low utilization of skilled birth attendants has been attributed to delay in seeking care, delay in reaching a health facility and delay in receiving adequate care. Health workers could play a role in helping women prepare for birth and anticipate complications, in order to reduce delays. There is little evidence to support these birth preparedness and complication readiness (BP/CR) programs; however, BP/CR programs are frequently implemented. The objective of this review is to assess the effect of BP/CR programs on increasing skilled birth attendance in low-resource settings.

Methods: Due to the complexity of BP/CR programs and the need to understand why certain programs are more effective than others, we will combine both quantitative and qualitative studies in this systematic review. Search terms were selected with the assistance of a health information specialist. Three reviewers will independently select and assess studies for quality. Data will be extracted by one reviewer and checked for accuracy and completeness by a second reviewer. Discussion between the reviewers will resolve disagreements. If disagreements remain, a third party will be consulted. Data analysis will be carried out in accordance with the BP/CR matrix, developed by the Johns Hopkins Program for International Education in Gynecology and Obstetrics (JHPIEGO). Study data will be grouped and analyzed by quality and study design and regrouped according to type of intervention strategy.

Discussion: This review will provide: 1) an insight into existing BP/CR programs, 2) recommendations on effective elements of the different approaches, 3) proposals for concrete action plans for health professionals in the field of reproductive health in resource-poor settings and 4) an overview of existing knowledge gaps requiring further research.

Trial registration: PROSPERO registration no.: CRD42012003124

Keywords: Birth preparedness and complication readiness, Birth plan, Maternal mortality, Utilization, Skilled birth attendant, Safe motherhood, Health education

* Correspondence: asolnesmiltenburg@vu.nl

¹Athena Institute for Research on Innovation and Communication in Health and Life sciences, Faculty of Earth and Life Sciences, VU University, De Boelelaan 1105, 1081 HV, Amsterdam, the Netherlands
 Full list of author information is available at the end of the article



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Background

Poor maternal health, leading to maternal death and severe acute maternal morbidity, remains a major problem, especially in sub-Saharan Africa, where the maternal mortality ratio (MMR) is declining steadily [1]. While a number of countries have made substantial progress in reducing child mortality, the high neonatal mortality rate and its link to obstetric causes is still of great concern [2]. The main direct causes for maternal death and severe acute maternal morbidity are hemorrhage, eclampsia, sepsis, obstructed labor and complications arising from an unsafe abortion [3]. It is assumed that most cases of maternal death and severe acute maternal morbidity can be prevented when births are assisted by skilled birth attendants. Safe Motherhood programs were successful in reducing maternal mortality by placing skilled birth attendants within functioning health systems, which include the availability of or referral to emergency obstetric care services [4]. Packages of (integrated) interventions, including antenatal and postnatal care services, safe abortion services, and the availability of family planning services can further reduce severe acute maternal morbidity and improve overall maternal health. It is expected that there will be a reduction in both neonatal mortality and morbidity rates when these services are available [4-6]. However, the availability of maternal health services does not mean they that are affordable and accessible, provide good quality of care and are used.

The low utilization of maternal health services is frequently analyzed with the Three Delays Model developed by Thaddeus and Maine (1994), which identifies three phases of delay: delay in seeking care, delay in reaching care and delay in receiving adequate care when reaching a health facility [5]. Better knowledge of danger signs means that the predictable elements of the three phases of delay can be anticipated and prepared for with a birth plan for each pregnancy. Birth preparedness and complication readiness (BP/CR) is a process of planning for birth and anticipating actions needed in case of an emergency [7]. In 2001 the Johns Hopkins Program for International Education in Gynecology and Obstetrics (JHPIEGO) developed the BP/CR matrix, which 'delineates the roles of policymakers, facility managers, providers, communities, families, and women in ensuring that women and newborns receive appropriate, effective, and timely care' [7]. It is hypothesized that implementation of BP/CR concepts that focus on individuals, families and communities could reduce at least the first two phases of delay. An operational BP/CR matrix means prepared health facilities that are able to handle child-births and complications, thus contributing to a reduction of the third phase of delay [7,8]. Although there is little evidence that BP/CR interventions are effective,

some promising results from a Nepalese study have been published. Components of the birth-preparedness matrix were implemented and led to a 30% reduction in neonatal mortality and 75% reduction in maternal mortality [9]. However, another Nepalese study on the implementation of a birth-preparedness package did not show any change in the utilization of skilled birth attendants. This study concluded that programs that merely encourage pregnant women to use skilled birth attendants were not efficient and suggested research must go beyond the household level in order to have a significant impact [10].

Although there is a paucity of evidence measuring the effect of BP/CR, it has nevertheless been implemented as an essential part of antenatal care consultations. BP/CR is included in the new World Health Organization (WHO) model for antenatal care as part of antenatal care education. Several countries have adopted this new model to fit the local context [11-13]. A growing number of pregnant women make use of antenatal care services. Roughly 80% of the women in sub-Saharan Africa use antenatal care services at least once [14]. The WHO model proposes that antenatal care attendance should result in all pregnant women being aware of the need for skilled birth attendance as well as increased knowledge of how and when to access skilled birth attendants [12]. Despite the growing number of antenatal care visits, the number of births attended by skilled birth attendants still lags behind. In Tanzania, for example, despite the antenatal care coverage rate of around 94% (one time visit), the rate of skilled birth attendance can be as low as 30%, especially in rural areas. The same study found that two components of BP/CR, health education and counseling, were the least likely components of antenatal care to be provided [15].

Evidence for the effect of antenatal care education and BP/CR programs on the reduction of the three phases of delay, ideally resulting in a reduction of maternal mortality and morbidity, is limited [8,12]. According to Stanton (2004), reasons for the limited evidence include the use of study samples that are too small to capture the complexity of birth preparedness. Also, the historical focus on collecting data on BP/CR using women as the primary target group has hampered the gaining of insights into the success or failure of interventions [8]. In many rural contexts, women are not the decision-makers in the family and are thus rarely involved in pregnancy-related decisions [14]. To gain insights into the involvement of decision-makers, interventions should include partners and other community members. For example, a woman is only fully prepared when, in addition to having planned where to deliver (preferably with skilled birth attendants), funds are allocated for transport and family members are identified to accompany her when

labor starts or complications arise [7,14,16]. How to link individuals, families and communities to health systems that are capable of supporting birth preparedness, requires further study. Examples of links include adequate transportation services and health-care workers capable of responding according to guidelines if there is an obstetric emergency while simultaneously attending to the woman's needs [10,14,16]. Representative samples of involved actors are needed to evaluate BP/CR interventions. The BP/CR matrix provides an overview of the different roles and responsibilities for the variety of actors implementing BP/CR. So far, the main effect measurements have mostly focused on health outcome indicators, such as mortality and morbidity rates; however, the evaluation of the knowledge, intentions and behaviors of the various actors around childbirth might provide insights into why BP/CR programs are effective or not. Qualitative evaluation of BP/CR programs can assist this process [8].

Study design

Aim and objectives

The objective of this study is to assess the effect of BP/CR programs on increasing skilled birth attendance in a low-resource environment. We have chosen to focus on the effects of skilled birth attendance since it is expected that this will give us an indication of the effects of BP/CR before any impact on mortality and morbidity is noticeable, especially since health outcome indicators such as MMR are difficult to obtain with sufficient accuracy to measure progress [17].

As there are several ways to implement and evaluate BP/CR interventions, the following key research questions need to be answered.

1. To what extent do BP/CR programs result in increasing skilled birth attendance.
2. What strategies are used to implement BP/CR?
3. What methodologies are used to measure the effectiveness of BP/CR?
4. Which factors influence the effectiveness of BP/CR?

Methods

This systematic review follows the guidelines for a systematic review as given in the *Cochrane Handbook for Systematic Reviews of Interventions* [18], the PRISMA statement [19] and the guidelines published by the NHS Center for Reviews and Dissemination [20]. As randomized trials may be scarce in this area, excluding other quantitative data (for example, quasi-experimental studies) and qualitative data would substantially narrow the evidence base and exclude valuable data. Furthermore, quantitative evidence is needed to assess the effectiveness of BP/CR, whereas qualitative data is needed to

inform important factors influencing BP/CR effectiveness [21]. Recent literature shows that, although challenging, there are ways to include qualitative studies in systematic reviews [20,22].

Study inclusion criteria

The studies included are randomized controlled trials, quasi-experimental studies, cohort studies, case control studies, cross-sectional surveys and qualitative studies. Table 1 displays the PICOTS elements: participants, intervention, control, outcome, timeframe and setting.

Participants

We have included women of reproductive age who are pregnant at any given gestational stage or women who have recently given birth. We have restricted inclusion to women who have had births in the past two years to avoid recall problems, since we assume that recollections of pregnancy and birth experience more than two years ago will be prone to bias. Husbands of pregnant women or husbands of women who recently gave birth are also included in the target population. The targeted population also includes health workers who deliver pregnancy care. This includes skilled birth attendants, health promotion officers and community health workers, and others working in community, government or private (including faith-based) health institutions. We also include (trained) traditional birth attendants, because of their important role in childbirth in many communities.

Intervention and control

Interventions include single interventions that address one component of the BP/CR matrix, such as training of health workers to deliver BP/CR education. Also included are combined interventions such as overall antenatal care interventions and community health interventions that include multiple BP/CR elements. Public health interventions usually consist of a package of components and can be seen as complex since the different components can have independent and inter-dependent effects [20]. In the analysis and presentation of our results, we will mention if BP/CR was part of a sole intervention or part of a combined approach. We expect that many interventions are not defined or described as relating to birth preparedness but in fact do contribute to the process of planning for birth. Since BP/CR comprises elements of antenatal, intrapartum and postpartum care, interventions can take place in all or one of these phases of pregnancy and childbirth. Also interventions can take place at different levels of care (household, community, provider, facility and policy level). Interventions made on one level and those that cover all levels will be included. We anticipate difficulties in defining a control group, since elements of the BP/CR matrix have already been

Table 1 Inclusion criteria (PICOTS elements)

PICOTS	Inclusion criteria
Participants	Pregnant women, women who have recently delivered, husbands of pregnant women, husbands of women who have recently delivered, health-care providers, traditional birth attendants, all adults in the community (in low- and middle-income countries)
Intervention	Antenatal care education containing BP/CR components, community programs including BP/CR, single BP/CR interventions, training of health workers (skilled birth attendant, community health worker, health promotion officer), training of community volunteers
Control	Standard practice
Outcome	Preparedness: Knowledge of danger signs, creation of and applying a birth plan, funds allocated, transportation arrangements Pregnancy: Antenatal care with skilled health worker Delivery: Delivery by a skilled birth attendant, maternal and neonatal mortality and morbidity
Timeframe	Duration of follow-up and possible exposure to the intervention
Setting	Low- and middle-income countries. Interventions can use facility-based, community-based or home-based services

BP/CR, birth preparedness and complication readiness; PICOTS, participant, intervention, control, outcome, timeframe and setting.

incorporated into standard care. Control groups could receive standard care or interventions that are not BP/CR interventions. Furthermore, control groups are generally highly heterogeneous and depend on the available resources in low- and middle-income countries. In this study, we define standard care as the care that is provided in clinics according to local or national guidelines. However, we acknowledge that due to limited (human) resources these guidelines are not always adhered to [15]. Due to difficulties in performing controlled interventions in rural settings, uncontrolled studies will also be included.

Outcomes

Studies will be included if they assess any of the primary or secondary outcomes mentioned below. Lower maternal and neonatal mortality might not necessarily be seen as a result of the BP/CR elements alone and are, therefore, chosen as secondary outcomes. Since skilled birth attendance sometimes is presented as a complementary outcome rather than a main outcome measure we also include studies that do not primarily promote the use of skilled birth attendance but contribute to reaching this goal. For example, some facility-based studies focus more on service delivery and quality improvement, which influences health-care utilization indirectly. Although such interventions might not directly result in increased skilled birth attendance, it is assumed that they will contribute to the promotion of the use of skilled birth attendants in the long run. Studies will also be included when the primary outcome is related to the use of (trained) traditional birth attendants.

Primary outcome

Delivery by a skilled birth attendant (defined as 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 uncomplicated pregnancies, childbirth and the immediate postnatal

period, and in the identification, management and referral of complications in women and newborns [23]).

Secondary outcomes

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 [24].

Severe acute maternal morbidity or near miss: A woman who nearly died but survived a complication that occurred during pregnancy, childbirth or within 42 days of termination of pregnancy [25].

Neonatal mortality: The death of a neonate divided between early neonatal mortality (death in the first week of life) or late neonatal mortality (death after 7 to 28 days of life) [2].

Neonatal morbidity or near miss: A neonate that survived a life-threatening condition at birth or during the neonatal period as a result of adverse influences or treatments (or non-treatments) during the neonatal period [26].

Knowledge/awareness: Knowledge of the importance of pregnancy care and delivery care by a skilled birth attendant, the danger signs of pregnancy, the location of health institutions and/or emergency obstetric care and existing community services for emergencies (funds and transport) [8].

Intention: The intention to save money for childbirth, to use a skilled birth attendant, to arrange for transport, to contact health facilities when complications arise and to use postpartum care [8].

Practice/behavior: Women who had more than one antenatal care visit, a birth plan was made, money was saved, arrangements were made for emergency transport, the birth was attended by a skilled birth attendant [8].

Timeframe

We will assess the duration of follow-up and possible exposure to the intervention. It is expected that the length of time required for interventions to show any effect from the use of skilled birth attendants could easily exceed 3 to 5 years. We anticipate that improvements in knowledge, intentions and behavior with regard to birth preparedness could be measured earlier, but will ultimately result in improvements in the use of skilled birth attendants [7].

Setting

We decided to review evidence from populations in low- and middle-income countries as classified by the World Bank [27]. Study settings for interventions can be facility based, community based or home based.

Search methods

To identify relevant studies, the following three bibliographic databases will be searched: PubMed, Embase and CINAHL (Cumulative Index to Nursing and Allied Health Literature). We will hand search potentially relevant internet sources such as African Index Medicus, African Journals Online and the World Health Organization (WHO) library to increase the likelihood of including studies from low-resource environments. In addition we will check relevant web pages from the WHO, the Population Council and Google Scholar for additional grey literature. All reference lists in retrieved articles will be checked to see if they contain additional relevant studies. The searches will be limited to publications that have been published between 1 January 1987 and 1 October 2012, that are in English and are for low- and middle-income countries. A health information specialist assisted in the selection of search terms. The literature search will use the following keywords in relation to pregnancy: health, knowledge, attitudes, practices; birth preparedness or birth plan; safe motherhood; empowerment; women's (or maternal) autonomy. Based on a pilot search we excluded 'complication readiness', 'education' and 'counseling' from our search because relevant articles also appeared with the selected keywords and these additional terms were judged to be unnecessary. The preliminary search strategy is given in Additional file 1.

Study selection

Three reviewers (ASM, YR and ME) will independently search and screen abstracts and titles in duplicate. The titles and abstracts for articles found will be matched against the BP/CR matrix. The full articles will be retrieved for all included articles or those that remain unclear and which will be assessed to see if they match the inclusion criteria. Reviewers will independently review the articles

to see if they meet the inclusion criteria. Discussion between the reviewers will resolve disagreements. If disagreements remain, a third party (JB, JR or JS) will be consulted. A flow chart showing the number of studies remaining at each stage will be used according to the PRISMA statement [19]. The flow chart is given in Additional file 2.

Quality criteria

The quality of the included studies will be assessed by the three reviewers independently. Two instruments will be used in the quality assessment of quantitative and qualitative studies. The risk of bias of quantitative studies will be assessed using the criteria outlined in the *Cochrane Handbook for Systematic Reviews of Interventions* [18]. Although there has been considerable debate on how the quality of qualitative research should be assessed, several studies have successfully included qualitative studies along with quantitative studies in systematic reviews [28,29]. Several appraisal tools have been developed. For this research, we will make use of the criteria developed by Walsh and Downe (2006). After reviewing all the existing frameworks and checklists, they developed a workable list of essential criteria classified into eight key areas: scope and purpose, design, sampling strategy, analysis, interpretation, reflexivity, ethical dimensions, and relevance and transferability [30]. All articles based on qualitative data will be assessed according to these eight criteria and will be rated as strong, moderate or weak. See Additional file 3 for a detailed overview of the assessment tool for qualitative studies.

Data extraction

Study data will be extracted using a standard format and entered into Microsoft Excel spreadsheets. Data will be extracted by one reviewer and checked for accuracy and completeness by a second reviewer. Data to be extracted include identification features of the study (setting, study design, outcomes and funding sources), stakeholder group(s) involved in the intervention (policymakers, facility managers, providers, communities, families and women), whether the intervention is focused on antenatal, intrapartum and/or postpartum care, type of intervention strategy (single or combined interventions) and level of evidence (according to the Oxford levels of evidence [31]).

Data analysis and synthesis

First, the analysis will use the BP/CR indicators developed by JHPIEGO [32]. The matrix provides an overview of all stakeholders with a shared responsibility for BP/CR such as policymakers, health-care providers and communities. It includes all elements for which

individual stakeholders are responsible in either pregnancy, childbirth or the postpartum period. The format of this matrix can be seen in Additional file 4. Study data for each stakeholder will be grouped and analyzed by quality and study design (quantitative or qualitative studies). After this, the study data will be collected and regrouped according to the type of intervention strategy. From this, a descriptive analysis of the included studies will be formulated, identifying those types of intervention that have an effect on primary and secondary outcomes.

We anticipate that there will be substantial heterogeneity between studies regarding both interventions and outcomes. If it is possible to cluster studies and compute an effect size for a number of outcomes for at least three studies, we will conduct a meta-analysis of randomized controlled trials. The meta-analysis will be performed using the Cochrane Review Manager (the Cochrane Collaboration, Copenhagen, Denmark) [33]. If a meta-analysis is conducted, we will consider heterogeneity using the chi-square test for homogeneity with statistical significance $P < 0.05$ and where I^2 is the percentage of variation between studies due to heterogeneity rather than chance. Inclusion of cluster-randomized controlled trials in the meta-analysis will be analyzed and reported separately from randomized controlled trials. For dichotomous outcomes, we will compute the odds ratio with a confidence interval of 95% to estimate the effect size, and the standardized mean difference for continuous outcome variables.

The aim of this review is to assess the effects of BP/CR programs. However, the effects are not merely outcomes. We are also interested to know why certain programs seem to be more effective than others. Therefore, we also propose to conduct a narrative synthesis, making use of the available qualitative studies. Narrative synthesis can be used in systematic reviews to tell the story behind the numbers and provide a new body of knowledge to explain the effect. To avoid any chance of bias and remain systematic in our approach, we will make use of the narrative syntheses framework described in the guidance report developed by the UK Economic and Social Research Council. A flow chart summarizing the synthesis process is given in Additional file 5 [34]. When the qualitative studies support the outcomes of the quantitative studies, we will use triangulation methods. If, however, there is a disconnect we will analyze it and provide advice for future research.

Dissemination

Skilled birth attendance is an essential element through which maternal and neonatal health problems can be reduced. Several interventions aim to increase the utilization of skilled birth attendance. This review will

assess an element of antenatal care that has gained attention in recent years, namely the development of a birth plan. Recent interventions have aimed to raise awareness and the knowledge of mothers, families and communities, stressing that they are responsible for developing a birth plan and demanding skilled birth attendance. The effectiveness of this intervention is promising, although to what extent and why needs to be determined. The knowledge gained from this review should therefore be of interest to those involved in reproductive health matters in low- and middle-income countries, ranging from midwives and clinical officers on the ground, to academic researchers and decision-makers at the policy level. Also communities, families and women will be targeted. We will make use of dissemination strategies such as publishing in relevant peer-reviewed journals and presenting at conferences. To reach midwives and clinical officers on the ground, we will channel the results through those non-governmental organizations interested in our results and through decision-makers. They will be encouraged to forward the message to communities, families and women. Decision-makers will be reached through reproductive health seminars and conferences and through face-to-face discussions of our findings.

Discussion

Expected significance of the study

With the growing demand for evidence based interventions of Safe Motherhood programs, this review will add to the evidence base of effective promotion and implementation of BP/CR programs. This review will provide 1) an insight into existing BP/CR programs, 2) recommendations on effective elements within the different approaches, 3) proposals for concrete action plans for health professionals in the field of reproductive health in resource poor settings and 4) an overview of existing knowledge gaps that require further research.

Additional files

Additional file 1: Search strategy on 12 November 2012. PubMed (12 November 2012).

Additional file 2: PRISMA 2009 flow chart (Moher et al. [19]).

Additional file 3: Quality assessment tool for qualitative studies – based on criteria developed by Walsh and Downe [30].

Additional file 4: Birth-preparedness and complication-readiness (BP/CR) matrix (adapted from the Maternal and Neonatal Health Program).

Additional file 5: Flow chart for synthesis process (adapted from guidance developed by Popay et al., [34]).

Abbreviations

BP/CR: birth preparedness and complication readiness; JHPIEGO: John Hopkins Program for International Education in Gynecology and Obstetrics;

MMR: Maternal mortality ratio; PICOTS: Participant, intervention, control, outcome, timeframe and setting; WHO: World Health Organization.

Competing interests

The authors declare that they have no competing interests.

Authors' contributions

ASM, YR and ME formed the review team and designed the study. LS was consulted on the methodology. JB, JR and JS provided expert advice and assisted with the study design. All authors read and approved the final manuscript.

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Author details

¹Athena Institute for Research on Innovation and Communication in Health and Life sciences, Faculty of Earth and Life Sciences, VU University, De Boelelaan 1105, 1081 HV, Amsterdam, the Netherlands. ²Department of Medical Humanities (EMGO) Institute for Health and Care Research VU, University Medical Center (VUmc), Van der Boerhorststraat 7, 1081, BT Amsterdam, the Netherlands. ³Department of Obstetrics & Gynaecology, Leeuwarden Medical Centre, Henri Dunantweg 2, 8934, AD Leeuwarden, The Netherlands.

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Supplement 3 - Search Strategy

Search Categories	Search Terms
Maternal health	Pregnancy [MeSH] AND Safe Motherhood [tiab] OR midwifery [MeSH] OR Doulas [MeSH]
Birth Preparedness	Birth Preparedness [tiab] OR birth plan [tiab]
Decision making	Women's autonomy [tiab] OR women's authority [tiab] OR Maternal autonomy [tiab] OR maternal authority [tiab] OR empower* [tiab] OR personal autonomy [tiab]
Knowledge	Health Knowledge, Attitudes, Practice [MeSH] OR awareness [MeSH]
Countries (Low-middle income)	Africa [MeSH] OR Caribbean Region [mesh] OR Central America [MeSH] OR Latin America [MeSH] OR Mexico [MeSH] OR South America [MeSH] OR Asia [MeSH] OR Indian Ocean Islands [mesh] OR Pacific Islands [mesh:NoExp] OR Melanesia [MeSH] OR Micronesia [hMeSH] OR Polynesia [MeSH]

Taken from:

Search	Add to builder	Query	Items found	Time
#8	Add	Search (#1 AND #2 AND #5) Filters: Publication date from 1987/01/01; English	2645	04:14:39
#7	Add	Search (#1 AND #2 AND #5) Filters: English	2961	04:12:09
#6	Add	Search (#1 AND #2 AND #5)	3267	04:11:55
#5	Add	Search (#3 OR #4)	109002	04:11:24
#4	Add	Search ((Birth preparedness[tiab] OR birth plan*[tiab] OR safe motherhood[tiab] OR empower*[tiab] OR women's autonomy[tiab] OR woman's autonomy[tiab] OR women's authority[tiab] OR woman's authority[tiab] OR maternal autonomy[tiab] OR maternal authority[tiab]))	11831	04:11:14
#3	Add	Search (((("Health Knowledge, Attitudes, Practice"[Mesh] OR "Awareness"[Mesh] OR "Midwifery"[Mesh] OR "Doulas"[Mesh])) OR "Personal Autonomy"[Mesh]))	98402	04:11:03
#2	Add	Search (("Africa"[Mesh] OR "Caribbean Region"[Mesh] OR "Central America"[Mesh] OR "Latin America"[Mesh] OR "Mexico"[Mesh] OR "South America"[Mesh] OR "Asia"[Mesh] OR "Indian Ocean Islands"[Mesh] OR "Pacific Islands"[Mesh:NoExp] OR "Melanesia"[Mesh] OR "Micronesia"[Mesh] OR "Polynesia"[Mesh]))	747955	04:10:51
#1	Add	Search "Pregnancy"[Mesh]	672597	04:10:39

Supplement 4 - Quality Assessment of the included studies

Quantitative	Selection	Study design	Confounders	Blinding	Data collection methods	Withdrawals and dropouts	Intervention integrity	Analysis	Overall rate
Kumar et al	MODERATE	STRONG	STRONG	WEAK	STRONG	STRONG	MODERATE	STRONG	MODERATE
Midhet et al	MODERATE	STRONG	WEAK	WEAK	MODERATE	STRONG	WEAK	MODERATE	WEAK
Mullany et al	MODERATE	STRONG	STRONG	WEAK	WEAK	STRONG	STRONG	STRONG	WEAK
Darmstadt et al	MODERATE	STRONG	STRONG	WEAK	STRONG	STRONG	MODERATE	MODERATE	MODERATE
Turan et al	MODERATE	MODERATE	MODERATE	WEAK	WEAK	NA	MODERATE	WEAK	WEAK
Hounton et al	STRONG	MODERATE	MODERATE	WEAK	STRONG	NA	MODERATE	MODERATE	MODERATE
FCI Kenya	STRONG	MODERATE	WEAK	WEAK	STRONG	NA	MODERATE	MODERATE	WEAK
FCI Tanzania	STRONG	MODERATE	WEAK	WEAK	STRONG	NA	MODERATE	MODERATE	WEAK
Moran et al	MODERATE	MODERATE	MODERATE	WEAK	MODERATE	NA	MODERATE	MODERATE	MODERATE
Sood et al Indonesia	MODERATE	MODERATE	WEAK	WEAK	STRONG	NA	MODERATE	MODERATE	WEAK
Sood et al Nepal	WEAK	MODERATE	WEAK	WEAK	STRONG	NA	WEAK	MODERATE	WEAK
Fonseca-Becker et al	MODERATE	MODERATE	MODERATE	WEAK	MODERATE	NA	MODERATE	MODERATE	MODERATE
Ahluwalia et al.	MODERATE	WEAK	WEAK	WEAK	MODERATE	NA	MODERATE	MODERATE	WEAK
Mc Pherson et al	MODERATE	MODERATE	WEAK	WEAK	WEAK	NA	WEAK	MODERATE	WEAK
Hossain et al	MODERATE	MODERATE	WEAK	WEAK	WEAK	NA	MODERATE	WEAK	WEAK
Mushi et al	MODERATE	MODERATE	WEAK	WEAK	MODERATE	NA	MODERATE	MODERATE	WEAK
Hodgins et al	MODERATE	WEAK	MODERATE	WEAK	STRONG	NA	WEAK	WEAK	WEAK
Sinha et al	WEAK	WEAK	WEAK	WEAK	WEAK	NA	WEAK	WEAK	WEAK
Baqui et al	MODERATE	MODERATE	STRONG	WEAK	WEAK	NA	WEAK	WEAK	WEAK
Qualitative	Scope and purpose	Design	Sampling	Analysis	Interpretation	Reflexivity	Ethics	Relevance and transferability	Overall rate
Ahluwalia et al.	STRONG	MODERATE	WEAK	WEAK	WEAK	WEAK	MODERATE	MODERATE	WEAK
Moran et al.	MODERATE	WEAK	MODERATE	STRONG	MODERATE	MODERATE	STRONG	STRONG	MODERATE
Skinner et al	MODERATE	MODERATE	WEAK	WEAK	WEAK	STRONG	WEAK	MODERATE	WEAK
Mushi et al	MODERATE	MODERATE	STRONG	WEAK	MODERATE	WEAK	STRONG	STRONG	WEAK

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Factors influencing implementation of interventions to promote birth preparedness and complication readiness

Yadira Roggeveen, Andrea Solnes Miltenburg (shared first authorship),
Jos van Roosmalen, Helen Smith

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ABSTRACT

Background: The recent WHO report on health promotion interventions for maternal and newborn health recommends birth preparedness and complications readiness interventions to increase the use of skilled care at birth and to increase timely use of facility care for obstetric and newborn complications. However, these interventions are complex and relate strongly to the context in which they are implemented. In this article we explore factors to consider when implementing these interventions.

Methods: This paper reports a secondary analysis of 64 studies on birth preparedness and complication readiness interventions identified through a systematic review and updated searches. Analysis was performed using the Supporting the Use of Research Evidence (SURE) framework to guide thematic analysis of barriers and facilitators for implementation.

Results: Differences in definitions, indicators and evaluation strategies of birth preparedness and complication readiness interventions complicate the analysis. Although most studies focus on women as the main target group, multi-stakeholder participation with interventions occurring simultaneously at both community and facility level facilitated the impact on seeking skilled care at birth. Increase in formal education for women most likely contributed positively to results. Women and their families adhering to traditional beliefs, (human) resource scarcities, financial constraints of women and families and mismatches between offered and desired maternity care services were identified as key barriers for implementation.

Conclusion: Implementation of birth preparedness and complication readiness to improve the use of skilled care at birth can be facilitated by contextualizing interventions through multi-stakeholder involvement, targeting interventions at multiple levels of the health system and ensuring interventions and program messages are consistent with local knowledge and practices and the capabilities of the health system.

INTRODUCTION

Our systematic review on the impact of birth preparedness and complication readiness (BPCR) interventions on birth with a skilled attendant revealed that BPCR is a complex intervention, highly dependent on the context in which it is implemented.¹ We also found that BPCR interventions vary in terms of approaches, actors involved, in definitions applied, in outcomes measured and in the strategies used to evaluate them.

The concept of BPCR emerged almost 20 years ago and is described as a process of planning for birth and anticipating actions in case of obstetric emergencies in order to reduce delays in seeking skilled care.² In 2005 BPCR was included in the World Health Organization (WHO) antenatal care package,^{3,4} with emphasis on the following elements: deciding on desired place of birth; preferred birth attendant; location of the closest facility for birth and in case of complications: funds for expenses related to birth and/or complications; supplies necessary to bring to the facility; an identified labour and birth companion; an identified support to look after home and other children while the woman is away; transport to a facility for birth or when complications arise; and identification of compatible blood donors when needed. At around the same time, Johns Hopkins Program for International Education in Gynecology and Obstetrics (JHPIEGO) developed a BPCR matrix acknowledging the important role of coordinated efforts of all 'safe motherhood stakeholders' for implementing BPCR. The matrix delineates roles and activities of policymakers, facility managers, providers, communities, families, and women in ensuring that women and newborns reach accessible, appropriate, acceptable and good quality care during pregnancy, childbirth and postpartum.²

Despite widespread promotion and inclusion of BPCR in Safe Motherhood interventions, evidence on the effect of BPCR interventions remains limited. Our recent systematic review of the available evidence found that BPCR, as part of a package of interventions, has the potential to increase skilled care at birth and timely use of facility care for obstetric and newborn complications.¹ The results of the review have been included in recently published WHO guidelines on health promotion interventions for maternal and newborn health, where WHO recommends implementation of BPCR interventions.⁵

To support those who plan to implement BPCR interventions, we conducted a secondary analysis of the papers included in our systematic review¹ and additional studies identified, in order to identify factors influencing implementation. We explore stakeholder perceptions and experiences of BPCR interventions, identify barriers and facilitators to BPCR implementation, and discuss how these relate to improvements in use of skilled care at birth.

METHODS

This article reports a secondary analysis of studies identified in a systematic review conducted in 2013^{1,6} and additional articles identified through a subsequent search. The systematic review included articles published in English between 2000–2012, identified from PubMed, Embase and CINAHL plus a manual search of the grey literature and a database that included results of systematic mapping of maternal health research in low- and middle-income countries.⁷ The original review was concerned with effects on care seeking including use of a skilled attendant at birth (SBA) or facility birth, use of antenatal care (ANC) as well as effects on knowledge and preparations made for BPCR.

For this secondary analysis of factors influencing implementation, we included all articles included in the systematic review [$n = 33$] of 20 BPCR interventions. Additional identified studies include 16 papers on BPCR consisting mainly of descriptive studies⁸⁻²³ and a methodological evaluation of BPCR²⁴ which were identified through the original search but excluded for the systematic review. A subsequent search identified 14 newly published studies of the past 3 years for inclusion in this article.²⁵⁻³⁸ In total we reviewed 64 papers for this secondary analysis.

For the findings presented in this paper, we conducted a narrative synthesis of qualitative information on implementation factors from the 64 papers. We used an adapted SURE (Supporting the Use of Research Evidence) framework to guide the extraction of relevant information from studies and to structure the synthesis.³⁹ The framework comprises a comprehensive list of barriers and facilitators to implementing health systems interventions including stakeholder knowledge and attitudes, health service delivery factors, and social and political considerations; the framework has been used in other systematic reviews of qualitative evidence.^{40,41}

RESULTS

Description of included studies

Characteristics of the 64 included studies are presented in Table 1; some studies report on the same BPCR programme or intervention and are listed together. Most of the studies of BPCR interventions were conducted in South Asia (Nepal $n=7$; India $n=6$; Bangladesh $n=4$; Pakistan $n=1$; and Tibet $n=1$), followed by East Africa (Tanzania $n=7$; Ethiopia $n=6$; Uganda $n=4$; Eritrea $n=1$; and Kenya $n=1$), West Africa (Burkina Faso $n=3$; Nigeria $n=3$; and Benin $n=1$), South East Asia (Cambodia $n=1$; and Indonesia $n=1$), and Latin America (Guatemala $n=1$); one study included multiple countries, and two articles were literature reviews. BPCR implementation strategies varied and often included multiple interventions, which are summarized in Table 2. These included house visits by volunteers who provided education on BPCR, training of health workers in facilities to provide BPCR as part of ANC, provision of education materials or other visual aids with BPCR information, community mobilization activities to increase awareness on BPCR and mass media campaigns with BPCR messages.

Table 1. Characteristics of studies included in the systematic review.

Author(s)	Study Design	Setting	Description of intervention
Ahluwalia et al, 2003; Kaharuza, 2001; Ahluwalia et al, 2010 *	Pre and post study with qualitative component	TANZANIA, rural, Kwimba and Missungwi districts, Mwanza region	Multiple interventions included house visits by volunteers to provide BPCR education to pregnant women and their families. A community surveillance system for pregnancies and community-based plans for transportation to health facilities were also set up. Transport methods included by canoe, oxcart, bicycle/tricycle and stretcher.
Acharya et al, 2015	Cross-sectional facility based study	INDIA, New Delhi	<u>Study aim:</u> To assess the status of BPCR among pregnant women attending a primary health center. <u>Main findings:</u> Majority of women had identified a skilled attendant at birth for delivery. Nearly half of the women had saved money for delivery and had also identified a mode of transportation for the delivery.
Agarwal 2010	Cross-sectional study	INDIA, Indore City (Slum)	<u>Study aim:</u> To present levels and factors associated with BPCR among slum women. <u>Main findings:</u> Half of all respondents were well prepared taking more than 2 steps (identified a trained birth attendant, identified a health facility, arranged for transport, and saved money for emergency). Factors associated with well prepared women were maternal literacy and availing of antenatal services. A TBA attended majority of births. Skilled attendance during delivery was three times higher in well-prepared mothers compared to less-prepared mothers.
August 2015	Cross-sectional study	TANZANIA, Rufiji District	<u>Study aim:</u> to assess men's knowledge and their involvement in BPCR. <u>Main findings:</u> Half of the men were able to mention one danger sign and made birth preparations in the form of a birth kit. There was no association with age, education and marital status.
Baqi et al. 2008 *	Quasi-experimental pre and post comparative study with a control group	INDIA, rural districts of Uttar Pradesh	Interventions included house visits by auxiliary nurse midwives (ANMs) or Anganwadi workers and change agents to provide BPCR counselling to pregnant women and their families.
Brazier et al, 2009; Hounton et al, 2008; Graham et al, 2008; Hounton et al, 2008; Newlands, 2008; Graham et al, 2008 *	Quasi-experimental pre and post study with a control group	BURKINA FASO, rural	Behaviour change and community mobilization through participatory theatre and songs. Upgrading of health facilities and improving the referral system. Control district was also provided with facility upgrades but not the behavioural change component.

Table 1. (Continued)

Author(s)	Study Design	Setting	Description of intervention
Choudhury, 2011	Qualitative	BANGLADESH, Rangpur and Kurigram districts	Study aim: qualitative exploration of the existing maternal care practices during pregnancy, delivery and post-partum period among women of the ultra poor households. Main findings: Traditional believes could impose restrictions in mobility (evil spirits more active in evening). Few women were birth prepared and local birth attendant (TBA) was not contacted in advance out of fear of black magic. Making too many plans for arrival such as new clothes could bring bad luck. There was fear of health workers for various reasons.
Darmstadt et al, 2010 *	Cluster-RCT	BANGLADESH, rural unions in Mirzapur	Antenatal house visits by volunteers who promoted BPCR including for newborn education. CHWs conducted additional postnatal visits to promote preventive newborn care practices and to identify and refer sick neonates. The control group received the usual care services provided by the local and national governments.
Debelew, 2014	Cross-sectional study	ETHIOPIA, Jimma Zone	Study aim: to identify the factors affecting birth preparedness and complication readiness at the different levels. Main findings: The majority of respondents planned to save money and to arrange transport. One third planned to give birth in health facility and planned to be attended by skilled attendant for their current pregnancy. Being in urban residence and having health center within two hours distance as well as educational status of primary or above, husband's occupation of employed or merchant, third or above wealth quintiles, knowledge of key danger signs during labor and attitude and frequency of antenatal care visits increased the likelihood of preparation for birth and its complications.
Dickerson, 2010	Programme evaluation	TIBET, Medrogongkar and Dulong Dechen County	Intervention: PAVOT (Pregnancy and Village Outreach Tibet) is a community- and home-based maternal- newborn outreach program that serves rural pregnant Tibetan women. The program is based on a training-of- trainers model in which experienced master trainers train rural healthcare workers and laypersons to outreach the homes of rural-living women and families. During out- reach, providers relay maternal-newborn health education, hands-on skills training, and material resources directly to recipients. One of the specific PAVOT interventions was encouragement of development of a birth plan. Main findings: The majority of women attended more than 3 ANC visits but half of the women gave birth at home.

Table 1. (Continued)

Author(s)	Study Design	Setting	Description of intervention
Ekabua, 2011	Cross-sectional study	NIGERIA, Cross River State	Study aim: to assess the awareness and intention to use maternity services. Main findings: The majority of respondents were aware of birth preparedness. Knowledge of danger signs was poor.
Family Care International Kenya, 2007; Moor et al, 2002; Family Care International Kenya, 2003 *	Quasi-experimental pre and post study	KENYA, Homa Bay and Migori districts, Nyanza province	Behaviour change campaign making use of printed materials including birth preparedness messages through drama and meetings. Materials supplied to health care workers (HCWs) as well as facility upgrades and improving provider skills. The control district received only facility intervention.
Family Care International Tanzania, 2007 *	Quasi-experimental pre and post study with a control group	TANZANIA, Igunga and Urambo districts, Tabora region	Behaviour change communication and mobilization efforts through participatory meetings at village level and theatre and performing arts. Improvements to the availability and quality of maternity care through strengthening physical infrastructure and improving provider skills. Control district received no intervention.
Fonseca-Becker et al, 2004 *	One group before and after evaluation	GUATEMALA, north-west and south-west regions	Service delivery improvements and trained health care providers and behaviour change interventions focused on organizing communities to effectively respond to obstetric emergencies and creating demand for the improved services through the use of radio and printed materials. Includes a community action cycle: a five-step participatory cycle consisting of organizing for community action; promoting community dialogue; planning together; collective action; and participatory evaluation. The communities developed their own emergency plans.
Hailu, 2011	Cross-sectional study	ETHIOPIA, Sidama Zone	Study aim: To assess the current status and factors associated with birth preparedness and complication readiness among pregnant women. Main findings: The majority prepared to give birth at home and few women were birth prepared. First time pregnancy and ANC attendance were associated with being prepared.
Hiluf, 2007	Cross-sectional study	ETHIOPIA, Tigray Region	Study aim: to assess knowledge and practices with respect to BPCR and factors associated with women who gave birth in the last 12 months. Main findings: Nearly a quarter of the respondents were prepared for birth and its complications. Preparedness was higher amongst literate mother, married women, women with previous stillbirth and those who received information about BPCR.

Table 1. (Continued)

Author(s)	Study Design	Setting	Description of intervention
Hodgins et al, 2009; Valley Research Group, 2007 *	One group before and after evaluation	NEPAL, rural, Jhapa and Banke districts	House visits by volunteers who provide BPCR education to pregnant women and family members, making use of pictorial handouts.
Hossain et al, 2006; Barbey et al, 2001 *	Quasi-experimental study pre and post comparative study with a control group	BANGLADESH, rural, Birampur region	Interventions included facility upgrades, quality of care and BPCR and community mobilization. SBAs, fieldworkers and village doctors were trained to disseminate BPCR messages that were also incorporated into a variety of visual aids during home visits; group discussions at clinics and village meetings. Comparison district received facility upgrade but no community intervention; control district received no intervention.
Iliyasu 2010	Cross-sectional study	NIGERIA, Kano State	<u>Study aim:</u> to assess men's perception of high risk pregnancy and danger signs; birth preparedness and complication readiness, and participation in maternity care. <u>Main findings:</u> Half of the men considered bleeding a danger sign. One third mentioned convulsion as danger sign. Less than a third of the men made arrangements for mother's health care, transportation and delivery or made savings for obstetric emergencies. One third of the men accompanied women to maternity care. Higher participation was observed in younger educated men.
Jennings 2010	Quasi-experimental pre and post comparative study with a control group	BENIN, Zou/Collines region	<u>Intervention:</u> Introduction of the job aids: a set of pictorial counseling cards designed to support communication to women about care during and after pregnancy according to national guidelines. <u>Intervention components:</u> training, organizational changes, and field support. All health care personnel at the intervention sites were trained for three days in the content and use of the counseling cards, interpersonal communication, and quality improvement. <u>Main findings:</u> The study measured three outcomes: (1) quality of counseling provided to pregnant women; (2) provider perceptions regarding use of the job aids; and (3) women's knowledge of messages relating to maternal and newborn care. Women in the intervention arm received more recommended messages than in the control arm. Increased communication skills regarding use of visual aids and verification of understanding was seen in the intervention arm. Improvements in knowledge among pregnant women were observed in the area of birth preparedness, recognition of danger signs, and clean delivery.

Table 1. (Continued)

Author(s)	Study Design	Setting	Description of intervention
Kabakyenga 2011	Cross-sectional survey	UGANDA, Mbarara district	<u>Study aim:</u> To explore the association between knowledge of obstetric danger signs and birth preparedness among recently delivered women: <u>Main findings:</u> More than half of the women knew at least one danger signs during pregnancy, childbirth than during the post-partum period. Few women had knowledge of 3 or more key danger signs during the three periods. Of the four birth preparedness practices; 91% had saved money, 71% had bought birth materials, 61% identified a health professional and 61% identified means of transport. Overall one third of the respondents were birth prepared (saved money, bought materials, identified health professional and identified transport). Young age and high levels of education had synergistic effect on the relationship between knowledge and birth preparedness.
Kabakyenga 2012	Cross-sectional survey	UGANDA, Mbarara district	<u>Study aim:</u> to assess the influence of birth preparedness practices and decision-making on location of birth and assistance by SBAs. <u>Main findings:</u> One third of the women had been prepared for childbirth and the prevalence of assistance by SBAs in the sample was two thirds. Decision making on location of birth was the husband in the majority of cases. When women made the final decision on location of birth in consultation with either the spouse or other people, the likelihood of giving birth assisted by a skilled birth attendant was very high and low when they made the decision alone.
Kakaire 2011	Cross-sectional facility based study	UGANDA, Kabale district	<u>Study aim:</u> to assess factors associated with birth preparedness and complication readiness as well as the level of male participation in the birth plan and healthcare seeking for emergency obstetric referrals. <u>Main findings:</u> Nearly half of the women had saved money in the event of complications and were joined by their men to ANC and during labour.
Karkee 2013	Prospective cohort study	NEPAL, Kaski district	<u>Study aim:</u> to assess birth preparedness level in expectant mothers and to evaluate its association with skilled attendance at birth. <u>Main findings:</u> The majority of women were birth prepared, 72% prepared the five activities (identification of delivery place, identification of transport, identification of blood donor, money saving, and antenatal care check-up). Of the cohort 85% SBA and it appeared that the more arrangements made, the more likely were the women to have skilled attendance at birth.
Kaso 2014	Cross-sectional study	ETHIOPIA, Robe Woreda, Oromia Region	<u>Study aim:</u> to assess knowledge and practices with respect to birth preparedness and complication readiness and factors associated in rural community among women of reproductive age. <u>Main findings:</u> Few respondents were prepared for birth and its complications and was higher amongst educated women.

Table 1. (Continued)

Author(s)	Study Design	Setting	Description of intervention
Kumar et al, 2012 ; Kumar et al, 2008 *	Cluster-RCT	INDIA, rural Shivgarh, Uttar Pradesh	Intervention package including home visits, community meetings and folk-song meetings, maternal and newborn health stakeholder meetings and meetings for community volunteers. Control clusters received standard care.
Kuteyi 2011	Cross-sectional study	NIGERIA, Osun State	<p><u>Study Aim:</u> to assess knowledge and practices of pregnant women attending antenatal clinics with respect to BPCR. <u>Main findings:</u> The majority of pregnant women had poor knowledge of obstetric danger signs; only a third were birth prepared (if they had identified and agreed on a place of delivery, were saving money towards delivery, had begun purchasing materials/supplies for a clean delivery and newborn care, if they knew their estimated date of delivery and had undergone voluntary counseling and testing for HIV), while one third were not complication ready (if they fulfilled at least four of the following criteria: had adequate knowledge of danger signs as defined above, designated a decision maker, identified the nearest functional comprehensive emergency obstetric care facility to use in case of emergency, identified the source of emergency funds, arranged an emergency means of transport, arranged a means of communication, and identified a suitable blood donor). Women who received antenatal care from the tertiary health facility, those with higher education, were married, who had more ANC visits, booked or were at the time of study in the third trimester and those who lived close to the health facility were more likely to prepare for birth.</p>
Magoma 2010	Qualitative	TANZANIA, Ngorongoro district	<p><u>Study aim:</u> to gain an understanding of the socio-cultural and health systems factors influencing women's decisions to seek antenatal, skilled delivery and immediate post-partum care. <u>Main findings:</u> The Maasai and Watemi women's preferences for a home birth and lack of planning for delivery are reinforced by the failure of health care providers to consistently communicate the importance of skilled delivery and immediate post-partum care for all women during routine antenatal visits. Husbands typically serve as gatekeepers of women's reproductive health in the two groups - including decisions about where they will deliver- yet they are rarely encouraged to attend antenatal sessions.</p>

Table 1. (Continued)

Author(s)	Study Design	Setting	Description of intervention
Magoma 2013	RCT	TANZANIA, Ngorongoro district	<u>Intervention:</u> introduction and promotion of birth plans by care providers during ANC to prepare women and their families for birth and complication readiness. This included discussions on planned place of delivery, the importance of skilled delivery care for all women, transport arrangements to the delivery site or during an emergency, funding arrangements for delivery or emergency care services if needed, identification of possible blood donors, identification of a birth companion if desired and appropriate, and support in looking after the house- hold while the woman was at the health facility. <u>Main findings:</u> More women in the intervention arm discussed birth planning with their providers and more women delivered in health facility and attended post-natal care.
Markos 2014	Cross-sectional study	ETHIOPIA, Goba woreda, Bale Zone	<u>Study aim:</u> to assess BPCR among women of child bearing age. <u>Main findings:</u> Only 82 (14.6%) study subjects were knowledgeable about BPCR and 29% was prepared and complication ready.. Women with primary or secondary education as well as women who attended ANC were more likely to be birth prepared.
Mbalinda 2014	Mixed-Methods	UGANDA, Mulago hospital	<u>Study aim:</u> to explore the association between knowledge of obstetric danger signs and BPCR among women admitted in pregnancy with obstetric complications. <u>Main findings:</u> Only about 1 in 3 women were able to mention at least three of the five basic components of BPCR, and could be regarded as 'knowledgeable on BPCR'. One in every 4 women could not mention any of the five components..
McPherson et al. 2006 *	One group before and after evaluation	NEPAL, Siraha rural district	Community health workers (CHWs) used a BPCR package with flip charts and distributed key chains to pregnant women containing BPCR messages through monthly discussions in women's groups. Facility-based CHWs counselled women who used facility-based services.

Table 1. (Continued)

Author(s)	Study Design	Setting	Description of intervention
McPherson 2010	Process evaluation	NEPAL, Banke and Jhapa district	<p>Intervention: <i>Jeevan Suraksha</i> “provides information about recommended actions to be taken at each stage of normal pregnancy and birth, identifies the danger signs that indicate possible complications, and encourages financial planning for normal births and for possible emergencies”. Content was integrated into a set of activities including 1) health education and counseling with pregnant women and household decision-makers during the antenatal period, primarily by Female Community Health Volunteers (FCHVs); (2) strengthening existing health services; and (3) postpartum home visits by FCHVs. A key aspect of the intervention was the distribution of a pictorial booklet that promotes key MNH practices to all pregnant women who are registered with FCHVs. <u>Main findings:</u> FCHVs increased their workload and expanded their role and relationship with the community. The booklet is shared and discussed among household and community members through a number of channels and clearly informs and influences household practices and decision-making. ‘Too many messages’ caused by redundancies reduces the potential impact of the booklets. Inclusion of additional household members as potential decision makers would increase effectiveness.</p>
Midhet et al, 2010 *	Cluster-RCT	PAKISTAN, rural, Khuzdar district, Balochistan province	<p>Women and their husbands received pictorial booklets-and audio cassettes, training of birth attendants in early recognition of obstetric danger signs, and providing telecommunication and transportation services for women in need of emergency obstetric and neonatal care. The intervention group consisted of a woman’s only and a couples group. Additionally, TBAs were trained for clean home delivery and owners of local vehicles were trained for referral. Healthcare providers in intervention and control arms received clinical training</p>
Moran et al, 2006; Baya et al, 2004 *	One group before and after evaluation	BURKINA FASO, Koupela	<p>Community and facility-based HCWs and SBAs provided one-on-one counselling with pregnant women and families on key messages focused on BPCR using a flip chart. These messages were reinforced through district-based radio messages and theatre plays. Facilities were upgraded and HCWs were provided with additional training.</p>

Table 1. (Continued)

Author(s)	Study Design	Setting	Description of intervention
Mukhopadhyay 2013	Cross-sectional survey	INDIA, West Bengal, Uttar Dinajpur district	<u>Study aim:</u> to find out the perceptions and practices regarding BPCR at individual level and the related factors among pregnant and recently delivered women. <u>Main findings:</u> Half of the respondents planned for first ANC within 12 weeks, four or more ANCs and FB. Awareness of danger signs was poor with half of the women knowing at least one. Overall BPCR index of the study population was 34.5. Less than half of the women saved money and identified transport, the majority was aware of the government finance scheme.
Mullany et al, 2007 *	RCT;	NEPAL, Kathmandu	Intervention group consisted of couples and women alone who received health education (two sessions) provided by health educators. The control group received no education, only a brief flyer designed to resemble and standardize the health education of normal care provided.
Mushi et al, 2010 *	One group before and after evaluation	TANZANIA, rural, Mtwara region	Training of safe motherhood promoters to educate and raise awareness on maternal health aspects for pregnant women, husbands and community members through home visits. Training of safe motherhood promoters and education interventions at home and in community for pregnant women, their husbands and key community members.
Nawal 2013	DHS survey	NEPAL	<u>Study aim:</u> to assess the birth preparedness and its association with institutional delivery and postnatal check-up. <u>Main findings:</u> Only 10% of the population was well prepared for delivery. If prepared there was a greater likelihood of FB. The level of BP/CR is greater among women with pregnancy complications, lower age group, and higher education and economic status and with greater women autonomy. <u>Note:</u> The MOHP implemented the birth preparedness package. The guidelines recommend that families should save money for emergencies, arrange transportation in advance based on local conditions; identify persons who can and are eligible to donate blood if required, identify and contact health facilities and health workers who can provide services, and have a clean delivery kit

Table 1. (Continued)

Author(s)	Study Design	Setting	Description of intervention
Pasha 2013	Cluster-RCT	MULTI-COUNTRY	<p><u>Intervention:</u> Cluster teams of trainers were formed who facilitated a multi-faceted intervention including: 1) Community mobilization to establish village-level core groups and to strengthen community capacity to identify and address barriers to obstetric and neonatal care, 2) Home-Based Life Saving Skills (HBLSS) for birth attendants and families, 3) Improvement of quality of care in existing health facilities through a combination of facility staff Emergency Obstetric and Newborn Care (EMONC) training and health facility audits. Community mobilization and birth attendant training focused on birth planning and transportation to a hospital;</p> <p><u>Main findings:</u> No differences were seen between control and intervention group on primary and secondary outcomes.</p>
Sinha et al, 2008 *	One group before after	INDIA, rural, Andhra Pradesh, Rangareddy district	<p>The intervention involved awareness raising and community support for pregnant women through local government and youth committees; involvement of their families (particularly husbands) in pregnancy-related care through monthly meetings; and bi-monthly home visits by a community organizer who worked with families to create a birth preparedness plan and support access to care. Dissemination and discussion of visual aids on danger signs and BPCR with families and communities.</p>
Skinner et al, 2009 *	Qualitative	CAMBODIA, Kampong Chhnang	
Stanton 2004	Literature review	N/A	<p><u>Study aim:</u> To provide a detailed discussion of the issues involved in measuring birth preparedness in support of safe motherhood with the aim of improving the design and conduct of future research.</p> <p><u>Main findings:</u> For effective BPCR evaluations there is a greater demand for data from or about women who are currently pregnant and conventional sampling approaches will not generate a sufficient sample of current pregnant women and recently delivered women. Additionally documenting birth preparedness requires data on knowledge, intentions, and behaviors associated with live and stillbirths.</p>
Sood et al, 2004 *	One group before and after evaluation	NEPAL, rural, districts of Bagalung and Lalitpur	<p>Social mobilization campaigns. The Suami SIAGA (alert husband) campaign delivered through the following mass media campaigns: The Warga SIAGA encouraged community members to be alert and prepared for births within the community. The Bidan SIAGA promoted the midwife as preferred maternal healthcare provider. The Desa SIAGA campaign encouraged villages to establish lifesaving systems for women with obstetric emergencies.</p>

Table 1. (Continued)

Author(s)	Study Design	Setting	Description of intervention
Sood et al, 2004 *	Pre and post comparative study with a control group	INDONESIA, West Java	Encourage and promote birth preparedness on each level directly targeting husbands, villages and communities through several (media) campaigns. In addition midwives received skills training both clinically as in communicating the basics of BPCR to their clients during ANC.
Soubeiga, 2013	Retrospective cohort study	BURKINA FASO, Koupela and Dori district	Study aim: to examine whether BPCR counseling provided to during routine prenatal visits increased the probability of delivering in a health facility. <u>Main findings:</u> Exposure to information varied and not all BPCR messages were received equally. The four messages together (information on danger signs; promotion of facility-based delivery; information on the cost of delivery and advice on transportation during labour and in cases of obstetric emergencies) did not significantly influence the use of SBA.
Soubeiga, 2014	Systematic Review	N/A	Study aim: to evaluate the impact BPCR interventions in reducing maternal and neonatal mortality in low-income countries. <u>Main findings:</u> Meta-analysis showed no significant reduction on maternal mortality but identified an 18% reduction in neonatal mortality risk. There was a slight increase in the probability of facility-delivery. <u>Note:</u> seven out of the twelve included studies implemented action-learning cycles with women's groups.
Taleb 2015	Qualitative program evaluation	BANGLADESH, Netrokona district	<u>Intervention:</u> implementation of Individuals, Families and Communities (IFC) program which focused on BPCR and working with TBAs to serve a new role in MNH which prioritized education, referral and social support of women rather than birth attendance with the aim to influence the social and cultural norms and practices surrounding care seeking in order to increase the utilization of skilled care. In order to promote BPCR, community- and facility-based health workers were trained to assist pregnant women and their families in creating a plan and to build community awareness of the importance of BPCR. A Birth and Emergency Preparedness Plan (BEP) card was produced illustrating the following preparations: selecting a birth attendant; choosing a birth place and transportation to reach the birthplace; organizing with a birth companion; identifying a potential blood donor; developing a strategy to save money for costs related to pregnancy; and identifying where to seek care in the case of complications. Women receive the card either from health care providers in facilities during ANC visits or from CHWs through home visits. <u>Main findings:</u> Qualitative assessment revealed a more general trend towards planning for birth and complications and increase in knowledge of danger signs. Additionally a shift was identified in choosing for skilled care, although this was primarily for choosing community-based skilled birth attendant (CBSBA) at home.

Table 1. (Continued)

Author(s)	Study Design	Setting	Description of intervention
Turan et al, 2011 *	Quasi-experimental pre and post study with non-equivalent control group	ERITREA, one district in the Red zone and another in the Anseba zone	Training of community members (women and men) to become maternal health volunteers and lead participatory education sessions making use of materials developed. Skills training for health care providers was also conducted.
Turan 2014	Prospective cohort study	ETHIOPIA, Jimma Zone	Study aim: to determine the effect of BPCR on skilled care. One third of the respondents gave birth with skilled care. <u>Main findings:</u> Two thirds of women who planned SBA actual used it. Reasons for non-use of SBA despite planning were: labor was not associated with problems, lack of transport, lack of money for transport and services. Women who had knowledge of key danger signs and were well prepared (performing three or more BPCR actions: planned to save money, planned to arrange transport, planned to give birth in health facility, planned to be attended by skilled attendant and planned to arrange blood donor) were more likely to use SBA.
Urassa 2012	Cross-sectional survey	TANZANIA, Mpwapwa District	Study aim: To assess knowledge and practices with respect to BPCR amongst women who recently delivered in Mpwapa District. <u>Main findings:</u> The majority of the women had decisions made on place of delivery, a person to make final decision, a person to assist during delivery, someone to take care of the family, a person to escort her to health facility and planned to be delivered by a SBA. Age of the woman, education level, marital status, number of ANC visits and knowing ≥3 obstetric danger signs were associated with birth preparedness and complication readiness.

Table 2. BPCR implementation strategies employed by the included studies.

Type of strategy	Studies employing the strategy
House visits by volunteers who provide BPCR education	Ahluwalia et al. 2003; Baqui 2008; Darmstadt et al. 2010; Dickerson 2010; Hodgins et al. 2009; Hossain and Ross 2006; Kumar et al. 2012b; McPherson et al. 2006; McPherson 2010; Moran et al. 2006; Mushi, Mpembeni, and Jahn 2010a; Sinha 2008; Skinner and Rathavy 2009; Taleb 2015
Training of facility healthcare workers to provide BPCR education as part of antenatal care	Brazier et al. 2009; Dickerson 2010; Family care international 2007a, 2007b; Fonseca-Becker and Schenck-Yglesias 2004; Jennings 2010; Moran et al. 2006; Mullany, Becker, and Hindin 2007; Soubeiga, 2013; Sood, Urvashi, Palmer, et al. 2004; Taleb 2015
Providing women (and families) with booklets/flipcharts or other visual aids with BPCR information	Brazier et al. 2009; Family care international 2007a, 2007b; Fonseca-Becker and Schenck-Yglesias 2004; Hodgins et al. 2009; Hossain and Ross 2006; McPherson et al. 2006; McPherson 2010; Midhet and Becker 2010; Moran et al. 2006; Skinner and Rathavy 2009; Sood, Urvashi, Mishra, et al. 2004)there has been little progress in reducing wealth inequities in access to maternity care. This paper describes the results of a maternal health intervention in Burkina Faso that was aimed at increasing access to skilled maternity care by improving availability and quality of maternity care, particularly at primary care health facilities, and promoting its use before, during, and after delivery. Post-intervention data show a large overall increase in use of facility-based maternity care in the intervention district, particularly at primary care facilities, but little change in the comparison district. In addition, large wealth inequities in the use of professional care during childbirth were almost eliminated in the intervention district while they increased in the comparison district-both among all women, and among the subset of women who reported experiencing complications during delivery. Study results suggest that efforts to upgrade maternity services at primary care facilities may be key for improving poor women's access to and use of skilled care during childbirth.", "author" : [{ "dropping-particle" : "", "family" : "Brazier", "given" : "Ellen", "non-dropping-particle" : "", "parse-names" : false, "suffix" : "" }, { "dropping-particle" : "", "family" : "Andrzejewski", "given" : "Catherine", "non-dropping-particle" : "", "parse-names" : false, "suffix" : "" }, { "dropping-particle" : "", "family" : "Perkins", "given" : "Margaret E", "non-dropping-particle" : "", "parse-names" : false, "suffix" : "" }, { "dropping-particle" : "", "family" : "Themmen", "given" : "Ellen M", "non-dropping-particle" : "", "parse-names" : false, "suffix" : "" }, { "dropping-particle" : "", "family" : "Knight", "given" : "Rodney J", "non-dropping-particle" : "", "parse-names" : false, "suffix" : "" }, { "dropping-particle" : "", "family" : "Bassane", "given" : "Brahima", "non-dropping-particle" : "", "parse-names" : false, "suffix" : "" }], "container-title" : "Social science & medicine (1982; Taleb 2015

Table 2. (Continued)

Type of strategy	Studies employing the strategy
Community mobilization activities (Participatory groups, village meetings or community theater and songs with BPCR information)	<p>Brazier et al. 2009; Family care international 2007a, 2007b; Fonseca-Becker and Schenck-Yglesias 2004; Hossain and Ross 2006; Midhet and Becker 2010; Moran et al. 2006; Mushi, Mpembeni, and Jahn 2010a; Pasha 2013; Sinha 2008; Skinner and Rathavy 2009; Sood, Urvashi, Mishra, et al. 2004; Sood, Urvashi, Palmer, et al. 2004; Turan, Tesfagiorgis, and Polan 2011)there has been little progress in reducing wealth inequities in access to maternity care. This paper describes the results of a maternal health intervention in Burkina Faso that was aimed at increasing access to skilled maternity care by improving availability and quality of maternity care, particularly at primary care health facilities, and promoting its use before, during, and after delivery. Post-intervention data show a large overall increase in use of facility-based maternity care in the intervention district, particularly at primary care facilities, but little change in the comparison district. In addition, large wealth inequities in the use of professional care during childbirth were almost eliminated in the intervention district while they increased in the comparison district-both among all women, and among the subset of women who reported experiencing complications during delivery. Study results suggest that efforts to upgrade maternity services at primary care facilities may be key for improving poor women's access to and use of skilled care during childbirth.</p> <p>,"author" : [{ "dropping-particle" : "", "family" : "Brazier", "given" : "Ellen", "non-dropping-particle" : "", "parse-names" : false, "suffix" : "" }, { "dropping-particle" : "", "family" : "Andrzejewski", "given" : "Catherine", "non-dropping-particle" : "", "parse-names" : false, "suffix" : "" }, { "dropping-particle" : "", "family" : "Perkins", "given" : "Margaret E", "non-dropping-particle" : "", "parse-names" : false, "suffix" : "" }, { "dropping-particle" : "", "family" : "Themmen", "given" : "Ellen M", "non-dropping-particle" : "", "parse-names" : false, "suffix" : "" }, { "dropping-particle" : "", "family" : "Knight", "given" : "Rodney J", "non-dropping-particle" : "", "parse-names" : false, "suffix" : "" }, { "dropping-particle" : "", "family" : "Bassane", "given" : "Brahima", "non-dropping-particle" : "", "parse-names" : false, "suffix" : "" }], "container-title" : "Social science & medicine (1982</p>
Media campaign (radio, jingles, posters, leaflets) with BPCR messages	Fonseca-Becker and Schenck-Yglesias 2004; Moran et al. 2006; Sood, Urvashi, Mishra, et al. 2004; Sood, Urvashi, Palmer, et al. 2004)
Improving (quality of) BPCR of health facilities	Pasha 2013;
No strategy, descriptive studies	Acharya et al. 2015; Agarwal 2010; August 2015; Choudhury 2011; Debelew 2014; Ekabua 2011; Hailu 2011; Hiluf 2007; Iliyasu 2010; Kabakyenga 2011; Kabakyenga 2012; Kakaire 2011; Kaso 2014; Kuteyi 2011; Magoma 2010; Magoma 2013; Markos 2014; Mbalinda 2014; Mukhopadhyay 2013; Nawal 2013; Tura 2014; Urassa 2012
No strategy, literature review	Stanton 2004; Soubeiga 2014

Studies define BPCR and its main components variously which complicates interpretation of results, context and policy advice. For example, the most commonly described components include: identifying funds for birth and emergency expenses; deciding on a preferred birth attendant; identifying transport to the health facility for birth or complications; choosing the place of birth and location of nearest facility; and knowledge and identification of danger signs in pregnancy. Other definitions include identifying compatible blood donors, preparing supplies, identifying a birth companion, and discussing plans with husband and family. In the systematic review, it was impossible to determine which strategy and which components, or which combination of strategies and components, was most effective in improving health seeking outcomes.¹ Despite these differences, this analysis of contextual and implementation factors provides an understanding of some common barriers and facilitators to implementing interventions that promote BPCR. The SURE framework is added as Supplement 1.

Stakeholder perspectives on BPCR

All studies involved women and their families; some specifically addressed communities at large;^{42-47,49-53,55,56,59,61,64,67,68,70,73} and three studies specifically targeted health care workers.^{43,46,47} Descriptive studies of BPCR almost exclusively evaluated preparedness of women,^{9,11,13,16,17,19,21,27,29,30,35,48} with the exception of Iliyasu et al. (2010) and August et al. (2013) that specifically assessed BPCR among husbands.^{18,26} The JHPIEGO Maternal and Newborn Health Program and Skilled Care Initiative directed BPCR interventions at individuals, communities, facilities and policy level.^{49,52}

Perspectives of women and their families

Some studies reported women's perceptions of birth as a normal and 'natural event' which could be successful at home, and that this often reduced the urgency to plan for facility birth. Other studies similarly reported beliefs that pregnancy outcomes are predetermined and 'in God's hands', therefore there was no perceived need to be prepared for birth.^{13,14,45,63} In two studies in Tanzania and Nepal 'modern' health services were regarded as the 'last resort' to be used only after complications arose.^{14,55} Improving knowledge of danger signs is an essential element of most BPCR interventions. However, promoting this knowledge without ensuring awareness of the need for planning for normal birth might unintentionally results in the perception that no actions need to be taken if all signs are 'absent' and promote the notion that uncomplicated births indeed are best at home.¹⁴ Quasi-experimental studies identified strong correlations between education level and BPCR, and concluded that BPCR interventions were more successful, and facility delivery more likely, among women with higher levels of education.^{11,13,15,17,21,56,57}

We found evidence in the studies that despite being able to recognise danger signs during pregnancy sometimes women remain silent and do not seek care because of cultural beliefs

about the underlying causes. For example, in Tanzania obstructed labour, retained placenta and eclampsia were associated with adultery.^{47,58} In some countries BPCR actions are limited due to fear of unfavourable outcomes and the belief that ‘preparing’ could bring bad luck.^{20,45} In Tanzania and Kenya, although families reportedly discussed pregnancy and childbirth together (including husbands and wives), the studies indicate that taboos still exist and that this can restrict BPCR discussions. For example, announcing pregnancy and informing the husband when labour starts, is believed to bring misfortune,⁵³ limiting husbands’ ability to make timely preparations.⁴⁷ Cultural beliefs and norms also hindered transport preparations in some contexts, as women refrained from crossing a river since this was believed to cause abortion/preterm birth,⁴⁷ and travel at night was considered dangerous due to active evil spirits.²⁰ In Bangladesh and Kenya, purchasing relevant items in preparation for birth was reportedly discouraged, especially items for the baby. Financial preparations were perceived as wasteful as it is unknown if the child would survive.^{20,53,58}

Identifying a SBA beforehand was a key BPCR message in all studies, and this inevitably involved making a choice about where to give birth and with whom. Some studies emphasized the importance of providing women with clear information during ANC on who is considered a SBA.^{50,55} In some contexts, traditional birth attendants (TBAs) are the preferred attendant as the first point of care in pregnancy and when complications arise. They are considered ‘skilled’ because of their years of experience, ability to perform important rituals and willingness to attend women at home.^{48,59,60} Similarly, women’s understanding of the expected date of birth could limit timely preparations for facility birth or birth with a SBA, as some women perceived the estimated date of birth as exact date of birth, thus awaiting this exact time to make further plans.^{14,20,45,47}

Most interventions took place in contexts where men or other family members are the main decision makers and gatekeepers to women’s timely access to care. Despite this, men are often excluded from maternal health interventions, and this can impact on the likelihood that BPCR actions are taken. In studies in Tanzania women reported that men may cause delay in seeking transport for women in labour or with complications for several reasons: they are unavailable at the time, they may not be aware of the emergency, or they feel ashamed to be seen supporting their wives.^{14,47} A study in India reported that although men appear willing to perform certain tasks, primarily related to financial contributions, they often do not take on more proactive or supportive roles and are reluctant to get fully involved.⁶¹ In a Nepali programme, women requested volunteers to increase awareness of husbands and mothers-in-law, to help them in childbirth preparations.⁵⁵ Descriptive studies indicate that when men are involved in making plans for birth, they more often accompany their wives to the antenatal clinic and labour ward.^{16,18,45} Some studies specifically involved men, by providing information to men,⁶⁸ or training men as maternal health promoters.^{56,58} In the latter intervention,

implemented in Eritrea and Tanzania, men delivered BPCR messages to households and communities, which was well received and contributed to men's understanding of the importance of timely care seeking during pregnancy and for childbirth.

Perspectives of community stakeholders

Pregnancy and childbirth are usually regarded as family events and the wider community rarely plays a major role in preparation or readiness activities.^{47,50,61} However, other community stakeholders who were not always targeted by BPCR interventions, such as community leaders, responded positively to interventions and implementers.^{57,61,62} Interventions that did include community BPCR components resulted in increased awareness of maternal deaths in the community⁴³ and increased feeling of responsibility for pregnant women in the community. The latter through interventions which were specifically applicable to communities at large,⁵⁰ such as developing transport or financial support systems, or through linking interventions to existing community structures.^{43,47} In one study in Nepal, women requested more detailed information on where to go for birth and how to arrange transport.⁵⁵

In one study in India, community leadership was particularly supportive where youth groups held activities to increase awareness of maternal health problems, which subsequently increased direct interaction with government officials on problems faced by health providers and the women themselves.⁶¹ Community transport and financial schemes for maternal emergencies were successful if supervised by transparent, trustworthy and stable leadership^{57,63} and reversely inefficient when corrupted or insufficiently managed.^{43,57}

Implementers of BPCR messages, health workers or volunteers, were generally well accepted by individuals, families and communities. In one Tanzanian study, home visits by volunteers were especially appreciated for the time spent on discussions and questions.⁴⁵ BPCR messages were easily understood by women respondents in Nepal and Burkina Faso.^{23,52} Studies that used visual aids such as cards, posters or booklets were positively received and understood.^{32,42,43,45,50}

Perspectives of health workers and BPCR implementers

Although most studies trained facility-based health workers to implement BPCR interventions either at facility or in the community,^{39-45,47-60,64-68,70} other studies worked mainly with community health workers^{47,50,52,55,56,59,67} including TBAs^{43,50} and community volunteers.^{42,44,45,61,64,65,68,69} In studies in Tanzania, facility-based health workers indicated they felt appreciated by the community volunteers, which increased collaboration.^{45,47} In another Tanzanian study, TBAs changed from childbirth care providers to educators, counsellors and referral advisors, thus becoming active promoters of skilled attendance at birth.⁴⁵

Implementers generally reported they were satisfied with their activities and job aids^{22,23,42,45,47} and felt supported by combinations of job aids with training, field support, and organizational change.^{22,23} Some village volunteers felt appreciated by their communities and were committed to activities,^{47,55} others felt overburdened by study tasks.²³ Implementers in Nepal and Benin reported that job aids included too many or a repetition of messages or lacked concrete activities or examples for preparations to effectively help women and their families.^{22,23} Facility interventions of BPCR during ANC in Benin and Tanzania increased workload by requiring more time with pregnant women.^{14,22}

Health service delivery factors

In some studies hospital staff and researchers noted that shortage of staff at facilities, in particular during nights and weekends, and high staff turnover limited intervention effectiveness. For example high turnover of facility personnel in Tanzania and Bangladesh,^{43,56} limited government training or supervision of staff in Burkina Faso and India^{64,70} and limiting staff payments, causing health staff to run private business and as a consequence SBA absence in the clinics in Cambodia.⁴² Giving staff additional tasks while at the same time maintaining morale and commitment was not easy, despite provision of additional training.^{43,47,49,51,53,56,64,66} Several BPCR interventions reported in the included studies incorporated service delivery improvements including training of facility-based^{43-45,48,49,52,54,68} and community-based^{46,47,64,67} health workers on (emergency) obstetric care, improving facility infrastructure and supplies^{43,47,53,56,64} as well as strengthening the transport and referral system.^{46,51,53,56,64} A study in Tanzania made additional effort to improve the supply of drugs, provided essential obstetric equipment, and facilitated strengthening of the logistics system at facility level.⁵⁶ However, no improvements were seen as ordered supplies were frequently not available mainly due to logistics problems at higher levels in the health system.⁵⁶

Women's and family member's views about the accessibility of care seemed to influence their willingness to prepare for facility birth. Lack of availability of care 24 h a day⁴² or lack of awareness that lower-level health facilities also provide childbirth services⁵³ could result in women choosing home birth. Even if women considered facility birth, large distances to nearest facilities, poor road conditions and lack of transport options^{39-41,44,45,47,48,52,54,68} made facility birth unrealistic. Cost for transportation, formal and informal costs for facility-based services and general out-of-pocket payments limited affordability of care^{14,47,53,55,56,61} and made TBA care often the cheaper option.⁴² Perceived lack of quality of care at facilities including accounts of staff being described as inattentive and unconcerned or needing bribes before treatment was another barrier for SBA.^{53,58}

Social and political factors

Three studies in Nepal show implementation was affected by political instability and civil war, hindering implementation location or intensity.^{50,55,68} The situation in Nepal reduced accessibility to health facilities due to security concerns in some areas⁶⁸ and in one study changed the implementation location from rural to urban although the intervention was thought to be most effective in rural geographical locations.⁵⁰

BPCR interventions in the studies included in this review were primarily implemented in patriarchal societies where gender inequality pervades household decision making.^{54,57,71} Several interventions attempted to address this specific barrier to BPCR, by involving locally influential people. For example, TBAs, traditional healers, church leaders, community or clan elders and political leaders were consulted prior to the intervention or were encouraged to become involved as active promoters.^{62,63,66} In Indonesia, promotion material featured a popular singer which helped to give the campaign a brand name which spoke to the majority of the target population.⁴⁹

One study in Tanzania showed benefits of collaboration with key-stakeholders and government leadership,⁴⁷ in other countries government policies or changes in for example payment regulations could preclude BPCR implementation.⁴² Although national policy changes in favour of MNHC priorities assisted the implementation process in Guatemala⁵¹ BPCR implementation was limited by other national policy changes, such as ending cost-sharing policy in Kenya, increasing overall costs of care,⁵³ and consequently reports of corruption.^{53,56}

Good rapport between the donor agency and government workers together with communities facilitated BPCR implementation, especially when engaging communities in problem solving in relation to BPCR.^{57,68,71} Translating Non Governmental Organization (NGO) concepts into locally meaningful capacities or strategies, not only required time, but also adaptive skills from NGO workers from headquarter to local NGO level in Kenya and Tanzania.^{48,58} Ability of national and local policy makers to continuously connect with communities and hospitals, through newly established village health worker committees or supportive supervision of health services, seem important factors for sustainability of interventions and finances.^{51,63} Scale-up of the BPCR intervention was facilitated in Burkina Faso by connecting to existing health system structures.⁷¹ In Cambodia, short-term BPCR interventions implemented independently of the health system structure, led to fear among programme planners and implementers, that project staff would become unemployed or move to the private sector once the intervention ended.⁴²

DISCUSSION

Linking implementation factors with improvements in care seeking outcomes

For studies included in the original systematic review that reported improvements in use of SBA or birth in a facility, the important factors that seemed to make a difference were positive perceptions of the intervention among women, families and community members and readily understood BPCR messages which motivated behaviour change.^{43,45,52} Positive behaviour change, which could be making more preparations for childbirth or choosing to give birth with a skilled attendant, seemed to be more likely in women with higher levels of formal education,^{11,13,15,17,21,56,57} when husbands (as well as women) were targeted with BPCR messages on the need for SBA,^{43,45,52,61} or when the intervention helped to lessen the influence of traditional or cultural barriers.⁵¹ In studies where BPCR interventions led to no or marginal improvements in number of women giving birth with a skilled attendant or at a facility, preference for home birth and underlying cultural beliefs mitigated the need for facility birth.^{47,53,55}

Political instability^{50,55,68} and short duration of interventions^{42,50} were reported to be among factors which prevented BPCR interventions impacting on care seeking outcomes. On the contrary, in studies reporting improvements in SBA or facility birth, BPCR was generally implemented within a package of interventions designed to address both demand and supply strengthening.^{43,46,49,51,56,64} It is well recognized that community sensitization to BPCR without concurrent improvements in access to facilities and the quality of care provided will have little impact on care seeking or other health outcomes.^{43,55} When interventions were integrated into existing government health service delivery systems,^{51,70} or were delivered in partnership with relevant safe motherhood stakeholders to ensure close links between the community and facilities,^{43,45} this seemed to increase impact on care-seeking outcomes. According to study evaluations the inclusion of perceptions of hospital management and sub-district policy makers on BPCR should be part of and could facilitate NGO implementation strategies.⁶⁵ These stakeholders could be offered support to make quality improvements in health policy making.⁷²

Limitations

Firstly, the variety of definitions and topics used to describe BPCR complicate interpretation of results, context and policy advice. Seven authors did not specify any BPCR definition.^{42,46,53,56,61,64,73} Six interventions were focused on complication readiness only.^{43,46,47,59,67,70} Five authors did explain that BPCR should also include preparedness for routine birth,^{48,51-54} although in one study this was not part of the intervention.⁴³ In areas with extremely low SBA use, ensuring improved conditions at home [preparing birth kits, a clean confinement room] were considered improvements in BPCR.^{43,46,47,59,67} Secondly, skilled

birth attendants are variously described in the included studies, making extrapolation of results from one context to another difficult. Ten studies defined skilled birth attendants as doctors, midwives or nurses.^{47,51-53,55,56,59,64,67,70} In some studies - as per WHO definition - unqualified staff including nurse aides were considered SBAs.^{47,53,56,64} Other studies reported on health facility births,^{43,44,46,49,51,61,64,67,68} which does not necessarily mean the presence of a SBA. Two interventions included promotion of skilled care irrespective of location which consequently resulted in inclusion of home birth with SBAs.^{45,50} As study contexts varied vastly, comparing studies on intervention and outcomes remains difficult. In our view defining interventions and outcome measures properly is crucial in BPCR, as improper definitions complicate interpretation of outcomes.

Further research of robust design is needed to: agree on key definitions and priority BPCR actions; assess the effect of including men and other key-stakeholders on care-seeking outcomes; and to understand how cultural factors influence BPCR implementation.⁵ Although we aimed to include additional qualitative studies, only few were identified. Few studies reported on barriers or facilitators related to the intervention or program itself, such as resource implications, intervention integrity, leadership, and only some reported on donor policies or legislations. Often studies did not elaborate how and why such factors lead to successful or non-successful outcomes. These aspects also require further consideration in future research on BPCR interventions or packages.

The SURE framework proved useful in assessment of factors influencing implementation although we would argue that especially in low-resource settings 'cultural factors' should be added as a separate category. Cultural factors are generally under researched in maternal health studies⁷⁴ and such adaptation of existing models could form a way to swiftly create insight into complexities of implementing health interventions locally.⁷⁵

CONCLUSION

Implementation of BPCR interventions to improve the use of skilled care at birth requires careful consideration of contextual factors influencing implementation. When developing programmes and interventions, BPCR messages and strategies should match and respect the target audience and the different decision makers in maternal health and their values, as well as the organisation and capacities of the local health system. When mismatch occurs, such as when increased demand for facility births meets unprepared facilities in contexts where essential and comprehensive emergency obstetric care services are not available, this could cause considerable damage to the often already fragile trust the community has in the formal health system and increase complications or mistreatment of women giving birth at facilities. For this reason, it is important that BPCR is implemented alongside other

interventions and activities to strengthen the supply and improve the quality of maternity care services. Implementation of BPCR should always include preparedness for both routine childbirth care and for complications, ensuring women and families have discussed the plans. Local socio-economic realities and determinants however remain a heavy burden for effective implementation of BPCR, and therefore require actions with the community and other stakeholders. BPCR messages should therefore be adapted to the local context in terms of availability, accessibility and affordability of health facilities and services. Inclusive and active involvement of all levels of stakeholders, including health officials and policymakers, appears to be a crucial step for securing linkages between the actions of all respective stakeholders that optimizes chances for women and newborns to reach needed care and contributes to the success of BPCR.

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Supplementary files

Supplement 1 - the SURE framework. Larger table available online as "Additional file" at: <https://bmcpregnancychildbirth.biomedcentral.com/articles/10.1186/s12884-017-1448-8#Sec15>

Level	Barriers and enablers	Extracts from papers
1. Main Stakeholders from the community	Women and their families may have varying degrees of knowledge about the healthcare issue or the intervention, or may not have the skills to engage with the intervention. E.g. People may be unaware that the intervention exists or how it is supposed to help them.	<p>[Unaware of importance of care for pregnant women] Sinah. Discussions revealed that pregnancy was perceived as a normal event in the life of a woman, and one in which the community did not have a role to play. For instance, the community did not show any concern if a woman had to deliver under a tree because a doctor was not available at the health facility, or if a maternal or newborn death occurred. Moreover, members of the community were unaware of their right to access public health services or their right to monitor these services and demand better quality care. As a result of prevailing traditional norms, communities tended to discount the need to invest in women's health and well-being.</p> <p>[Increase in education and/or communication increases understanding] Muliyan. Based on these findings, it is difficult to speculate on whether the benefits seen from including husbands were a result of simply educating men (as primary decision makers in families) or educating men with their wives. Increased communication and interaction between couples regarding health practices during or after the education sessions may therefore, have led to a greater understanding and/or retention of new information.</p> <p>[Role of female literacy] Turan: Female literacy courses appear to have greatly contributed to women's education in both areas during the time period, with around 41% of all participants having attended such a course at final assessment, compared with 27% at baseline.</p> <p>[Lack of awareness of the problems and responsibilities] Ahuwalia. Stakeholder participation in decision making and program actions was part of the program. In the beginning of the intervention, it appeared that although maternal mortality was high, maternal health was not a priority for the communities (stated in method section, not further specified). It seems that they mean it was seen as a responsibility for families). After the intervention, community perceptions on ownership on certain barriers had changed; e.g. the arrangement of transport for obstetric emergencies was regarded a community responsibility and not of a family. After the intervention, women attended community meetings on health related topics more often and sometimes participated in decisionmaking. No report is made on how this participation or change because of the intervention was perceived.</p> <p>[Believes hindering use of services] Ahuwalia/Kaharuz. Prevalent beliefs and values limit the use of delivery services. Though complications of delivery were adequately identified, understanding of their causes and management of emergencies were not appropriate and this affected the community management of these complications. For example, "Luwikilo" is believed to be a result of having intercourse with another man besides one's husband. Complications like obstructed labour, retained placenta, and eclampsia are poorly understood and related to "Luwikilo". [FGD women-Luhala] Mothers do not announce onset of labour - they believe that if they talk, the labour pains will disappear. [FGD men- Mbarika] A pregnant woman should not cross a river as she may abort - this may be a factor that affects use of services in an area with rivers during dry season. [FGD Men- Mwadubi]</p> <p>[Men's knowledge lacking] Ahuwalia/Kaharuz. other constraint is the delay in decision making at the community level. Focus group data showed that men are the main decision-makers who may cause delay in seeking transport given that they are either not at home or are not aware of the emergency. Some factors that limit male involvement identified included cultur fs, sayings and taboos, absence from home, feeling of shame if seen supporting his wife, and lack of money. Eclampsia is also believed to be due to multiple partners and is treated by taking sand mixed with water in a glass. The sand should be from place where a dog has delivered [Men Mwabachuma]</p> <p>[Limited perceptions of need SBA] McPherson. Limited knowledge of who provides local skilled birth attendance services and a preference for home-deliveries likely contributed to the low use of SBAs, as "no service available nearby" and "no practice in the community" were frequently cited. Key-informants in Siraha reported that many community members believe that SBAs are only necessary if an emergency occurs during delivery and, thus, only contact them in the event of a crisis. This study did not specifically explore the rationale underlying community preference for home-deliveries; however, it does not appear to be rooted in negative attitudes towards the use of health facilities. Both mothers-in-law and pregnant women reported that fathers-in-law were influential in taking decisions for issues relating to finance and transport—both related to the use of SBAs. The low use of SBAs in Siraha results from factors that include the following: faith in a traditional system of delivery care that views delivery as a natural event that takes place at home; a view of modern health services and SBAs as a "last resort" to be used only if an emergency develops; a cadre of poorly-trained SBAs who do not possess the requisite skills and who are generally unwilling and/or unable to attend births at home; a populace with inadequate information regarding who the SBAs in their areas are and how to access them; and high costs associated with emergency transport and health services.</p> <p>[Maternal health behaviors rooted in cultural traditions] Kumar. Within communities, there is a preference toward care-seeking from unqualified medical practitioners as the first point of care, including care for obstetric complications. Maternal health behaviors have been largely shaped by deep-rooted cultural traditions and are sustained by closely-knit, often caste-based social structures, the poor social status of women, low literacy rates, and limited interaction with the formal healthcare system.</p> <p>[Educational levels]: FCI Tan. Consistent with the baseline survey, educated women are more likely to deliver in a facility than uneducated women.</p> <p>[Normally services not provided/task shift] FCI Kenya. It may be that more time is needed to build the communities' confidence in mid- and lower-level health facilities given that delivery care has not traditionally been provided at many of these sites.</p> <p>[In gods hands] FCI KEN/Moore. Many community members perceive pregnancy outcomes as predetermined by God. Others commented that the time of day that labour begins determines their decisions about place of delivery, "with pregnancy, God alone will take care."</p>

Level	Barriers and enablers	Extracts from papers
		<p>(Specify if this is data from study findings, or information/opinion from background/discussion)</p> <p>[Value of TBAs] FCI KEN/Moore In other words, skilled caregivers were perceived to be better equipped and trained to provide specialized treatment for problems perceived as medical in nature, whereas community-based providers were perceived as having unique expertise in managing problems that fall outside the realm of western medicine.</p> <p>[Discussing brings misfortune] FCI KEN/Moore: While most respondents reported that they talked about pregnancy and childbirth with family members, a few reported that these matters are not discussed. Of these study participants, a small number reported that taboos or traditional beliefs restricted such discussions, noting that discussing and announcing pregnancy could invite misfortune, putting the health and life of the woman and her baby at risk.</p> <p>[Misfortune to prepare] FCI KEN/Moore: "You cannot prepare for something you have not seen," argued one woman in Homabay. Another woman in Migori commented: "It is only after you have delivered is when you can buy baby layete. But when I have not delivered, there is nothing that I buy." Some older respondents also believed that it was inadvisable to purchase items for the baby before it is born. They commented that if towels, napkins and other baby things are purchased in advance, the family will not know what to do with the items if the baby dies at birth. In addition, some saw such preparations as inviting misfortune, staff at local health facilities indicated that their counselling on birth preparedness is primarily focused on preparing items for the baby</p> <p>Extra articles</p> <p>[Evil spirits in evening limiting mobilization] Choudury Bangladesh: It is generally believed among the extreme poor house-holds that evil spirits are more active in the evening, at noon and at night, so pregnant women avoided leaving their houses during those times. Most of the respondents mentioned that lunar and solar eclipses could affect pregnant women. They reported (those who got eclipse during last pregnancy) that they had stayed inside the household, walked near the home or inside the home, but had never laid down on the bed during eclipses.</p> <p>[Preparing birth attendant can cause black magic] Choudury Most women did not contact the birth attendant who is locally known as traditional birth attendants (TBAs or dais) in advance because they thought TBAs could make some jadditona (Black magic) in advance during pregnancy so that without their presence delivery would not occur and that there were greater chances to pay more for delivery.</p> <p>[Preparing not necessary] Choudury The women believed that it was bad to buy new clothes or make too many plans in advance for the new arrival as it could bring bad luck. Moreover, they were not sure whether the coming child would survive or not. Money spent on her/him was considered to be unnecessary. Women assumed that transportation would be available either from a family member or from a neighbour when needed and, as such, did not plan for the transportation in advance.</p> <p>[Importance of ANC] Magoma Antenatal care is highly regarded in both communities, the quality of available care is considered good and most women feel obligated to attend. Regular ANC attendance is believed to guarantee healthier pregnancies and uneventful deliveries, and women who miss visits are considered at risk of poor pregnancy outcomes</p> <p>[Delay in facility care for birth] Magoma Delivery care at health units is usually sought as a last resort after serious complications have developed. Barriers identified as detracting from women's ability to access skilled delivery and emergency obstetric care include: 1) distance from health units 2) lack of reliable and affordable transport 3) lack of advanced planning for accessing delivery care units 4) widely held beliefs that pregnancies labeled as "normal" during ANC visits will result in successful deliveries at home 5) failure of providers to convey information about the importance of skilled delivery care for all women, and 6) women's low social status and inability to independently make labour and delivery decisions.</p> <p>[EDD knowledge] Magoma One specific communication problem mentioned was providers' failure to inform women about the meaning of the expected date of delivery. Women in the two communities are interpreting the date listed on their antenatal cards as their actual delivery date and are waiting until this time to make delivery plans. As a result, women who start labour before their expected delivery date often end up delivering at home even if they expressed interest in delivering in health care facilities.</p> <p>[Husbands decision making] Magoma Husbands typically decide on place of delivery in both ethnic communities, although the expressed preferences of Watemi women are beginning to be respected. Most Maasai women will only leave their households during labour after being granted permission by their husbands.</p> <p>[Naturalness of home births] Magoma Perceptions about the "naturalness" and safety of home delivery is an obstacle to convincing women in the two ethnic groups of the importance of skilled delivery care in all cases. Although the women, TBAs and Elders from both communities expressed a awareness of the potential risks of delivering at home, they stressed that delivering at health units is beneficial only for women with known complications. Women with "normal" pregnancies – defined by the women participants as those with no problems or risk factors identified at ANC visits – are expected to be able to deliver without incident at home.</p> <p>[Gods choice and complication as punishment] Magoma They claimed that only 'God' can protect women from a maternal death. These sentiments are rooted in traditional beliefs in both communities about pregnancy complications and maternal death as punishment for past transgressions:</p> <p>[No perceived need of SBA] Taleb With few exceptions, women preferred birth with a TBA at home and did not recognize the value of the presence of a skilled attendant. Rarely were actions taken by women and families to prepare to access skilled care. TBAs considered themselves the principal provider of MNH services, as did women and families. Men generally felt that pregnancy and birth were a woman's affair only and therefore remained hesitant to be involved, while still being the primary decision-maker, as the gate-keeper of family finances and women's movement outside the household. All of these factors contributed to a low level of seeking and utilization of health services, and the program aims to influence these underlying factors to improve the health of women and newborns.</p>

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	<p>Women and their families may have opinions about the healthcare issue and the intervention, including views about the acceptability and appropriateness and credibility of the intervention and the credibility of the provider and the healthcare system. E.g. People may not agree with the choice of intervention or may not trust the reasons behind it</p>	<p>Specify if this is data from study findings, or information/opinion from background/discussion.</p> <p>[Attitude regarding male involvement and its importance] Sinah: Husbands, for example, perceived that pregnancy-related messages were relevant only for their wives or other women, and many refused to participate in discussions during home visits. Most husbands were willing to allow their wives to obtain antenatal care services; many would readily provide for the purchase of medicines and some even accompanied their wives to the doctor, especially those who went to a private doctor. However, the large majority perceived that their involvement and responsibility ended there; they were unwilling to assume a more proactive or supportive role at home and appeared embarrassed to discuss pregnancy-related issues with community organisers, directing them, rather, to their wives or mothers. In order to break down this reticence among husbands and involve them in discussions, the project initiated a strategy other than home visits to reach this group. Meetings were held outside the home that brought together husbands and gave them space to open up and discuss maternal health issues, including ways in which they could support their pregnant wives.</p> <p>[Mistrust in the intervention approach] Hossain/Barbey: The failure of this CnSSS seemed to be due to: 1) lack of ownership in the CnSSS by a majority of families in the village (CnSSS: 2) lack of use of the CnSSS for EmOC by the villagers; 3) lack of trust by the village as the committee running the CnSSS never met; and 4) due to a lack of a transparency regarding the fund management. A fourth possible factor is familiarity with credits schemes. Many of the communities had other clubs and committees, such as youth clubs and Grameen Bank fund, and so had a good understanding of credit schemes and group process. However, as discussed above, many villages had negative experiences that were detrimental to establishing support systems.</p> <p>[Visual aids easy to understand] Hossain/Barbey: The cards were found to be easy for the villagers to understand. In two villages the team showed them to women who had never seen them and they readily picked out salient points either on their own or with minimal orienting questioning. Two visual cues were not understood: the crosses through things a woman should not do had to be explained (and the pills were mistaken for vitamins), and the visual display of time. However, with explanation, the cues appeared to be easy for women and their families to comprehend and remember. Also, the VAW flashcards have been found to be very effective.</p> <p>[Acceptability of the implementers] Mush: “When SMPs visit us at home we feel good because we have enough time to discuss and to ask questions” (a nursing mother). Acceptance of volunteers by the community is important for program success. In general, the majority of respondents, including health providers, did accept and were positive about SMPs and their role in the community. In this study the inclusion of men (almost 50%) and religious leaders in the SMPs’ team made the intervention valued and acceptable.</p> <p>[Visual aids useful] Musht: Nearly eighty percent of respondents visited were satisfied with the education and information, education and communication (IEC) material given.</p> <p>[Visual aids need to be consistent] Sood Nepal: It is important that IEC material is consistent so that the messages are clear. Majority of respondents understood the messages which were spread.</p> <p>[Community approach to finances not matching reality] Sood Nepal: Financial decision making and financial arrangements are more a family issue than a community issue and thus not necessarily benefitting from community level participation.</p> <p>[Acceptability of intervention across audiences] Sood Indonesia: As a concept the SIAGA campaign had great appeal because of its applicability across a variety of audiences, with appropriately tailored goals and approaches. Husbands were specifically targeted (Suami Siaga). Level of recall of messages was remarkable, 3/4th of the respondents had used the messages, the respondents were able to apply the SIAGA information to their lives, and additionally it sparked attention within the respondent’s social networks.</p> <p>[Acceptability of the visual aids and intervention approach] Skinner: All the village volunteers and midwives interviewed were very positive about the process, and many stated that they would continue to use the posters for education after the project ended. They felt that the information on the danger signs of pregnancy was new to most village members and that most understood them. The focus groups were also very successful and were one of the most positive aspects of the intervention. All were fully attended and, according to the village volunteers and the supervisory staff interviewed, were easy to organize. There seemed to be considerable interest in the community for discussing the health of their pregnant women. The midwives had never conducted focus groups before and although they were very nervous of doing them, all the midwives interviewed commented that the focus groups were the best part of the project as it was the first time they had been able to talk with the community.</p> <p>[Perceptions on problems] Ahluwalia: Key findings from a baseline evaluation what were causes of delay in emergency obstetric care were used to develop program content. (perceptions of communities on the problem used). The key findings were: lack of options and money for transportation to health facilities; delayed the receipt of timely services; obtaining transport was considered a family rather than community responsibility; hiring transport was very expensive, and very pregnant women were referred to health facilities. In addition, the initial prenatal visit to any health care facility often occurred after the 5th month of pregnancy when a pregnancy begins to show. On the other hand, most communities had a history of organizing and mobilizing resources to address health related problems (e.g. building a water tank for a local health facility).</p> <p>[Acceptance of implementers by community] Ahluwalia/Kaharua: VHWs in some communities enjoyed the support of local leaders and were given audience at village meetings and gave birth planning, family planning, and STI education talks.</p> <p>[Male involvement poor] Ahluwalia/Kaharua: Male involvement in reproductive health is low. CBHRP targeted pregnant mothers and expected husbands to attend birth-planning discussions. VHWs reported this rarely occurred.</p> <p>[Understanding BPCR messages] Moran: women involvement in reproductive health and complication readiness and mentioned antenatal care services as a means for ensuring good health for their babies. They heard of the concept from auxiliary mid-level antenatal care visits and from radio transmissions.</p> <p>[No perceived need to prepare transport] Moran: Although many women planned to give birth in a health centre, few women made plans for transportation. Women assumed that transportation would be available either from a family member or from a neighbour when needed and, therefore, did not feel the necessity of planning for transport in advance. A 35-year old explained: “I do not have any mode of transport. But there are certain people in the family who will help bring you in case you need. I thought that, at the time, I would feel the labour starting, within the family, I could find someone who would take me to the health centre. Since we live together, there are those who have a method of transportation and she goes with them.”</p> <p>[Acceptability of approach] McPherson: Key-informant mothers-in-law and pregnant women reported that most “women like us” understood the messages and found them to be acceptable. These informants confirmed the survey results by reporting that key chains—FCHVs, trained TBAs, and other health workers—were important channels for receiving the BPP messages. They noted that some pregnant women prefer trained TBAs to FCHVs as Mobilizers because they also deliver services.</p> <p>[Neonatal issues more important] Hodgkin: Perception that effective care for neonatal problems may be more affordable and more readily at hand than care that would be required for maternal complications.</p> <p>[TBAs forming culture bridge] Fonseca: At Sobola Hospital, TBAs are allowed to accompany women during childbirth, providing social support in a culturally sensitive manner. Anecdotal data suggest that nearly all women giving birth at Sobola opt in for this practice, as they often do not speak the same language as the formal medical providers and it is not part of their usual practice to have their husbands join them in the delivery room.</p> <p>Extra articles</p> <p>[Roles of HCW overlap] Choudry: It was found from the present study that since the same individual was responsible for providing contraceptive pills as well as for antenatal care, the women felt shy and sometimes scared to share their pregnancy news with the health care provider in fear of being scolded for discontinuation of the contraception.</p> <p>[Low expectation of care] Majama 2013: Women have low expectations of care so satisfaction can be a difficult measurement.</p>

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		<p>(Specify if this is data from study findings, or information/opinion from background/discussion)</p> <p>[Acceptance of information] McPherson Mothers, mothers-in-law and almost all husbands who were interviewed perceive information given by their FCHVs to be accurate and trustworthy. Several respondents said they would have preferred to receive more detailed information on where to go for delivery and how to arrange for transportation. Some mothers mentioned that they would prefer if the FCHV would promote messages from the booklet with their family members more aggressively as it is difficult for mothers to influence senior family members regarding care-related decisions. For example, one mother said she would have preferred that the FCHV convince her mother-in-law to arrange for a skilled birth attendant.</p> <p>[Acceptance for both literate and illiterate] Taleb Participants expressed that this change has been facilitated by utilization of the BEPP card which had been introduced in the study area by CHWs of partner NGOs. All participating women were aware of the BEPP card and had used one to elaborate a plan for birth and complications. Women had received their cards from CHWs participating in the program or from health care providers when having sought ANC in health facilities. The card was deemed to be effective in transmitting information to participants regardless of literacy status and illiterate men and women expressed an in-depth understanding of the elements illustrated in the card.</p>
<p>Motivation to change or adopt new behaviour</p> <p>Women and their families may have varying degrees of motivation to change behaviour or adopt new behaviours, e.g. they may be more or less motivated to seek care</p>	<p>[Fear of having blood withdrawn] Taleb as a reason for non preparation for blood donor.</p> <p>[Lack of husbands' motivation to change] Smith: Changing husbands' attitudes was not an easy task. It was clear that efforts to make husbands more supportive questioned deep-rooted norms and beliefs, and met with considerable resistance; consequently, husbands were slow to change their views. Attendance at group meetings appeared to enhance solidarity among husbands, many of whom agreed to counter traditional norms and contribute to housework; reduce alcohol use and spend, rather, on improving the nutritional status of their pregnant wives; and accompany their wives for pregnancy-related services. Often, during meetings, men who had attended one or more previous meetings described the ways in which they had supported their pregnant wives, providing role models for other husbands as well. However, several women reported that while their husbands were willing to contribute to housework, they were apprehensive of the reaction of their parents, neighbours and others to men becoming engaged in what is perceived as women's work. There is also a need to address deep-rooted traditional gender norms that underscore that pregnancy is a "woman's issue," and that husbands are not required to participate in pregnancy care.</p> <p>[More motivated to change if concrete role for husband, also more motivation if mother in law is not there] Mullany: Men's roles during the post-partum period are traditionally more limited than in the antenatal period because female family members more commonly assist the woman at this time [51]. It is possible, therefore, that taking his wife to a post-partum checkup may provide a concrete way for a husband to feel less "left out" and to become involved during the post-partum period. Alternatively, husbands may perceive the post-partum checkup as being important for the baby, and may therefore express greater interest in this after learning about its importance. Since the time of birth has traditionally been viewed as mothers-in-law domain in much of South Asia [45], it is conceivable that women (and their husbands) living apart from a mother-in-law are more receptive to learning about birth preparedness messages because they know no one else is there to take care of such matters.</p> <p>[Hiding of pregnancy reduces motivation to change but intervention seemed effective to tackle this] Mushi: Due to culture and beliefs, women in many settings do not disclose their pregnancy status and most of them wait until the third trimester. In our study area, early visits by SMPs made it possible for more women to disclose their pregnant status and to book early for ANC. Although not all women were willing to disclose their pregnancy status to SMPs during home visits, as soon as the SMPs had left, a number of women with early pregnancies decided to go to ANC, based on the SMPs' general advice and considering that in the following months the "hidden secret" will be known anyhow.</p> <p>[Women feel the danger of home birth] Moran: Most women planned to give birth in a health centre with a skilled provider to ensure "health security". Women stated that complications can arise at home, and health workers in the health centres are more qualified and competent to handle and refer these complications.</p> <p>[Exposure to maternal deaths motivated communities to address the problem] Hossain/Barbey: A third facilitating factor was the large number of maternal deaths. While not all villages had experienced a maternal death, all of the communities interviewed had heard of a maternal death in a neighboring village. However, families were only able to recognize and address the problem when CARE staff brought a case to their attention and encouraged them to identify their own solutions. These cases stimulated thinking and problems solving, motivating community members to do birth planning and preparation.</p>	
		<p>[Careful with incentives] Awhualia/Kaharuzza: The project provided bicycles to VHVs to allow them to cover the extensive distances implied by their catchment areas. Management of this resource proved problematic in some instances. Some communities saw the bicycles as incentives to the VHW and therefore felt no need to develop other mechanisms to compensate or "encourage" their VHW. This led to dissatisfaction on the part of some VHWs.</p> <p>[Motivated to prepare] Moran: Women consistently mentioned saving money during their pregnancy for antenatal care, unforeseen costs due to birth-related complications, buying essentials, such as foods, soap, and clothes for the mother and newborn, and a means to avoid borrowing money from others. Women generated income for their savings plans through agricultural and market activities, including selling millet, peanuts, dolo (local millet beer), and Shea butter. Their husbands saved money also had savings plans through agriculture and raising livestock. Several women mentioned learning about the importance of financial planning and how to save money at antenatal care visits. Healthcare workers explained a method that almost every woman revealed save half of what is earned for the day and spend the other half. A 39-year-old asserted the importance of a savings plan: "It is good, something that I thought about and planned. I say that when I knew I was pregnant that it was necessary to save five francs every time I earned 15 francs. This initiative was to help me face the needs of the expenses that would come with the pregnancy, during the birth, and even after the birth. In saving the money, this helped me to have financial means to do what necessitates in any the case of need, that is what I did."</p> <p>[District chosen due to previous positive experiences] FCITAN: The district was relatively small, and it had an active and committed District Health Management Team (DHMT) which had successfully piloted the Community Health Fund, a World Bank-funded community health insurance scheme. In addition, the district had an adequate health infrastructure at the outset of the project, which was an essential foundation for planned interventions.</p> <p>[Fear for male provider] Taleb: For instance, women are hesitant to seek services at formal health facilities since they fear that a male provider may ultimately attend the birth. According to the participants, this is culturally unacceptable. In addition, although all participants wished to give birth in the presence of a CSBA at home, availability of CommunitySBAs was an issue. In situations where a CSBA was not available, the default action was to give birth with a TBA at home rather than going to a health facility, although most participants were aware that they had access to transportation schemes that had been developed within the context of the program.</p> <p>[Decision making power] Taleb: On a promising note related to rights, women and men expressed their perception that interventions related to birth preparedness and complication readiness are influencing the role of women in household decision-making processes, which was previously limited to male members. Interactions between women and their family members in decision-making were reported to be present in terms of seeking health care from informal or formal providers. Though women's participation in decision-making processes is reportedly increasing, informants also stated that women are still not the primary decision makers as the final decisions are made by the male members of the women's family.</p> <p>[Intention leads to action but not in unpredictable situations] Tura: For policy and program implications, this study came up with the evidence that intention implies action in skilled care use; but, sometimes this may not be the case as complication during labor is unpredictable.</p>

Level	Barriers and enablers	Extracts from papers
<p>2. Healthcare providers and volunteers involved in implementing the intervention</p>	<p>Knowledge and skills</p> <p>Providers may have varying degrees of knowledge about the healthcare issue or the intervention, or may not have the skills to apply this knowledge. E.g. health workers may be unaware of service models to address cultural barriers to care, or may not have received training on how to implement these models</p>	<p>[Community organisers had skills to bring people together] Sinah: Most community organisers had 10 years of schooling. They were skilled in bringing people together and working with them to initiate change. They had the advantage of knowing the local residents and of having established a rapport with members of local bodies such as the gram panchayats, youth groups and mahila mandals. They had also established a reputation for being honest and dependable, which contributed to the acceptability of the intervention activities. Prior to initiating the intervention, community organisers underwent training on issues related to maternal health. Through these organisers, the project established a link between pregnant women, their families and the community, pregnant women and the health system; and the community and the health system. Community organisers supported youth committee leaders to build awareness among youth of the need to make health service providers accountable to the community.</p> <p>[Less knowledge than expected] Bagui: Through interviews with programme managers and community-based workers, we identified that the workers' competency in the new neonatal component of the programme, their workload and inadequate management and supervision were possible barriers to higher coverage. CARE-India conducted an evaluation and noted that change agents' reach was lower than expected.</p> <p>[CHW need adequate training] Darmstadt: Intervention was designed to address the major causes of mortality in neonates, it was most robust for the prevention and management of infections. In the Mirzapur population, however, nearly 60% of deaths were due to birth asphyxia or prematurity, and the program had limitations in reaching households at the critical times (i.e., during labour, childbirth and immediately after delivery) to address these conditions, and the CHWs lacked the necessary tools and skills to effectively address these conditions</p> <p>[Selection of implementers] Kumar: The primary enablers of behaviour change were paid (US\$35–40 per month) community-based health workers, the Saksham Sahayak (n=26), who were recruited from the local community based on 12 years or more of education, proficient communication and reasoning skills, commitment towards community work, and references of community stakeholders.25</p> <p>[Job satisfaction] Ahiwalla: 27% of VHWs reported low satisfaction; 62%, medium; and 2% high. The fact that VHWs have begun to organize themselves indicates their commitment to their work and the value placed on by their communities.</p> <p>[No acceptance of full tasks] McPherson: Although the FCHVs were encouraged to promote the BPP messages through home-visits, these visits are not part of the job description of the FCHV, and some FCHVs were reluctant to perform this task.</p> <p>[BPP messages not concrete enough] McPherson: The BPP personnel reported that the BPP was helpful in arranging existing messages into a coherent framework. They noted that some BPP messages were difficult to promote because they lacked concrete, pragmatic mechanisms to achieve their performance. The broad focus of birth-preparedness messages should be matched by an equally broad array of activities to support their practice.</p> <p>[Appreciation for work] Skinner: Moreover, for the staff of the MCH service in Cambodia, it was a satisfying and exciting project, in part because it established their own capacity to undertake such work, unassisted by NGOs. The findings are a reflection of the fact that making meaningful change need not be expensive. The enthusiasm at all levels was apparent, from national MCH leaders to village volunteers.</p> <p>Extra articles</p> <p>[Time of ANC] Magoma: The providers interviewed cited heavy workloads as the main reason for insufficient dialogue on the importance of skilled delivery care.</p> <p>[Feeling appreciated] McPherson: FCHVs in Nepal are generally recognized and honored by the communities they serve for their contributions. Elderly FCHVs who served as respondents noted that they do not want to retire from their positions due to the appreciation they receive from the community. Some FCHVs stated that now they are trusted more than before the intervention by their clients due to the new services they provide. Other FCHVs expressed the pride they feel in providing women and children with information and services. One FCHV noted that the enhanced supervision that she received under the intervention motivated her to work harder.</p> <p>[Cards good but too many messages] McPherson: Too many messages and repetition of messages causes some cards to be skipped, reducing the amount of messages that are better used.</p> <p>[Fear of costs discussion] Soubeiga 2013: However, the proportion of women in this study who received cost information was low. It appears that care providers were reluctant to talk about cost of care with prenatal patients because the rates set by the Ministry of Health are not applicable to all patients.</p> <p>[Motivation of men to take on change agent role] Mushi: In our study we have been able to demonstrate that men can be organized as a group of change agents that work hand in hand with other community structures in promoting safe motherhood. Half of the SMPs team was men. Since, in traditional societies, men are respected, heard and they make or influence most decisions, the involvement of men in the SMPs team was an important element that contributed to the effectiveness of the intervention. Involving men in maternity care is essential and health planners should be trained to view men as "partners and key players" and not as "barriers". A positive view of men will increase the health of women.</p> <p>Extra articles:</p> <p>[Time constrains] McPherson: FCHVs reported difficulties finding the time to complete their newly assigned tasks given their personal responsibilities; FCHVs who serve scattered populations or who cross rivers on foot during monsoon to reach clients were especially vocal in this regard.</p> <p>[Increase in knowledge and skills of other stakeholders due to intervention leading to cascade of influencing relevant community stakeholders] Sinah: Gram panchayat and youth committee members reported that, following project activities and review meetings, they had become sensitised to consider health an important community need. Gram panchayat members and youth who could influence families and women as well as demand accountability from health service providers, ANNs who are directly involved in providing health services, and teachers and headmasters who are respected members who could mobilise attitudinal change.</p> <p>[Increased understanding between community, facility and leadership of the problems women experienced] Sinah: Community leaders reported that as a result of direct interaction with government officials on problems faced by health providers and the women themselves, there was more openness among officials to resolving issues and a greater willingness to accept feedback from the community. For example, at review meetings, one problem repeatedly highlighted was that several women were being unnecessarily referred to the District Hospital when they sought deliveries at the primary health centre. Gram panchayat members brought this problem to the attention of the primary health centre staff and were offered the poor facilities in the primary health centre and the inability of the staff to cater to unforeseen delivery-related complications; at the same time, the medical officer assured them that every effort would be made to minimise unnecessary referrals. Such interaction not only led to a better understanding between community members and primary health centre staff, but also motivated communities to apply pressure on government staff to provide the necessary services at the level of the primary health centre.</p>
<p>3. Other stakeholders (including other healthcare providers, community health committees, community leaders, programme managers, donors, policy makers and opinion leaders)</p>	<p>Attitudes regarding programme acceptability, appropriateness, and credibility</p> <p>Providers may have opinions about the healthcare issue and the intervention, including views about the acceptability and appropriateness of the intervention and the credibility of the provider and the healthcare system. E.g. health workers may not agree with the choice of intervention or may not trust the reasons behind it</p>	<p>Providers may have varying degrees of motivation to change behaviour or adopt new behaviours. E.g. they may be more or less motivated to take on new tasks</p> <p>Other stakeholders may have varying degrees of knowledge about the healthcare issue or the intervention, or may not have the skills to apply this knowledge. E.g. a community leader may have insufficient knowledge of the benefits of community participation in quality improvement or may not feel skilled in running community meetings to promote this.</p>

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	<p>Attitudes regarding programme acceptability, appropriateness and credibility</p> <p>Other stakeholders' may have opinions about the healthcare issue or the intervention, including views about the acceptability and appropriateness of the intervention and the credibility of the provider and the healthcare system. E.g. stakeholders may not agree with the choice of intervention because of competing interests or priorities</p>	<p>[Other HCW accepted the promoters of the intervention] Mushi: SMPs were also accepted by health providers and they felt proud when realizing that their work was valued and supported by professional health workers. Some-times SMPs would meet with midwives to ask questions and to discuss progress and challenges. This was possible because from the beginning midwives were involved in all stages and in the main activities of the intervention. Midwives also supported SMPs because they found them to be helpful in their community outreach activities. Health providers and community leaders were also found to have a positive attitude towards SMPs. SMPs reported that they were very much accepted by the midwives in the health facilities and that they were free to meet them in case of any question.</p> <p>[Positive attitudes of drivers and of men to increase assistance to pregnant women] Sinah: Auto rickshaw drivers were also mobilised to provide transport without delay, and on credit if necessary, to pregnant women. As all members of village level youth committees were men, community organisers helped youth groups to set up committees of girls and young women. Interestingly, members of male-dominated youth committees helped to overcome the obstacles to girls' participation at these meetings.</p> <p>[Leadership view of intervention promoters] Ahuwalia: All village leaders and villagers appeared to have a good understanding of the VHW's roles and responsibilities. Three villages indicated that VHWs were not providing reports on their activities, 38 that the VHWs reported to the village leadership on occasion, and 11 VHWs reported regularly. More than half (32/52, 63.5%) reported that VHW reports were used to help guide decisions.</p> <p>[HCW accept implementers] Ahuwalia/Kaharaza: Health facility staff recognized and acknowledged the roles of VHWs and TBAs in referral of mothers to the health units. Health facility staff also trained TBAs in safe delivery at the health facilities. Health centre staff carried out support supervision visits to TBAs.</p> <p>[Positive perception of job aids] Jennings: The three most commonly reported advantages to using the aids were that they helped women retain information given the images of key signs or practices; they helped the provider remember what topics to discuss during the antenatal session; and the perceived time required for explaining a practice was less since the images well depicted the desired communication goal. Sing the counseling job aids also noted that having them allowed workers to improve their skills over time and that women presenting at the clinics also appreciated and showed interest in the counseling cards. On the other hand, providers remarked that the required additional time to use all of the counseling cards in a given module, including verification of prior knowledge in preceding modules, was a disadvantage that delayed women's departure from the antenatal clinic. Some providers suggested that the number of counseling cards be decreased in tandem with an increase in the number of messages per card while improving their durability as well from the original laminated format. A few workers proposed that the training session be extended from its current three-day module to provide more time for discussion and practice. All providers recommended that the counseling job aids be introduced at other sites to strengthen antenatal education.</p> <p>[Continuation] During interviews, providers reported that lack of or limited dedicated space for counseling remained a challenge along with language barriers (in areas with multiple dialects). In addition, clinical tasks, such as managing deliveries, disrupted or prevented high quality antenatal communication. Lack of time was the most commonly reported barrier as providers recognized that good communication takes time. Particularly in facilities where health personnel are understaffed or have multiple clinical responsibilities, one alternative may be to explore the feasibility and effectiveness of expanding the role of less skilled health workers, who may have fewer time constraints. Nearly three-fourths of women in the intervention arm said they would have preferred having the provider spend more time with them for counseling. One drawback may be overreliance on the tools that results in overly structured, less individualized sessions.</p> <p>[Staff difficult in ending project] Skinner: The time-limited nature of the project caused considerable distress to the planners and implementers when they realised that the work they had done was going to cease as the project ended. They were particularly concerned at the loss of the midwifery workforce, either to unemployment or back into the private sector. It proved challenging for the Kampong Chhnang staff to get ongoing funding for further production of the posters or to continue with community engagement. What did eventuate however was a series of requests from other districts, some of which were managed by NGOs, for use of the posters and the training packages.</p> <p>[Motivation of TBAs to change practices] Mushi: The intervention has built linkages between health providers, SMPs and pregnant women and TBAs. TBAs who were part of SMPs have become active promoters of skilled attendant at delivery and some have changed from delivery care provider to educators and counselors and referral advisors. Further more being part of the team some TBAs became reluctant to perform home deliveries on their own, particularly in women with specific risk factors</p> <p>[Being open for others] Hossain: stepwise implementation of stakeholder committees sensitized providers to the importance of community involvement and enabled community members to be active participants in decision-making</p> <p>[Extra articles]</p> <p>[ANC time] Jennings: These improvements were associated with increases in consultation duration. Each session lasted an average 18 minutes at baseline in both study arms and significantly increased to 24 minutes in the intervention arm (Δ = +5.9, 95% CI: 3.0, 8.8). The observed additional time appears to have been associated with increased communication, although time spent in clinical examination versus communication was not measured systematically.</p>
	<p>Motivation to change or adopt new behaviour</p> <p>Other stakeholders may have varying degrees of motivation to change behaviour or adopt new behaviours. E.g. programme managers may not be motivated to supervise TBAs in new roles.</p>	

Level	Barriers and enablers	Extracts from papers
<p>4. Health service delivery factors</p>	<p>The accessibility of healthcare facilities may affect implementation of the option, for instance because of financial (user fees), geographic (distance to clinic), or social (access for certain ethnic groups) factors</p>	<p>(Specify this as data from study findings, or in format/opinion from background/discussion)</p> <p>[Lack of perceived access] Stimmer there were also negative comments relating to the affordability, accessibility and acceptability of the health centre and its staff. These related to the fact that health centre care was more expensive than TB care, the centres were not open all day or at night, and fear of the staff, who were often unknown. The voices from the community revealed that although there was movement towards understanding the causes of maternal mortality, there was still a real need to address issues of accessibility, affordability and acceptability of both midwifery care (midwives should be known and trusted) and health centre care (it needed to cost less and be open 24 hours a day, seven days a week). In the participating health centres, there was a tendency for staff to only work in the public sector in the mornings, with the afternoons being for their 'private' cases. This left the health centres unattended by midwives and seemed to be a well-accepted practice.</p> <p>[Eliminated barriers to access] Darmstadt: To eliminate potential barriers to care seeking for illness, CHWs facilitated transport. If necessary, for neonates needing referral-level evaluation at Kuniundi Hospital, and all care at the hospital was free-of-charge for referred neonates. The mean travel time to the hospital was about one hour and formal referral suggested positive community perception of the quality of care at the hospital.</p> <p>[Large geographical distances making implementation difficult] Ahualia/Kaharua The project staff noted that, since villages are so large (often consisting of five or more sub-villages) it was very difficult for just two VHVs to cover their assigned area. Health facilities are geographically inaccessible. The roads are poor, especially in the rainy season and villages are remote from even very basic care. Again, remedies for this problem were beyond the scope of the project. Referral to the tertiary facilities remains a challenge. VHVs refer to the nearest health facilities, but this level often finds it difficult to refer to next level, due to lack of communication and transport.</p> <p>[Large distances] Moran: Distances from villages to health centres were often long, women travelled 22.8 km, on average, through remote, rural areas to reach a health facility. One woman stated: "I gave birth at home because the health centre is far away and it was during the rainy season. During the rainy season, two bottles of water enclose us and since it was during the night, if I went to the health centre, I would not be able to arrive there... even if you are with a moped, during the rainy season you cannot arrive. The person risks giving birth on the way and, there, that would be me on the way."</p> <p>[No accessible care] McPherson ANMs and MCHWs are seldom asked to attend births. Services provided by these workers are supposed to be free, although informal charges of US\$ 10-20 may be levied. There is one government hospital in Siraha municipality that offers 24-hour delivery services but does not provide basic emergency obstetric services. Women in Siraha who require a caesarean section or management of severe complications have a choice of using one of two facilities offering C/OC services in Lahan, Siraha—the government hospital or a private nursing home—or travelling to a neighbouring district. Most women in Siraha must travel 2-8 hours by oxcart and/or taxi to access these services at a transportation cost alone of US\$ 5-30. Borghi et al. noted that the average cost of a caesarean section in a representative cross-section of districts in Nepal—including service, transport, and opportunity costs, and additional charges—exceeds US\$ 150. Thus, while the SBAs—as categorized by the government—are relatively accessible, facilities and personnel that offer basic life-saving services to a woman with an obstetric emergency are much less so.</p> <p>(Continuation) The BPP messages must be consistent with available health services. The lack of supply-side programming in the Siraha BPP field trial represents a central limitation of the programme design. Care-seeking decisions take place within a complex setting that includes community-level factors, such as characteristics of local health systems, birth-preparedness programmes will be more effective if they improve accessibility to and quality of health services.</p> <p>[Improving accessibility, quality] Fonseca Working in close collaboration with the MOH, the Program developed a Performance and Quality Improvement (PQI) approach using an accreditation model. The approach ensured that there were facilities (hospitals, community maternities, health centers, and health posts) that had skilled personnel, as well as supplies and management systems, in place so that obstetric emergencies could be attended to. It should be noted that not only was the clinical aspect taken into account, but factors such as interpersonal communication, infection prevention, and issues such as who could accompany the woman during birth were also considered.</p> <p>[Capacity of HP perceived low] FCI KEN/MOORE Study participants also commented on staffing shortages at local facilities and observed that it can be difficult to locate a skilled attendant at the health facility when one needs information and treatment. They added that there are usually too few skilled attendants to provide effective services, especially when women present with complications.</p> <p>[QoC low] FCI KEN/MOORE many characterised facility-based providers as negligent at best, and as emotionally and physically abusive at worst. Others complained of outright neglect, describing health staff as inattentive and unconcerned about women's progress with labour or their discomfort. Community members also perceived facility-based staff as judgmental and discriminatory, commenting that women who are well-dressed receive good care, whereas those who appear less affluent are shamed and criticised.</p> <p>[Distance/transport] FCKEN/MOORE Inaccessibility of facility-based delivery care: Community members cited distance to health facilities and lack of transportation as major barriers to use of skilled care. Most community members described the hospital as being very far away, and they spoke of travelling long distances—usually on foot—to reach a facility. The problems of distance and transport appeared to play a major role in determining where a woman would deliver. Many study respondents indicated that while they would prefer to deliver at a health facility, they did not even consider this a realistic option.</p> <p>Normally services not provided/task shift] FCI Kenya It may be that more time is needed to build the communities' confidence in mid- and lower-level health facilities given that delivery care has not traditionally been provided at many of these sites.</p>

Level	Barriers and enablers	Extracts from papers
	Financial resources Additional financial resources may be needed to implement the option	<p>[Other barriers limiting impact] Darmstadt: emphasis must be placed on community mobilization and empowerment, (48) and on greater understanding of and development of improved approaches to overcome social and financial barriers to referral compliance and care seeking at facilities, especially in the first week of life and in settings where cultural seclusion after birth remains a social norm</p> <p>[Financial support for Implementers] Ahuwalla: Initially, villages did not provide any social, financial, or technical support for VHWs. After CBRRP, however, most villages provided technical, administrative, and social support for VHWs, and some occasionally provided financial support. Our data show that VHWs enjoyed strong social and administrative support.</p> <p>[High out of pocket expenses limiting access] Ahuwalla/Kaharuzi: It is a reality of the current economic situation in Tanzania that there are high informal charges at health facilities. Although maternal and child health services are supposed to be free, informal charges are common and are a deterrent to care seeking. Furthermore, the formal charges at paying hospitals were said to be out of reach for some members of the community.</p> <p>[Out of pocket expenses] FCI Tanzania: Although health services for pregnant women are officially provided free-of-charge in Tanzania, in reality, women do incur out-of-pocket expenses for such care. Fully 89% of women in the baseline survey and 91% in the endline survey in Igunga reported incurring out-of-pocket expenditures for delivery care. Thirty-nine (39) percent of women said that the costs of delivery care were more than they expected. The large increase in cost of care during the intervention period may have been an important barrier to skilled care-seeking, even those who were exposed to the SCI intervention.</p> <p>[Out of pocket expenses] FCI KEN: In both surveys, the vast majority of women (97%-98%) reported that they incurred out-of-pocket costs for institutional delivery care. There was no decrease in the proportion of women who reported paying out-of-pocket expenditures for maternity care in the 2006 survey, approximately 20 months after the cost-sharing policy had officially ended. In addition, the overall costs of care increased; the mean costs of normal delivery care represents approximately 17% of mean monthly household income while the mean costs of complicated delivery care increased by 32%, from 1,791 Ksh, to 2,363 Ksh—an amount that could potentially result in household impoverishment. These high costs of care seeking may be an important barrier to the use of skilled care during childbirth.</p> <p>[Transport costs] Magoma: For most Maasai and other women living in remote villages, transport to health units for delivery or emergency obstetrical care is unreliable and unaffordable.</p> <p>[Challenging staff levels and motivation] Hossain: In terms of quality of care, staffing during nights and weekends varied from facility to facility. Many service providers do not live nearby further pro-longing delay in treating complications. There was frequent turnover of key personnel. Finally, sustaining high staff morale and commitment amidst difficult working conditions proved difficult.</p> <p>[High workload] Bagui: Through interviews with programme managers and community-based workers, we identified that the workers' competency in the new neonatal component of the programme, their workload and inadequate management and supervision were possible barriers to higher coverage. CARE-India conducted an evaluation and noted that change agents' reach was lower than expected.</p> <p>[Poor quality and staff shortage] Ahuwalla/Kaharuzi: The quality of services was quite poor at some health facilities. Some of the health facilities were poorly equipped, lacked privacy, were severely understaffed, and staff lacked skills and/or motivation. Some of the factors were beyond the scope of the project. The project was able to train some health workers and but could not equip or improve the infrastructure of the health units.</p> <p>[Training implementers and HCWs] Hossain/Barbey: Training was another facilitating factor. As reported above, CARE staff facilitated hundreds of on the job training sessions which were key to educating families on danger signs and preparation for birth.</p> <p>[CHW need adequate training] Darmstadt: intervention was designed to address the major causes of mortality in neonates, it was most robust for the prevention and management of infections. In the Mirzapur population, however, nearly 60% of deaths were due to birth asphyxia or prematurity, and the program had limitations in reaching households at the critical times (i.e., during labour, childbirth and immediately after delivery) to address these conditions, and the CHWs lacked the necessary tools and skills to effectively address these conditions.</p> <p>[Intervention provided training] FCI TAN: A total of 115 maternity care providers from the district were trained in routine obstetric care skills, such as focused antenatal care, active management of the third stage of labour, use of the partograph, infection prevention, and interpersonal communication skills, including compassionate care, as well as the management of obstetric complications (e.g. pregnancy-induced hypertension, haemorrhage, shock, prolonged and obstructed labour, and sepsis). A total of 76 providers (doctors, nursing officers, nurse/midwives, and clinical officers) were trained in advanced life-saving skills (ALSS), and 39 providers (Public Health Nurse Bs, trained nurses, and MCH Aides) were trained in basic life-saving skills (BLSS).</p> <p>[Lack of impact of training] FCI TAN: Evaluation results suggested that changes in provider knowledge and competencies related to the management of obstetric complications were small—results that were surprising given that all maternity care providers were trained in either advanced or basic life-saving skills, which is an intensive competency-based residential training. These results may be influenced by several factors, including the transfer and redeployment of many providers trained in LSS, as well as evaluation challenges related to measuring providers' skills and competencies.</p> <p>FCI TAN/KEN and Brazil: all focused on increasing QOC as well with training and infrastructure improvements.</p> <p>[Job aids with training and supervision] Jennings One: This study demonstrates that job aids with training, field support, and organizational change are an effective strategy for improving provider communication and should be integrated into routine antenatal care strategies.</p> <p>[Increasing communication between levels] Mushi: The intervention has built linkages between health providers, SMPs and pregnant women and TBAs. TBAs who were part of SMPs have become active promoters of skilled attendant at delivery and some have changed from delivery care provider to educators and counsellors and referral advisors. Strong link between the community and health service providers through village-based structures such as the village health committee.</p> <p>[Increasing mutual understanding] Sinah: The regular review meetings not only ensured the proper functioning of health facilities and staff, but also provided health functionaries an opportunity to share their problems and the obstacles they faced in performing their duties and providing services. This, in turn, helped the community to appreciate providers' difficulties.</p>
	Human resources An increased supply or distribution of health workers may be needed to implement the option	
	Healthcare providers, community health workers or community members may need to be trained in how to deliver or use the intervention	
	Training	
	Communication Changes in communication between different levels of the health system or between the community and the health system may be needed to implement the option	

Level	Barriers and enablers	Extracts from papers
<p>Changes may be needed so that those with the authority to make decisions are accountable for the decisions they make</p>	<p>Accountability</p>	<p>(Specify if this is data from study findings, or information/opinion from background/discussion)</p> <p>[Increase in accountability] Sinai: Several gram panchayat and youth members reported that the primary health centre staff were attending to their duties more regularly, and the need to be accountable to the community was better accepted by the staff. Because we did all this [questioning public health facility staff in gram panchayat meetings], AMWs and doctors come on time and do their work properly. Youth committee members likewise reported that activities such as regular committee meetings and frequent visits to the primary health centre had resulted in more accountability among health staff, better quality services at facilities and improved care by providers at the primary health centre.</p>
<p>Implementation may require multiple organizations at multiple levels working in partnership, and require participation and support of many stakeholders or sectors. Leadership and responsibility of each group may need to be clear</p>	<p>Leadership roles and responsibility</p>	<p>[Partnerships with clear understanding of different roles and responsibilities] Hossain/Barbey: One of the important values of partnership that has been practiced throughout the DSI is the feeling of ownership. CARE took the key role to facilitate and advocate for the partnership process involving all the partners, clarifying understanding of the purpose and mutual expectation from the outset of the Project. Partners included: household, community, GoB Health Infrastructure at the Upadala and below, local institutions such as local NGOs, CBOs, Union Parishad, and educational institutions, TBAs and village doctors, CARE, UNICEF, and the GoB. Each partner was involved in each step of the Project, giving a feeling of ownership to the partnership to the partner. It was believed that the less involvement of money in the partnership, the more likely the efforts will be sustained. The success of the partnership was due to the consistent practice of participatory methodologies, partnership values, and guiding principles.</p> <p>[Implement action through government infrastructure] Baqut: The programme was implemented through the infrastructure of the government's Ministry of Women and Child Development's Integrated Child Development Services and the Ministry of Health and Family Welfare.</p> <p>[Collaboration] Ahuwalla/Kaharuzza: Close collaboration among key actors in maternal health service delivery was a key determinant of project success at all levels: health facilities, the community and partner agencies.</p> <p>[Involvement of leadership] McPherson: The Siraha District Health Office (DHO) was involved at all levels of the implementation of the Programme. The BPP-related tasks were part of the workload of the DHO, monitoring data were collected through the reporting system of the DHO, supervision of the BPP was integrated into the supervisory activities of DHO, and the DHO staff served as Master Trainers for the roll-out of the BPP.</p> <p>[Committed leadership] FCI TAN: The district was relatively small, and it had an active and committed District Health Management Team (DHMT) which had successfully piloted the Community Health Fund, a World Bank-funded community health insurance scheme. In addition, the district had an adequate health infrastructure at the outset of the project, which was an essential foundation for planned interventions.</p>
<p>Adequate information systems to assess and monitor needs, resource use, and utilisation of the intervention may be needed to implement the option</p>	<p>Information systems</p>	<p>[Increased use of data] Hossain: For example, the regular use of data in the facilities, including death and near miss reviews, allowed service providers to better understand patient needs and the importance of providing timely and quality care.</p> <p>[Effective information system] Ahuwalla/Kaharuzza: The information management system developed promotes integration of data and its collection at all levels calls for extensive feedback at all levels. The feedback allows community dialogue and decision making on factors that affect maternal and child health in their communities. The participatory monitoring systems (the community board), bridges community and health facility data for public health information/data for decision making.</p> <p>[Both supply and demand side] Brazier: The importance of both supply and demand side attention as well as focus on infrastructure problems roads etc to increase accessibility</p>
<p>Adequate supply and distribution of necessary supplies and equipment to facilities, and maintenance of these facilities, may be needed to implement the option</p>	<p>Facilities</p>	<p>[Supplies shortages hindered working conditions] FCI Tanzania: Although the project included interventions to improve requisition of drugs and supplies, no improvements in these areas were observed. Routine monitoring of this issue during project implementation revealed that while facility staff were ordering the drugs and supplies they needed based on their caseloads, the items ordered were frequently not available from the Central Medical Stores Department because of logistics problems at the national level—a challenge that is not possible to address through a district-level intervention.</p> <p>[Aims to Address equipment and supply gaps] FCI Tanzania: Based on gaps identified through baseline research, a package of essential obstetric equipment was provided to each health facility — equipment such as blood pressure gauges, weighing scales, delivery kits, examination beds, auto-claves/sterilisers, examination lamps, reagents, autoclave drums, speculum, trays, baby towels, etc. FCI also worked with district health managers and facility in-charges to strengthen logistics systems and improve the availability of essential obstetric drugs and supplies. These efforts included modification of the Community Health Fund (CHF) drug ordering form to include drugs specific to maternal and child health, as well as training staff at all health centres and dispensaries in a new logistics system (the Indent System) to support the district's shift from a kit system in which each facility determines and orders its needs based on its caseload.</p> <p>[Skills and drugs] FCI Tanzania: The primary improvements that women reported observing at their local health facility were improvements in provider skills and drugs. Interestingly, while the availability of solar power, radio equipment or the ambulance would seem to be improvements that would be relatively apparent or visible to community members, these types of improvements were only mentioned by about 8% to 11% of women who reported noting changes at their local facility. In addition, while there was a significant improvement in the basic infrastructure (source of solar power, water source, and steriliser), there was no significant difference in the utilisation of “high infrastructure” and “low infrastructure” facilities, indicating that such improvements did not influence women's care-seeking decisions.</p> <p>[Improve the availability and quality of maternity care through health systems interventions] FCI KEN: These interventions included upgrading the health infrastructure, including surgical facilities, where needed; addressing equipment and supply gaps; training providers in clinical and interpersonal skills in routine and emergency obstetric care; providing resources to strengthen referral systems; and improve health management systems.</p>
<p>Paperwork and procedures may need to be structured to facilitate rather than hinder implementation of the option</p>	<p>Bureaucracy</p>	<p>NA</p>

Level	Barriers and enablers	Extracts from papers (Specify if this is data from study findings, or information/opinion from background/discussion)
5. Social and political factors	Intervention integrity	<p>[Government activities] Turan: These improvements may be due to other safe motherhood campaigns of the Eritrean Ministry of Health and/or the increased educational level of women [Government activities and other partners activities]. Sood Nepal: The government of Nepal supports many SW partners in an effort to reduce maternal and neonatal morbidity. In the area of behavioral change many partners are implementing complementary activities.</p>
	Ideology	<p>[Building on traditional practices] Sood Indonesia: The campaign build on the traditional cultural practice which embodies shared responsibility central to Indonesian value of community help</p>
	Short-term thinking	<p>[Short term project with long term aims] Skinner: It was, in effect, a short-term project, not embedded in a systematic strategy of intervention. In planning this project, for example, it was not possible to locate details of any similar projects which may have been undertaken, nor was the project initially seen as ongoing. No record, published or unpublished, could be found of similar activity. The time-limited nature of the project caused considerable distress to the planners and implementers when they realised that the work they had done was going to cease as the project ended. They were particularly concerned at the loss of the midwifery workforce, either to unemployment or back into the private sector. It proved challenging for the Kampong Chhnang staff to get ongoing funding for further production of the posters or to continue with community engagement. What did eventuate however was a series of requests from other districts, some of which were managed by NGOs, for use of the posters and the training packages.</p>
	Contracts	<p>NA</p>
	Legislation or regulations	<p>[Government decisions affecting intervention] Skinner: The fact that many of the midwives in this study had stopped being paid from Government funds part way through the year as they had run out of money reinforced the need to seek private work, undermining the effectiveness of health centre care. [Cost-sharing policy ended] FCI KEN: cost-sharing policy had officially ended. In addition, the overall costs of care increased; the mean costs of normal delivery care represents approximately 17% of mean monthly household income while the mean costs of complicated delivery care increased by 32%, from 1,791 Ksh, to 2,363 Ksh—an amount that could potentially result in household impoverishment. These high costs of care-seeking may be an important barrier to the use of skilled care during childbirth.</p>
	Donor policies	<p>[Lack of funding] Skinner: The initial funding for the project only allowed for a six-month time period and it was seen as unfeasible to assess outcome in such a short time frame. The second stage of the evaluation was undertaken six months later. As the project was extended to look at outcome in particular, this was the focus of the second evaluation. As this had not been anticipated prior to the project commencing, specific pre-programme data for the participating villages had not been collected so outcome data were collated from routine health centre data, thought to be reasonably accurate</p>

Level	Barriers and enablers	Extracts from papers
Influential people	The opinions of influential people may influence the composition of the option or implementation of it	<p>(Specify if this is data from study findings, or information/opinion from background/discussion)</p> <p>[Involving decision makers and influencers in the family to adopt new practices] Kumar 2012/Kumar 2008 The approach of behavior change management sought to understand the deep-rooted community rationale for existing behaviors, to create a state of cognitive dissonance using common examples and messages (primarily through story-telling), which would encourage women to adopt improved practices; to create an alignment with scientific rationale for improved practices; to negotiate for recommended practices; and to support families in adopting new practices. This ushered a culture of inquisitiveness and "evidence-based" decision-making within families. The multilevel and inclusive strategy of integrating family members (including males), existing healthcare stakeholders, and community stakeholders within the folds of the intervention helped to create an enabling environment for changes in household behavior and shifts in social norms, and an open forum for discussion on issues related to newborn care and pregnancy. Because pregnant women in this region are usually not empowered with decision-making on maternal and newborn health, the engagement of CHWs with decisionmakers and influencers in the family may have enabled positive decision-making and action.</p> <p>[Involving important community leaders] Turan The local community used several methods to promote ownership of this project. The local community leaders in the intervention area were consulted and involved from the initial visit for selection of the project site to the final assessment visits. Throughout the life of the project, efforts were made to implement the community members' suggestions for improving the project.</p> <p>[Involving celebrities] Soed Indonesia: Each phase shared a common look featuring popular singer as the spokesperson for print material with consistent colour and scheme and logo which helped to make the campaign a brand name.</p> <p>[Involving religious leaders] Musht Increased involvement of religious leaders in community health activities. A ward secretary commented "Because they are part of SMP's team, we have seen some of them conducting home visits and heard them promoting and encouraging women to deliver with skilled attendants during worship services"</p> <p>[Training MOH people as well] Anwarul/Kaharuz: The project strengthened DHMT training and supervision capabilities. CBHP used MOH "master trainers" in developing its training strategy. These master trainers received important training in reproductive health issues targeted by the project. They are now better trainers and ready to continue providing training in those subjects. By including MOH personnel in its supervisory activities where possible, the project has served to strengthen their abilities and skills in supervising and supporting community level activities. This is an activity which the MOH has largely neglected in the past. Their ability to continue to apply those skills to support VHWS/FBAs and community leadership structures, will be an important factor in the sustainability of CBHP activities and impact.</p>
Corruption	Corrupt behaviour by decision makers or others may influence implementation	<p>[Political instability affecting methodology] Soed Nepal. Given political instability in Nepal, in the ensuing period many SUMATA activities could only be conducted in and around district headquarters for security reasons and messages for urban audiences were developed.</p> <p>[Armed conflict] McPherson. The coverage may have been influenced by the armed conflict between the government security forces and the insurgents.</p> <p>[Civil war] Hodgins Nepal was in a state of civil war, which affected both intervention districts. Although during the conflict there were frequent anecdotal reports of security problems restricting access to hospitals, our study did not show any significant change in the proportion reporting inability to access health services due to security concerns. A more significant problem with regard to access to emergency care has been transport and geographic barriers, such conditions were essentially the same at baseline and endline.</p>
Political stability	Political instability may influence implementation	<p>[Programme costs] Midhet: for the IECC intervention, the total cost of booklets, cassettes, group sessions and training of facilitators, etc., was roughly Rs. 530 (US\$ 12) per woman in the target population. The average cost of all other training programs including healthcare providers, Dais (traditional birth attendants) and drivers, was Rs. 2,900 (US\$ 60) per trainee. The telecommunications systems cost approximately US\$ 30,000, which included four base stations with transmission towers and about 100 walkie-talkie instruments provided to drivers and Dais.</p> <p>[Costs] Turan: The intervention was low-cost; the total cost to train the 60 Maternal Health Volunteers and maintain the intervention activities over a 2-year period was approximately \$40,000.</p> <p>[Costs] Skinner: The first six months of the project cost US\$9000. There were 1780 educational interactions and 327 people participated in focus group discussions. This cost breaks down to \$4.27 per interaction. Apart from preparation of the posters, the main costs were in planning and preparation and in supervision and support of a new project. If this was an established programme, it is estimated that the costs would possibly halve as overall planning and preparation costs could be minimised and super-vision requirements could be reduced. This programme would ideally be integrated alongside other primary health-care activities, thus reducing the cost further.</p> <p>[Costs] Brazier If these additional institutional deliveries are attributed solely to the stimulus of demand for skilled care by the CMBC activities, which cost 37.5 million CFAZ, our narrow measure of incremental cost per delivery was 28 431 CFA or \$164 international dollars. 3 This is our favoured estimate. It compares with the average cost per delivery in Health Centres across the two districts which we estimate below to be \$214 international dollars. If, however, SCI programme management costs (260.9 million CFA) are also included, the incremental cost per delivery increases markedly to 226 232 CFA or \$1306 international dollars.</p> <p>[Costs] Pasha Another possibility is that although we had three intervention components, most sites appeared to give more attention to community mobilization and community birth attendant training and less to hospital staff training. Since a well-functioning hospital and a trained, motivated staff seem crucial for achieving the level of mortality reduction hoped for in this study, it may be that hospital training was insufficient. However, a substantial amount of hospital training occurred, and potential areas for improvement were made apparent to the hospital administrators and staff by the facility and mortality audits.</p>
Resource implications	How resource-intense an intervention is, whether it is cost-effective and whether it offers any incremental benefit are important considerations for sustainability	

Level	Barriers and enablers	Extracts from papers
	<p>Sustainability</p> <p>Whether implementation continues depends on whether the health benefits from the intervention are sustained; the intervention is incorporated into the health system; and capacity building in the system and the community</p>	<p>(Specify if this is data from study findings, or information/opinion from background/discussion)</p> <p>[Government continuing with visual aids but use depends on commitment to pay for development and distribution] Hossain/Barbey: The Birth Planning card used by DSI has been adopted for use by the Gov. However, sustainability of the card depends on staff remaining motivated to train clients to use it, and the commitment of Gov or donors to pay for its provision to clients.</p> <p>[Continuation by staff] Skinner: The staff in Kampong Chhnang were enthusiastic to continue the programme</p> <p>[Ongoing activities after closing] Ahuwalia: Approximately 1 year after the CBRHP's major interventions ceased in these communities, most of the VHWs continued to do health promotion by visiting pregnant women, teaching them about birth planning and danger signs, and assisting them in obtaining both prenatal and obstetric services. Local VHW associations are forming with support from local political leaders, the Ministry of Health, and CARE to sustain the work of the VHWs. The community development officers, some of who were also the master trainers, are involved in spearheading the formation of VHW organizations. Already, the VHWs, with the assistance of the local government, the Ministry of Health, and CARE have begun to organize themselves into local professional organizations. These organizations will work with their communities and with government agencies to help ensure that the VHWs have opportunities for further training and are compensated for their work. MDH is willing and capable of assuming responsibility for continued support, supervision and feedback to community agents and structures as well as its own personnel.</p> <p>[Government adoption of approach] Fonseca: With regard to sustainability of these achievements, both the in-service training and preservice education systems have been strengthened, allowing for future generations of providers to receive high-quality training in evidence-based medicine. Fifty-seven Guatemalan clinical trainers were developed, and seven of eight nursing schools implemented revised curricula on EMNC. In addition, the Guatemalan government formally institutionalized the PQJ process as the methodology that will be used to establish and maintain high-quality services at its health facilities on a national basis.</p>

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4

Motherhood, Infertility, and HIV: The Maasai Context of Northern Tanzania

Lauren Birks, Yadira Roggeveen, Jennifer Hatfield

In:

Pranee Liamputtong (ed)

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ABSTRACT

In a culture emphasizing procreation and sexual relations as an integral part of everyday life and success in society, the Maasai of Northern Tanzania face a difficult task when confronting HIV/AIDS. Reproduction and motherhood are inextricably linked to prosperity and success for the Maasai. In fact, Maasai women are expected to produce children to fulfill life's purpose, and women without children are most certainly pitied. Therefore, an absence of children gives said women license to engage in sexual practises that may be considered as high risk in order to cure her affliction of infertility. HIV/AIDS becomes of particular concern with infertility is a factor for Maasai women because such women are more likely to engage in unprotected sexual intercourse with greater numbers of male partners in an attempt to conceive, thereby increasing the likelihood of exposure to HIV and other diseases. This chapter will explore the unique cultural and sexual practises of the Maasai that seek to mitigate infertility and achieve motherhood, while also examining how such practises contribute to risk of exposure to HIV/AIDS. The research discussed in this chapter has been collected over the course of 2 years, between 2008 and 2010 in the Maasai community of the Ngorongoro Conservation Area (NCA) in Northern Tanzania. To gather data in a culturally sensitive manner and emphasize a participatory approach, participatory action research (PAR) methodology was employed in this research.

INTRODUCTION

In a culture emphasizing procreation and sexual relations as an integral part of everyday life and success in society, the Maasai of Northern Tanzania face a difficult task when confronting HIV/AIDS. Reproduction and motherhood are inextricably linked to prosperity and growth for the Maasai, which privileges sexual intercourse as a necessity of life related to good health, responsibility, and procreation.¹ In fact, Talle asserts that “to produce children is life’s (and marriage’s) fulfillment” for both Maasai women and men (p. 355).¹ Thus, it is certain that a woman without children is to be pitied, thereby receiving license to “go to sexual extremes” to cure her affliction of so-called infertility (p.355).¹ HIV/AIDS becomes of particular concern when infertility is a factor for Maasai women trying to achieve motherhood. These concerns arise from increased exposure to the disease through a great number of sexual partners – as a result of culturally unique sexual practises – as well as cultural expectations to produce many children.²

The purpose of this chapter is to describe HIV in the Maasai context in Northern Tanzania and to link Maasai women’s experiences of motherhood and fertility with the risk of HIV. We will examine the juxtaposition between the desire of Maasai women to experience motherhood and the risk to get infected with HIV in their attempt to become a mother. We will highlight and discuss challenges of achieving motherhood in the face of infertility, HIV, and specific cultural practises, like polygamy. We conclude the chapter by articulating the implications of our findings, which can help to inform HIV policy makers and to develop effective HIV prevention strategies, while maintaining respect for Maasai cultural practises that seek to mitigate infertility and achieve motherhood.

THE MAASAI: SOCIAL AND CULTURAL CONTEXTS

Maasai Culture and History

The Maasai are a seminomadic, pastoralist population of approximately 840,000 people living in Northern Tanzania and Southern Kenya. Until the late 1800s and early 1900s, the Maasai functioned largely as an egalitarian society with distinct and separate gendered and age-related roles where *both* men and women occupied sections of the domestic and public (i.e., economic and political) spheres.^{3,4} Women maintained the Maasai production system by functioning as traders of surplus milk, hides, donkeys, and small livestock with groups of non-Maasai women traveling through their homesteads or with other permanent trading settlements for goods such as grains and other foodstuffs.^{3,4} By trading with other groups, women were “crucial intermediaries in the extensive and active trade networks that enabled the Maasai to sustain their specialized production strategy by linking them to commodities of

regional and global commerce” (p.48).^{3,4} Hodgson asserts that while men were more central in the political sphere, women occupied a more central role in the sphere of ritual.^{3,4}

Contemporary Maasai social structure is governed by such age and gender distinctions that were in place prior to German colonialism in the late 1800s. Although German colonialism (1890–1910) had an influence on the Maasai, it was inconsistent and had limited long-term impacts on Maasai social, economic, and political structures. Following World War I, British colonialism in Tanzania significantly altered Maasai society with profound implications for Maasai gender roles. British colonial leadership designated Maasai men as the “authorities” in communications between Maasai communities and the British colonists.^{3,4} British fears of unpredictable young male Maasai “warriors” motivated colonialists to reinforce the power of elder male authorities while disregarding the vital social roles of both young men (morans) and women in guiding and governing Maasai society.^{3,4} At once, the British eroded Maasai women’s economic power as traders and caregivers of livestock, political power as ritualistic leaders, and social currency as a valuable part of the Maasai identity by relegating women to domestic duties.^{3,4} Men became the dominant and most important members of Maasai society, which is now understood by Maasai themselves as “being a pastoralist and a warrior: a dominant masculinity forged in “modernity” and sustained by certain economic and social interventions” introduced and propagated by British colonists (p.122).^{3,4}

For Maasai women, the consequences of the colonial-induced shift in Maasai society from an egalitarian system to a patriarchal structure are far-reaching. Most notably, Maasai women have been affected in terms of their rights to livestock, property, ritualistic roles (i.e., facilitating rites of passage for both men and women), and political participation. By and large, Maasai women have been marginalized by being limited to domestic duties with little to no power beyond that sphere, which has further emphasized an already existing stress on female reproduction.

Gender, Social Constructs, and Sexuality of the Maasai

As mentioned previously, Maasai society is governed by “distinct social, developmental and social-sexual phases according to age-gender sets”(p.585).⁵ Primary to the age-set system is the division of the male population into hierarchal age groups, which also govern sexual and gender relations in this patriarchal society.⁶ Each male age-set is marked by a rite of passage, starting with circumcision between the ages of 16–18 years, upon which time Maasai men become “warriors” (morans or the preferred term is *ilmurran*).⁶ Morans are under the authority of elders, are recognized as protectors of people and livestock, and must refrain from marrying, reproducing, or associating sexually with married women.⁶ During the 7–8 years that Maasai men are part of the moran age-set, they are viewed as “separate” from the rest of society and engage in ritual practises of solidarity such as slaughter, physical

togetherness, and commensality, which aim to build their physical and sexual strength.⁶ While building physical strength is important for the protection of people and livestock, the building of sexual strength is an essential part of moranhood and Maasai social structure because moran sexuality is considered to be directly linked to female fertility. In fact, female fertility is a culturally mediated process that does not occur naturally.⁶

Female fertility is developed over a period of time with the help of morans, who start engaging with young girls in a process of gradual coital penetration, which is ultimately consummated when the girl's mother and moran agree that she is sufficiently mature.⁶ The early sexual debut of Maasai girls is based on the cultural idea that semen of the morans promotes the development of young females' breasts and sexual "health," thus making the "services" of the moran imperative for women's physical development and attainment of fertility.⁶ Once young women have fully developed physically, have attained fertility through regular sexual interactions with morans, and have been circumcised, they are considered to be ready for childbearing and are married to men 10–15 years their senior.⁶ The implications for women's sexual and reproductive health are seen in their elevated risk of exposure to sexually transmitted infections, such as syphilis, and more recently HIV. That Maasai gender roles threaten women's sexual and reproductive health is largely due to the subordination of women and the value ascribed to them as vehicles for propagating as many children as possible.

THEORETICAL FRAMEWORK: INTRODUCING PARTICIPATORY ACTION RESEARCH AND THE STUDY

We used participatory action research (PAR) methodology to gather data in a culturally sensitive manner, to emphasize a participatory approach, and to encourage action – based on research findings. By combining participation with action, research is made contextually relevant. In order to foster an understanding of people's problems, the roles of the researchers and the researched are interchanged to promote communication and encourage mutual development of knowledge and learning.⁷ The PAR approach enables ordinary people (i.e., Maasai women) to directly engage the research process rather than remaining at arm's length.⁷ Greenwood and Levin⁸ refer to this process of direct engagement as *cogenerative inquiry*, where knowledge is cogenerated through collaborative communication between the researcher and the co-researchers.

Fundamentally, the knowledge and experiences shared between researchers and co-researchers coalesce to reveal new knowledge about the investigated phenomenon (i.e., Maasai women's knowledge about, and experiences of, motherhood, (in)fertility, and HIV/AIDS). PAR methodology ensured that our inquiry into Maasai women's experiences of

motherhood, (in)fertility, and HIV/AIDS would encourage action for social change, relevant to the local context and local knowledge, the very essence of PAR.⁸ Central to the PAR approach is a critical assessment of social experiences that drives both participants and researchers toward identifying social needs and achieving social transformation. Employing cogenerative inquiry and corresponding iterative critical interpretation generates knowledge that then calls for the new ideas or new ways of such knowledge to be translated into new practise (p.330).⁹

In addition to direct engagement that was culturally sensitive, we acknowledged the historical impact that previous research has had on many Maasai communities. Although Maasai have been the subject of much social sciences-based research and are familiar with the concept of research, they have rarely been asked to participate in studies that seek to include them as co-investigators. Rather, like other researched populations, they are more familiar with traditional research methods that take people as objects of research.⁷ Therefore, by emphasizing participation of both the researchers and the local people in the research process, a bidirectional exchange of existing knowledge fostered an enriched understanding of motherhood, infertility, and HIV. In this way, PAR became the mechanism by which Maasai women codirected our study and formulated solutions to the problems they identified through the research process.

Participants were selected after seeking advice from local hospital staff familiar with women that would be consistently participatory during the research sessions and were from villages within walking distance to the local hospital (maximum 2 h). In order to respect cultural and community hierarchies, we sought to involve traditional birth attendants (TBAs) and women representing a cross section of the local community while still holding separate meetings to request permission from and inform local community leaders about our research topic and process.

PRINCIPLE ISSUES

Examining HIV Prevalence and Risk in the Maasai

The primary hospital serving the Ngorongoro Conservation Area population is a faith-based (Roman Catholic) hospital, and is the only hospital in the area that offers HIV/AIDS care and treatment (CTC), voluntary counselling and testing (VCT), provider-initiated counselling and testing (PICT), and prevention of mother-to-child transmission (PMTCT) services, as regulated by Tanzanian government policy. Aside regular outreach clinics for Mother and Child Health (MCH), special outreach camping trips are done. During these special trips, hospital staff sets up camp in remote corners of the catchment area for 2 weeks at a time to offer these

services locally (funded by the Elizabeth Glaser Pediatric AIDS Foundation). Around 80% of the catchment population of the hospital is Maasai.

To date, data on HIV prevalence among Tanzanian Maasai remains sparse. Local hospital surveillance estimates HIV incidence at approximately 1.7% as compared with the national prevalence at 6.5%.^{10,11} While HIV prevalence among Maasai seems notably low, hospital surveillance reflects only an estimated 12.4% of the total NCA population (i.e., 10,040 people from 2007 to September 2010, out of an estimated population of 81,071).¹² Hence, surveillance of HIV may not be reflective of the actual incidence and prevalence of HIV among these Maasai communities. The limited number of people tested for HIV can be explained by several factors including a remote and dispersed population located far from the hospital (the area of the NCA is approximately 8,300 km²), limited access to services, limited medical outreach capacity, stigma associated with both HIV testing and diagnosis, and lack of knowledge and understanding about HIV/AIDS.

Lack of access to healthcare, combined with unique sexual practises, places Maasai at greater risk for health-related problems, including high rates of HIV transmission.¹³ Such risk factors include the cultural practise of polygamy, the widespread perception that HIV is not a Maasai or a rural problem, a reluctance to use condoms due to the belief that fertility and masculinity can be negatively impacted by condoms, as well as difficulties around translating and interpreting the concept of HIV.¹ Additional factors that may amplify the impacts of HIV/AIDS for the Maasai women include the slow decrease in female HIV infections – in Tanzania, 6.6% of women in reproductive age are HIV positive as compared to 4.6% of men¹⁴ – Maasai cultural practises (discussed in detail below), exclusion from health education, food insecurity, gendered divisions of labor and decision making, and urban migration.¹³

These factors, linked with the Maasai viewpoint that achieving motherhood is an integral element of successful womanhood, create high risk for HIV infection in Maasai women of childbearing age (approximately ages 14–40 years). Thus, understanding the local cultural setting and applying culturally appropriate prevention and relevant testing and treatment strategies are essential to attenuating the risk of HIV infection in pregnant mothers. The importance of reproduction and children in Maasai culture must be acknowledged as a priority, as the role of mandatory motherhood adds significant complexity to achieving HIV prevention. Therefore, while considering the status of a potential HIV epidemic among these communities, we employed a culturally sensitive research methodology to investigate this emotive topic.

Emergence of (In)Fertility and Motherhood as Salient Factors in Risk of HIV Infection

Initially, we set out to examine women's knowledge and experience of HIV/AIDS and how such knowledge relates to prevention of mother-to-child HIV transmission. Our questions focused on defining HIV, establishing local knowledge of HIV, discussing HIV transmission (vertical and horizontal), and pregnancy. According to the participatory and collaborative tenets of PAR, these questions were posed in conversational style sessions that enabled women to introduce their own experiences of motherhood and pregnancy, beyond the topic of HIV and HIV transmission. Such experiences of motherhood and pregnancy included birthing practises, hospital care, obstetrical difficulties, sexually transmitted infections, family planning, and fertility issues.

As the research progressed, fertility concerns became increasingly apparent. This realization required us, as researchers, to adjust our research approach and to focus on including an in-depth examination of Maasai maternal health, traditional birthing practises, and (in) fertility-related cultural practises. The emergence of safe motherhood issues and fertility concerns signified that participants began to feel comfortable enough to bring up issues such as infertility and its associated risks (both socially and physically) as a major concern that extended beyond HIV. By being open to their identified concerns, our approach to formulate HIV prevention and treatment strategies became more relevant to their aims of achieving fertility and becoming a mother. By incorporating hospital staff, knowledge about sexual and reproductive health from a medical perspective was contributed throughout the research process. Thus, stakeholder interaction was amplified by the PAR approach, as questions and answers of Maasai women, as well as the hospital staff about pregnancy, infertility, and STI prevention were considered. Both women and hospital staff, to improve maternal health, could immediately use knowledge gained from our interactions with the women.

Reproduction and motherhood are inextricably linked to prosperity and growth for the Maasai. This linkage privileges sexual intercourse as a necessity of life related to good health, responsibility, and procreation.¹ In fact, Talle asserts, "to produce children is life's (and marriage's) fulfillment" for both Maasai women and men (p.355).¹ Because "fertility is linked to clan or ethnic or family name continuation", Maasai culture emphasizes the importance of reproduction (p.389).¹⁵ The success of Maasai men is directly proportional to the number of children they father; similarly, successful Maasai women are those who are able to bear children. Hence, motherhood can be seen as mandatory in Maasai culture. In other words, it is not socially acceptable for Maasai women to *choose* not to have children.

The implications of mandatory motherhood are far-reaching, both in terms of social ramifications and in terms of biological effects. The maternal mortality ratio among women attending antenatal clinics in the Ngorongoro area is estimated at 642 per 100,000 live

births.¹⁶ Moreover, the local hospital has no blood bank and relies on local transfusion services only. Thus, pregnancy poses a fatal risk to Maasai woman. For these women, working toward fertility and motherhood starts with the very first sexual contact. Maasai girls start having sexual relationships prior to puberty with young male adults (*ilmurran*).⁶ Talle describes how young Maasai girls are gradually introduced to sexual contact with young men, mostly under supervision of an older woman.⁶ Further, Talle describes that once girls are considered to be mature enough, they “comply to be penetrated, but not without fear or anger sometimes, because they know that the making of their “hole” opens their way to birth giving and finally social adulthood” (p.281).⁶ Girls choose male sexual partners, announcing their choice through a milk-drinking ritual (*Inkipot^{hi}*).⁶ Coast¹⁵ and Talle^{6,17} describe how exposure to sperm and semen from the *ilmurran* helps young Maasai girls to become full-grown, fertile females. Because the development of physical puberty traits (i.e., growth of breasts) and achievement of female fertility (i.e., menstruation) are believed to be enhanced by male sperm, female contact with sperm must be direct (i.e., without a condom) for the sperm to stimulate fertility and female sexual development.^{6,15} Once a woman is fertile, the role of sperm transitions to that of procreation and maintenance of sexual health.¹⁵

Though female circumcision is illegal in Tanzania, it is still practised among Maasai communities. Traditionally, when considered sexually mature and ready for marriage, the girl is circumcised in order to “[...] avoid pre-marital pregnancy”(p.391).¹⁵ Furthermore, Talle asserts “clitoridectomy and marriage transfers the sexually “free” girl into a potential childbearer”(p.282).⁶ Female circumcision involves excision of the clitoris (clitoridectomy) and labia minora, which results in the female genitals getting a more “open look”(p.282).⁶ The clitoris is removed to “prevent continued growth that may not only obstruct childbirth but also male sexual penetration”⁶. Our findings confirmed that female circumcision is recognized by the local community as a risky practise for HIV infection, particularly because the same knife is often used for various circumcisions, thus potentially leading to cross infection of HIV.⁵ In addition, if a woman is infected with HIV and becomes pregnant, female circumcision increases the risk of mother-to-child HIV transmission during childbirth, as usually the joined labia tear during labour and delivery (personal communication with hospital staff).

Toward Motherhood by Enhancing Fertility: Planning a Family

In our discussions with Maasai women, it became clear that the cultural practices discussed above are not only an integral part of developing sexual maturity but also in achieving fertility and ultimately motherhood. By giving birth and becoming a mother, Maasai women meet social norms and attain social adulthood. What also became clear was that in the absence of motherhood, Maasai women live on the margins of their society and, in some cases, can be ostracized by other women. Motherhood is, by and large, considered to be a mark of success, thus making mothering somewhat mandatory.

As our understanding of the Maasai female experience of mandatory motherhood began to expand, we were privileged with questions from our co-researchers about family planning, contraception, and birth spacing. At the same time, similar questions from local women were beginning to manifest in the outpatient department (OPD) at the hospital. Therefore, we decided to directly address these questions in our research sessions, as well as with local hospital staff. We discovered that, in the past, Maasai had perceived family planning approaches as offensive. Although we were unable to confirm reasons for such offense, we suspect that it is because contraception and the idea of avoiding reproduction and motherhood fly in direct contradiction to traditional Maasai beliefs. Furthermore, NGOs practicing in the area had been using “family planning” as a synonym to contraceptive use, which is in line with common use of this term, although family planning according to (inter) national definitions includes infertility care.¹⁸

Of particular note is that while the Maasai people have had little interest in preventing conception, they have had an interest in *planning a family*. In planning a family, infertility plays a particularly distressing role. Our co-researchers clearly linked the need for planning a family to the cultural norm of mandatory motherhood, not only in terms of appropriate birth spacing, but also in terms of addressing the concerns of infertile women. Bringing the discussion back to how HIV influences family planning, we were also able to address questions and concerns about adequate HIV prevention, in spite of the desire and requirement of motherhood. For example, we emphasized the importance of testing for STIs and HIV prior to pregnancy or upon conception, as well as the rationale of a hospital delivery under skilled attendance (increased care in case of complications for all women, availability of medication to prevent PMTCT in case of HIV infection).

Infertility is a major concern for Maasai women, and contraception is rarely considered. Women who are unable to conceive due to infertility face potential social isolation and judgment. Although circumstances occur where families who are close to one another will “share” children with women who are unable to conceive by gifting a child to the afflicted woman, infertility is still an embarrassing and difficult experience.¹⁷ A woman without children is to be pitied and licensed to “go to sexual extremes” to cure her affliction (p.355).¹ Women who try to achieve motherhood through increased sexual activity are subject to increased risk of HIV infection. Concerns about HIV infection related to infertility and motherhood stem from two principle factors: (1) the exposure to greater numbers of sexual partners correlates with greater exposure to STIs, including HIV;^{5,6} and (2) societal norms regarding development of female fertility and mandatory motherhood compel females to perform sexual practices from an early age. A protracted period of sexual activity combined with the encouragement to have sexual intercourse with multiple partners situates these women closer to HIV infection.

As mentioned, Maasai culture has many unique practises around sex and sexual development. In case of infertility, women seek help from local traditional healers, who mostly attribute infertility to social imbalances. Women organize separate meetings with women only at local spiritual places, to ask for blessing from Engai, the Maasai god.¹⁹ Men can ask friends from the same age-set to help his wife get pregnant, to strengthen their friendship.⁶ For infertility, once every couple of years, a big ceremony is organized: the *Olamal*, meaning “blessing ceremony”.^{19,20}

The ceremony is officially announced and can be attended by Maasai women from anywhere, even across borders. It therefore mostly is a far and ritual journey that Maasai women undertake to enhance their fertility and/or to address infertility. Central concept in the ceremony is the cleansing of any sin that can cause infertility and to be cleansed of the sin that infertility is itself. During *Olamal*, a traditional healer or important elder facilitates rituals and prayers to overcome infertility.^{19,20} The film “The Women’s *Olamal*” gives an insight on *Olamal* practises by Kenyan Maasai women.²⁰ It is well known, and anecdotally confirmed by our research, that Tanzanian Maasai women also engage in the fertility practises of *Olamal*. While it is not openly discussed in public, it is widely understood that when practicing *Olamal*, women are engaging in sexual intercourse with multiple sexual partners to enhance existing female fertility and/or to overcome infertility by increasing the likelihood of pregnancy (male infertility issues aside). Consequently, the risk of STI infection, especially HIV, becomes exponential.

Maintaining cultural sensitivity during our research process required us to challenge our own ideologies and assumptions about what is more important: prevention of HIV or fertility and achievement of motherhood. We necessarily acknowledge that shifting our emphasis from HIV transmission toward infertility posed a considerable digression from our original research objective. Still, our experiences with these women provoked us to accord our original research agenda with the needs of our co-researchers. Ultimately, the way to improve HIV prevention is through better understanding the needs of this community. We thus see primary prevention of HIV in (to be) mothers, as a strategy in PMTCT. The rationale then is that a reduction of HIV infection in (to be) mothers leads to less HIV-infected pregnant women and leads to a decreased risk of mother-to-child transmission, thus less HIV-infected children. We suggest that our decision to reorient our research objectives is persuasively illustrated by one of our co-researchers/participants:

“Children are the most important to us, Maasai. When we become a mother, and have children, we feel the blessing of God. We have the burden of life. Being a mother helps us to tighten our relationship with the children’s father. We can also ensure that the cattle will be inherited by our children. So, then we will always have cattle and income to take care of us mothers.”

By establishing an in-depth cognizance of the role of infertility, as related to mandatory motherhood in the Maasai, we come to comprehend why women are not willing to use protective measures, such as condoms, to protect against HIV and other STIs. Essentially, sex with multiple partners and exposure to diseases are, on balance, worth the risk if it means successful conception and the achievement of motherhood. As illustrated by a quote from Coast (p.396):¹⁵ “Even if a young girl gets this disease, she will still have a baby, so it is Enkai (God) telling you to have children, but just die sooner”.

Our participants expressed concern about HIV infection, trying different sexual partners in an attempt to conceive. They requested to learn more about infertility, and we realized there was more to learn about the Maasai perspective on infertility.

Infertility Causes: The Maasai Perspective and the Medical Perspective

Maasai women recognize different reasons for infertility. For example, syphilis (*emireka*) is known to cause internal boils that may “harm the womb”(p.271–272).¹⁹ Sins and a “bad look” of particular individuals are documented as potential reasons for infertility.¹⁹ The “softness” of children and “the child in the back” are also important concepts relating to infertility. A child that is born is considered a “soft child,” which is a child that first needs to prove its existence by surviving the first years of life.¹⁹ Similarly, in the first trimester of pregnancy, Maasai women regard the conception “not ready” or as “being in a fluent state that gradually becomes solid under the influence of semen [from intercourse] in the first three months of pregnancy”(p.271–272).¹⁹ This might not be surprising, as when a miscarriage occurs in the first 3 months, the fetus is undifferentiated amidst blood clots.

Strange cravings of a mother with a *young* pregnancy are seen as the “blood” desire of the fetus. When something goes wrong in this blood flow, the fetus can “dry out...leaving only an empty child”(p.263),¹⁹ thus becoming a “child in the back”. The vital role of sperm to resolving this condition is conveyed by Johnsen: “The condition is only terminated when the dry, undeveloped fetus once more becomes filled with blood, with life that is, after having met with men”(p.263).¹⁹

Therefore, it becomes clear that semen, which Maasai men and women refer to as blood (*sangre*), is important in establishing fertility and in addressing infertility.¹⁵ For Maasai, the importance of semen not only plays a role in fertility and conception but also plays a role in a community-wide aversion to condom use. The Maasai culture views collection of sperm in a condom, whether it is for contraception or for STI prevention, as wasting semen.¹⁵ Wasting semen, either with condom use, oral sex, or masturbation, is viewed as less than desirable in the Maasai culture because every sperm is seen as a potential life and therefore valued

above all else, including protection from STIs.¹⁵ Coast's assertions regarding condoms and the corresponding wasting of semen have significant implications for HIV prevention.

Furthermore, observations during ultrasounds at the outpatient department of the local hospital, which were confirmed in research discussions with participants, confirm the existence of the cultural concept of "the child in the back" in the local community. When women with infertility have an ultrasound, many of them ask if "the child in the back" can be seen. If not aware of the importance of this child in the back (being able to conceive, but just having a child inside that does not grow), one could easily reply "no." More culturally sensitive in this case is to reply that the machine that is used (ultrasound) is not able to display such a dry child in the back. This is actually true and respecting the status of the woman as possibly having "conceived" in another meaning than medical.

Factors that are known in the etiology of infertility are many, among which are tubal pathology (after ectopic pregnancy, pelvic inflammatory disease, STIs), endometrial granuloma (tuberculosis, schistosomiasis), ovulation defects, a history of spontaneous abortion, complications after delivery, STIs, semen pathology, and higher age.²¹ Though no research on causes of infertility is conducted in the local community, several of these factors are present at the local hospital: it is located in a tuberculosis endemic area; STIs and pelvic inflammatory disease are frequently diagnosed at the outpatient department and wards. Syphilis incidence at antenatal controls is 3–4%.¹¹ Of deliveries in the district, only 7% take place with skilled attendance.¹⁶ Complications/illness during pregnancy covered 15% of the annual female hospital admissions in 2008.¹¹ Most couples attending OPD with infertility had a history of STIs, most notably of syphilis. Syphilis is a frequent diagnosis, mostly in the top ten of Endulen Hospital diseases among adults. Although it is understood that the disease can be prevented through barrier methods, the preference of Maasai to refrain from condom use remains unchanged. Hospital staff reports the Maasai value antibiotic treatment with injections as a "good therapy," thus decreasing the perceived need for prevention of infection. In addition, Maasai men lack motivation for partner treatment when their wife is the symptomatic case, thus allowing for reinfection and a ground for both infertility and HIV superinfection. The Maasai's familiarity with syphilis treatment may have contributed to the local idea that HIV can be cured as well, therefore encouraging a lack of condom use. Moreover, hospital staffs have consistently reported difficulties in explaining to patients that antiretroviral medication does improve health, but does not cure HIV. Therefore, while there is a significant overall understanding of HIV in the Maasai community, such complete understanding does not extend to knowledge about prevention and effective treatment.

Although we did not collect quantitative data on infertility in the community, prevalence of infertility cases in consultations by the medical officer started at zero and increased to

approximately 25% of the female consultations in the outpatient department (OPD). We suspect that the increase in numbers of women experiencing infertility presenting at the OPD was due to word spreading through the community that infertility was an acceptable medical topic and that potential treatment could be provided at the hospital. In fact, couples attending the OPD mentioned their increased trust to discuss the topic of infertility and increased awareness of services in counselling on infertility in the hospital. At the same time, hospital staff became more aware that infertility is a concern and referred couples to the medical officer for review. During counselling, aside full medical history and physical examination, diagnostic and treatment options are discussed, including referral possibilities. It is made clear that no successful outcome, a pregnancy, can be guaranteed. After basic diagnostics, counselling, and treatment at the hospital, five couples chose to be referred to a larger hospital outside the NCA for more comprehensive diagnostics and treatment of infertility, after which two couples had a successful pregnancy. One led to hospital-based delivery in collaboration with the traditional birth attendant, who made explicit that because of great infertility care, she had more trust in the hospital institution as a whole. There is anecdotal evidence on satisfaction with the infertility service, even when not leading to a pregnancy. At the same time, more fertile couples presented at OPD with questions on birth spacing (both natural and contraceptives). Creating successful stories in a narrative culture, as the Maasai, is a strategy that is not to be underestimated.

Implications for HIV Prevention and Care and Treatment in the Face of Infertility

When conception is the goal of sexual contact, as is the case in infertility, use of condoms is contradictive. Vaginal application products that reduce STIs/HIV transmission risk could be a solution to the STI/HIV risk that semen contact brings, while keeping the procreative function and cultural appreciation of semen. Recent research shows promising but also ambiguous results.^{22,23} Two different applicants, one with and one without contraceptive effect, would be ideal for the Maasai setting, allowing women to make own reproductive choices.

In addition to this background not in favour of condom use, culture-sensitive education on and availability of condoms are low throughout Ngorongoro district. In a local village, an advert sign by a condom provider was put in the center of the village, showing a happy non-Maasai couple, a man and one woman (and no cattle). This picture does not reflect the ideal Maasai family picture at all. Although condoms are on sale at the local shops, our participants felt not in charge of the decision to use them and find them expensive. This makes accessibility to condoms low, in addition to remote and dispersed populations and religious beliefs (Catholic hospital service only). Interestingly, the women denied that the condom would not fit the Maasai male genitals, something believed by outsiders due to the specific male circumcision technique, which leaves the foreskin hanging loosely aside the glans penis.

However, it is also futile to push HIV prevention in the face of cultural practises that emphasize mandatory motherhood, enhancement of fertility, and sexual practices that attempt to mitigate infertility when such practises are an essential cultural norm. By neglecting the importance of cultural practises, HIV prevention efforts are likely to be unsuccessful. Moreover, a lack of cultural respect discourages the community from discussing infertility issues. By incorporating Maasai knowledge of fertility and infertility with knowledge of HIV prevention, we are more likely to maintain the respect and engagement of the community in bio medically derived strategies that seek to mitigate HIV transmission while relieving major concerns about infertility.

The action and knowledge translation from this research has led to the adaptation of maternal health services, including infertility care at the local hospital. Attention to infertility at OPD and awareness of traditional practises can lead to an open discussion of treatment options and the application of basic diagnostic tools (physical examination, laboratory investigation, and ultrasound).

The research discussed in this chapter has been collected over the course of 2 years, between 2008 and 2010 in the Maasai community of the Ngorongoro Conservation Area (NCA) in Northern Tanzania. Although the original research purpose was to examine women's knowledge and experience of HIV/AIDS and how such knowledge relates to pregnancy, motherhood and prevention of mother-to-child HIV transmission, safe motherhood issues, and fertility concerns emerged during the research process as equally significant matters for Maasai women. It is notable that the emergence of safe motherhood issues and fertility concerns in the context of this research signifies differences in perceptions of salient cultural interests between the researchers and the Maasai women. Participatory action research is a useful tool in overcoming such barriers and can be used in any local setting.

CONCLUSION

Mandatory motherhood has significant implications for risk of HIV infection in women. In particular, the Maasai women living in the Ngorongoro Conservation Area of Northern Tanzania face not only the expectation of procreation and motherhood but also the expectations associated with other unique cultural and sexual practices of the Maasai as potential risk factors for contracting HIV. Most notably, these unique cultural practices include polygamy, fertility-inducing sexual practices, female and male circumcision, extramarital sexual practices, and traditional birth outside hospital circumstances. Ultimately, our exploration of HIV and motherhood in the context of the Maasai of Northern Tanzania has showed us that mandatory motherhood leads to significant distress when women experience infertility because of failure to achieve womanhood and social isolation. Therefore, it is

notable that when Maasai women experience infertility, the imperative nature of motherhood leads them to pursue sexual practices that will increase their risk of HIV infection. The risk of HIV infection is not without acknowledgment; however, HIV infection is less important than the experience of motherhood and ability to procreate within the Maasai context of social norms and cultural expectations.

FOOTNOTES

- i. In Maa, the Maasai language, *biitia* is the word used to refer to HIV/AIDS. *Biitia* is used to represent multiple diseases that are associated with significant weight loss, as its meaning is literally “to shrink.” Consequently, multiple meanings for HIV and other diseases with similar external symptoms lead to confusion about how to define HIV, as well as how to address causation, prevention, and treatment.

- ii. *Inkipot* is a milk-drinking ritual initiated by Maasai girls, where each girl “publicly” selects moran boyfriends (usually three). The girl provides the selected morans with milk, and then each reciprocates with semen ⁶. Before the girl presents the milk to the moran and his age-mates, it must be clean and prepared well. This ritual is seen to be the exchange of two bodily fluids that symbolizes a complimentary although not equal relationship between Maasai men and women.⁶

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5

Low utilization of skilled birth attendants in Ngorongoro Conservation Area, Tanzania:
a complex reality requiring action

Yadira Roggeveen, Lauren Birks, Jetty van Kats, Mange Manyama, Jennifer Hatfield, Joske Bunders, Fedde Scheele, Jos van Roosmalen

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ABSTRACT

Objective: Limited integration of contextual factors in maternal care contributes to slow progress towards achieving MDG5 in sub-Saharan Africa. In Ngorongoro, rural Tanzania, the maternal mortality ratio is high with 642 maternal deaths /100,000 live births. SBAs assist only 7% of deliveries.

Methods: This study, undertaken from 2009 to 2011, used Participatory Action Research involving local stakeholders (Maasai women and men, TBAs, hospital staff) to examine reasons for low utilization of SBAs and moreover to develop proposals how to integrate contextual factors and local needs in the health care system. Interviews, observations and literature study were also conducted. Thaddeus and Maine's Three Delays model is used to structure the analysis.

Results: Delaying factors in decision making at home: negative perceptions by the community on availability and quality of care in the hospital; discontinuity of care by TBAs; food and financial insecurity; desired nearness to cattle and family; limited recognition of maternal deaths; limited male health education and suboptimal birth preparedness. Delaying factors in reaching the hospital: vehicle and road limitations. Delaying factors in receiving hospital care: limited (human) resources and limited knowledge sharing at the hospital. Community members and health workers proposed: increasing food/financial security; tailoring male health education; combining TBA/SBA care to provide continuous, culturally appropriate labour support; creating separate maternity wards; increasing the number and training of staff; ensuring continuous availability of Comprehensive Emergency Obstetric and Neonatal Care.

Conclusion: Applying solutions to increase hospital utilization seems complex as collaborative actions by multiple actors and institutions are needed to create both a needs based and clinically sound continuum of maternal care. To follow-up this process of integrating local solutions into the maternal care system, we suggest to adapt the WHO Strategic Approach - a top-down framework for the implementation of innovations – to fit this bottom-up approach.

INTRODUCTION

Sub-Saharan Africa faces the challenge of insufficient progress towards MDG 5, concerning maternal and reproductive health. Increasing utilization of SBA and access to CEmONC are global, evidence-based strategies to reduce maternal mortality and improve maternal health.¹ However, translation of global strategies into local implementation is difficult. Even when national maternal health policies are in place, locally, utilization of SBAs may remain low and maternal mortality high.^{2,3}

Research suggests that this policy-practice gap is caused by limited adaptation of maternal health care to local contexts.⁴ When linkages between maternal health, local culture, gender, socio-economic and political factors are better acknowledged³⁻⁷ and community experiences and needs are addressed, the acceptability, appropriateness, use and sustainability of services increases.^{8,9} However, achieving both locally appropriate care during childbirth while simultaneously safeguarding clinical best practices is not straightforward and insufficiently researched.^{3,4,10} This study aims to research and assist the development of such care in a local setting; Ngorongoro, rural Tanzania.

METHODS

Setting

In 2008, Tanzania had a MMR of 790 maternal deaths per 100,000 live births (range 470-1300).¹ While in 2008 ANC attendance in Tanzania had increased to 76% of pregnant women attending at least once, utilization of SBAs lagged behind at 43% of deliveries.¹ In Ngorongoro, where the population consists of 97% pastoralists, mainly Maasai,¹¹ even 90% of pregnant women received ANC at least once, but only 7% of deliveries were assisted by SBAs. Most childbirths (93%) took place at home, alone or with presence of TBAs.¹²

The Ngorongoro Maasai are a semi-nomadic pastoralist population that have settled in the NCA due to eviction from grazing lands in the adjacent Serengeti plains.¹³ At the time of settlement in the NCA, Maasai were promised resources such as access to healthcare, water and education. Although UNESCO's declaration of the NCA as a World Heritage Site in 1979 increased tourism and job opportunities, Maasai living in the area experienced loss of land rights and loss of access to other resources. Implementation of services fell short of commitments, which led to distrust of government services, including healthcare.^{11,14,15}

In 2008, a 72-bed hospital served the 77,580 population of NCA, an area of 8,292 km².^{11,16} Annually, some 3351 births are expected in the hospital's catchment area (calculation based on population and a crude birth rate of 43.2).¹⁷ Although not all these women might need

hospital care, at least an estimated 500 women would need CEmONC from the hospital.¹⁸ Although the hospital maternal care included CEmONC and also PMTCT, only 47 hospital deliveries occurred in 2008, illustrating severe underutilization of the hospital-based SBAs.

Low utilization of hospital maternal care takes place in a context where delivering at home is potentially fatal.¹² Maternal deaths are a major cause of death among pastoralist women¹⁹ and the MMR in Ngorongoro District has been estimated at 642 / 100,000 live births (CI 329/955).²⁰ In 2008, 62 hospital cases (10% of 603 female admissions) provided an illustration of local maternal morbidity: prolonged labour (5), post partum haemorrhage/sepsis after home deliveries (20), complicated miscarriages (11) and indirect maternal morbidity (26), mostly malaria. In addition to maternal risks, homebirths have been suggested to increase risk of HIV infection for all involved and hinder full provision of PMTCT.²¹ Low utilization of SBAs in Ngorongoro is linked to negative attitudes of health care providers and limited time and human resources to educate women on birth preparedness during ANC.^{12,22} However, the local hospital was not included in previous studies.

Aims

We undertook an in-depth exploration of reasons for almost non-use of SBAs in Ngorongoro. We aimed to first understand why and secondly - from this understanding and in collaboration with local stakeholders - to develop proposals for increasing utilization of SBAs.

Approach

To study problems in low resource settings, combining knowledge of communities, practitioners and researchers, has been advised. However, experiential knowledge of local actors, such as health workers and communities is underestimated and poorly utilized in maternal health research.^{4,23,24} This study used a combination of methods, with an emphasis on Participatory Action Research (PAR), which engaged local stakeholders as experts, incorporating them as co-researchers. Co-generative inquiry, which generates knowledge on problems and solutions through communication between researchers and local experts,²⁵ took place in order to identify actions linked to increased use of SBAs.

When using PAR, additional data collection strategies are commonly used to enrich and clarify information. These included: naturalistic and participant observation, semi-structured, in-depth interviews and reflexive journaling. Literature (research articles, books and reports on Maasai culture and health) assisted study of the historical and cultural context.

During the 2009-2011 period, 23 research meetings were conducted with 3-28 persons, lasting in duration from 30 minutes to 4 hours. Participants (Table 1) were included on the basis of convenience, purposeful and snowball sampling.²⁵ Participants were Maasai women

and men of reproductive age, SBAs (medical/clinical officers, nurse-midwives) from the hospital and TBAs, community health workers, nurse attendants and hospital officers. Contact with all participants was initiated during informal conversations explaining the research at the hospital and in the community, as well as during formal meetings with local authorities. TBAs from the hospital catchment area were actively invited to participate. The study started with sessions that separately discussed topics with small numbers of participants from one group. Due to snowball sampling, the groups per session enlarged. The separation of categories of participants in the beginning ensured that perspectives of different categories of participants were discussed while limiting the possible inhibiting factor of presence of other stakeholders. However YR was always present, in agreement with community members, due to her respected work as medical doctor in the local hospital. In later stage, when discussing local care adaptations, community members and more hospital workers were mixed in the same session. This mix enhanced detailed discussion of different viewpoints, which created additional insights in problems and solutions. To enrich the mainly female community perspectives with male viewpoints, we included a session with 13 male community leaders, respecting their community role and knowledge. Research meetings varied in terms of composition of participants and took place in either the hospital or surrounding villages, following the advice from participants. YR worked as a medical doctor at the local hospital during the 2008-2010 period. Her inclusion in the research team, combining the dual roles of practitioner and researcher, is intrinsic to PAR. This contributed to continuous contact and the development of trust-based relationships with participants, and facilitated reflection on observations.

The majority of the participants spoke Kiswahili, which was the language spoken during health care. Translation to Maa, the language of the Maasai, was undertaken when necessary by a male research assistant, also working as a local community health worker and fluent in English, Maa and Kiswahili. Concerns from the research team that his male and health worker status might bias answers, were opposed by community members, who preferred his facilitation to any other person.

Starting points for discussion were questions raised by YR and LKB regarding childbirth and knowledge of HIV/PMTCT, as PMTCT was originally planned as large part of the research. Questionnaires and topic guides on childbirth and knowledge of HIV/PMTCT were available in both Kiswahili and English, the languages of technical instruction in Tanzania. Discussions were facilitated in a manner that accommodated concerns of the participants (community members, SBAs - including YR), such as requests to discuss HIV within the broader context of maternal health. During these discussions, participants linked low utilization of maternal health services to the absence of locally adapted maternal care. These conversations were included in data analysis. Maternal health topics identified using the questionnaires mentioned

above were expanded in discussion with participants. To generate additional insights from hospital maternal care users and providers, in-depth interviews were undertaken with 31 hospital staff and community members (Table 1).

Table 1. Participant distribution.

Categories participants	Number of participants per data collection technique	
	Research sessions	Interviews
Women	61 ^a	10
Men	19 ^b	3 ^c
TBAs	201	6
SBAAs	49	10
Nurse attendants	5	
Hospital Administration	9	2
Researcher	13 + 15 students	
Translator	15	13

a. Including a female community leader

b. Including male community leaders, a traditional healer, representatives from NCAA, a politician.

c. Including two community leaders.

Meeting minutes with verbatim quotes were recorded in field note books or audio recorded with participants' consent. Respondent validation after transcription and the collaborative discussion of gained knowledge in the following meetings increased accuracy and validity of the data.²⁶ Transcripts of field notes and recordings were analysed manually and with Atlas.ti research software. An iterative process of data analysis identified emerging themes. Informal remarks by community members and hospital staff, assisted analysis and reflection.²⁷ Because of its assistance in reflections on contextual consideration's influence on utilization of care,⁴ we used the Three Delay Model²⁸ to structure our analysis. This model recognizes that delay in receiving treatment consists of three phases: phase 1) delay in taking the decision to seek care, phase 2) delay in reaching a health facility and phase 3) delay in receiving adequate treatment in the health facility.

The Tanzanian Commission for Science and Technology (COSTECH) and the National Institute for Medical Research (NIMR) (NIMR/HQ/R.8a/VolX./876), University of Calgary and VU Medical Centre provided ethical approval for the research. Local approval from the hospital, village leader, village and ward council and Ngorongoro Conservation Area Authority (NCAA) was obtained. Informed verbal consent was obtained from research participants.

RESULTS

Phase 1 Delay: Deciding to seek care

Proposed solutions plus identification of actors who could implement solutions are summarized in Box 1.

Food security

Maasai originally relied on cattle as their main food source for milk, fat, blood and meat,^{11,29} but the NCA offers limited areas for extensive grazing of cattle, making their livestock less productive. To supplement nutritional needs, small-scale farming was temporarily allowed in the NCA^{13,30,31} but during our study, the ban on farming was renewed in 2009 due to ecological pressure.³² Resulting food insecurity affected our participants significantly. According to one TBA:

“There are many problems; even those days we have no fields to grow our food. This brings kwashiorkor to our children. So we are having a very difficult time.”

Maasai participants considered that hospital childbirth increased food insecurity because of the distance from cattle. Furthermore, food from canteens and markets close to the hospital is expensive because it is imported from outside NCA. The hospital offers one daily meal plus kitchen facilities, facilitating low food costs during admission. In addition to the concerns about food security, Maasai women and TBAs stated they disliked pregnant women having to mix with other patients in kitchens and wards, risking contagious diseases such as tuberculosis. They requested unlimited access to separate kitchens to allow care for women in labour at night.

Opportunity costs

Hospital birth increased costs for women by diminishing their capacity to gather firewood, collect water and nurture children at home. As one woman delivering in hospital stated:

“So the children were just taken care of by children.”

Some men regarded the Maasai’s polygamous structure to be protective of pregnant women, as most of the women had co-wives or female family to assist them. According to a male community member:

“If they have co-wives they would get people in the same village. That is usually not a big problem.”

Meaning of childbirth, connection to traditions

Wives, children and cattle are signs of wealth in Maasai culture. Childbirth is crucial to women, proving their ability to give life and prosperity to husband and family.³³ Biomedical health services have been available since 1976,³⁴ but assistance at childbirth has traditionally been provided by TBAs. The TBAs are regarded as having a spiritual relationship with Eng'ai (the Maasai god) while they share the ability to give life.³⁵ At the same time, they meet women's expectations of care before, during and after labour.¹²

TBAs participating in the study showed their shell-decorated-bracelets and explained the spiritual linkage as those are worn to avert blame for difficulties during childbirth (i.e. breech delivery, placental problems, maternal/neonatal deaths). Participants stated that TBAs' efforts are recognized by families in the form of sharing quality sheep meat with them. On the first day postpartum, men announce the child's sex by performing cattle rituals. These actions of cultural significance could not be performed in hospital. Both participating women and TBAs themselves argued that hospital births lacked the continuous care, rituals and massage, which were provided by TBAs. To increase utilization of the hospital, TBAs and SBAs suggested to combine TBA and SBA care in the hospital.

Perceived risks of childbirth

Seeking help from SBAs is based on awareness of the risks of childbirth and recognition that SBAs are able to assist²⁸. Maasai traditionally view childbirth as Eng'ai's practice, with limited human influence. Trust in Eng'ai as a life giving entity and prayers are central³⁵. Although all participants experienced maternal deaths in their communities, most thought that these were exceptions. The practice of not talking about the deceased seemed to reduce awareness of the magnitude of maternal deaths and the urgency to act. As one male community leader noted:

“When somebody dies while she is pregnant or after delivery it is sad, it is very bad....After seven days, they slaughter a sheep and then from there everybody tries to forget what happened.”

Although maternal death was not generally perceived as a significant risk, Maasai women and TBAs recognized the risk of obstructed labour. In their eyes, obstructed labour could be prevented by dietary restrictions to limit foetal growth. Women related giving birth to large babies to lack of self-discipline in adherence to these dietary restrictions. Vaginal delivery was considered to be the norm to the extent that some husbands perceived that the woman had failed if she needed instrumental intervention. Hospital fees for instrumental deliveries served to reinforce this trend of 'blaming the victim' exhibited by some Maasai women and TBAs. The TBAs considered that referral to hospital was necessary in cases of abnormal foetal

position, high estimated birth weight, intrapartum bleeding and placenta previa. Bleeding was considered to be a major cause of maternal deaths at home where limited measures could be taken. As one TBA noted: ‘We can only give cows blood to drink and it is Eng’ai that stops bleeding.’ Immediate breastfeeding was not employed to reduce bleeding nor was abdominal massage, despite its use during labour, because, as one TBA said:

“We are afraid to touch.”

The TBAs also recognized that the home is an unsafe environment to prevent HIV infection. Instead of considering this to be a reason for hospital referral, TBAs requested protective measures at home:

“Women say: we are at big risk of transmission, also at home. When we are helping women to deliver, we have nothing, no apron, no gloves. We would really like these things, to be safe at home.”

It is noteworthy that most women who delivered in hospital had previously experienced obstetric complications at home and demonstrated increased awareness of risks. As one woman noted:

“I am afraid that I may die... so that is a risk.”

In comparison with community perceptions, hospital staff regarded hospital as the safest environment to deliver.

Education

In our study, SBAs also considered limited training and knowledge sharing by hospital staff as a factor in low SBA utilization. As one SBA argued:

“We need to counsel women more and to do this properly, more training is needed. Some staff is trained, but those without secondary school diplomas are not sent for training. When the ones who go for training come back, they do not always give feed back to the nurse attendants, so for them it is difficult to learn.”

Box 1. Solutions to delay in deciding to seek care.

Short term strategies	Action by
Increase awareness of risk of maternal mortality	All
Combine ANC/ HIV outreach	SBAs, administration
Increase education of all stakeholders at ANC	SBAs, community health workers
Increase knowledge sharing in hospital	SBAs, administration
Implement birth preparedness	All
Involve TBAs in hospital childbirth care	All
Improve perceived quality of care (see phase 3)	All
Long term strategies	Action by
Increase food security at home/hospital	Community, NCAA, administration
Prepare finances for hospital stay, increase resources other than cattle	Women, TBAs, men
Maintain community reward to TBAs/create hospital reward to TBAs in case of hospital referral	Community, administration
Create male health education outside the hospital	Administration, men
Educate TBAs on childbirth emergency care (bleeding), provide TBAs with HIV protective measures	Administration, SBAs, TBAs

Staff attitudes to TBAs at ANC could be more welcoming and more focused on education. As one TBA remarked:

“When I came, I was not welcome. I never heard I should come to hospital. The women come to me. I do not come to the clinics.”

Men and women requested male education on SBA utilization. SBAs agreed:

“More health education at antenatal clinics is needed for TBAs and community leaders, because women need permission from their husband to deliver in hospital. But change is very slow, because there have been many seminars already and I didn’t see more women coming.”

Men considered that ANC was not the right place for male health education because ANC was regarded a women’s territory. Male ANC outreach visits were associated with being sick (seeking medical care, collecting tuberculostatics/antiretrovirals). For this reason, men suggested that male education should take place during gatherings at council offices or in the community. To increase maternal care and education in general, SBAs proposed combining ANC with HIV outreach:

“People live far away; many mothers do not reach [antenatal] clinics. And even then sometimes clinics are too short to counsel and test for HIV.... We have outreach camps, where hospital staff camps for 1-2 weeks on one spot to do extensive counselling and testing, but pregnant women do not come to those places. There is no service for them there. It would be possible to combine care for pregnant women with VCT [Voluntary Counselling and Testing] outreach, but then we need a camp-base where we can also see people privately. Now the camp is for us only, we visit people in their homes or in schools, halls. Aside a camp-base, we would also need all the things to do ANC.”

It seems that the ANC services that the hospital offers could be adapted to fit both community needs and to spend limited resources more efficiently.

Finances

Our study found that uncertainty about hospital costs led to delay in seeking care because male absence, bi-weekly cattle markets and unsure business outcomes combined badly with the unpredictable timing of childbirth. As one TBA noted:

“Also money for the car and fuel: it depends on cows or goats to sell. Suppose you do not have anybody who can just buy [your cattle] at that time, then what will you do?”

One woman delivering in hospital overcame the delay:

“I said okay, we borrow money from people because my father was not at home on that day.”

Participants suggested that a flat fee structure would be best. At the moment, the uncertainty of the size of hospital bills meant that cattle could not be sold until after discharge. Women also recognized that some women could not afford hospital stays. Income generation independent of cattle, such as women’s enterprises, was suggested.

Decision making process

Pastoralist women historically carry a double burden: public underrepresentation of pastoralists and limited female influence within the pastoralist community.³⁶ The decision whether or not to go to hospital was not made by participating Maasai women themselves. Husbands, and, in exceptional cases, family or friends decided. Although TBAs had an advisory role, it was not their decision. Decision-making was complicated by the fact that many husbands are at a distance because of cattle grazing or urban employment. Although the

mobile phone network was expanding, communication with absent husbands was difficult. When to communicate was unclear, as many women did not know their due date. A male community member mentioned some people used moon calendars, market dates or mobile phones to keep track of date. Some men accused TBAs of keeping women at home and avoiding the hospital. However, TBAs stated that women often called TBAs too late in labour, leaving them with no option. TBAs were afraid to decide on hospital births without the husband's support and, in the absence of birth plans, women stayed home, surrounded by indecisive people. Women delivering in hospital had often prepared birth plans with decision-makers or they communicated well by phone.

Phase 2 Delay: Reaching the hospital

Proposed solutions plus identification of actors who could implement solutions are summarized in Box 2.

Distance to hospital

Historically, rainfall dictated Maasai migration with cattle to pastures and temporary homesteads. As one SBA noted:

“Still even pregnant women go with the cattle.”

Creation of artificial water holes allowed some people to reside in semi permanent *bomas* (settlements or compounds) all year.^{14,19} In case of obstetric complications, long distances (up to 70 km) and rough terrain need to be covered to reach SBAs. Therefore, SBAs suggested that women who are due to give birth should await childbirth near health facilities.

Transport, roads & communication

Transport to hospital was by foot, motorbike, car or small aircraft, with immobile patients sometimes being carried on stretchers of hides and sticks. Market days increased availability of private vehicles for hospital transport. However, transport is a challenge due to mainly 'black cotton soil' roads with hazardous driving conditions during rainy periods. Nocturnal driving restrictions (to maintain nocturnal peace for wildlife), restricted people to call a car for women in labour. Increasing mobile phone availability and network coverage facilitated arranging ambulances. Most people knew the private telephone numbers of ambulance drivers. Some refused to keep these numbers at home because this was believed to invite obstetric complications. This resembles an evil eye, as a Maasai woman noted:

“Looking at you and causing things.”

TBAs regarded this as an ancient, declining belief. To facilitate arrangements, one telephone number for hospital emergencies was proposed. Participants reported that cars were usually called in prolonged labour, requiring drivers to approach *bomas* closely, gaining community respect for the hospital. None of the participants knew of maternal deaths due to Phase two Delay. All participants suggested that more ambulances would facilitate emergency transport, but recognized hospital budget and resource limitations. Male community members suggested men should develop community car planning.

Travel costs

Community members and hospital staff perceived hospital transport fees as unclear. Hospital policy was free transport for childbirth, but women with pregnancy complications and not in labour sometimes had to pay. HIV positive or very poor women could request fee exemption. Men requested simplification of the billing structure to increase awareness of and adherence to the hospital transport policy.

Box 2. Solutions to delay in reaching the hospital.

Short term strategies	Action by
Reduce distance to hospital by having due pregnant women stay near the hospital	All
Prepare evacuation plan	All
Clarify hospital car policy & practice, create and promote hospital emergency phone number	Administration, all
Create community mobilization plan	Men
Long term strategies	Action by
Increase number of ambulances available for emergencies	Administration

Phase 3 Delay: Receiving adequate treatment

Proposed solutions plus identification of actors who could implement solutions are summarized in Box 3.

Perception of hospital services, quality of care & provider reputation

Negative user perceptions of quality of care, staff attitudes, waiting times, lack of supplies and inefficiency hinder SBA utilization.²⁸ When community decisions not to use SBAs can be simply reduced to cultural background - as illustrated by a one SBA participant:

“It is just their culture”

- critical appraisal of care and health services might be hindered. Women who delivered in hospital had positive hospital experiences, reporting that SBAs handled complications well.

Some mentioned negative stories about SBAs circulated in the community, not in line with their own positive experiences, as a woman shared:

“I was scared of the history of the nurses, that okay, they can just help you, they are helpful, but not much. But when I came here I saw that they are really very sharp, smart, not like the people were telling.”

Women who preferred home births, perceived hospital services negatively, based on stories and past experiences. Women disapproved of non-pregnant patients to be admitted in maternity ward (due to hospital overcrowding). Although labour wards were private, and the wards were perceived as cold when compared to *bomas*. Women also said that they felt alone when TBAs were excluded from the labour ward. As one woman said:

“There is a new environment for us, there are new people there we don’t know, and then someone else is taking care of you.”

SBAs requested TBAs to stay outside the labour ward. According to one TBA:

“TBAs aren’t allowed in labour ward. This is hurting us, as we want to be with the mother. We feel not respected.”

Women and TBAs desired to be close to each other, even if this meant TBAs would sit in the same hospital bed while awaiting delivery. Other issues concerned differing approaches to labour and delivery. For example, women preferred the ‘all fours’ position taken at home births over the supine position of hospital births. As one TBA noted:

“We Maasai don’t like to lie down.”

Vaginal examination was also disliked:

“We don’t like to be touched in our vagina.”

The massage, rituals and hot drinks associated with home delivery were missed in the hospital. A TBA participant compared the different locations:

“We are not allowed to use oil for massage in the hospital. At home, fat is melted and used to massage the abdomen of women who are giving birth.”

Women and TBAs preferred perineal tears to episiotomy. Misconceptions about the word ‘cut’ in the Maa language (used interchangeably for both episiotomies and caesarean sections), led people to fearfully believe that childbirth in the hospital often implied surgery.

SBA explained past collaboration with TBAs had been difficult, often due to late TBA referral to hospital, causing delay in care for complications. SBAs felt that they had been blamed by community members for childbirth complications, which occurred in hospital, but may have been prevented if women had arrived earlier. SBAs said they kept TBAs outside the labour ward because of past TBA interference with vaginal examination and episiotomy. Additionally, most SBAs perceived rituals and massage as not contributing to care, although some SBAs mentioned they did not know enough about TBA care to judge. SBAs also disliked working conditions in the labour ward (dark, cold, easily accessible to mosquitoes). Some SBAs regretted not being able to provide continuous support during labour due to high workload and staff shortages. A SBA summarized:

“People don’t like hospital. They say the mother is left alone in the labour ward. They want a nurse to be there all the time, but this isn’t possible, there aren’t enough. At the boma, TBAs do abdominal massage; we do not allow that in hospital. People dislike birthing position in the hospital, they would like to squat [note YR: opposed by women and TBAs, who preferred ‘all fours’ position]. They are afraid of episiotomy and pv [vaginal] examination, they say: my child will come out by itself. In the boma, there is a big fire, which makes it very hot; in labour ward it is very cold. During delivery women don’t eat, [in the boma] they have porridge. After delivery, they have soup of blood with local herbs.”

Both TBAs and SBAs stated that confidence in SBAs facilitated the choice for hospital childbirth. Incentives and inspiring leadership were mentioned as motivating SBAs. Despite negative past experiences, SBAs and TBAs proposed to increase collaboration. As one asserted:

“If we can work together, we can make it better!”

Communication

Positive experiences for TBAs and women included conversations with SBAs awaiting childbirth and guidance during labour. SBAs recognized the importance of having good relationships to optimize labour outcome. However, language barriers between SBAs, women and TBAs contributed to miscommunication because SBAs felt they could not provide optimal care if women did not speak Kiswahili. Additionally, some TBA did not understand differences between nurses, technicians and nurse assistants, which led to wrong expectations; e.g. a

TBA expected a nurse assistant to perform delivery, while the nurse assistant was present to watch over a woman while the SBA attended another patient. When the nurse assistant walked out of labour ward to call the SBA, the TBA felt helpless, being outside labour ward, while the woman was alone inside and the TBA thought the SBA was leaving instead of being called). Such factors may cause women to stay at home according to a SBA:

“So some [women] deliver at home, because they are afraid of coming to hospital because of communication.” One male community member proposed that Kiswahili speaking TBAs should assist hospital staff: “Language can be problematic, culture can be problematic. TBAs would be a big help to alleviate that kind of thing if they were working with professional staff.”

Resources

Medication, intravenous fluids and blood were well appreciated by community members and SBAs. SBAs suggested CEmONC equipment could be expanded and updated, but mentioned staff shortages challenged continuous availability of CEmONC:

“We only have one doctor. So once doctor isn’t here... complicated cases can appear here and no management can be taken. So that is why the clinical officer decided to refer.”

Box 3. Solutions to delay in receiving adequate treatment.

Short term strategies	Action by
Increase quality of care at hospital childbirths: Amplify positive experiences Learn from negative experiences	All
Create woman centered care: Provide continuum of care during childbirth Communicate, explanation of procedures Choose birthing position, birth companion Allow TBAs in labour ward and hospital wards, evaluate traditional practices	All, mainly SBAs, TBAs, women
Optimize environment: Labour ward: lighter, warmer, less insects Separate pregnant women from patients Continuous kitchen access Ensure medical supplies	Administration, SBAs

Box 3. (Continued)

Short term strategies	Action by
Long term strategies	Action by
Organization	Administration
Motivate SBAs (monetary/ non-monetary)	
Increase training and number of SBAs	
Ensure continuous availability of CEmONC	
Upgrade anesthetic care	
Increase and update medical supplies	
Reconsider childbirth fees	
Space:	Administration
Separate ward/kitchen for pregnant women	
Create spaces for people awaiting women in labour	

Both SBAs and community members mentioned that limited human resources could inhibit SBA utilization:

*“I think if there is no doctor, also patients aren’t coming,
they are going to another hospital.”*

SBAs suggested the need to increase the number of SBAs and the availability of anaesthetist training to ensure around the clock provision of CEmONC.

Hospital fee structure

Uncomplicated hospital delivery was free, but instrumental delivery or treatment of complications was not. Many Maasai women stated that this was unfair because complications were caused by Eng’ai and were not the fault of individuals. Furthermore, women felt this fee structure and the costs it imposed on the family encouraged husbands to blame women for complications. Women proposed flat fee structures for hospital childbirth, regardless of complications, because fixed costs would facilitate discussions with husbands and inclusion of foreseeable hospital costs when they prepare for birth. Women stated that husbands would be willing to pay for good quality care. TBAs and women suggested that the hospital should explain who (hospital, government or donors) paid the costs if childbirth was free because previous experiences with free items, such as promotion articles from commercial companies, had led to associations of free care with bad quality.

DISCUSSION

Low utilization of SBAs: a complex reality

Low utilization of SBAs in the NCA is a complex issue, influenced by a variety of factors and actors. Delaying factors could be identified in all phases of Thaddeus and Maine's model. Many of these factors did not only have their origins directly in health services but other interdependent domains (politics and policies, traditions, food security, family life, cattle, gender, infrastructure, conservation of flora and fauna) were also implicated. Additionally, the culture of silence surrounding maternal deaths in the Maasai community hampered a sense of urgency to address the issue.

Finding solutions

None of the actors alone held the power to implement all suggested solutions to increase utilization of SBAs. Participants identified a need for increased collaboration and communication between various actors and institutions. This will require behavioural changes in both maternal health services and the community. Viability of solutions can be determined through implementation of the proposed solutions, creating a life experience, *vivencia*³⁷ that will further test the internal and external validity of study results.³⁸ Choosing a solution to start implementation is difficult considering the diversity of proposed solutions. In our study the choices where to start off were not made rigidly, but evolved from which stakeholders were most active in changing existing patterns. The "lowest fruit" to pick, was the enthusiasm of TBAs and SBAs to increase collaboration.

Collaborative labour care

Participants proposed to combine traditional and biomedical care to women in labour, which would involve active collaboration between TBAs and SBAs in the form of shared care. This would be an innovation² in local maternal care as this is no current practice.

The Maasai have been labelled as reluctant to change practices, but this does not do justice to the complexity of traditional ways of life. In reality, Maasai combine use of both traditional (male) healers and biomedical health providers³⁹ and adapt to circumstances when change is desired by the community itself.^{40,41} Combined care by SBAs and Maasai TBAs has not previously been reported. To facilitate change, TBAs wanted hospital staff to inform community leaders of the need for TBAs to accompany women to hospital. One woman who delivered in hospital illustrated change from within and the role of men in this process:

"My husband talked for a long time to them [co-wives], but they just delivered at home. But because I started now here [in hospital], it will be custom now that no one can just deliver at home."

Suggestions for SBA-TBA collaboration in literature range from case referrals by TBAs to TBAs providing psychosocial support during labour.⁴² The integration of TBAs with formal health systems has been previously suggested as a way of increasing utilization.⁴³ Moreover, birth companions enhance both quality of care and progress of labour, and reduce the need for CEmONC.^{44,45} Respect for the central role of Maasai TBAs would include allowing them to be a continuous birth companion if women desire, not only at home but also in hospital. We expect that collaboration could enhance a continuous learning environment for both TBAs and SBAs. To identify which roles Maasai TBAs could fulfil in collaboration with SBAs, precise childbirth practices by TBAs are subject of further study.

Institutional responsiveness & resources

The promotion of SBAs should occur simultaneously with the improvement of the quality of health care services, health systems and (human) resources in order to ensure continuity of care and access to CEmONC.^{28,43,45} In the NCA, as in other low resource settings in Tanzania and elsewhere, these are challenging issues.^{46–48} Clinical audits, but also funding of locally identified solutions and flexible financing from donors would be supportive.^{8,49–52} Community preference for flat rate maternal care fees should be seriously considered. Participants also suggested that the maternity ward and kitchen should be a separate unit, resembling Maternity Waiting Homes. Although it is unknown if such facilities reduce maternal mortality or morbidity,⁵³ respecting the call for a separate hospital structure for pregnant women may increase perceived quality of services.

Persistent problem

The complex linkages and long history of low utilization of SBAs in the NCA begs the question of whether low utilization is a “persistent” problem. Application of this terminology from policy science and information technology has been suggested to analyse longstanding health problems.⁵⁴ Persistent problems are systemic in nature, while deeply rooted within our actions, institutions and societies. By repeating our common actions, problems are enforced rather than solved. Recognizing persistent problems can be the start of solving them. However, conservative approaches from one sector’s perspective, such as simply promoting SBAs as ‘best practice’, do not suffice. Other approaches are needed, such as embracing different perspectives to care to successfully create context specific maternal care practices. This multifaceted approach is suggested to eventually make health systems ‘accessible, affordable, of high quality and trustworthy’.⁵⁴ This is a fragile process, as it relies on the willingness of actors and institutions, users and providers to communicate, collaborate and share power.²³ However, collaborative approaches to increase utilization of SBAs have proved successful and cost-effective in Tanzania and Kenya.^{10,55} Implementation of solutions could further clarify if low utilization of SBAs in NCA is a persistent problem.

Follow-up

Rapidly changing low resource settings require flexible adaptation to local circumstances.²³ This research was of direct interest to those participating because we included local researchers, practitioners and community experts and focused on maternal health topics, which were identified as important. We are of opinion that: “Lessons learnt from project interventions that are based on local knowledge and practices, take a highly participatory approach and allow interventions to be managed flexibly should be taken forward in project design and policy development”.¹¹ To follow up the implementation of suggested solutions, we propose an adaptation of the WHO Strategic Approach, a top down approach to incorporate innovations into policies and programmes.² This approach stimulates policymakers to start a multidisciplinary exploration of Sexual and Reproductive Health challenges, identify local needs and stimulates that local successful health innovations can be used to scale up quality, use of and access to services. We argue, that the Strategic Approach could be applied to maternal health in a bottom up process (Figure 1), in which local stakeholders themselves initiate this process, recognizing that context specific problem solving by local stakeholders (in our case women, men, management, healthcare workers and community leaders) can also start the adaptation of maternal policies and practices in health systems.⁵⁶ Local stakeholders can then connect with policy makers from bottom up. The bottom up implementation of local innovations into health systems is under-researched.

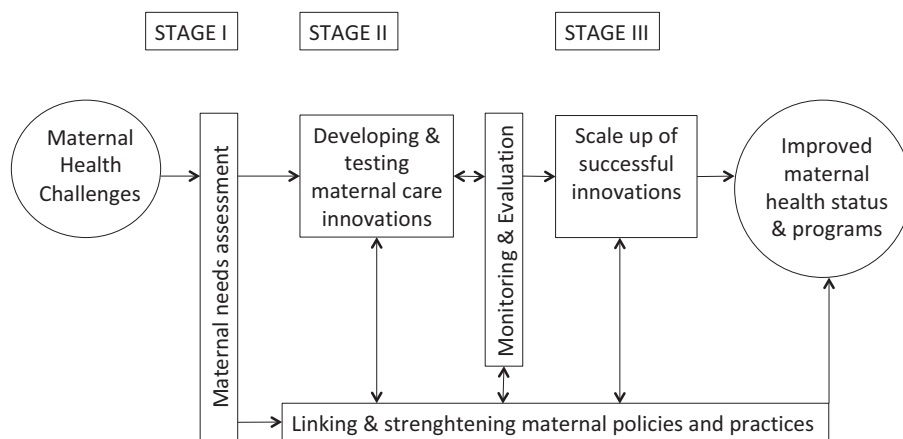


Figure 1. WHO Strategic Approach² from “bottom up”

The WHO Strategic Approach has three stages. The process our participants engaged in shows similar stages: Stage I: they identified challenges, needs and proposed solutions. In the context of our study of utilization of SBAs, Stage II would involve the further development, testing and study of proposed innovations. This is the focus of on-going research in our case

study. Stage III would involve scaling up of successful innovations. Connecting with policy makers and common health services mainly takes place in Stage II and III.

Limitations of our study require discussion. First, sample size was limited and selection of participants was narrowed to those available. Second, participatory approaches such as PAR are biased by inclusion of active and articulate participants, resulting in underrepresentation of those who are not. In order to mitigate this bias, we included participants that did and did not use hospital for childbirth, and during the research created a respectful and patient atmosphere. Third, TBAs outnumbered SBAs in our sample and women who were not TBA were underrepresented. In addition, PAR is evidently context specific and results cannot be automatically generalized, nor is it intended to produce results that can be generalized.

Research involvement of policy makers and NCAA representatives was limited, which may hamper implementation and up scaling of results. A more extended approach with focus groups of policy makers and NCAA representatives could create additional insights. Quantitative data gathering strategies and analysis could assist to show the dominate factors of low utilization of skilled birth attendants and could help to create further insight in behavior patters. Magoma et al¹² have started research on Birth Preparedness and Complication Readiness and the use of SBAs in the area. We propose that prospective follow up study of a big cohort of pregnant women which studies utilization of SBAs and inhibiting and facilitating factors/implementations could further quantify dominate factors and problem-solving. Quantitative data on current maternal mortality ratio in the area is also needed. Awareness of limitations has informed our follow-up study of this local setting.

CONCLUSION

Low utilization of SBAs in NCA is a complex issue, which requires context specific problem solving. The implementation of solutions requires communication and collaboration by all actors and institutions, while creating continuity of care during childbirth and a needs-based, comprehensive maternal care pathway that is both culturally appropriate and clinically optimal.

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6

Developing a Pictorial Sisterhood Method in collaboration with illiterate Maasai traditional birth attendants in northern Tanzania

Yadira Roggeveen, Renske Schreuder, Marjolein Zweekhorst,
Mange Manyama, Jennifer Hatfield, Fedde Scheele, Jos van Roosmalen

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ABSTRACT

Objective: To study whether data on maternal mortality can be gathered while maintaining local ownership of data in a pastoralist setting where a scarcity of data sources and a culture of silence around maternal death amplifies limited awareness of the magnitude of maternal mortality.

Methods: As part of a participatory action research project, investigators and illiterate traditional birth attendants (TBAs) collaboratively developed a quantitative participatory tool—the Pictorial Sisterhood Method—that was pilot-tested between March 12 and May 30, 2011, by researchers and TBAs in a cross-sectional study.

Results: Fourteen TBAs interviewed 496 women (sample), which led to 2241 sister units of risk and a maternal mortality ratio of 689 deaths per 100 000 live births (95% confidence interval 419–959). Researchers interviewed 474 women (sample), leading to 1487 sister units of risk and a maternal mortality ratio of 484 (95% confidence interval 172–795).

Conclusion: The Pictorial Sisterhood Method is an innovative application that might increase the participation of illiterate individuals in maternal health research and advocacy. It offers interesting opportunities to increase maternal mortality data ownership and awareness, and warrants further study and validation.

INTRODUCTION

The maternal mortality ratio (MMR) has been used to monitor progress toward Millennium Development Goal 5, and is again included in WHO's Sustainable Development Goals. Statistics not only assist monitoring and evaluation of interventions, but also increase awareness around maternal death and action toward health improvement.^{1,2} However, the reliability of MMR estimates is a subject of debate. Data collection is often difficult owing to a scarcity of information, human resources, budget, and time. Moreover, local ownership of data is limited: researchers gain insight, but do not share the results with communities.²

In the Ngorongoro Conservation Area in rural northern Tanzania—predominantly populated by semi-pastoralist Maasai - skilled birth attendants (SBAs) are present at only 7% of deliveries.³ Maternal complications are a significant cause of death among pastoralist women,⁴ but gathering data has been difficult owing to migration and a lack of vital registration.⁵ Cultural silence about deceased individuals further challenges data collection.^{4,6} In 2001, the lifetime risk of maternal death among Maasai women was suspected to be higher than 1 in 33.⁶ In 2005, MMR among women attending prenatal clinics in Ngorongoro was estimated to be 642 per 100 000 live births.³ On the basis of the population count (81 071) in the catchment area of the local hospital and the rural Tanzanian crude birth rate in 2010 (390 per 1000 individuals), 3162 births would have been expected in this area in 2010.^{7,8}

The aim of the present study was to assess whether it was possible to measure maternal mortality in the Ngorongoro Conservation Area while maintaining local ownership of data.

MATERIALS AND METHODS

As part of an overarching qualitative participatory action research (PAR) project,⁹ between March 12 and May 30, 2011, researchers and illiterate traditional birth attendants (TBAs) in the Ngorongoro Conservation Area collaboratively developed and cross-sectionally tested a quantitative participatory approach: the Pictorial Sisterhood Method. Ethical approval for the PAR was provided by the University of Calgary (Calgary, AB, Canada), VU University Medical Centre (Amsterdam, the Netherlands), Tanzanian Commission for Science and Technology, and National Institute for Medical Research Tanzania (research code NIMR/ HQ/R.8a/VoIX./876). Given the illiterate status of TBAs, verbal informed consent was obtained.

Full details of the PAR have been described elsewhere.⁹ Briefly, the PAR project stimulated participants to enact solutions to context-specific problems,¹⁰ which entailed finding solutions to local problems in maternal health and prevention of mother-to-child HIV transmission. The research took place between 2009 and 2011, and engaged local stakeholders (researchers,

Maasai women and men, TBAs, SBAs, hospital management, and community leaders) as co-researchers. Participants were included through expert sampling, including stakeholders who were interested in evaluating, and enacting solutions to, low use of maternal health services.⁹

Participants combined their knowledge, whether local experience, or cultural or academic knowledge. Through such a mix of knowledge, called “co-generative enquiry”, new knowledge is co-created; this often includes “outside-the-box” solutions that are extremely relevant to the local setting and that would not emerge if stakeholders participate in research in isolation.¹⁰ Additional data collection strategies to enrich and clarify information included naturalistic and participant observation, semi-structured in-depth interviews, and reflexive journaling.⁹

Two academic researchers (RS and YR, a former doctor at a hospital in Ngorongoro Conservation Area), a local research assistant, 19 Maasai TBAs, four hospital management and community leaders, and a supervising team (JH, MM, JvR, MZ, and FS) participated in the development of the Pictorial Sisterhood Method.

In the overarching PAR project, high maternal mortality was identified as a major local problem; however, silence around it hampered awareness of its magnitude, which contributed to limited use of SBAs.¹⁰ An SBA was defined in accordance with WHO as someone who is “trained to proficiency in skills needed to manage uncomplicated pregnancies, childbirth and the postnatal period, and in identification, management and referral of complications in women and newborns”.¹¹

The present participants discussed whether data on maternal mortality could be collected, and if and how the barrier of cultural silence might be respectfully overcome. Four semi-structured interviews with hospital management and local leaders addressed different methods to estimate maternal mortality. Only 68 institutional deliveries took place in 2010, and women experiencing complications of home delivery arrived at hospital in extremis, reflecting the severe underutilization of local health services and leading to limitations in calculating community mortality estimates from hospital figures. Follow-up data of women who attended prenatal clinics were limited. Government vital registration was hardly used by the Maasai community. Participants suggested the Sisterhood Method¹ as a possible alternative.

Although the sisterhood method is deemed unreliable in populations that migrate,¹ participants suggested that it might increase insight into local maternal mortality among the Maasai community itself by breaking the silence. Talking about deceased individuals

is restricted to specific people,⁶ and outsiders can easily take the wrong approach. Maasai TBAs stated that they would be able to appropriately collect these data in their communities. Researchers regarded the involvement of TBAs as crucial, respecting their central role in childbirth and in maternal-health-related research locally.⁹ The TBA community that had participated in the overarching PAR project selected 19 TBAs for the present study. Although their illiteracy formed a barrier, active participation in the whole project and statements on motivation to improve maternal health were great motivators.⁹

The original indirect sisterhood method consists of four questions (Box 1).¹


Box 1 - Questions in the sisterhood method^a


1. How many sisters (born to the same mother) have you ever had (including those who are now dead)?
2. How many of these ever-married sisters are alive now?
3. How many of these ever-married sisters are dead?
4. How many of these dead sisters died while they were pregnant, or during childbirth, or during the 6 weeks after the end of pregnancy?


^a Reproduced from The Sisterhood Method for Estimating Maternal Mortality: Guidance notes for potential users ¹ with permission from WHO.

To overcome illiteracy, researchers, a Maasai research assistant, and TBAs collaboratively discussed how these questions might be adapted to the Maasai setting, which led to the Pictorial Sisterhood Method (Fig. 1). Pawns depict the women and their “ever-married” sisters, circles indicate live births¹². An oval shape was collectively chosen to indicate a pregnant or 6-week postpartum status. Sisters were defined as those from the same biological mother - an important fact in polygamous Maasai marriage. Only after having reached puberty and, by tradition, after rituals including circumcision, young women are considered to be ready for childbearing.¹³ Although female circumcision is illegal, “post-circumcision” was used to delineate female sibling inclusion in line with previous Maasai population research after local advice from TBAs. The postpartum period of 42 days, when not clear, was replaced by “entomonone,” the period of seclusion after childbirth, which varies among families from some weeks to some months.⁶

Phone:
Return date:
Name:

 Alive

 Has died
--

 Died while pregnant / giving birth / within six weeks after birth

<input type="checkbox"/> Alive

<input checked="" type="checkbox"/> Has died
--

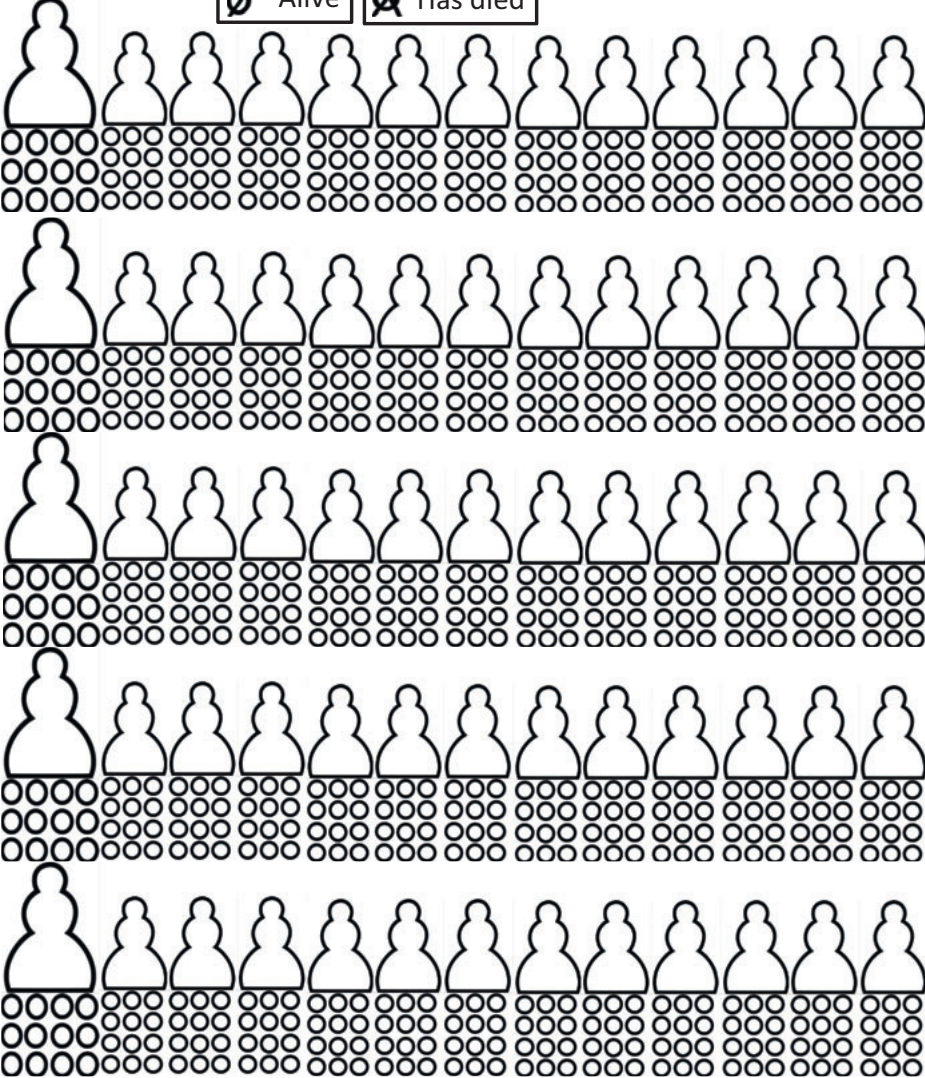


Figure 1. Empty Pictorial Sisterhood Form (English version). One form could be used to interview five separate women.

Researchers developed the research form in line with advice from the TBAs and practiced how to use it with the TBAs (Fig. 2). Every line of the form starts with a big pawn that was checked (via a diagonal line), representing the woman interviewed by the TBAs and/or researchers. Consecutively, the adjacent smaller pawns were checked according to the number of “post-circumcision” sisters of the woman. When a “post-circumcision” sister had died, a second diagonal line was put across the pawn, creating a cross. Next, sisters who died while they were pregnant, during birth, or in the postpartum period were identified by drawing an oval shape inside the “womb” of their crossed pawn. From each sister, checking circles below their pawn identified live births. In practice interviews, some women included spontaneous abortions and stillbirths as live births, owing to the significance that these pregnancies hold in the Maasai community. Spontaneous abortions have historically been interpreted as children who stay inside the woman in a different form and remain “in her back”.¹⁴ TBAs and women were specifically instructed not to include spontaneous abortions as live births.

During the study, TBAs visited as many homes of women of reproductive age in their communities as possible, and applied the Pictorial Sisterhood Method. Although it was planned that male respondents would be included, they were excluded soon after the study began because they had insufficient knowledge on the pregnancy status of sisters.

Using the Pictorial Sisterhood Method, researchers also interviewed women who attended prenatal clinics and markets to identify any problems that might occur while using the form. Researchers and TBAs discussed progress and challenges during market days, a common local opportunity for information exchange.

Study data were entered into Excel 2010 (Microsoft, Redmond, WA, USA). The MMR was calculated, with 95% confidence intervals (CIs), as the number of maternal deaths per live births \times 100 000. After calculating the MMR, researchers and TBAs shared the data in a presentation that was attended by hospital staff, local leaders, and politicians.



Figure 2. TBAs practicing to fill in the Pictorial Sisterhood Method

RESULTS

Five TBAs did not understand how to fill in the form correctly or had exclusively interviewed women with sibling maternal deaths that they already knew about. These five biased samples, which included only women with sibling maternal deaths, differ from the other TBA Pictorial Sisterhood samples, which also included women without sibling maternal deaths. The data from the five TBAs provided interesting samples for maternal death audits. Because of their bias, however, the data collected by these five TBAs were excluded from the maternal mortality calculations.

Thus, during the 8-week study period, 14 TBAs interviewed 496 women (sample), which led to 2241 sister units of risk and a MMR of 689 (95% CI 419-959). Researchers interviewed 474 women (sample), leading to 1487 sister units of risk and a MMR of 484 (95% CI 172-795).

The TBAs showed that the Pictorial Sisterhood Method is a feasible way to involve illiterate individuals in measuring maternal mortality. The method also provided community members with insight into local maternal mortality. There was an increase in awareness that losing women through maternal death was not an exceptional experience affecting only some individuals, but a shared experience that was common within many communities. As one Maasai TBA stated:

“I thought we were just unlucky, but this is a bigger problem that affects all of us”.

DISCUSSION

The PAR project within a rural Maasai community has led to a new method to estimate the MMR: the Pictorial Sisterhood Method is an innovation of the indirect sisterhood method that involves illiterate stakeholders. Importantly, this method needs further development and testing.

The Pictorial Sisterhood Method resembles methods such as the quantitative participatory method (QPM) or participatory statistics. QPM involves communities in data gathering, monitoring, and evaluation of societal problems, and has been applied in agricultural, environmental, development, and policy research. The book “Who Counts? The Power of Participatory Statistics” offers examples and an introduction to QPM.¹⁵ Chambers states that QPMs create revolutionary “win-win” situations—i.e. while scientists/practitioners gain data through the insights generated, (illiterate) communities gain situational awareness and ownership, increasing empowerment.¹⁵ Application of QPM in maternal health research is

very limited. Examples are not labeled as QPM, but include TBAs who followed up maternal and perinatal deaths¹⁶ and who adequately reported on maternal health, even when illiterate.^{17,18}

The present MMR estimate resembles results from other sisterhood method studies in Tanzania.^{19,20} The possibility that the sisterhood method assists advocacy in maternal health is mentioned in the original sisterhood method explanation,¹ but how this occurs is not explicated in the Tanzanian studies. The Pictorial Sisterhood Method might provide an entry point for maternal death audits, enabling factors contributing to mortality to be identified.¹ A study in Cambodia indicated that surveys through primary informants do not generate other statistical data, but gain more qualitative information on the reasons why women die.²¹

By removing literacy barriers, the Pictorial Sisterhood Method increases local skills and capacity to collect data on maternal mortality.² As suggested by Graham,² it assists advocacy for safer motherhood.¹ Collaboration with the community, especially with TBAs, increased availability and accessibility of maternal death stories and increased appropriateness of data collection in the present Maasai context. Ownership of information stayed where it should – in the community. This might increase action that is based on local facts even when vital registration systems are non-existent because, as Freedman et al. stated, “What you count is what you do and where your resources go”.²²

However, although participants and researchers assumed that this knowledge might lead to increased skilled birth attendance, TBAs also stated that awareness of maternal mortality without actions would be only a painful experience. At the meeting where results of the Pictorial Method were presented, TBAs advocated for increased collaboration between community and health services to reduce maternal mortality. This request was also addressed during the overarching PAR project,⁹ and the research facilitated collaboration between TBAs and SBAs. This resulted in the creation of women-centered care at the local hospital, whereby TBAs and SBAs combined their qualities in caring for women in labor.⁹ Advocacy through participation is an application of human rights principles to maternal health, which can assist the connection of communities to institutions.²³ Freedman et al. warned that the creation of accountable health systems and improvement of maternal care systems need to occur simultaneously to improve maternal health.²²

The study has a few limitations. Like any sisterhood method, the Pictorial Sisterhood Method does not result in data of sufficient quality for international comparison. Additionally, the sisterhood method is a retrospective method: the present MMR reflects the 10–15 years preceding the study and the results cannot be used as ongoing report system to monitor either MMR changes or the impact of safe motherhood programs.¹

Given the estimated local MMR of 642,³ the sample size was too small, leading to large CIs.¹ Logistical problems (availability of money, transport, fuel and time) restricted efficiency of testing the Pictorial Sister Method in a larger study sample. Involving men in the sisterhood method offers an opportunity to increase sample size. In the present study, men had insufficient knowledge of the pregnancy status of their sisters, but other studies have shown that questioning males on maternal deaths among their sisters can increase sample size, thus narrowing CIs without leading to data that are significantly different from those obtained when only women are interviewed.²⁴ Another limitation was the inability to create age categories, as is usual in the sisterhood method, because the women did not know their age. Although the validity of data generated by the Pictorial Sisterhood Method should be tested in future studies, data from other QPMs have shown that participatory statistics generate valid results.¹⁵

Use of the Pictorial Sisterhood Method requires awareness of, and adaptation to, local definitions of pregnancy and birth. Misconceptions could have affected data collection in the present study. If early pregnancy loss were included in counting live births, it would have increased the numerator and decreased the MMR. By contrast, “incommensurability between Western biomedical and local categories of reproductive loss”²⁵ might influence the data in the opposite direction. Reproductive narratives from women in rural Tanzania indicate that women often hide early neonatal death, stillbirth, spontaneous abortion, and early stages of pregnancy. Disclosure of these events increases social control, and one-third of the interviewed women were blamed for the loss of pregnancy.²⁵ The Pictorial Sisterhood Method might face this bias equally one way or the other if women do not wish to disclose their past pregnancies and outcomes to local researchers.

CONCLUSION

Despite these limitations, the Pictorial Sisterhood Method is an innovative tool that requires further study. Participatory statistics or QPMs deserve to be applied in maternal health research to test and improve its potential. Its possible use in advocacy for safe motherhood would be interesting to monitor, especially in remote communities that are recognized as most vulnerable in reaching the WHO’s Sustainable Development Goals. We invite others to use, test, develop and improve the Pictorial Sisterhood Method.

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7

Increasing Safe Motherhood Practices through building on Sustainable Relationships between Maasai Traditional Birth Attendants and Hospital Staff & Structures in Ngorongoro, Tanzania

Yadira Roggeveen, Lauren Birks, Mange Manyama, Joske Bunders, Jennifer Hatfield, Jos van Roosmalen

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NOTE

This chapter is a summary of the presentation given during the FIGO World Congress of Gynecology and Obstetrics in Rome on 11th October 2012. It is illustrated by the quotes used in the presentation. Results are drafted for a future publication. Details on background, methodology and references can be found in previous chapters of this thesis.

SUMMARY

Background: Endulen Hospital is the only hospital in the Ngorongoro Area, Tanzania, serving a semi pastoralist community of mainly Maasai (81%). Skilled birth attendance is estimated to be 7% of deliveries in the catchment area. Most deliveries are at home, facilitated by traditional birth attendants (TBAs). Of the female hospital admissions in 2008, 10% was associated with complications of motherhood.

Objectives: To investigate barriers perceived by TBAs and hospital staff, causing women not to deliver in the hospital. To increase bilateral knowledge about practices at home and hospital. To find common ground for TBAs and the hospital to cooperate.

Underlying values and principles: Community engagement has been known to increase the success of health promotion. We are more likely to succeed in reducing morbidity and mortality in Motherhood when incorporating traditional values and approaches into the biomedical approach of the hospital.

Knowledge / Evidence base: Increasing cooperation in skilled birth attendance and good practices in safe motherhood can contribute to reduction of complications like maternal mortality and therefore contributes to MDG 5.

Context of intervention / project / work: This is representing part of a multi-focus research conducted at Endulen Hospital (Safe Motherhood, PMTCT, family planning, infertility). Through community engagement a need was identified to discuss these topics and work towards a holistic approach to better meet the community's maternal health needs.

Methods: Participatory action research (PAR) methodology was used to conduct this research. PAR seeks to incorporate and engage the non-experts/co-researchers (Maasai women) into the research. The researcher collaborates with participants to examine, as well as to seek and enact solutions to problems identified in the community that contribute to little hospital based deliveries. This process is termed as *co-generative inquiry*, where knowledge is cogenerated through collaborative communication between research and co-researchers, which generates action that is linked to social change.¹

23 PAR sessions and 31 interviews were conducted between 2008 and 2011 (participant distribution is given in Chapter 5 of this thesis).

Results: We qualitatively analysed our data through using the Three Delay Model by Thaddeus and Maine, in which many results revolved around perceptions of quality of care (presented

in Chapter 5). TBAs and SBAs were regarded to offer different and complementary qualities of care, in which:

“She (TBA) works more close to God.” (Maasai woman)

and

“They (SBA) immediately inject you and then they will make sure that each and everything comes out which is supposed to get out.” (Maasai woman)

Discontinuity of care was mentioned as reason not to deliver with an SBA in the hospital.

TBA's expressed the following barriers to hospital delivery: they feel not welcome in labor ward (attitude hospital staff, no place to sit/sleep), no place for traditional rituals, bad environment to deliver (cold, no food / drinks ready), distance, uncertainty about transport, obstetric emergency procedures, language barrier, financial barriers and barriers related to gendered roles.

Hospital staff complained late presentation by TBA's of women in labour, mostly with complications of labour. Other barriers to collaborate with TBA's were hygiene, language barrier, misunderstanding of traditional rituals like abdominal massage, interference of TBA with sterile procedures (p.v. examination and episiotomy).

Solutions: Through participatory action research, TBAs and SBAs talked about barriers to provide care of good quality.

“They say the mother is left alone in the labour ward. They want a nurse to be there all the time, but this is not possible, there are not enough.” (SBA)²

Through discussions they decided to try to shape collaborative care for women in labour. This led to hospital childbirths with both a TBA and SBA present.

“She (TBA) can see if something's wrong, which she can advice the doctors and then it can help me also.” (woman in labour)

There were barriers to overcome, as common practice in the hospital as well as in medical training had taught otherwise:

“We are learning in training that a relative is not allowed to sit in labour.” (SBA)

Hospital management, TBAs and SBAs decided to overcome barriers by trying out collaborative care in labour ward. This was greatly appreciated by women in labour, as illustrated by the following quotes by women who experienced care from her TBA in the hospital:

“She was just comforting me.”

“She is my eye.”

Also care by hospital SBAs was appreciated:

“They are really good people.” (woman about SBA)

However, the implementation of collaborative care in labour ward did not much affect skilled birth attendance in the hospital (from 47 in total in 2008 to 68 in total in 2010).

Conclusion: Results showed barriers for women to come for hospital delivery. Discussion between TBAs and SBAs brought understanding of and ways to overcome barriers, which led to action (TBAs allowed inside labour rooms, temporary maternity ward set up, involving TBAs in designing of a new maternity wing, reconsideration of hospital fee structures and involving men in education). PAR with community members seems a very useful tool to evaluate and overcome barriers. Whether new practices can further increase skilled birth attendance at Endulen Hospital, needs to be followed up. Our data support a change from a polarized debate³ on TBA involvement in maternity care towards a context specific approach^{4,5}.

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General discussion

GENERAL DISCUSSION

With this thesis I contribute to finding answers and strategies for increasing low skilled birth attendance (SBA) in low-resource settings in order to ultimately reduce maternal and perinatal mortality and morbidity. In **Part One** the effect of birth preparedness and complication readiness (BP/CR) programs on SBA is analyzed and qualitatively studied which contextual factors influence implementation of BP/CR interventions. In **Part Two** the improvement of SBA is analyzed by taking a contextual perspective and participatory action approach into consideration. In this discussion I provide an overview of research questions and reference to the chapters in which these are addressed. I continue with a reflection on the main findings, lessons learnt in a broader perspective and recommendations for care and research.

Part One: BP/CR INTERVENTIONS

Research question 1
How does the application of BP/CR effect SBA in low resource settings?
<i>BP/CR interventions have the potential to increase SBA in low resource settings, but are as strong as the weakest link in the maternity care pathway (Chapter 2 & 3)</i>

In order to increase SBA and access to Comprehensive Emergency Obstetric and Neonatal Care (CEmONC), the BP/CR Matrix¹ was designed keeping shared responsibility along the maternity care pathway in mind. Identifying roles and responsibilities of women, families, communities, maternity care providers, facility managers and policy makers would help to overcome delay in the timely receiving of adequate, appropriate maternity care of good quality.^{1,2} BP/CR was mostly defined as knowledge and preparation of the following: a woman who identified place of birth, a birth companion, transport, potential blood donors, saved money and who knows danger signs in pregnancy. Women are considered “prepared” even if they only partially meet these criteria.

However, knowing what BP/CR *is* and knowing what to *do*, does not equal *doing it*, nor does it assure a birth with SBA (**Chapter 2**). We have shown that BP/CR interventions are complex context-dependant interventions that have the potential to increase SBA, but do not necessarily do so (**Chapter 2**). Convincing evidence of context analysis in the studies included in our review is limited.

The effect on SBA seems stronger when BP/CR strategies are applied in combination with other strategies (**Chapter 2 and 3**). BP/CR interventions are as strong as the weakest link in the continuum of the maternal care pathway (**Chapter 2 and 3**). Weakest links in getting to SBAs (skilled birth attendants) need to be addressed to effectuate attendance at health

facilities, otherwise women who are considered “well” or “partially” BP/CR prepared still remain at home³. For example: women who know where SBA is, how to get there and in what circumstances, are still not going if they did not anticipate the decision to really go, or when money for transport or hospital fees are not prepared (**Chapter 2, 3**). From the NCA context (**Chapter 5**) we find an example that a lack of clarity around costs for transport or hospital care contributed to money not being prepared.

We describe in **Chapter 3**, that implementation of BP/CR interventions is facilitated when interventions are contextualized through multi-stakeholder involvement, in a process where context-specific practices and knowledge are respected. Multiple levels from the BP/CR matrix within local health systems (community health workers, dispensaries, health centers, hospitals, referral hospitals) need to connect to form BP/CR pathways. Local health care capacity should prepare for increased demands to avoid negative care experiences (**Chapter 3**).

However, application of the BP/CR matrix as a whole is marginal. None of the programs in our review, context analysis nor recent publications report on BP/CR of *all* stakeholders. The focus remains on the demand side of care (women, families, communities). Although many facility and health systems’ improvements could fall under the BP/CR matrix, such as obstetric skills training or improved facility supplies, they are not labeled as “BP/CR actions” in the literature and thus not accessible to be analyzed as BP/CR interventions. Various authors stress the need for further linkages between stakeholders within the BP/CR matrix (**Chapter 3**). Successful more recent examples include policy makers and NGOs who align with local needs and fill in gaps in the maternity care pathway: securing and sustaining medical insurance, transport, referral schemes, fee structures or payments of community health workers (CHW).³⁻⁶

Addressing social determinants of poor maternal health on BP/CR, such as poverty, limited education and political instability is very challenging. Examples of critical determinants include a correlation between higher education and more complete BP/CR practices (**Chapter 3**). Vice versa school absence and school denial of pregnant girls leads to less educated girls.⁷⁻¹⁰ These determinants could be addressed through collaboration between district medical officers and others at their level of representation, from disciplines such as education. Policymakers, but also district reproductive and child health coordinators can help strengthen important messages about the need for ANC attendance, BP/CR and SBA. As a maternal health professor in Tanzania called upon SBAs and women to take mutual responsibility in the provision of maternity care: health workers to upgrade their knowledge and skills to provide care of good quality and women to seek care timely and not await emergencies.¹¹

Some recent studies, published after our research from Chapter 2 and 3, report positive effects of BP/CR interventions on SBA. Stronger effects are found when BP/CR preparations are more complete. In rural Tanzania, more BP/CR knowledge was correlated with institutional birth (aOR 2.45, 95 % CI 1.12-5.34).⁷ In another Tanzanian study there was some evidence that personalized birth plans led to increased SBA (16,8% adjusted difference in proportions between intervention and control areas; 95% CI 2.6-31.0, p=0.02).¹² In Bangladesh increased BP/CR was associated with increased SBA (OR 2.4; 95% CI 1.9-3.1).³ Another study in Bangladesh showed that more components of BP/CR correlated with a consistently increasing odds of SBA; aOR 3.3 (95% CI 1,6-6,6) for 3-5 BP/CR components, aOR 5.5 (95% CI 2,5-12,4) for 4-5 BP/CR components, aOR 10.4 (95% CI 3,1-34,4) for all 5 BP/CR components compared to a control area without a BP/CR program.¹³

Research question 2
Which contextual factors are to be considered when implementing a BP/CR programme in low resource settings?
<i>BP/CR education during ANC should be simple, personalized, repeated and followed up (Chapter 3)</i>
<i>Male involvement in BP/CR should be implemented, but carefully (Chapter 3)</i>
<i>Local knowledge should be respected and represented in BP/CR and maternity care pathways (Chapter 3)</i>

BP/CR education during ANC should be simple, personalized, repeated and followed up

The results of **Chapter 3** show that BP/CR programs should always contain messages on uncomplicated childbirth. Complications can arise unexpectedly, even when “nothing is wrong during ANC” or “previous births have been uncomplicated”.^{Chapter 3, 14} A study in Guinea showed that only when women’s BP/CR knowledge included preparations for uncomplicated birth, was this positively associated with BP/CR practices and with SBA¹⁵. This supports our findings that the focus on complications in BP/CR can dilute the message, which should be very clear to have an effect: “Just come to SBAs for any childbirth” and “How can you get there?”.¹⁵

More recently, frequent ANC attendance was positively associated with BP/CR practices in Nepal, Bangladesh and Tanzania.^{3,7,13,16} In Rwanda, this relation between more frequent ANC visits and increased BP/CR knowledge and practices was not confirmed.¹⁴ Increased BP/CR knowledge, practices and SBA are correlated to ANC providers and CHW who a) counsel on BP/CR repeatedly, b) include multiparous women, c) inquire on decisions (not yet) made around place of childbirth and d) provide personalized advice involving women and their families (**Chapter 3**,^{3,13,14,16}). Doing this in the time available for ANC is challenging¹⁷, but was not negatively influencing ANC satisfaction of women and providers in Tanzania.¹²

Male involvement in BP/CR should be implemented, but carefully

Recent publications support our results from **Chapter 3**, that male involvement in BP/CR is crucial, thus gendered roles in decision-making around childbirth need to be navigated.^{15,18,19} Female empowerment is of utmost importance, economically and around childbirth⁸. However, facing the realities women live in, care providers should also include male decision makers in BP/CR education.²⁰ Low male BP/CR knowledge^{18,21,22} could be tackled through couple counselling at home, during ANC,¹³ or in male gatherings.¹⁹

Couple preparedness amplified the effect of BP/CR in Bangladesh.¹³ In a setting, where husbands were decision makers in 70% of childbirths, a higher level of education of husbands correlated with increased BP/CR.³ Male BP/CR education in Tanzania has resulted in increased male involvement in childbirth.²² In a systematic review male involvement in low resource settings significantly reduces odds of postpartum depression (OR 0.36; 95% CI 0.19-0.68 for male involvement during pregnancy; OR 0.34; 95% CI 0.19 - 0.62 for male involvement post partum).¹⁹

Engagement of men thus is a promising maternity health promotion strategy. However, some careful considerations should be made. Negative effects of male education on couple relationship dynamics should be mitigated²³, as intimate partner violence in itself is a reason for low ANC attendance (aOR 0.75; 95% CI 0.61-0.92) and low SBA (aOR 0.8; 95% CI 0.69-0.92).²⁴ Moreover, implementation of male involvement in ANC should not be counterproductive; when men were invited to accompany women some men have not supported their wives going to ANC and women who came without husbands have been declined ANC by care providers.^{25,26}

Local knowledge should be respected and represented in BP/CR and maternity care pathways

There is an assumption that individuals and communities living in poverty have less knowledge regarding health matters, in studies often correlated to the level of formal education or measurable health knowledge.^{27,28} However, what is measured as knowledge seldom includes knowledge on context specific factors contributing to real life problems.^{27,28} In the BP/CR part of this thesis, this is reflected in what was counted as “being prepared”: mostly defined as knowing danger signs in pregnancy and making preparations from the biomedical paradigm. When measured as such, women are often regarded as having “limited knowledge”. However, women do prepare their homes for labour, hold excellent knowledge of how to live in their setting and mitigate complex dynamics.²⁸ They consider various options of labour companionship, transport and location from their own perspective that often revolve around perceptions of quality of care.²⁹ Different “knowledge cultures” thus co-exist.²⁹

Researchers should realize that in low resource settings, many actors who hold excellent knowledge on local maternity care, such as communities, TBAs and SBAs might not have the opportunity nor the power to explicate their perspectives and valuable advices on how maternity care can be improved and access to SBA increased.³⁰ When developing context specific maternity care, representation of local knowledge is needed with special attention, recognition and respect for local, often indigenous knowledge.^{29,31} I reflect on this more in depth in the last section of this discussion.

To ensure that knowledge co-creation and social learning takes place, classical applications of patient participation do not suffice.³⁰ Participatory and transdisciplinary approaches can complement, but even then researchers need to rethink their roles as primary investigators and see themselves more as facilitators.³¹ Furthering solidarity and deliberative dialogue as ethical bases to community engagement and research in global health could foster empathy, understanding, recognition and moral imagination between researchers and community members.^{32,33}

Connections between the “knowledge-holders” and policy makers need to increase at all levels of maternity care. Policymakers’ lack of knowledge on public and maternal health are critical barriers towards evidence-informed policymaking and maternal health fund allocation.³⁴ The SDGs stress the importance of exogenous (formalized) knowledge, such as education for girls, but they are ambiguous about the importance of local (indigenous) knowledge.³⁵ The Knowledge Agenda for Development puts co-creation of knowledge central in sustainable development and in this way complement the SDGs.³⁶ The importance of knowledge co-creation, transdisciplinary approaches and connecting to policy makers within maternity care could also be further integrated in midwifery and medical education.³⁴

Part Two: LOW SBA IN A MAASAI COMMUNITY IN NORTHERN TANZANIA: A COMPLEX REALITY REQUIRING ACTION

Research question 3
What does motherhood entail from a local perspective and how does this influence health care needs and demands locally?
<i>Maasai motherhood has complex linkages with Maasai culture and practices. Hospital maternity and fertility care does not meet the needs connected to these linkages (Chapter 4)</i>

Motherhood from a Maasai perspective in northern Tanzania: the need for fertility care

In **Chapter 4** we described how factors such as Maasai culture and associated practices, HIV and infertility influence maternity care needs and demands in northern Tanzania. Fertility

care as part of “planning a family” was requested by participants in order to reduce HIV risks that were associated with traditional practices.

Infertility in low resource settings has been a chronically neglected topic.³⁷ In 2019, infertility worldwide was estimated to affect around 8-12% of couples of reproductive age, in both high and low resource settings.³⁷ Infertility in low resource settings, however, differs from infertility in high resource settings in a number of ways; as explained in the following paragraph, based more often on secondary infertility and of longer duration.³⁷⁻³⁹ Although infertility was incorporated in research and in guidelines on human reproduction by WHO, progress in access to fertility care in low resource settings is very slow.³⁸⁻⁴⁰

Infertility is part of the complexity of pregnancy related illnesses in various ways. Infectious diseases, pregnancy and childbirth complications often caused by poor access to maternity care, including safe abortion care, can lead to pathology of the internal genitalia, including impaired conception and ectopic pregnancies.³⁸ Infectious diseases that cause male and female infertility are not limited to sexually transmitted diseases, but include infectious diseases very prevalent in low resource settings, such as tuberculosis and schistosomiasis.³⁸

As illustrated in **Chapter 4** for a Maasai context, social consequences of infertility are enormous when female roles in society are intrinsically and exclusively linked to motherhood. While globally 50% of infertility is attributed to male health factors, women are mostly blamed for not conceiving.^{38,41} Not fulfilling motherhood is personally painful, is associated with depression and can lead to social exclusion and intimate partner violence, further aggravating pain.^{40,42,43}

Female participants in our study shared their worries that lack of access to fertility care could increase exposure to HIV (**Chapter 4**). HIV relates to infertility in two ways: being infertile exposes women to longer unprotected intercourse, which can lead to HIV infection and already HIV positive women conceive with more difficulty.⁴⁴ Acting on these findings led to the initiation of counselling, basic testing (semen analysis and ultrasound) in Endulen hospital and referrals for specialized diagnostics (hysterosalpingography) and treatment.

Although some decline in primary infertility has been reported in sub Saharan Africa, the absolute number of infertile couples increased due to global population growth.⁴² As professor Mahmoud Fathalla stated: “In a world that needs vigorous control of population growth, concerns about infertility may seem odd, but the adoption of a small family norm makes the issue of involuntary infertility more pressing”.³⁹

The body of literature on infertility in low resource settings is growing steadily. The WHO topic page on infertility provides linkages to the history of infertility care in low resource settings, recent reports and ongoing research.⁴⁵ Some successful examples of fertility care that is made affordable and accessible in low resource settings include Egypt, Uganda and Kenya.^{37,39,41} Guidelines, tools, advocacy and financing for implementation of fertility care in low resource settings are further developed.³⁹

A more holistic approach to fertility care that provides linkages with reproductive and maternity care, including family planning and HIV care, is of utmost importance.^{40,44} Especially in addition to ANC and childbirth, quality reproductive health care including fertility care can be entry points to improve maternal and newborn health outcomes.³⁸ Some patients who presented for fertility care in Endulen Hospital later became pregnant and gave birth with an SBA. Some women related their positive fertility care experience to increased trust in maternity care as well. This anecdotal evidence suggests that SBA utilization can grow when fertility care is provided.

Research question 4
Which contextual factors contribute to low SBA in Ngorongoro, Tanzania?
<i>We identified a variety of factors that contributed to underutilization of SBA, which caused delay in all Phases of the Three Delays Model of Thaddeus and Maine (Chapter 5).</i>

Factors contributing to low skilled birth attendance in Ngorongoro, Tanzania

In **Chapter 5** using a PAR approach and the Three Delays Model of Thaddeus and Maine, the complexities underlying low SBA in Ngorongoro, Tanzania were revealed.^{2,46} For each phase of delay problems and possible solutions were identified.

Recent studies in Northern Tanzania in Maasai populations and adjacent areas confirm our results. Health facility related factors, self-perceived obstetric risk, economic concerns and socio-cultural issues were emerging themes when analyzing low SBA.^{47,48} Insights in current and traditional Maasai herbal medicine use and preparations around childbirth (food, butter, firewood and clean supplies)^{49,50} resemble experiences during our study period that are so far unpublished. Home birth is regarded a blessing from God and a safe normal life event, for which TBAs and herbal medicines are more trusted than SBAs.^{47,49} BP/CR was limited.^{47,49} TBAs did not accompany women to SBAs outside emergencies and were not invited into labour wards when they did,⁵⁰ which is supported by data and the responses of our study participants:

“The TBA is not allowed in the labour ward. This is hurting us, as we want to be with the mother. We feel not respected” (TBA)⁵¹

*“There is a new environment for us, there are new people there we do not know, and then someone else is taking care of you (woman who chose to give birth at home)”.*⁵²

Negative SBA care experiences and distrust of local facilities were described by the participants as reasons for low SBA.^{49,53} Experiences included out of pocket payments for maternity care⁴⁷, maternal deaths after referral⁴⁹, dirty wards⁴⁹, disrespectful care⁵³, stock outs of supplies including blood banks⁴⁹, male SBAs or unavailability of SBAs when arriving in a facility^{49,53}. All these concerns revolve around the themes of “failing to provide care” and “failing to care”.⁵³ Migration, relating transport costs and delays in decision making also contributed.⁴⁹ Research on Maasai women’s empowerment through use of mobile phones show ambiguous results.⁵⁴ Maternity waiting homes are advised.⁵⁰ The 24/7 availability of SBA in health facilities and provision of culturally sensitive care remain problematic.⁵⁰ Not only cultural practices, beliefs and socio-demographic factors need to be addressed, but maternity care should consider comfort, women’s birth preferences and modesty as TBAs do locally.^{48,55} However, although women had their last childbirth with TBAs, a steady change in support of SBA was noted among women and TBAs.⁵⁰

These results in 2020 did not differ much from our results ten years earlier and this confirms low SBA to be a persistent problem in Ngorongoro. Contextual problems outside health care that Maasai in Ngorongoro and other pastoralist peoples in East Africa are facing, are topics of continuous debate, advocacy and programming by parties other than health care providers.^{56–58} The promising visions and missions, concerning sustainable livelihoods and development, conservation and tourism need implementation and evaluation to positively affect the well being of the peoples involved.⁵⁹

Research question 5

Which local solutions to these contextual factors can be addressed to increase SBA in Ngorongoro, Tanzania?

*Local solutions to contextual factors in Ngorongoro, Tanzania include:
The Pictorial Sisterhood Method (Chapter 6)
Collaborative care between TBAs and SBAs (Chapter 5 & 7)*

The Pictorial Sisterhood Method

In **Chapter 6** PAR with illiterate TBAs led to the development of a Quantitative Participatory Method (QPM), the Pictorial Sisterhood Method, an innovation of the original Sisterhood Method.⁶⁰ It was used to overcome silence around death as cultural barrier so as to experience the magnitude of maternal mortality. The intent was to develop a more accurate view of the problem in order to take action.. By pilot testing, TBAs showed that they can use

this quantitative participatory tool and we shared lessons learnt. We stressed the utmost importance of linking the method to other actions for maternity care improvements, as only talking about death without action will be a painful and harmful experience (**Chapter 6**). Our results resemble other studies where TBAs use pictorial tools for ultrasound results, gynaecological examination, cervical carcinoma and the human papilloma virus (HPV).^{61,62} As in our study, development of those tools provided a platform for knowledge exchange around childbirth practices and needs, gynaecological examination and HPV.^{61,62}

MMR in Arusha region, wherein NCA is located, was estimated from DHS data at 585 per 100.000 live births in 2015.⁶³ As any Sisterhood Method, the Pictorial Sisterhood Method cannot create exact comparative numbers on maternal deaths. For this, all births and deaths must be registered in Africa⁶⁴ and experimental vital registration systems further tested and implemented,⁶⁵ such as the Maternal Death Surveillance and Response (MDSR) systems.⁶⁶ This will be a tremendous undertaking, as the World Health Statistics 2019 reported that 63 of 194 WHO Member States lack recent primary data for more than half of the health-related SDG-indicators. Digitalizing data could assist this endeavour, but as many health professionals in low-resource settings need to cope with incomplete and inaccurate information systems, also digital data will probably inadequately answer any questions that need to be answered.⁶⁷

Participatory data collection in maternal health, as with the Pictorial Sisterhood Method, is not reported in a recent review on measuring maternal mortality in low- and middle-income countries.⁶⁸ We presented our results at the 2nd Global Women's (GLOW) Research Conference in Birmingham (2013). We continue to invite others to further test the Pictorial Sisterhood Method or other QPMs, because the potential of QPMs for knowledge exchange and advocacy deserves further study while data ownership stays within the communities. It will be interesting to follow a new study in NCA, where TBAs provide interpersonal behavioural change communication and a structure for a community health information system that registers deaths, births and new pregnancies detected during home visits.⁵⁰

Research question 6
How does implementation of locally identified solutions affect the identified problems? Does it increase SBA?
<i>SBA hardly changed between 2008 and 2010 (Chapter 6)</i> <i>Qualitative evidence supports the Pictorial Sisterhood Method and collaborative TBA-SBA care and identified ongoing challenges (Chapter 5, 6 & 7)</i>

Collaborative care between TBAs and SBAs

In **Chapter 7** our results in "Linking community to skilled birth attendance in Ngorongoro" are presented.⁵² SBAs and TBAs collaborated through PAR towards understanding each other's

forms of care, overcoming barriers to utilization of SBAs and TBA-SBA collaboration, which continuously guided local maternity care adaptations. This resulted in more patient-centered maternity care, which included preferred care shared between TBAs and SBAs, combining traditional and biomedical paradigms of childbirth in the hospital labour ward.

The number of hospital births by SBAs hardly changed from 47/year in 2008 to 68/year in 2010, whereas 3162 births would have been expected in this area in 2010, calculated from the population count (81 071) in the catchment area of the local hospital and the rural Tanzanian crude birth rate in 2010 (39 per 1000 individuals).^{69,70} In hospital births are still few and cannot be attributed to TBA-SBA collaboration nor the Pictorial Sisterhood, however a SBA explained how positive hospital experiences from collaborative care created words of mouth: *“If the woman maybe deliver in the hospital, when she goes back to the village, she explains to the others - o, when I go there, I get a delivery, I get nurses, good nurses, good doctors, I get care... so it motivates others: it is better to go there, it is better to go there”* (SBA).⁵²

The adapted hospital care incorporated local needs, but also put those involved out of their comfort zone. Distrust and growing trust between women, TBAs and SBAs influenced implementation, as well as historic and institutional factors, such as (ideas about) rules and regulations, education and experience, as is illustrated in the following quote: *“We are learning in [medical] training that a relative is not allowed to sit in labour ward”* (SBA)⁵². Through TBA-SBA collaboration these ideas changed: *“I have learned something, because we used not to have TBAs in the school, I mean in nursing college where I learned, we never had something to do with the TBA. I have just come to experience it here”* (SBA-unpublished quote).

To increase SBA, many issues needed resolution still, such as embedding this context specific care in institutional regulations, financial and physical spaces in NCA. Even so, efforts were much appreciated by labouring women, who felt comforted and watched over by TBAs: *“She was just comforting me”* (Maasai woman, shared care), *“She (TBA) can see if something’s wrong, which she can advice the doctors and then it can help me also.”* (Maasai woman, shared care), *“She is my eye”* (Maasai woman, shared care).⁵² The hospital management and owners took identified problems and solutions into account, among others through increasing comfort in the labour ward and nursing stations, through light, wiring, supplies and advices to build a maternity waiting home⁷¹ where TBAs were allowed to stay with women.^{Chapter 7,⁵²}

Collaborative models between TBAs and SBAs have potential. Historically debates and policies around TBAs have been polarized, often resulting in governments prohibiting TBAs, which led to disengagement and disconnection of local TBAs with local health care.^{72,73} In reality, many women continue to use the care of TBAs.^{73,74} As a result, current TBA roles and practices

have been little understood.⁷³ The last decade, a more balanced view emerged, in which TBAs take on different roles, depending on local contexts. The systematic review by Byrne and Morgan (2011) provides an extensive overview of the different ways TBA inclusion in formal health systems can increase SBA⁷⁵ and the WHO guidelines on health promotion include new roles for TBAs.⁷¹

Research on collaborative models of care in Peru, Kenya, Nigeria, Tanzania and Uganda showed that interim collaborative models of care that are in line with local policies are viable options to facilitate the transition from TBA to SBA care, increase SBA, improve obstetric outcomes, experiences and reduce childbirth fear simultaneously.^{73,76–80} When Kenyan TBAs educated women on the importance of SBA, accompanied women to SBAs for which TBAs received a stipend, SBA increased significantly with 11.6 %. This effect was greater than only providing SBA for free (1,8% increase).⁸¹ However, it is important that TBAs are not merely instrumental to facilitate access to SBAs, but can form partnerships with SBAs. TBAs and SBAs offer complementary forms of care in providing context-specific maternity care that in combination is culturally sensitive care with access to CEmONC.^{73,82–84} As we showed among our quotes: *“‘She (TBA) works more close to God’ (Maasai woman) and ‘They (SBA) immediately inject you and then they will make sure that each and everything comes out which is supposed to get out’.”*⁵²

Aside direct care effects, knowledge exchange on both forms of care occurs in TBA-SBA collaboration, reinforcing one another.^{61,85} In NCA among others, knowledge exchange around management of peripartum haemorrhage, Maasai childbirth preparations and practices took place (unpublished results). Knowledge co-creation had the form of conversational information exchange and spontaneous role-plays, instead of lectures. SBAs shared their knowledge on first aid assistance in case of postpartum haemorrhage at home and on routine SBA-care in the hospital, including education on what CEmONC in the hospital entailed, and answered questions on the prevention of mother to child transmission of HIV, ultrasound, birth spacing and infertility (**Chapter 4**). TBAs especially appreciated the knowledge on post partum haemorrhage: *“Since that day you taught us, when a mother is giving birth, I do that [TBA showing uterine massage]... then it [the placenta] comes out fast, within minutes, we thank you [a SBA] very much”* (TBA-unpublished quote). TBAs shared this knowledge with peers during community meetings: *“I really tell them, even at big meetings I bring this news. I tell them, do this!”* (TBA-unpublished quote). One SBA reported an anecdote on shared care in the third stage of labour: *“The placenta was retained and we were preparing for manual removal. The TBA asked if she could do a trick with a leather strip to stimulate a strong abdominal contraction. I said, OK as long as you do not really make her vomit. She did the trick and the placenta was expelled. We all had fun that it worked.”* (SBA-unpublished quote).

As we have shown in part One of this thesis, it remains equally important to increase access and availability of SBA, including upgrading the skills needed to provide maternity care of good quality.⁸⁶ Research has shown that negative childbirth experiences limit SBA and is associated with adverse maternal and neonatal outcomes.^{4,87–89} Limitations in quality maternity care have included many reports of disrespect during childbirth.^{90,91}

From this debate on respectful childbirth care and in collaboration with multiple partners, including The International Mother Baby Childbirth Organization (IMBCO) and the International Federation of Gynecology and Obstetrics (FIGO), “The International Childbirth Initiative: 12 steps to safe and respectful Mother Baby–Family maternity care” has provided a framework in which patient-centered care is core. This could not only serve as a framework for respectful care, but context specific and collaborative care models too, as contextual factors and the complex linkages in maternity care are recognized.^{92,93} In Kenya, Morgan et al have successfully transformed these “12 steps” into a locally adapted and endorsed checklist for context specific pastoralist maternity care, which includes shared care between TBAs and SBAs.⁹⁴

LESSONS LEARNT

In our application of the BP/CR matrix and a PAR approach to low SBA, many issues revolved around the interconnectedness of solutions and actors and the persistence of low SBA. In the following section I take perspectives from (health system) innovation, persistent problems and power dynamics to better understand what happens when developing context-specific maternity care.

The innovative Pictorial Sisterhood Method and context specific maternity care

A broad perspective on innovations is used here to account for the social aspects involved in maternity care, as the Social Innovation Health Initiative (SIHI) and different scholars have done.⁹⁵ We must be aware of the “innovation trap”, thinking that only technical innovations are the correct way forward. Traditions and current practices sometimes form barriers, but are tremendous rich resources too. Often these are the “mundane humanitarian practices that really change people’s lives”.^{96,97}

I followed Francis and Bessant by viewing innovations as: “dynamic processes which focus on the creation and implementation of new or improved products and services, processes, positions and paradigms”.^{98,99} Successful innovations are those that accommodate complex local challenges into improvements in efficiency, effectiveness, quality or social outcomes and impacts”.^{98,100,101} To take examples from this thesis, creating BP/CR pathways, performing a Sisterhood Method, collaborating between TBAs and SBAs, labour companionship nor

fertility care are new. Practice, new roles and positioning within the local health system *are* innovative.

The closer care innovations are to local cultural and political contexts, especially when local beneficiaries drive this adaptation, the more likely sustainability and accountability are included in the innovation process.^{95,102,103} The presumption, however, that when this is achieved, maternity care innovations will automatically and sustainably diffuse into health systems is false. This is inherent to the systemic nature of persistent problems and so does apply to low SBA. When surrounding health systems remain the same, common “old” actions, protocols and structures are repeated which may undermine maternity innovations.¹⁰⁴

Local approaches to health system innovation need new ways of thinking.⁹⁵ Health systems that accommodate local innovations are complex adaptive systems (CAS), constantly changing and being shaped by the activities of various actors who have different interests to engage or not.¹⁰⁵ Moreover, any shift towards SBA in a community health system where TBAs were the original maternity care providers, means maternity health system innovations and transitions occur simultaneously in both formalized and traditional health systems.

Health system transition

The application of concepts from innovation and transition theory, such as the multilevel model and multiphase concept can increase understanding of these complex adaptations and health system innovations.^{100,105}

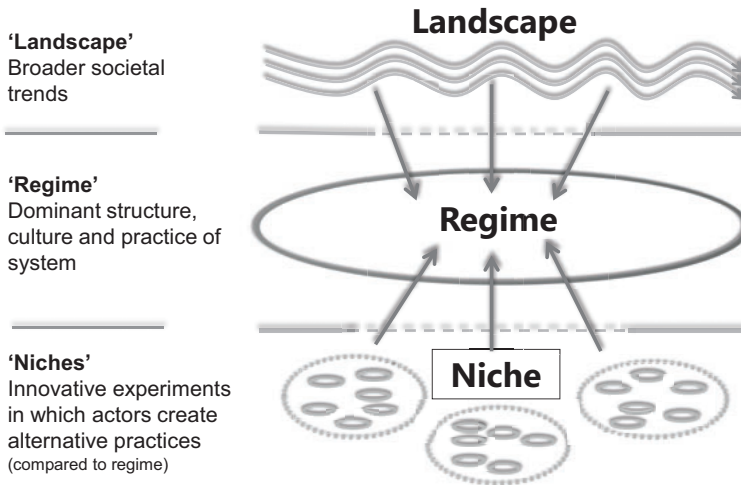


Figure 1. The multi-level model (Bunders and Broerse, adapted from Geels & Kemp).^{104,106}

The multi-level model

Three levels of social organization in transitions are part of the multi-level model:^{104,106}

1. The landscape, which is the overarching societal setting and consists of environmental, cultural, demographic, economic, infrastructural, societal factors: such as national governments, (inter)national law, human rights, right to care, global policies such as the SDGs and donor influences.¹⁰⁴
2. The patchwork of regimes, includes actors who interact through dominant practices, cultures and structures. These structures stabilize health systems and guide behaviour and the decision-making of individual actors. These systemic features include national guidelines, protocols and institutional ethical or religious perspectives, but also medical hierarchies and community-organization. As these function to stabilizing the health system, change or innovation is difficult.¹⁰⁴
3. The niches, where individual actors test technological, social or political innovations.

¹⁰⁴

Local maternity care adaptations from the BP/CR studies and in the NCA are influenced by factors from all three levels. The co-creation of context specific maternity care results in local innovations at niche level. When women, families, communities, skilled birth attendants, hospital owners and (health) policy makers together form maternity care pathways, they are all confronted with new realities.

Niche level innovations often divert from how “best practices” are viewed from the regimes at meso level.^{98,104} In this thesis we found examples in perspectives on motherhood, family planning and collaboration between TBAs and SBAs. Community requests for family planning and fertility care, although supported by the landscape level of country guidelines and WHO policies, were not in line with institutional religious ethics at regime level. At regime and landscape level collaborative maternity care was not supported by international and in-country regulations that merely limited roles of TBAs, nor was medical education of midwives and doctors supportive of collaborative care. Both in the BP/CR analysis and low use of SBAs in NCA we identified factors at landscape level, including (inter)national policies, but also specific contextual factors such as rules and regulations applying to living within the NCA, that are difficult to address.

In the Health Sector Strategic Plan IV of Tanzania, the importance of improving maternal health is recognized.¹⁰⁷ However, the health system and finances that should be supportive of maternity care, are deficient: “no regions met the benchmarks for the health systems building blocks including health finance, health workforce, health facilities and commodities” (Armstrong et al).¹⁰⁸ Analysis of maternal mortality ratio trends against economic, political and policy decisions and major Tanzanian events (1990-2016), including Health Sector Reforms,

has shown that current health system approaches in Tanzania do not suffice and that major inequities exist in the health system.¹⁰⁹ To address these, especially for rural populations and areas with the highest unmet need of family planning, an improved health system approach is needed to increase coverage and use of maternity care.^{108,110,111}

To increase quality of and access to maternity care in Tanzania, task shifting and rights-based approaches are proposed in which accountability of politics, finances and performance in maternity care takes place in a root cause analysis at community and facility levels with supporting supervision.^{53,109,112,113} Community involvement in reforming culture and practices of health care should continue to be improved.^{109,112,113} Also, wishes and voices of health care staff should be taken into account to optimize retention, including payments, housing, workplace safety and late night transport.¹¹⁴

The multi-phase concept

The multi-phase concept^{104,106} shows four stages of a transition process: predevelopment/initial phase, take-off, acceleration and stabilization. Lack of progress in health system transition is recognized in “lock in” (partial transition) or “backlash” (returning to the original health system, with loss of innovation).^{104,106}

In the BP/CR intervention studies and in the PAR in NCA, the initial phase resulted in niche experiments that led to adapted maternity care. However, in many BP/CR interventions in our Chapters 2 and 3, maternity care adaptations or linkages were not sustained. In our study in the NCA the transition process was too early to be fully evaluated.

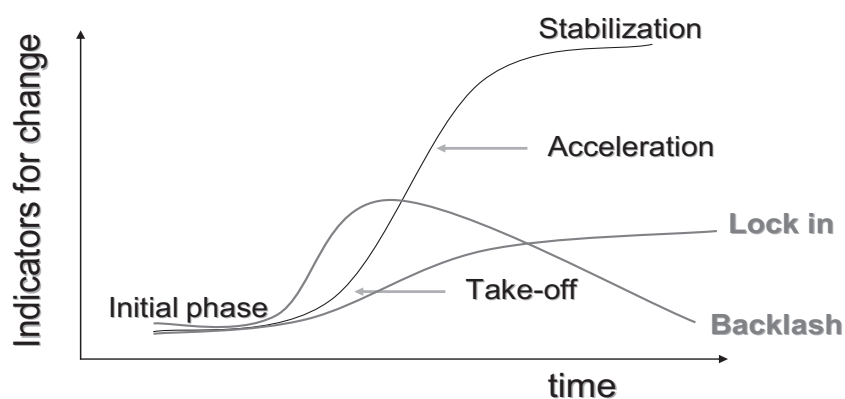


Figure 2. Four phases of a transition process (Bunders and Broerse).¹⁰⁴

Transition management

Although these transition processes cannot be controlled, transition management can influence its direction and speed. If we apply this to local maternity care transitions to increase SBA, multiple actors along the maternity care pathway need to connect to effectuate this.

In the *transition arena*, the niche, innovation follows phases of problem definition (low SBA, high maternal mortality) and shared visions¹⁰⁴. In the NCA this was reflected in: “*This is a problem that affects all of us*” (TBA)¹¹⁵ and “*To help a mother at home is not an easy thing, it is a big job*” (SBA to TBA).⁵¹ TBAs and SBAs collaboratively stated all had the goal to provide good maternity care.⁵¹ Joint action plans then follow (in NCA through PAR, in the BP/CR studies a variety of approaches) which result in various niche experiments, such as in this thesis newly developed BP/CR pathways, adapted maternity care and the Pictorial Sisterhood Method.

What happens when maternity care innovations transform health systems in low resource settings is not well documented in the literature. Other disciplines, such as humanitarian action, offer interesting learning opportunities.⁹⁸ Although innovation processes are fluid and not sequential, successful innovations share common elements and developmental stages. Anticipating these stages can help to sustain the innovation in the local setting, to connect to the regime and landscape level and to scale up the intervention in other contexts.⁹⁸ Common elements are: curiosity to look for new solutions for longstanding problems, willingness to experiment to test these solutions, preparing resources to do so, including time for staff to participate, a flexible environment that allows testing and evaluation of innovations and sharing of evidence, success stories and lessons learnt.⁹⁸

Resources, relationships, the right kind of partnerships and leadership within and across the involved organizations are needed.⁹⁸ Public sector organizations, such as in maternity health care, have a more rigid hierarchy and often little tolerance to innovations and innovators.⁹⁸ In addition to multiple conflicting interests of diverse stakeholders, complex and ambiguous rules and a variety of resource, operational and ethical constraints, this makes innovation in maternity care challenging.⁹⁸

Power dynamics in maternity care, health system innovation and transition

Power relationships between various stakeholders in and between niche, regime and landscape levels must be transformed in order to make high-quality maternity care in low resource settings a reality.^{34,116,117} Context-specific maternity care inevitably disrupts established health systems and challenges existing power structures.⁹⁵ The co-generative learning that takes place when questioning existing frameworks, practices, policies and norms to adapt care, often conflicts with existing organizational processes and can be inhibited by

it. Questions on “how are things currently done, and is this the best way to do them?” are meant positively, but hold criticism.⁹⁸

In transdisciplinary research, especially in PAR, it is not only wise, but also necessary to anticipate these power dynamics, to explicate this along the line of hierarchy and to create time for reflection on power.¹¹⁸ Even when having done so, innovations can develop differently than anticipated due to their needs-based nature and therefore can cause dispute over contextualized care.¹¹⁸

If context-specific problem solving is to bloom fully and scale up appropriately, women, families and communities should not solely empower themselves¹¹⁹. For empowerment to be successful disempowering forces also need to be considered. Health care professionals, researchers and governments will need to be ready to give room, share power within the health care hierarchy within multiple levels and adapt health systems accordingly.^{95,116} At niche level this means increased collaboration within families, communities and responsive maternity care.¹¹⁶ SBAs, hospital owners and policymakers in areas with low SBA and high MMR need to listen carefully to hear voices that can help improving maternity care.¹²⁰ Silence is what is left in many cases of maternal deaths and ill women, with families left behind struggling to cope. To stop the silence around maternal deaths, audits and verbal autopsies could be linked to women who died during pregnancy and childbirth, not only to identify causes of maternal deaths, but also to identify gaps in the maternity care pathway and make the health system accountable to the community.^{121,122} Women’s powerlessness to challenge situations such as being alone in labour is illustrated in a Tanzanian study where SBAs observed more disrespect and abuse from their colleagues than parturing women themselves.¹²³ The concept of hidden power explains normalisation of disrespect and abuse in maternity care as “both routine and unremarkable and a pattern of behaviour that functions in practice, informally, to regulate the actions of health workers”.¹²³ Space in the hospital and labour ward is not a neutral concept, but a social construct where power plays a role.¹²³ Through daily use of spaces SBAs feel at home. Women and TBAs, however, are incidental users in case of maternity care. Also SBAs use hospital spaces privately: they have social connections with the buildings (living on the compound) and colleagues, which strengthens their power position. Structuring privacy in these spaces, through private rooms, curtains or private reception desks, creates a counter reaction to this power imbalance and should be taken into account when providing maternity care. Allowing a birth companion of choice for continuous support in labour, including TBAs, helps to reduce these power imbalances and increases women’s sense of security in labour wards.¹²⁴

Simultaneously, authoritative knowledge, “the knowledge on the basis of which decisions are made in a given setting, by a given social group” influences power dynamics.¹²⁵ In NCA, different

legitimate knowledge systems exist: both TBAs and SBAs are of value to the community and considered skilled in their own way. The setting dictates which system is authoritative: in home births TBAs are in charge, while the labour ward is the SBAs' setting. However, when collaboration starts, a power play between the two is an ongoing social process, in which often the system based on the most formal education is strongest¹²⁶, in this case SBAs. Actors from the authoritative knowledge system, such as SBAs often do not perceive this system as such, as they are "children of these systems", and working and reinforcing the system occurs natural to them. An example is doctors who are prone to exercise power over others, if used to taking decisions and responsibility in clinical settings.^{34,120} They could be aware of this during patient care and while developing collaboration within the BP/CR matrix.^{34,120} Access to CEmONC should not lead to forced interventions such as unnecessary cesarean births.³⁴ As described more often for persistent problems¹¹⁷, maternity care providers create a negative by - effect of the success of SBA: guidelines and protocollized care create stability and protection, but make it very hard to adapt maternity care.

However, "neither medicine nor health care staff are violent by nature", but they are driven by reflections of the power structures in the health system and socio-political context.¹²⁷ When SBAs are blamed by patients or communities for insufficient (human) resources, equipment or training that lie outside their influence, also when observed by labour companions, this can cause great stress to SBAs, which can undermine quality of care.^{123,128-130} Perspectives of SBAs on how their working conditions and care could be improved should be considered, as disempowering medical hierarchies to SBAs can contribute to disrespect in maternity care.¹³¹ When increased collaboration and understanding of women and communities results in reflective SBAs this can increase feelings of SBAs of being disempowered, disconnected or marginalized from their own peer or regime levels.¹³² Positive working relationships between obstetric staff and managers are essential for staff motivation and positive work performance.¹³³ The "2020 Year of the Nurse and Midwife campaign" at landscape level is supportive of this currently.

STRENGTHS AND LIMITATIONS

We investigated low use of SBA and complexity in two ways: by analyzing BP/CR interventions and through a qualitative study of low SBA in NCA, Tanzania. In general, the research approach is strong, combining systematic research with transdisciplinary research and reflection, touching upon many topics identified in the WHO Recommendations on Health Promotion.¹³⁴ Strengths and limitations of the first part of this thesis are addressed in **Chapter 2 and 3**. Below we reflect on those of the second part.

Internal validity

Internal validity of the qualitative research in NCA was increased through triangulating data and reflection among co-researchers and supervisors with various backgrounds and by using multiple data sources (interviews, PAR sessions, reflexive journaling, and review of the literature). Prolonged contact amongst co-researchers was ensured as the author of this thesis was living and working as a medical officer in the NCA from January 2008 to July 2010.

In NCA, we have shared and implemented the study results real-time in collaboration with all local stakeholders continuously. We added reflexivity to the research by presenting and discussing results with co-researchers such as SBAs, TBAs, hospital management and local politicians. Member checks were done in PAR sessions by summarizing understanding from previous sessions and correcting where needed.

All chapters of this thesis have been presented at international conferences and all but one published in peer reviewed journals. Findings of our BP/CR systematic review and context analysis were included in a systematic mapping of maternal health interventions¹³⁵, presented at the WHO Technical Consultation on health promotion interventions for maternal and newborn health (15-17 July 2014, Geneva) and subsequently incorporated in WHO's recommendations in 2015.¹³⁴ Advocacy for fertility care in low resource settings from our results was strengthened through a publication in the WHO Bulletin.¹³⁶

External validity

The study in the NCA is situationally specific and therefore the results do not necessarily apply to all Maasai or pastoralist communities with different health systems and local characteristics. However, the research approach provides a valuable model that could be replicated in studies across similar settings, thereby testing the external validity of this study. The extensive description of the setting in NCA in Part II of this thesis will allow reflections on comparability.

It is suggested that it could be a valuable addition to use the new "International Childbirth Initiative"-framework to inform other researchers or clinicians in creating context-specific maternity care.^{92,94} It allows participatory approaches and simultaneously includes a template around which stakeholders from niche, regime and landscape health system levels could unite to promote context-specific quality maternity care. When tested in various niches, they together can create a body of evidence on the lessons learnt in context specific maternity care.⁹²

Our description of Maasai motherhood is limited by leaving out female genital mutilation, following advices from local (religious) leaders and NGOs, as discussing the topic had caused disconnection with the community in the past. Maasai approaches to reducing FGM have proved more successful when originating within the community.¹³⁷

Health system transformation and sustainability of interventions in the NCA have been difficult to assess. The gap between Tanzanian health policy and the situation on the ground regarding maternity care remains problematic in many rural jurisdictions.¹³⁸ This is especially challenging in settings like the NCA with government and faith-based elements of the health sector interfacing with local Maasai cultural and political challenges.^{105,118} However, it is clear that the niche level interventions that were part of this research project have continued to serve the community, most prominently the TBA-SBA collaboration.

Measuring the effect from BP/CR and context specific maternity care on SBA is difficult, as SBA in itself is a problematic outcome indicator when used as intervention coverage. The Effective Coverage Think Tank Group developed a consensus on measuring maternal, newborn, child and adolescent health and nutrition (MNCAHN), which is suggested to better reflect the quality of care.^{34,139} Finding publication opportunities for transdisciplinary and implementation research can be challenging. Many journals have set criteria, which cannot always be addressed.¹⁴⁰ While usefulness of contextualized research increases, often rigour and adherence to original research protocols decreases.¹⁰⁵ Also, describing the adaptive nature of PAR in ethical applications and articles can be problematic.¹⁴¹ The StaRI checklist could inform design and publication of future studies that aim to evaluate complex health interventions. Using the StaRI checklist during the design of research could help identify factors to be monitored and reported upon. This could strengthen approaches or interventions, their sustainability, scale up and dissemination.¹⁴² However, standardization of research approaches, especially of PAR should not decrease its contextuality nor complexity nor should be an expression of prior political orientations.¹⁴³ Interactions between research, interventions and health systems for quality maternity care are critical knowledge gaps that should be filled swiftly.³⁴

CONCLUSION

BPCR interventions have great potential, but do not necessarily increase SBA. Contextual adaptation of BPCR interventions and of education at ANC is of utmost importance in creating locally effective maternity care pathways. Women, their families and communities, together with maternity care providers, facility managers and policymakers will need to truly collaborate to effectuate this. Transdisciplinary research, as shown through participatory action research in Ngorongoro Conservation Area in northern Tanzania, reveals subtle

and unique characteristics of contexts (niches) in which SBA is low. Co-created local maternity care adaptations are essentially innovations that in order to sustain and scale up, require an integrated health system approach that is supportive to the niche level. Power dynamics between all stakeholders in maternity care pathways need to be addressed in care adaptations and research processes in order to facilitate sustainable health system innovation and transition. Transdisciplinary analysis of underutilization of SBA, creation of BP/CR pathways and context-specific, women-centered maternity care offer interesting opportunities in any global setting for increasing SBA and therefore deserve further attention in research, education and training.

THE WAY FORWARD

To assure a supportive health system to contextualized maternity care, voices of communities, women, TBAs and SBAs need to be acknowledged throughout the BP/CR matrix and along the line of scale up. At regime and landscape level, this requires an (inter) nationally supportive environment of context specific maternity care, politically and financially.^{34,132,144} Currently, at landscape level, the 2030 Agenda for Sustainable Development verbally supports full implementation and financing of the Addis Ababa Action Agenda in realization of SDGs.¹⁴⁵ The Global Action Plan, supported by the G20, aims to engage, accelerate, align and account to “streamline” accelerated progress on the SDGs by involving countries at all levels to share this process and “learn together”.⁶⁷ WHO repeats messages of local care adaptations.^{146,147}

African led-changes for Africa, acknowledging colonialism and other historic influences, are needed, not more non-contextualized solutions.^{148,149} The work of Agyepong et al, the Lancet Commission on the future of health in sub-Saharan Africa and The Lancet Global Health Commission on High Quality Health Systems provide valuable directions.^{95,150–153} These include 43 recommendations ranging from promoting stronger and more effective regional cooperation to the creation of people-centered health systems: focusing on respect, dignity and compassion rather than on abstract health system “building blocks”.¹⁴⁸

Creating context specific care takes time and effects are difficult to capture quickly in globally set targets such as the SDGs. NGOs can learn from research experiences that are based on a long-term intervention with co-creation of know-how across multiple domains, rather than quick in - quick out costly interventions.^{27,154} The above Lancet commission has thus refused “to provide simple solutions”.¹⁴⁸

RECOMMENDATIONS FOR CLINICAL CARE AND FUTURE RESEARCH

“No silver bullets, no one-size-fits-all solutions, recognise complex ecologies, listen to marginalised perspectives, open up to views and ideas, broaden out possibilities, pay attention to power, explore framings, appreciate uncertainties, create political spaces, seek justice”¹⁵⁵

Join or set up transdisciplinary projects in maternity care. Create niche experiments for context specific maternity care with scale up in mind. When applying PAR, combine with in-facility and health system data. Use and study the International Childbirth Initiative-12 step approach.⁹² Increase information on qualitative methods, implementation research, transdisciplinary research and participatory approaches in medical and midwifery education.

Make a systems perspective personal: who is willing to work on solutions and what is their perspective on increasing quality of maternity care pathways? Create connections and anticipate power dynamics between niche, regime and landscape levels. Make time for reflecting on research processes, results, powerdynamics and lessons learnt. Study how willingness to act, willingness to share knowledge, willingness to stop disempowerment and willingness to share power influence SBA.

Break the silence around maternal deaths and ill health. Use the Pictorial Sisterhood Method to further evaluate the potential of QPMs for doing so and for knowledge exchange and advocacy. Connect the Pictorial Sisterhood to other methods to disclose maternal death causes and gaps in the maternity pathway, such as maternal death audits and verbal autopsies.

Study and use the BP/CR matrix as a whole. Link quality of care frameworks such as the WHO Quality of Care framework and local adaptation of guidelines¹⁵⁶ to the BP/CR matrix to study interplays within the BP/CR matrix.

Include uncomplicated births in BP/CR education, also for multiparous women. Continue and repeat BP/CR education during ANC. Make and follow up personalized plans for SBA, involving men where possible.

Create spaces and architecture that accommodate labour companionship of choice, including TBAs. Study how this increases quality and utilization of SBA¹⁵⁷. Study how different local knowledge cultures, such as from TBAs and SBAs are integrating in context-specific

maternity care and how local knowledge is represented within political agendas, such as the SDGs.^{29,35}

Study how integrated family planning approaches, including fertility care, influences quality of care, uptake of family planning care and SBA. Analyze how social determinants of poor maternal health can be tackled through collaboration with stakeholders connected to those determinants.

Care for those who care.

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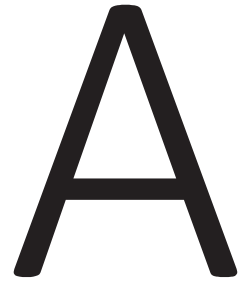
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Addendum

Abbreviations

Summary

Muhtasari

En'doropo oo lomon

Samenvatting

Authors and affiliations

PhD Portfolio

Acknowledgments (Dankwoord)

About the author

Safe Motherhood Series

ABBREVIATIONS

AIDS:	Acquired Immunodeficiency Syndrome
ANC:	Antenatal Care
BP/CR:	Birth Preparedness and Complication Readiness
CEmONC:	Comprehensive Emergency Obstetric and Neonatal Care
CI:	Confidence Interval
CHW:	Community Health Worker
COHRED:	Council On Health Research for Development
COSTECH:	Tanzania Commission for Science and Technology
CTC:	Care and Treatment Centre
DHS:	Distric Health Survey
FIGO:	International federation of gynaecology and obstetrics
HIV:	Human immunodeficiency virus
ICM:	International confederation of midwives
IMBCO:	International MotherBaby Childbirth Organization
JHPIEGO:	John Hopkins Program for International Education in Gynaecology and Obstetrics
MASCOT:	Multilateral Association for Studying Health Inequalities and enhancing North-south and South-south Cooperation
MCH:	Mother and Child Health
MDG:	Millennium Development Goal
MMR:	Maternal Mortality Ratio
MNH:	Maternal and Newborn Health
NCA:	Ngorongoro Conservation Area
NCAA:	Ngorongoro Conservation Area Authority
NGO:	Non-governmental organization
NHS:	National Health Service
NIMR:	Tanzania National Institute for Medical Research
OLVG:	Onze Lieve Vrouwe Gasthuis
PAR:	Participatory Action Research
PICT:	Provider-Initiated Counselling and Testing
PMTCT:	Prevention of Mother-To-Child Transmission
QPM:	Quantitative Participatory Method
RCT:	randomized controlled trial
SBA:	Skilled birth attendant or skilled birth attendance
SDG:	Sustainable development goal
STI:	sexually transmitted infection
WIHI:	Social Innovation Health Initiative

TACAIDS:	Tanzania Commission for AIDS
TBA:	Traditional birth attendant or traditional birth attendance
VCT:	Voluntary Counselling and Testing
VU(mc):	VU university (medical centre)
UNESCO:	United Nations Educational Scientific and Cultural Organization
WHO:	World Health Organization

SUMMARY

Motherhood is far from safe in various contexts and settings. Maternal mortality is still unacceptably high, as World Health Organization (WHO) reports indicate. In 2017, around 295 000 women died during pregnancy, childbirth and puerperium. Many initiatives contribute to decreasing the number of maternal deaths, among which those stemming from the Millennium Development Goals and more recently, the Sustainable Development Goals. The new goal is that in 2030, less than 70 women die per 100.000 live births. However, especially in vulnerable populations, the decrease in maternal mortality is too slow to reach this target. Although clear international strategies exist, these are not effective in some contexts. One of the strategies to decrease maternal mortality, is giving birth in the presence of a skilled birth attendant (SBA). Unfortunately, diverse barriers to SBA utilization exist. The underlying causes are often complex and insufficiently researched.

In this thesis, underutilization of SBAs is analyzed in two ways. In the first part, is described if interventions can increase skilled birth attendance through using the Birth Preparedness and Complication Readiness model (BPCR). In part two a local context in northern Tanzania is studied, where most women of the mainly Maasai population, give birth in the presence of a traditional birth attendant (TBA) instead of a SBA.

The BPCR model delineates roles and responsibilities of diverse parties involved in preparing for childbirth and complications: pregnant women, their families and communities, SBAs, hospitals, but also the health systems and political contexts in which hospitals are embedded. Through systematic research, in Chapter 2 is described how using the BPCR model affects skilled birth attendance. It seems that interventions that use the BPCR model, do increase knowledge on birth preparations, but do not automatically lead to increased skilled birth attendance.

In Chapter 3 is set out which factors influence the implementation of BPCR interventions. The diversity of interventions and definitions of BPCR makes it difficult to draw general conclusions. Interventions are more likely to be successful in contexts where education levels of women are high, when programs are adapted to local circumstances and when various parties in the BPCR model are involved simultaneously. Factors that limit SBA utilization include; care that is not well adapted to needs of women, shortages of obstetric staff or materials, when women or their communities prefer TBAs over SBAs, poverty and political instability. Short-term BPCR interventions seem less successful than long-term interventions.

In the second part of this thesis, a local situation in northern Tanzania is analyzed. Maternal mortality was locally estimated at 642 deaths per 100.000 live births in 2005. Only 7% of childbirth was in presence of a SBA. Most women delivered with a TBA. In 2008, only 47 childbirths took place in the local hospital. Previous research on HIV risk factors in this community identified that in order to adapt local health care, more knowledge was needed on problems in reproductive health, motherhood and the underutilization of SBAs. The research of the second part of the thesis took place between 2009 and 2011. It consists of qualitative research, among which participatory action research (PAR), interviews, observations and literature research. Maasai women, men, TBAs, hospital staff, among which SBAs, were involved in analyzing the underlying causes of low skilled birth attendance as well as providing solutions for the identified problems.

Chapter 4 is inventoried what motherhood, fertility and HIV can entail in a Maasai context in northern Tanzania. Traditionally, fertility and motherhood are inextricably connected, as well as to prosperity and growth. Maasai women experience motherhood as an essential, but also obligatory part of womanhood. Family planning programs of non-governmental organizations, which promoted contraceptives or condoms, were regarded as not respectful to this. Family planning in this context did not only imply not getting pregnant, but also fertility care when needed. Conversations on family planning in this local definition offered opportunities of exchanging traditional Maasai and biomedical perspectives. This knowledge was translated into locally sensitive maternity and reproductive health care, of which fertility care was part. The increase in outpatient consultations for reproductive health questions and problems, might be a careful reaction to this care.

In Chapter 5 local underlying causes for low skilled birth attendance are analyzed. The results are structured by using the Three Delays Model of Thaddeus en Maine, which recognizes 3 phases of delay in receiving maternity care of good quality (delay at home, on the way and in the hospital). Very diverse causes were identified: limited recognition of maternal mortality due to a culture of silence around maternal death, limited male education concerning safe motherhood and reproductive health topics, suboptimal birth preparedness, distance to children, family and cattle when admitted in the hospital, food and financial insecurity enforced by hospital admission, negative experiences with availability and quality of hospital care, discontinuity of TBA care when arriving at the hospital, insufficient availability and quality of transport and roads to the hospital, shortage of staff and supplies in the hospital, limited knowledge sharing in the hospital. These problems reflect diverse and interconnected domains: medical, health systems, political, livestock, gender, infrastructure and conservation of flora and fauna. Non of the groups of research participants was able to tackle or solve the problems on their own. The low utilization of SBAs can be viewed as a complex or persistent problem; a problem that is long lasting, embedded in diverse structures in society and

health care and in which each solution to a problem exposes new problems. Inherently, collaboration, communication and sharing power are needed when change is desired. As common in participatory action research, solutions to encountered problems were co-generated by diverse groups of research participants, to start to create both a needs based and clinically sound maternity care pathway. Some of the proposed solutions are further described in Chapter 6 and 7.

The development of a method that has potential to breaking the silence around maternal deaths is described in Chapter 6. In collaboration with TBAs, a method to estimate maternal mortality, the Sisterhood Method, was adjusted to a locally sensitive, quantitative participatory tool – the Pictorial Sisterhood Method. This method was pilot tested by TBAs and researchers as cross-sectional study. Fourteen TBAs interviewed 496 women (sample), leading to 2241 sister units of risk and a maternal mortality ratio of 689 deaths per 100 000 live births (95% CI 419–959). Researchers interviewed 474 women (sample), which led to 1487 sister units of risk and a maternal mortality ratio of 484 (95% CI 172–795). The Pictorial Sisterhood Method is an innovative application that might increase the participation of illiterate individuals in maternal health research and advocacy. It needs further study and validation, but it offers interesting opportunities to increase maternal mortality data ownership and awareness.

In Chapter 7, the research on the combined TBA/SBA care in the local hospital is summarized. The co-creation between SBAs and TBAs led to a more culturally acceptable, context specific maternity care, but barely increased the number of hospital births (68 in 2010). Challenges and opportunities in the collaboration between TBAs, SBAs and women are described.

So, this thesis endorses, through analysis of the BPCR model and a local context in northern Tanzania, the importance of: participatory evaluation of contexts in which skilled birth attendance is low, collaboration between all parties involved through co-creating context specific solutions and maternity care. Possibly this facilitates skilled birth attendance, but more certain this increases experiences quality of care and collaboration between maternity care providers, like TBAs and SBAs. The adaptive research approach made the research directly locally relevant.

In the discussion I describe that context specific care is often a social innovation and inherently a challenging process. Challenges include: making context specific care measurable, sustainable within health systems, taking power dynamics within communities and health systems into account. It is essential, that those who hold power in (the organization of) maternity care, give way to wishes and needs of women, their families and of those who care for them, both TBAs and SBAs.

The research in this thesis fits new definitions of implementation research, in which knowledge is represented in a trans disciplinary way. Insights from this thesis add, modestly, to how we can bridge the “know-do” gap between knowledge and practice. More specifically: how we can understand and counter underutilization of SBA: through participation and collaboration while respecting local expertise. I recommend continuing the co-creation in maternity care and as such contribute to maternity health, wellbeing and the decrease of maternal mortality globally.

MUHTASARI

Usalama wakati wa kujifungua uko chini katika mikitadha na maeneo mbalimbali. Vifo vitokanavyo na matatizo yatokanayo na ujauzito na kujifungua viko juu kiasi kisichokubalika kulingana na taarifa za Shirika la Afya Duniani (WHO). Mwaka 2017 takribani akina mama 295,000 walifariki dunia kutokana na matatizo yatokanayo na ujauzito, wakati wa kujifungua au mara tu baada ya kujifungua. Kuna mikakati mingi inayochangia kupunguza idadi ya vifo hivi vya akina mama, kati ya hiyo ni ile iliyolenga kutekeleza Malengo ya Maendeleo ya Milenia na sasa Malengo ya Maendeleo Endelevu. Lengo jipya la mwaka 2030 ni kupunguza vifo hivi kuwa chini ya 70 kati ya vizazi hai 100,000. Hata hivyo, hususa katika mazingira yaliyo katika hatari kubwa zaidi, kasi ya kupunguza vifo hivi bado ni ndogo kiasi cha kutoweza kufikia lengo hili. Ingawa mikakati wezeshi ya kimataifa ipo, bado haifanyi kazi vizuri katika baadhi ya maeneo. Moja ya mikakati ya kupunguza vifo vya akina mama vitokanavyo na matatizo ya ujauzito na kujifungua ni uwepo wa wakunga wenye ujuzi wakati wa kujifungua. Bahati mbaya kuna vikwazo vingi vinavyochangia matumizi ya wakunga wenye ujuzi. Sababu hizi ni pana na hazijafanyiwa utafiti wa kutosha.

Katika tasnifu hii, kiwango cha chini cha kutumia huduma za wakunga wenye ujuzi kimechambuliwa kwa namna mbili. Sehemu ya kwanza, inafafanua mikakati ya kuingilia kati (interventions) inayoweza kuongeza wingi wa akina mama wanaojifungua katika vituo walipo wakunga wenye ujuzi kwa kuhamasisha akina mama kufanya Maandalizi ya Kujifungua na Kujiweka Tayari Kwa Matatizo Yanayoweza Kujitokeza (Birth Preparedness and Complications Readiness model). Sehemu ya pili, inahusu kutafiti mikitadha wa Kaskazini mwa Tanzania, ambapo sehemu kubwa ya jamii ya akina mama wa kimasai hujifungua kwa wakunga wa jadi badala ya vituo vyenye wakunga wenye ujuzi.

Mkakati wa Maandalizi ya Kujifungua na Kujiweka Tayari Kwa Matatizo Yanayoweza Kujitokeza unaainisha majukumu na wajibu wa makundi yote yanazohusika katika kujiandaa kwa ajili ya kujifungua pamoja na matatizo yanayoweza kutokea: wajawazito, familia na jamii zao, wakunga wenye ujuzi, hospitali, lakini pia mfumo mzima wa afya na sera ambazo ndizo zinaongoza huduma za hospitali. Kwa kutumia utafiti, sura ya pili inafafanua jinsi *Maandalizi ya Kujifungua na Kujiweka Tayari Kwa Matatizo Yanayoweza Kujitokeza* yanavyoweza kuchangia kujifungulia katika vituo walipo wakunga wenye ujuzi. Inaonekana kwamba mikakati inayohamasisha Maandalizi ya Kujifungua na Kujiweka Tayari Kwa Matatizo Yanayoweza Kujitokeza, inaongeza ufahamu juu ya maandalizi ya kujifungua, lakini haiongezi moja kwa moja kujifungulia katika vituo walipo wakunga wenye ujuzi.

Sura ya 3 inaainisha sababu zinazoathiri utekelezaji wa mikakati ya kuwezesha Maandalizi ya Kujifungua na Kujiweka Tayari Kwa Matatizo Yanayoweza Kujitokeza. Upana wa njia za

kuingilia kati na maana ya mikakati hii inaleta ugumu wa kutoa hitimisho la jumla. Mkikati inawezekana kufanikiwa zaidi katika maeneo ambayo elimu ya akina mama iko juu, pale ambapo mipango italenga mkitadha mahalia na iwapo wadau wengi watahusishwa. Sababu zinazosababisha matumizi madogo ya huduma afya katika vituo vyenye wakunga wenye ujuzi ni pamoja na; tiba isiyozingatia mahitaji ya akina mama, ukosefu wa wataalamu wa afya ya uzazi na vifaa tiba muhimu, akima mama au jaamii zao kupendelea zaidi wakunga wa jadi, umaskini na mabadiliko ya kisiasa. Njia za muda mfupi za kuongeza Maandalizi ya Kujifungua na Kujiweka Tayari Kwa Matatizo Yanayoweza Kujitokeza zinafanya kazi kidogo zaidi kuliko zile za muda mrefu.

Sehemu ya pili ya tasnifu hii inafafanua hali ilivyo Kaskazini mwa Tanzania. Vifo vya akina mama vinavyosababishwa na matatizo ya ujuzito na kujifungua vilikadiriwa kuwa 642 kati ya vizazi hai 100,000 mwaka 2005. Ni 7% tu waliojifungulia katika vituo vyenye wakunga wenye ujuzi. Wengi walijifungua kwa wakunga wa jadi. Mwaka 2008, ni akina mama 47 tu waliojifungulia katika hospitali ya karibu. Utafiti uliofanyika kabla juu ya sababu ya maambukizi ya ukimwi katika ngazi ya jamii ulionesha kuwa ili kuboresha afya ya jamii, ufahamu zaidi unahitajika juu ya afya ya uzazi, na matumizi ya vituo vyenye wakunga wenye ujuzi. Utafiti wa sehemu ya pili ulifanyika kati ya mwaka 2009 na 2011. Utafiti huu ulitumia aina tofauti yaani mahojiano, uchunguzi kwa kutazama (observation) na kutafiti kupitia machapisho. Katika utafiti huu akina mama na baba wa kimasai, wakunga wa jadi, wahudumu wa afya hospitalini na wakunga wenye ujuzi walihusishwa katika uchunguzi wa kina wa sababu zinazochangia matumizi madogo ya huduma za afya ya uzazi katika vituo vyenye wakunga wenye ujuzi na suluhisho la tatizo hili.

Sura ya 4 inafafanua kile kinachoweza kusemwa juu ya uzazi, uzao na ukimwi katika mkitadha wa jamii ya kimasai Kaskazini mwa Tanzania. Kwa asili, uzazi na uzao haviwezi kutenganishwa kama ilivyo kwa ustawi na kukua. Akina mama wa kimasai wanaona kuwa uzazi si tu kuwa ni muhimu bali pia ni sehemu ya wajibu wa mwanamke. Mikakati ya uzazi wa mpango inayosimamiwa na asasi zisizokuwa za serikali inayohamasisha njia za uzazi wa mpango au kondomu ilichukuliwa kuwa inakinzana na haya. Katika mkitadha huu uzazi wa mpango, haukuonekana kuzuia ujuzito tu bali pia uwezo wa kuzaa. Mahojiano juu ya uzazi wa mpango yalitoa fursa ya kubadilishana uelewa kati ya tamaduni za kimasai na elimu ya kisasa ya tiba. Ufahamu huu iliingizwa katika kuboresha huduma za afya ya uzazi pamoja. Ongezeko la wanaotumia huduma za nje za afya ya uzazi yaweza kuwa ni matokeo mkakati huu.

Katika sura ya 5 sababu za matumizi madogo ya vituo vyenye wakunga wenye ujuzi inafafanuliwa. Matokeo yamechambuliwa kwa kutumia muundo wa kuchelewa kupata huduma za afya kama ulivyo chambuliwa na Thaddeus na Maine (the Three Delays Model of Thaddeus and Maine), ambao unaainisha aina tatu za kuchelewa kupata huduma zenye ubora

(kuchelewa nyumbani, njiani na katika kituo cha kutolea huduma za afya). Sababu tofauti ziligunduliwa: kiwango kidogo cha kutambua vifo vya akina mama vinavyotokana na matatizo ya ujauzito na kujifungua kwa sababu ya desturi za ukimya juu ya vifo vya namna hiyo; kiwango kidogo cha elimu ya wanaume wa kimasai juu ya uzazi salama, kiwango kidogo cha maandalizi ya kujifungua, umbali kati ya watoto, familia na mifugo wanapolazwa hospitalini, ukosefu wa chakula na fedha wanapolazwa, uzoefu hasi wa huduma za afya zisizoridhisha siku za nyuma, kusimamisha huduma za afya zilizotolewa na wakunga wa jadi baada ya kufika vituo vya afya, upungufu na huduma hafifu za usafiri na barabara mbovu, upungufu wa wahudumu na vifaa tiba, na upungufu wa upashanaji habari ndani ya hospitali. Matatizo haya yanaonesha upana wake na uhusiano mpana wa kissekta: afya, siasa, mifugo, jinsia, miundo mbinu na uoto asilia. Hakuna kundi lolote kati ya haya liliweza kutatua matatizo haya likiwa pekee yake. Matumizi madogo ya vituo vyenye wakunga wenye ujuzi yanaonekana kuwa ni tatizo pana na linaloendelea kudumu, linalohusu muundo mpana wa jamii, mfumo wa huduma za afya na suluhisho la tatizo linafunua matatizo mengine zaidi. Kimsingi ushirikiano, mawasiliano na uchangiaji wa mamlaka (ya maamuzi) unahitajika ili kuleta mabadiliko yanayohitajika. Kama ilivyo kawaida ya tafiti zinazohusu maamuzi shirikishi, suluhisho la matatizo yaliyojitokeza yalitolewa kwa pamoja katika makundi mbali mbali ya waliohusishwa katika utafiti, kuanza kujenga huduma za tiba zinazojikita kujibu mahitaji mahalia na zenye ubora, Baadhi ya suluhisho zimejadiliwa zaidi katika sura ya 6 na 7.

Utengenezaji wa njia yenye uwezekano wa kuondoa ukimya juu ya vifo vinavyotokana na matatizo ya ujauzito na kujifungua umefafanuliwa katika sura ya 6. Kwa ushirikiano na wakunga wa jadi, njia ya kukadiria vifo vya akina mama, yaani njia ya uchunguzi wa vifo kupitia njia ya dada katika familia (Sisterhood Method) ilitumiwa kwa kuzingatia mazingira mahalia, kupata dodoso shirikishi la kukuanyia takwimu. Njia hii ilifanyiwa majaribio kwa wakunga wa jadi. Wakunga wa jadi 14 waliwahoji akina mama 496, na kupata dada 2241 waliokuwa katika hatari na kupata vifo vya akina mama vinavyotokana na matatizo ya ujauzito na kujifungua vipatavyo 689 kati ya vizazi hai 100,000 (95%CI 419 – 959). Watafiti waliwahoji akina mama 474 na kupata idadi ya dada 1487 waliokuwa katika hatari na kupata vifo 484 kati ya vizazi hai 100,000 (95% CI 172–795). Njia hii ya kukadiria vifo vya akina mama kwa kuzingatia jamii husika (Pictorial Sisterhood Method) in ubunifu unaoweza kuongeza ushiriki wa watu wasiokuwa na elimu katika utafiti wa afya ya uzazi na uhamasishaji. Hata hivyo inahitaji utafiti zaidi na uthibitishaji, lakini inatoa fursa ya kuongeza umiliki wa takwimu za vifo vya akina mama vinavyotokana na matatizo ya ujauzito na kujifungua pamoja na uelewa wa tatizo hili.

Sura ya 7, ni ufupisho wa utafiti wa ushirikiano kati ya wakunga wa jadi na wale wenye ujuzi katika hospitali. Uundaji wa ushirikiano wa makundi haya usababisha kukubalika na huduma za afya ya uzazi kuonekana kuwa za kimkitadha na kuongeza idadi ya waliojifungulia katika

vituo vya kutolea huduma za afya (68 mwaka 2010). Changamoto na fursa kati ya wakunga wa jadi, wakunga wenye ujuzi na akina mama zimefafanuliwa pia.

Kwa hiyo, tasnifu hii inathibitisha kupitia uchambuzi wa muundo wa Maandalizi ya Kujifungua na Kujiweka Tayari Kwa Matatizo Yanayoweza Kujitokeza na mkitadha mahalia Kaskazini mwa Tanzania, umuhimu wa: tathmini shirikishi katika maeneo ambayo matumizi ya huduma za kujifungua katika vituo vya kutolea huduma za afya ni madogo, ushirikishaji wa makundi yote katika mchakato wa kuleta suluhisho la matatizo yanayohusu huduma za akina mama. Yamkini hili likahamasisha kujifungulia katika vituo vyenye wakunga wenye ujuzi, lakini kwa hakika hili linaongeza ubora wa huduma na ushirikiano kati ya watoa huduma hususa ni wakunga wa jadi na wale wenye ujuzi. Utafiti huu unaojikita katika mkitadha umeufanya utafiti huu kuwa wenye manufaa katika mazingira mahalia.

Katika sehemu ya mjadala ninafafanua juu ya huduma inayojali mkitadha wa eneo mahalia kuwa mara kwa mara ni ubunifu wa kijamii na mchakato wake una changamoto. Changamoto hizo ni pamoja: namna ya kupima huduma inayojali mkitadha wa eneo mahalia, kudumu kwa ubunifu huu ndani ya mifumo ya afya, namna ya kutumia mamlaka za maamuzi ziliko katika jamii na mifumo ya afya katika mchakato wote. Ni muhimu kuwa wote wenye nafasi ya kufanya maamuzi (katika taasisi) zinahusika na huduma ya afya ya uzazi, kuwa na utashi chanya kwa akina mama, familia zao na za wale wanaowahudumia, wote kwa pamoja wakunga wa jadi na wale wenye ujuzi katika vituo vya kutolea huduma za afya.

Utafiti katika tasnifu hii unatoa tafsiri mpya ya utafiti tekelezi (implementation research), ambao unawakilisha ufahamu katika njia za utekelezaji. Tasnifu hii inaongeza ufahamu, kiasi, jinsi ya kuziba mwanya uliopo kati ya ufahamu na utekelezaji (know-do). Kwa usahihi zaidi, ni namna gani tunaweza kuelewa na kuingilia kati matumizi madogo ya huduma ya afya ya uzazi katika vituo vyenye wakunga wenye ujuzi: kupitia ushiriki na ushirikishwaji wakati huo huo tukiheshimu utaalamu ulipo katika jamii husika. Ninapendekeza kuendeleza ubunifu wa pamoja katika huduma za afya ya uzazi na kuboresha afya za akina mama, ustawi wao na kupunguza vifo vyao vinavyotokana na matatizo ya ujauzito na kujifungua ulimwenguni.

EN'DOROPO OO LOMON

Kiti eseriani naleng' tengata eishoi oo endomonok too wuejiting' kumok, eton ake aa sapuk oleng' keeya nayepu engata eishoi, enaa enautu eng'eno ilo shirika loo loшон le erematare(WHO) talari le 2017, ejo ore ndomonok 295,000 (ilakin are o ingalifuni intomoni naudo oo imiet) naa kenang' engata eishoi, nemenyorarita naa ilo shirika leramatatare oo iloshon ina sapuko nayapu engata e tuaishu oo eishoi, arashu eishoi. Ereten sapuk naretoki aitodorop esapuko e keeya nayapu eishoi too ndomonok, ore tenena naretoki aitodorop na pee eesi enaa enatejoki pee itabaiki te ngishon oo larin ipp nabo (Millenium Development Goal). Nelotie sii engata natiiki tiatua engishon eina olong'.

Ore en'duata na ore oo metabaki alari le 2030 (ingalifuni are o tomoni uni) na pee esaruni indomonok kumok naanang'ita eishoi pee megiroro indomonok 70 (ndomoni naa pishana) tiatua eishoi naishu 100,000 (elaki nabo). Aisulaki oleng' too iltirenito oo tuang'ayoki (iltirenito lituepo dukuya netii ena nyamali sapuk, ore ena keeya nayepu eishoi eton aa kiti engotoki naiting'ie metaa kinyi oo metabaki inae nishaakino). Ore te engidenyeta naidimie iloshon eesai te ng'asiata o too iwuejitin kumok neton meesitai esiai enaa enashaikinore engai kidenyeta naitadoyio keeya nayapu eishoi na pee eetai ingatoyok naiteng'ena/naitng'enaki te ina olong' eishoi. Hooduo etii enyamali sapuk o ngikobeta atua esiai o te lalai oleng' hoo duo neitu esujakini tiatua airenges.

Ore emwa napoi aiki etii ingaitoyok naitengenaki n netujutroki too imuain are. Ore enedukuya pee italala nena kidenyat nees nena naidimie ndomonok menotoki aa teretenata te eishoi sidai ote eishoi torono (Birth Preparedness and Complication Readness Model).

Ore eniare nipirita en'jurore natujuroki lo losho le moikwappe e tanyania too ingituak oo nchere meiki ndomonok kumok sipitari kake eiki ingang'itie enye nitoyiyu ingaitoyok emila enye. Ore ereten naretenai tengata enduaishu oo metabaki engata etomononishu naa enoonjot pokira are pee eng'amuni enajoolu te inaolong'eishoi aa sidai o torono te ilo marei oipirita ana opirare, endomononi neng'amu sii ninje ingaitoyok neng'amu sipitari teina olong; nimeninje ake kake oo metabaki erikore pookin oseseni tenebo engitashoto o enye tiatua oo teguton naa ninye naitasheki esiai e sipitari.

Ore ena natujuroki tematua eare neitoki ajo eretenata narerena endomononi enaa sipitari enaa ingaitoyok enaa ilo orere pookin oipirita ilo omoni le eishoi teina olong' neitodolu nchere ekayau eyolounoto ererenata pee eishoi kake meponaa eyolounoto nalo endomononi aiki sipitari ine netii ingaitoyok naiteng'enaki enaa ingaitoyok.

Ore ematua euni neitodolu iriot namitiki elo dukuya ereten neretenai pee eisho neng'amuni enajoolu aa sidai oo torono, ore tengaraki elalai nabaikinyeki engiting'oto enye neyeu eyoloi ajo eretenata nagol nayeu ewalata nabayie.

Idimayu naleng' pee eretenai te eyolounoto sapuk too wuejiting' netii ngituak nashomoita engisoma, teine sii na eketoponaki iltung'anaak kumok meetu aayelou enaasitai nitaiyoloi im'boi pokira imbaa najoitoi o nayauni. Ore nena baa naibokito eng'eno oo ingataiyok pee meesisho naa, eramatata neitabaya iyeunot oo ngituak, meetai sii ilang'eni laata eng'eno e ramatare oo iltung'anak, o masaa naasishoreki e tipat, oo sii ingituak o irmarei lenye naa ekenyora a oleng' ingaitoyok enye emila etii erikore torono oo irkwaaki torok le siasa oo aisananishu itodolu njere ore engoitoo dorop naretenai pee ebaikini engata eishoi naa mee sidai oleng' enaa en'da oitoo nawodo, naaninye naitodolu ajo aisidai naa bainoti. Ore ematua eare ile sirata, kuna baa naitodolu enjurore nataasaki to losho le moikwappe le Tanzania njere ore keeya nayepu tomononishu nikenaki ajo ekeye ngera 642 (ippi uni oo artam oo are) teneini ngera 100,000 na talari loo 2005 (ingalifuni are oo imiet) na 7% oo ngera eikini sipitari. Ore ngituak kumok nejing' aji taa ingang'itie enye nitoyu ingaitoyok eang'.

Ore talari loo 2008 naa ngera 47 ake eikini sipitari, etujuroki apa te inakata juritoo biitia tiatua ele orere nitodolu njere eyeuni neetai eng'eno naipirita enjoto eishoi, oo tomononishu oo sii eloloto napuoi aishore te nena ajijiik naitayoki pee eikini (SBA). Etaasaki engaiyurore talari loo 2009 oo metabaiki 2011, netujuroki engoitoo sidai napoiyeki dukuya tengilikwanare o tenging'urata oo too sirat kumok.

Itushula apa ina jurore ngituak oo irmaasai, ilewa lenye o ingaitoyok oo irmaasai (TBAs), ilaisiyak le sipiritari tenebo ngaitoyok naiteng'ena e sipitari (SBAs) netotonitoo tenebo aajo kanyoo paa kuti, nemeyeuni nepuoi ang'amu ena ramatare naipirita embiyotishu eishoi tenebo oseseni nayeu ilaisiyak oo ngasiyak naiteng'enaki tiatua nena wuejitin neitengenaki pee esaas ina siai, ore enabayie ning'urakini ewalata nadupa ina baye.

Ore ena matua eong'wan naa ekitalalu imbaa naipirita tomononishu (tuaishu oo endomono), eishoi oo biitia tiatua olosho laa irmaasai le moikwappe engop e Tanzania. Ore te kimila, ore eishoi o endomono naakeboita merishai te esidano o embulunoto. Ore indomonok o irmaasai neyelo aajo keeta tipat eseriani etomononishu. Ore ingipangat eishoi oo ilchirikani le mele sipitari oogira ailepie ingoitoo naibooyo tuaishu enaa ewokoto oo ndundai oo ingishopoto oo imbirai naishopi naibooyo tuaishu nipirita kuna baa. Ore engipangata eishoi nemengibooto ake etuaishu ake kake sii eer eishoi.

Ore engikilikwanare pookin naipirita ingipangat eishoi te kimila naa ekishorua eng'asiata naibelekinyeki ingotoo eishoi oo irmaasai o induat o engisoma o ilkitarini leramatatare oo

iltung'anak neyewau ewalata engisoma sidai. Ore eng'eno naa ekibeleyenaki pee elo atua imbaa etipat naipirita tomononishu oo eishoi sidai tiatua irmaasai, naa ketii emponari sidai atua ine. Ore pee etoponate oleng' iltung'anak oo ponu te nganyit aduare ilkitarini too baa naipirita eishoi sidai tengikilikwanare o too indorok naatumito naa keidimayu tengaraki natushulateki airo.

Ore tena matua eimiet naa ikikilikwanaki ajo kanyoo paa kiti elototo napuo indomonok aisho tesipitari to engaitoyok naiteng'enaki nelimu ajo meeta eng'eno sapuk enkitoyore. Ore enjoolunoto naa kelimuni tiatua iriot uni enaa enatolimuo Thaddeus En Maine, iriot naitodolu imbaa uni engimutioto endumoto eramatata sidai (engimutioto ee ang'. Engoitoi oo enesipitari). Ore etayoloki apa indokiting' kumok nayelounyeki keeya nayepu eishoi o tomononishu tengaraki engira/emisilishu o irbulabul lenyanak, eyolounoto kiti o lewa/irmoruak loo irmaasai o mbaa naipirita eishoi naserian, eretenata kiti naipirita eishoi, elakwani nalakwanikino ngera teinoto, elakwani o irmareta tenebo eramatata enye teneridi tesipitari, elaunoto endaa o iropiani teneridi te sipitari, eramatata esipitari nemeitipisho too ingolong' i naa ninye enyanyata naanyi engaitoyoni emila tenebai sipitari, eramatata nemesidai, metiiimotokaani nemesidai irbarabarani, nemetii ildakitarini/ilkitaruni, nemetii imasaa eramatata o tumoto kiti oo ingoitoo natumieki irkiliku, engutishu o laramatak le sipitari.

Ore kuna nyamalitin nitodolu te endapasho ajo metii enjula eramatata olosho o ngishu,erikore, o erisito o lewa o ngituak o engulukoni. Ore tekuna pookin metii oltung'ani obo tiatua ele turur oidima ataasa esidai,ore kuna wejitin neitayoki etaa enyamali sapuk, netaa osina sapuk tiatua olosho naa ekeloito dukuya (aaku ake sapuk). Ore engiroroto o enaboishu enaa enatiu oshaake ina jurore pookin tonaipirita walata enaboishu ewala o isiaitin otupukuto injurore , nelimuno kuna tematua eile one naapishana.

Ore enaituruku naa engitobirata o ngoitoo naidim atihil egira naipirita engeeya o nduan enaa enalimuni tena matua eile. Ore tiatua enjula oo ngaitoyok naa iteng'enaki , naa ore enduata naidim atayelounye engeeya o nduan tengotoi naiji titoishu (sisterhood method) naa ekeimunyeki engoitoo ekimila. Ore enoitoo naa eketetemieki iltung'anak oiteng'enaki imbaa o engitashakinoto eishoi tenebo ilajurok lo imbukunot kumok. Era tomo oong'wan elaiteshekinok le eishoi oikilikwanaki imbaa naipirita eishoi, o ngituak 496, netumi 2241 o ndoye o 689 keeya tiatua iltung'anak oishu 100,000 (elaki nabo). Ore ilajurok nikilikwanishore ingituak 484. Naa ore enatoo etitoshu (pictorial sisterhood) naa inyi engoitoo naidim aidimie iltung'anak litusoma tiatua enjurore eramatata eishoi o eng'eno esheria. Ekeyeu enkiteng'ena o enjurore sapuk, kake ishoru sii eng'asiata naitasapuk imbaa naipirita eyolounoto o engitoria o imbaa engeeya o nduana.

Ore ena matua enaapishana na keutu te ndorop enjurore nataasaki tialo ingaitoyok e mila o ngaitoyok naiteng'enaki e sipitari. Ore tina naiboishu naibung'ate kuna aitoyok iboi pokira netumi aajo sidai ena siai eishoi tenemenari, ore tengaraki ina netumi indomonok nara esiana oo ntomoni ile oo isiet to lari loo ngalifuni are oo tomon (2010). Ore isinaitin oimatie ingaitoyok o mboi pokira tiatu ina shula engisiayiare nabo netolimuoki te guton. Metaa ore eretenata naretenai aanyu engata eishoi o engata etomononishu, neretenai sii aanyu esidai e ntomono naidim aatupiku tina olong' to losho le moikwape le Tanzania na njere ore ena kidenyata naidenyaki pee epuoi aiki ina weuji niteng'enakaki pee eiki ngituak na kiti elototo napuoi aisho tnewueji, kiti sii naiboshu naatai naimaki tenebo kulo sinaitin le ngata eishoi oo tomononishu tiatua olorere nejo naapaji pee etumi ewalata napuoi aaliki ine wueji niteng'elaki nitii sii kuna aitoyok naiteng'enaki nena baa eishoi, ore injurore netisiputua ilajurok aajo meeta enyamali enjurore tiatua inewueji netaasaki ena jurore.

Ore tena kiroroto naipirita ina siai natejo eramatare ena nayau engitashekinoto naipir ngibelenyat o mbaa naipir olosho o ngoitoi naiminieki ele sina to eng'amunot sidan.

Ore tiatua ina ramatare natejo kiroritai njere ajo eramatare ena nanyoraa emwa ine neesieki ina metaa eduata oolopeny enkop na ninche ooreu etii enyamali. ore enyamali naa enikoni pe ineneng'l aajo kamaa ena ramatare keeta eripoto tene neesiaki enake meeta, kamaa tene nenotieki ena duata olosho keijing'a oo ena ramatare eatua sipitarini eina kop too mwaini pookin. Kanyor nenyoraa lelo pookin oitayu iwala tiatua irkerengeti lolosho (the organization of) te eramatare oo iseseni loo ndomonok, nenyor neeta ndomonok eyelounoto te kuna baa pee eibung'are neasi. Neibung'are sii nije irmareita lenye oo lelo pookin ooramaita tenebo ingaitoyok emila o ngaitoyok naiteng'ena e sipitari too nena weujitini neramatieki ina ramatare.

Ore ena jurrore nayau ewalata ng'ejuk najurri neesi (implementation research) nitodolu eyolounoto too iyasat, ore enajurore netoponori anuk elusie narishita eyolounoto oesata ina saa, nikimbiribir aajo kaja kingo pee kiyolou nikijing'aki iyasat kutitik e ramatare oo seseni tiatua sipitari tiatua ingaitoyok naiteng'ena eimu naiboshu napiki enganyit eng'eno naata ilang'eni lina kop. Ajo sidai enaa ekishaakino tennikipuo dukuya te duata e ramatare oo nduan naisujaki aitosidan ena ramatare nitodorop oleng' keeya nayepu eishoi too loshon pookin.

SAMENVATTING

Moedersterfte blijft wereldwijd hoog. De World Health Organization meldt dat in 2017 wereldwijd ruim 295.000 vrouwen stierven tijdens de zwangerschap, bevalling of kraambed. Vele initiatieven, onder andere naar aanleiding van de Millennium Development Goals en de meer recente Sustainable Development Goals, dragen bij aan een vermindering van moedersterfte. Het nieuwe doel is dat in 2030 minder dan 70 vrouwen overlijden per 100.000 levend geboren kinderen. Met name in kwetsbare populaties gaat de afname van moedersterfte momenteel te langzaam om dit doel te halen. Hoewel er duidelijke internationale strategieën zijn, lijken deze in sommige contexten niet effectief. Een van de strategieën om moedersterfte te verminderen, is het bevallen in aanwezigheid van een getrainde obstetrisch hulpverlener (skilled birth attendant - SBA). Er bestaan helaas diverse barrières om van de diensten van een SBA gebruik te maken. De achterliggende oorzaken hiervan zijn vaak complex en onvoldoende onderzocht.

In dit proefschrift wordt het ondergebruik van SBAs op twee manieren geanalyseerd. In het eerste deel wordt bestudeerd of interventies die het Birth Preparedness and Complication Readiness (BPCR) model gebruiken, het aantal geboortes met een SBA verhogen. In deel twee wordt een lokale situatie in het noorden van Tanzania bestudeerd, waar het grootste deel van met name Maasai bevolking, niet bevalt in aanwezigheid van een SBA, maar van een traditionele vroedvrouw.

Het BPCR model bestaat uit een matrix waarin is beschreven wat een goede voorbereiding voor een bevalling en eventuele complicaties inhoudt. Hierin worden diverse partijen benoemd: vrouwen die gaan bevallen, hun families en gemeenschap, maar ook SBAs, ziekenhuizen en gezondheids- en politieke systemen waarvan de ziekenhuizen onderdeel zijn. In hoofdstuk 2 wordt door middel van systematisch literatuuronderzoek beschreven wat het effect is van het gebruik van het BPCR model op het aantal bevallingen met een SBA. Het blijkt dat programma's, die gebruik maken van het BPCR model, kennis over een goede voorbereiding verhogen, maar niet automatisch leiden tot een toename van het aantal bevallingen bij getrainde obstetrische hulpverlener.

In hoofdstuk 3 wordt beschreven welke factoren de implementatie van BPCR programma's beïnvloeden. Door de diversiteit van de programma's en de verschillende definities die programma's hanteren voor BPCR was het lastig om algemene conclusies te trekken. Programma's lijken succesvoller in contexten waar het opleidingsniveau van vrouwen hoger is, als programma's aan de context waarin ze plaatsvinden worden aangepast en als de verschillende partijen in het BPCR model tegelijk worden betrokken. Factoren die het gebruik van een SBA beperken zijn onder andere zorg die niet goed is afgestemd op de wensen van

patiënten, tekort aan getrainde obstetrische hulpverleners of materialen, als vrouwen of hun gemeenschap de voorkeur geven aan traditionele vroedvrouwen en armoede of politieke instabiliteit. Kortdurende BPCR interventies lijken bovendien minder succesvol dan lang lopende interventies.

In het tweede deel van dit proefschrift wordt een lokale situatie in het noorden van Tanzania geanalyseerd, waar de moedersterfte in 2005 ter plaatse werd geschat op 642/100.000 levendgeborenen. Slechts 7% van de bevallingen werd begeleid door een SBA. De meeste vrouwen bevallen onder begeleiding van een traditionele vroedvrouw (traditional birth attendant -TBA). In 2008 vonden in een lokaal ziekenhuis slechts 47 bevallingen plaats. Eerder onderzoek in deze gemeenschap naar risicofactoren voor HIV, identificeerde dat om tot lokale zorgaanpassingen te kunnen komen, verdere kennis nodig was van problemen binnen de reproductieve gezondheid, moederschap en het ondergebruik van SBAs. Dit verdiepende onderzoek vond plaats tussen 2009 en 2011 en is de basis voor het tweede deel van dit proefschrift. Het bestaat uit kwalitatief onderzoek, waaronder participatief actie-onderzoek (PAR), interviews, observaties en literatuuronderzoek. Maasai vrouwen, mannen, traditionele vroedvrouwen en ziekenhuispersoneel, waaronder SBAs, werden betrokken bij het onderzoek naar achterliggende factoren en oplossingen voor geïdentificeerde problemen.

In hoofdstuk 4 wordt beschreven wat moederschap, vruchtbaarheid en HIV in de Maasai context in Noord Tanzania inhoudt. Onder Maasai zijn voortplanting en moederschap traditioneel gezien onlosmakelijk met elkaar en met het concept van welvaart en groei verbonden. Maasai vrouwen ervaren het moederschap als essentieel, maar ook wel verplicht, onderdeel van hun sociale rol als vrouw. “Family planning” programma’s van non-gouvernementele organisaties uit het verleden, die onder andere condoomgebruik en anticonceptie propageerden, werden als niet passend ervaren. Voor de onderzoek deelnemers bleek “je familie plannen”, niet alleen anticonceptie te impliceren - zoals gebruikelijk binnen de internationale definities - maar ook juist fertiliteitsproblemen. Gesprekken over “family planning” in deze lokale definitie, gaven mogelijkheden tot uitwisseling van kennis tussen een traditioneel Maasai perspectief en een biomedisch perspectief. Deze kennis werd vertaald in lokaal sensitieve maternale en reproductieve gezondheidszorg, waar infertiliteitszorg een onderdeel van werd. De toename van de polikliniekbezoeken voor reproductieve vragen en problemen lijkt hier een voorzichtige reactie op.

In hoofdstuk 5 worden de achterliggende redenen voor het lage gebruik van SBAs beschreven. Deze worden gestructureerd middels het Three Delays Model van Thaddeus en Maine, dat verschillende fases van vertraging beschrijft in het krijgen van kwalitatief goede maternale zorg (vertraging thuis, onderweg en in het ziekenhuis). Er bleken zeer verschillende achtergronden te zijn, waaronder: beperkte erkenning van maternale mortaliteit door

zwijgen na sterfte; beperkte voorlichting van mannen over moederzorg/reproductieve gezondheid; suboptimale voorbereidingen op de bevalling; de afstand tot gezin, familie en vee bij ziekenhuisopname; voedsel en financiële onzekerheden die in het ziekenhuis versterkt werden; negatieve ervaringen met beschikbaarheid en kwaliteit van ziekenhuiszorg; het ongewenst beëindigen van de zorg door de TBA bij aankomst in het ziekenhuis; onvoldoende beschikbaarheid en kwaliteit van transport en wegen naar het ziekenhuis; tekorten van personeel en middelen in het ziekenhuis en onvoldoende delen van kennis in het ziekenhuis. Deze problemen reflecteren verschillende en onderling afhankelijke domeinen; medisch, gezondheidssysteem, politieke, traditionele, voedselzekerheid, gezinsleven, vee, gender, infrastructuur en conservatie van flora en fauna. Geen van de groepen onderzoek deelnemers was in staat solistisch deze problemen aan te pakken of op te lossen. Het lage gebruik van SBAs kan gezien worden als een “complex” of “persisterend” probleem; een probleem dat langdurig is, ingebed in diverse maatschappelijke- en zorgstructuren, waarbij elke (deel) oplossing nieuwe problemen creëert. Inherent hieraan is dat samenwerking, communicatie en delen van macht nodig is om tot verandering te komen. Zoals gebruikelijk bij participatief actie onderzoek, werd in samenspraak met de diverse deelnemers bepaald welke problemen en oplossingen hiervoor in aanmerking kwamen. Een aantal hiervan zijn verder uitgewerkt in hoofdstuk 6 en 7.

In hoofdstuk 6 wordt de ontwikkeling van een methode beschreven die bij kan dragen aan het doorbreken van zwijgen over maternale sterfte. In samenwerking met traditionele vroedvrouwen werd een methode voor het schatten van moedersterfte - de Sisterhood Method - aangepast tot een lokaal sensitieve, kwantitatief-participatieve meetmethode; de Pictorial Sisterhood Method, die vervolgens door onderzoekers en (ongeleterde) traditionele vroedvrouwen werd getest als crosssectionele studie. Veertien TBAs interviewden 496 vrouwen, leidend tot 2241 “sister units of risk” en een moedersterfte van 689 gevallen per 100 000 levendgeborenen (95% confidence interval 419–959). Onderzoekers interviewden 474 vrouwen (sample), leidend tot 1487 “sister units of risk” en moedersterfte van 484 vrouwen per 100 000 levendgeborenen (95% confidence interval 172–795). De Pictorial Sisterhood Method is een innovatieve applicatie die bijdraagt aan de participatie van ongeletterden in het meten van en opkomen voor gezondheid van moeders. Het biedt interessante mogelijkheden om het eigenaarschap van data over moedersterfte te behouden, daar waar het hoort: in de gemeenschap die het betreft. Deelnemende TBAs verzochten daarbij om actie: indien onderzoek naar moedersterfte niet leidt tot aanpakken van problemen, wordt praten over moedersterfte een pijnlijke ervaring. We adviseren de Pictorial Sisterhood Methode naar wens aan te passen en te testen in andere contexten.

Hoofdstuk 7 vat het onderzoek naar de gecombineerde TBA/SBA zorg in het lokale ziekenhuis samen. De samenwerking tussen SBAs en TBAs leidde tot een meer cultureel acceptabele,

context specifieke verloskundige zorg, maar leidde nog niet tot een toename van het aantal geboortes met een SBA (68 in 2010). In dit hoofdstuk worden positieve punten en uitdagingen in de samenwerking tussen TBAs, SBAs en vrouwen die bevielen, gedeeld.

Kortom, dit proefschrift onderschrijft naar aanleiding van de analyse van het BPCR model en de analyse van een Noord-Tanzaniaanse context, het belang van: participatieve analyse van een context waarin het gebruik van SBAs laag is, en vervolgens van samenwerking door alle betrokken partijen in het co-creëren van context specifieke oplossingen en zorg. Mogelijk faciliteert dit het gebruik van SBAs, maar met meer zekerheid draagt dit bij aan het verhogen van de ervaren kwaliteit van zorg en samenwerking tussen en met lokale zorgverleners. Door een adaptieve onderzoek agenda wordt onderzoek direct lokaal relevant.

De discussie beschrijft dat context specifieke zorg vaak sociaal innovatief en inherent daaraan uitdagend is. Dit is onder andere: context specifieke zorg meetbaar maken, duurzaam behouden binnen bestaande zorgsystemen, dan wel door zorg systemen aan te passen, waarbij krachtsstructuren binnen de betrokken gemeenschap en gezondheids-systemen in acht dienen te worden genomen. Hierbij is het essentieel dat er binnen de bestaande machtsstructuren in gezondheidszorg ruimte wordt gegeven aan de wensen en noden van vrouwen, hun families en hen die voor hen zorgen, zowel TBAs als SBAs.

Het verrichte onderzoek in dit proefschrift past bij nieuwe definities van implementatie onderzoek, waarin kennis van verschillende disciplines vertegenwoordigd is. Inzichten uit dit proefschrift dragen - in bescheiden mate - bij aan hoe we de “know-do” gap tussen weten en doen kunnen verkleinen. Specifieker: hoe ondergebruik van SBAs te begrijpen is en te kenteren: door middel van participatie, samenwerking en gebruik makend van lokale expertise. Het is aan te bevelen zó samen te werken en op deze wijze bij te dragen aan de gezondheid van moeders en de vermindering van moedersterfte wereldwijd.

AUTHORS AND AFFILIATIONS

Dr. L.K. Birks

Global Health & International Partnerships, Faculty of Medicine, University of Calgary, Canada

Prof. dr. J.F.G. Bunders

Athena Institute for Research on Innovation and Communication in Health and Life sciences, Faculty of Science, Vrije Universiteit, Amsterdam, the Netherlands

Dr. M. van Elteren

EMGO Institute for Health and Care Research VU, Department of Medical Humanities, VU University Medical Center, Amsterdam, the Netherlands

Dr. J.M. Hatfield

Global Health & International Partnerships, Faculty of Medicine, University of Calgary, Canada.

Drs. J. van Kats

Athena Institute for Research on Innovation and Communication in Health and Life sciences, Faculty of Science, Vrije Universiteit, Amsterdam, the Netherlands

Dr. M. Manyama

Department of Anatomy, Catholic University of Health & Allied Sciences, Mwanza, United Republic of Tanzania

A. Portela, BA, MA

Department of Maternal, Newborn, Child, Adolescent Health, World Health Organization, Geneva, Switzerland

Prof. dr. J.J.M. van Roosmalen

Athena Institute for Research on Innovation and Communication in Health and Life sciences, Faculty of Science, Vrije Universiteit, Amsterdam, the Netherlands

Prof. dr. F. Scheele

Athena Institute for Research on Innovation and Communication in Health and Life sciences, Faculty of Science, Vrije Universiteit, Amsterdam, the Netherlands

Drs. R. Schreuder

Athena Institute for Research on Innovation and Communication in Health and Life sciences,
Faculty of Science, Vrije Universiteit, Amsterdam, the Netherlands

Dr. L. Shields

Athena Institute for Research on Innovation and Communication in Health and Life sciences,
Faculty of Science, Vrije Universiteit, Amsterdam, the Netherlands

Dr. H. Smith

Centre for Maternal and Newborn Health, Liverpool School of Tropical Medicine, United
Kingdom

Dr. A. Solnes Miltenburg

Department of Community Medicine, Institute of Health and Society, University of Oslo,
Norway

Prof. dr. J. Stekelenburg

Faculty of Medical Sciences, University of Groningen, the Netherlands

Prof. dr. M.B.M. Zweekhorst

Athena Institute for Research on Innovation and Communication in Health and Life sciences,
Faculty of Science, Vrije Universiteit, Amsterdam, the Netherlands

PHD PORTFOLIO

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Society

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Sounding board member for the Guideline for Medical Care for Refugee Children, the Netherlands (together with Eveline Melman, Marcus Rijken), 2019.

Teaching

Thesis

Supervision of or consultation for various students of Master of Medicine, AmsterdamUMC (location VUmc), Master International Public Health, Vrije Universiteit Amsterdam, the Netherlands and Department of Community Health Sciences and Global Health & International Partnerships, University of Calgary, Canada. With special mention of:

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“Reproductive Health Care”, Bachelor Health Sciences, VU, Amsterdam (2011).

“Traditional health systems?!” , Master International Public Health, VU, Amsterdam (2011).

Project management in clinical work

Consultant RFE Education Project at Endulen Hospital: “Breaking Cultural Barriers in Maasai HIV education”, designing educational graphic novel for HIV peer to peer education program tailored to a Maasai context.

Liaison at Endulen Hospital “Income Generating Activities for People living with HIV / AIDS” Payment for Performance (P4P) program, Cordaid Tanzania, consultant at Endulen Hospital

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ABOUT THE AUTHOR

Yadira Roggeveen was born 16th December 1976 in Alkmaar, the Netherlands, as only daughter from Eveline Dudock, medical secretary and Tristan Roggeveen, structural and mechanical engineer. She grew up in Alkmaar and completed her secondary education at the “Petrus Canisius College”. She doubted between pursuing performance arts or medical sciences and chose the latter. After a negative draw for entering into Medical School, she completed the Psychology first-year certificate at the VU University. After this, she studied Medicine at VU University from 1996 to 2003, where she performed peer to peer clinical trainings and coordinated lectures in which patient participation was central. During her studies she joined theatre group La Boum. Her master thesis was on “Non-epileptical paroxysms in children”, which included follow up visits at home (prof. dr. L.M.E. Smit). Electives included Emergency Medicine, Pediatric Surgery, Tropical Medicine at Luwingu Hospital, Zambia (M.D. Koen and M. Hoexum) and an exchange to the University Hospital UANL, Monterrey, Mexico. After completing Medical School, she combined being a medical doctor at the Public Health Department in Amsterdam with performing theatre with La Boum. Thereafter, she started the Dutch “Tropenopleiding,” creating a profile as Medical Doctor in International Health and Tropical Medicine. The clinical training in obstetrics, gynaecology and surgery took place at Antonius Ziekenhuis Sneek (E. van Eyk and P.P. Jacobs). An additional training in pediatrics followed at the Jeroen Bosch Ziekenhuis (prof. E. de Vries and dr. H. Hoekstra). From 2008–2010 she worked as a medical doctor at Endulen Hospital, Ngorongoro Conservation Area, Tanzania, serving the mainly Maasai community (facilitated by the Arusha Archdiocese and Tweega Medica). Aside general clinical work, she asserted improvements in maternity care and relationships between the hospital and the community. She worked with Lauren Birks as a co-researcher in participatory action research on gender, HIV and maternal health under the supervision of dr. J.M. Hatfield and team. After returning to the Netherlands, Yadira was offered to develop a PhD thesis and to lecture at the Athena Institute at VU University (a joint effort by prof. dr. J.J.M. van Roosmalen and prof. dr. J.F.G. Bunders). Missing the clinical work, she started in Obstetrics and Gynaecology at the Sint Lucas Andreas Ziekenhuis. She started her residency in Obstetrics and Gynaecology in 2013, at OLVG (prof. dr. F. Scheele) and AUmc, location VU medical centre (prof. dr. J.I.P. de Vries), Amsterdam. Continued by supervision of dr. J. Kwee, dr. E. Kaaijk, dr. E. Moll, dr. A.W. Valkenburg - van den Berg, prof. dr. J.A.M. van der Post en dr. G. Fons. Yadira is married to Lars de Groot. They have two sons: Douwe and Lieuwe, with whom they live in Amsterdam.



The Dutch Working Party 'International Safe Motherhood and Reproductive Health' aims to contribute to improvement of the reproductive health status of women around the globe, in particular by collaborating with local health workers (<http://www.safemotherhood.nl>). The Working Party is part of both the Dutch Society of Obstetrics and Gynaecology (NVOG) and the Dutch Society for International Health and Tropical Medicine (NVTG). The activities that are undertaken under the umbrella of the Working Party can be grouped into four pillars: education, patient care, research and advocacy.

Research activities are undertaken by (medical) students, Medical Doctors International Health and Tropical Medicine and many others. Some research activities develop into PhD-trajectories. PhD- candidates all over the world, Dutch and non-Dutch, work on finding locally acceptable and achievable ways to improve the quality of maternal health services, supervised by different members of the Working Party. Professor Jos van Roosmalen initiated the Safe Motherhood Series, which started in 1995.

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