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Midwives for Haiti: Process Evaluation

Denielle Marie Riley

A Thesis Submitted to the Graduate Faculty of

GRAND VALLEY STATE UNIVERSITY

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Abstract

The reduction of maternal mortality is a long-time international objective. One often underemphasized component of addressing complex and context-driven health problems, such as maternal mortality, is the importance of program evaluation. Program evaluation has been identified as particularly scarce among safe motherhood initiatives, which seek to reduce maternal deaths and improve the health outcomes of mothers (Freedman et al., 2007). Useful program evaluation starts with process evaluation. This study is a case study process evaluation of postpartum data collection, which utilizes interviews, observations, and document review. The purpose of this study was to evaluate, describe, and compare the intended and actual data collection processes of Midwives for Haiti's postpartum program at Hospital Saint Therese (HST). This process evaluation included the identification of barriers and facilitators of data collection. Some consistent intentions for data use were identified despite limited planning for data collection and evaluation prior to implementation. These intentions include monitoring outputs, connecting identified complications to interventions used, and improving the quality of care provided. The next step to improving postpartum data collection at HST is to develop a clear program logic model and evaluation plan, which should include short-term and mid-term objectives to effectively address their long-term objective of reducing maternal mortality. The utilization of near-miss cases as proxy for maternal mortality may enable Midwives for Haiti to better understand postpartum outcomes and the impact of the postpartum program.

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List of Abbreviations

AIF	Admissions Intake Form
ANC	Antenatal Care
CHW	Community Health Worker
DC	Data Collection
DLC.....	Delivery Chart
HST	Hospital Saint Therese
LD	Labor and Delivery
LMP	Last Menstrual Period
MCH	Maternal and Child Health
MCL.....	Maternal Examination Checklist
MFH.....	Midwives for Haiti
MMR.....	Maternal Mortality Rate
MSPB	Ministry of Public Health and Population
PC.....	Prenatal Care
PHF	Pregnancy History Form
PN	Postnatal
PNC.....	Postnatal Clinic
PP	Postpartum
PR.....	Patient Register
SBA.....	Skilled Birth Attendant
TBA.....	Traditional Birth Attendant
WHO.....	World Health Organization

Midwives for Haiti: Process Evaluation

Maternal mortality is a complex human-rights issue that accounts for as many as an estimated half a million deaths each year (Ronsmans & Graham, 2006). The Safe Motherhood Initiative was launched to address maternal deaths at a conference in Kenya in 1987 and accepted by every region worldwide by 1992 (Maclean, 2010). Twenty years later, Dr. Mahmoud Fathalla, the physician who first brought the tragedy of maternal mortality to light in 1985, emphasized the reality that the fundamental reason women are still dying is because we have not yet decided if “their lives are worth saving” (Maclean, 2010, p. 7). Remarkable disparities in maternal death exist between countries, but also within them (Ronsmans & Graham, 2006). The vast majority of all preventable deaths take place in developing countries where the risk of dying due to pregnancy- or birth-related causes is nearly 300 times as great as it is in industrialized countries (Maclean, 2010). Evidence-based strategies for addressing maternal mortality have been identified as antenatal care (ANC), delivery with a skilled birth attendant, postpartum care, family planning, and safe abortion (Campbell, Graham, Ronsmans, & Borghi, 2006; Ronsmans & Graham, 2006).

The international consensus is that the provision of quality health care for all women across the lifespan is an essential approach to reducing maternal mortality, and special attention to the intrapartum (from the onset of labor until the delivery of the placenta) and postpartum periods is an instrumental element to the success of this approach (Nour, 2008). After the launch of the Safe Motherhood Initiative, antenatal care (ANC) was viewed as the “key action point” for reducing maternal mortality by increasing the identification of high risk women (Nour, 2008, p. 79). However, this approach proved to be less effective at reducing maternal mortality than hoped (Campbell et al., 2006; Nour, 2008). While ANC utilization has increased worldwide,

postpartum care is underutilized and its importance and impact far less understood (Koblinsky, Matthews, Hussien, & Mavalankar, 2006).

According to Koblinsky et al.'s (2006) review of the literature, the percentage of women across all socioeconomic situations receiving ANC has dramatically increased, but significantly less is known about postpartum care provision. Their review also indicates that postpartum care provision, as well as the use of a skilled birth attendant, is more heavily impacted by poverty than ANC. Research reveals that an elevated risk of maternal mortality and morbidity may exist for up to six months after giving birth (Ronsmans & Graham, 2006). The postpartum period is particularly important for women who have experienced pregnancy or childbirth complications, such as preeclampsia, which is often identified as hypertension and high levels of protein in the urine (Firoz & Melnik, 2011). Preeclampsia and eclampsia, a complication of preeclampsia involving seizures, are leading causes of maternal mortality in Haiti (Small et al., 2005).

Safe motherhood initiatives are typically complex interventions, which can be challenging to implement and evaluate (Moore et al., 2014). Research on maternal mortality indicates that there is a lack of examples of program evaluation among safe motherhood initiatives (Freedman et al., 2007). Evaluation of postpartum programs is especially scarce. Additionally, much of what is published lacks clarity and detail (Milne, Scotland, Tagiyeya-Milne, & Hussien, 2004). Process evaluation is an essential part of overall evaluation and can help to ensure the validity and usefulness of future evaluations. Although process evaluation has been deemed important by the research community, there is a significant shortage of examples in the literature (Moore et al., 2014). The first step to better understanding how to improve program outcomes and impact is process evaluation to ensure data collection fidelity and validity.

Midwives for Haiti (MFH), a non-profit organization located in Hinche, Haiti, is a comprehensive safe motherhood initiative that educates midwives, facilitates mobile prenatal and postnatal/postpartum clinics, staffs the local hospital's maternity ward, trains traditional birth attendants, and recently built and administers a birthing center in Cabestor, Haiti (N. Brunk, personal communication, June 17, 2016). Reducing maternal mortality is one of the organization's long-term impact objectives (B. Tusing, personal communication, 2015). Haiti's maternal mortality rate (MMR) is 350 per 100,000 live births, while the MMR of the neighboring Dominican Republic is 150 per 100,000 live births (O' Mallery Floyd, 2013). This puts Haiti at a higher maternal mortality rate than the average for developing nations, which is estimated at 216 (207-249) per 100,000 live births (Alkema, 2016). Prior to the implementation of the postpartum program by MFH in 2014, Hospital St. Therese (HST) was unable to provide postpartum care to its patients (S. Rapp, personal communication, February 9, 2016; B. Tusing, personal communication, March 20, 2016). Although data is being collected, there has not yet been any evaluation of the postpartum program (S. Rapp, personal communication, February 9, 2016).

Purpose

The postpartum period is understood as a contributor to poor maternal outcomes. There is an overall scarcity of evaluations of safe motherhood initiatives and evaluation of postpartum programs is an especially notable gap in the literature. An evaluation of the processes involved in postpartum data collection will provide MFH with useful information for future evaluation and help to ensure the efficacy of the data being collected. The purpose of this study was to evaluate, describe, and compare the intended and actual data collection processes of Midwives for Haiti's postpartum program at Hospital Saint Therese (HST).

Scope and Limitations

Scope. The focus of this evaluation was restricted to postpartum data collection processes and did not include postnatal data collection (i.e., data being collected about newborns). The more specific focus was on the postpartum data being collected about women's pregnancies. The two data collection sheets considered central to this evaluation were the pregnancy history form (PHF) and the maternal examination checklist (MCL). These data collection sheets can be found in Appendix H. Note that the terms postpartum and postnatal are colloquially, and even often times professionally, used interchangeably despite their actual difference in meaning. They are thus used interchangeably in this evaluation, as well.

Limitations. Limitations to this study include the following: time and funding constraints; logistical factors, which were outside my control (i.e., delays in receiving the letter of approval signed by the medical director at HST, scheduling and communication delays, which impacted when I was able to conduct some of the formative interviews, and needing to schedule one of the postpartum midwife interviews after observations had already begun and in a different setting than the other two postpartum midwife interviews); the language barrier and necessary use of a translator; the limitations of my own understanding of the social and cultural context; institutional factors, such as the presence of student midwives (both government and MFH) doing their clinical rotations during maternal examinations and education; and the limitations intrinsic to single case study analysis, namely limited methodological rigor, the potential for subjectivity or bias (by the researcher, translators, or participants), and the absence of generalizability. However, in this case, where the chief concern is particularization, the need for generalizability is less relevant.

Assumptions

The following assumptions have been made:

- (a) Despite the lack of generalizability inherent to this study, its value extends beyond use by MFH, as it serves to provide an example of how to use a case study to conduct a process evaluation of data collection procedures.
- (b) The unpredictable and humanitarian context of the evaluation site made a qualitative approach a necessary and advantageous methods selection.
- (c) Within-methods triangulation (the use of interviews, observation, and document review) strengthens the internal validity of the study.

Research Questions

The objectives of this process evaluation are to better understand what data is being collected by postpartum midwives about women's pregnancies, how data about women's pregnancies is being collected by the postpartum midwives, the extent to which data is being collected as intended and gaps in data collection processes, and if the data is being used for its intended purposes. Additionally, this evaluation will be far more useful to MFH if potential barriers and facilitators to collecting and using data as intended are also assessed.

The primary research questions for this process evaluation address data collection fidelity: (a) to what extent is postpartum data about women's pregnancies being collected as intended, and (b) to what extent is the data being used for its intended purposes? Secondary questions for this evaluation, which were intended to enable me to answer the primary questions as well as expand on them, include the following: What information about women's pregnancies is being collected (i.e., what indicators are being used)? How is this information being collected? What are the barriers and facilitators to collecting data about women's pregnancies as intended?

Research Site and Context

Haiti was selected as a location for a potential project due to the encouragement and previous experiences of Dr. Azizur Molla. My own preliminary reading and research about Haiti lead me to the realization that Haiti's needs align with my interest areas, specifically addressing high maternal and infant mortality rates. In the process of initial exploration I came across the website of the non-profit organization, Midwives for Haiti (MFH). I contacted the organization in June 2015. The specific program selected for evaluation, the postpartum program at Hospital St. Therese, was selected based on identified gaps in the literature, as well as the needs expressed by MFH staff members, namely the program and partnerships director.

Midwives for Haiti was started by Nadene Brunk and became a register 501(c) (3) in 2006. The MFH house is located in Hinche, Haiti and is a short distance from Hospital St. Therese, a regional district referral hospital in Haiti's Central plateau. The MFH house is painted a happy light pink with sage green pillars and operates as a home base for staff and volunteers, an office space, and a classroom. There is electricity, internet, potable water, a locked gate, and 24-hour security guards on the property. The American Haiti-based staff, all of whom stay at the MFH house, includes: the program and partnerships director, volunteer coordinator, education director, and interns. There are also several Haitian house staff members: a house manager, two cooks, a housekeeper, one laundress, one moto driver, two vehicle drivers, and two full-time security guards (B. Tusing, personal communication, March 10, 2016). The house has porches, several balconies, beautiful outdoor foliage, and a resource board and library for volunteers. There are three guest rooms for international visitors—one with five beds and the other two with four (C. Miller, personal communication, April 6, 2016). All the beds are either bunk beds or twin beds and each has a mosquito net.

The postpartum program was developed and implemented by MFH takes place at HST. Hospital St. Therese has four maternity rooms: antenatal or intrapartum, labor and delivery, postnatal/postpartum, and post-operative (B. Tusing, personal communication, March, 17, 2016). The postpartum room has about 11 beds and a desk for the nurses and postpartum midwives to use. There are fans and windows and a double-door with screens. B. Tusing (personal communication, April 8, 2016) communicated to me that “families often stay with the women in the room during the day, and healthy babies sleep with mom in the bed.”

On the MFH website St. Therese hospital is described as “staffed by dedicated people who are overworked and must constantly deal with difficult realities. There is limited running water, intermittent electricity, poor access to supplies, and a lack of equipment” (Midwives for Haiti, n.d.). As was communicated to me by the previous MPH intern: “The hospital can be a difficult place to work, especially if it's your first time there. The poverty is astounding, and it's very visceral—the sounds, the smells, the sights can be upsetting until you can look past it” (B. Tusing, personal communication, February 25, 2016). However, progress is being made thanks to a lot of hard work by dedicated individuals and the executive director’s persistent belief that “empowering women to care for their own communities [is] the way to effect lasting change in Haiti” (Midwives for Haiti, n.d.).

Significance

The literature on safe motherhood initiatives lacks examples of program evaluation (Freedman et al., 2007). Evaluation of postpartum programs is especially scarce, and much of what has been published is limited in clarity and detail (Milne, Scotland, Tagiyeya-Milne, & Hussien, 2004). The postpartum period is important for women who have experienced pregnancy or childbirth complications, such as preeclampsia (Firoz & Melnik, 2011). Preeclampsia and

eclampsia, a complication of preeclampsia involving seizures, are leading causes of maternal mortality in Haiti (Small et al., 2005).

Because safe motherhood initiatives are typically complex interventions, they can be challenging to implement and evaluate (Moore et al., 2014). Interventions implemented in unpredictable, developing, or humanitarian settings can be particularly difficult to evaluate. Case study evaluation lends itself to context-driven assessment, which does not require linear and conventional program development and evaluation (Balbach, 1999). One way that the current study contributes to the literature is by providing an example of how to do a case study evaluation of safe motherhood initiatives.

Successful reduction of maternal mortality rates is context-specific, which means that evaluation is necessary for improvement (Maclean, 2011). The first step to better understanding how to improve program outcomes and impact is process evaluation to ensure data collection fidelity and validity. Although process evaluation is considered important in the literature, there is a significant shortage of examples, particularly for complex interventions such as safe motherhood initiatives (Moore et al., 2014). Identification of the barriers to data collection are context specific, as well, and may go undetected without monitoring and evaluation. The literature on safe motherhood initiatives and reducing maternal mortality makes clear the importance of data collection monitoring and evaluation (Kuruvilla et al., 2014).

Definition of Terms

The following terms are defined to ensure understanding and clarity of use. All terms without citation have been developed by the researcher.

Barriers are those circumstances or obstacles which negatively influence data collection or the circumstances or obstacles which have a negative relationship with data quality (i.e., as these circumstances or obstacles increase in prevalence, data quality decreases or is reduced).

Beliefs and social norms (of both patients and midwives) are understood to be referring to personal thoughts or opinions or socially constructed influences that impact the perceptions, attitudes, and behaviors of patients and/or midwives.

Data collection forms (or patient forms) are any forms that are routinely used by Midwives for Haiti's postpartum midwives to collect, gather, or record patient information (i.e., patient history form (PHF), maternal examination checklist (MCL), and newborn examination checklist (NCL)).

Data collection process are any steps, procedures, or aspects of data collection that are taken or utilized to collect, gather or record patient information.

Data collection quality refers to the aspects of data collection procedures, as well as the facets of gathered information, that make it valuable—namely reliability, fidelity, accuracy, and clarity. Data collection quality is ensured by sufficient planning, which includes the development of *SMART objectives* and the implementation of a well-planned process for gathering the information needed to meet those defined objectives.

Data use refers to how the collected information (i.e., indicator measures, statistics, and/or observations) will be used. Both the intentions for data use and the reality of how data is actually being used will be explored in this study.

Distractions are defined as any interference which has the potential to impact the accuracy, completeness, or thoroughness of any aspect of the patient consultation.

Facilitators are those circumstances or factors which positively influence data collection or the circumstances or enablers which have a positive relationship with data quality (i.e., as these circumstances or obstacles increase in prevalence, data quality also increases).

Patient consultation or appointment refers to the three routine postpartum visits (i.e., 6 hours, 6 days, or 6 weeks), as well as any special visits a postpartum patient receives. These consultations include gathering patient information or data, the provision of patient education and care, and providing prescriptions or referrals as needed.

Interruptions are defined as any interference that pauses or momentarily redirects the flow of the patient consultation.

Logistical factors (experienced by either patients or midwives) refers to any barriers or facilitators to *how* something occurs. In other words, the physical realities (e.g., lack of transportation, mountainous terrain, limitations of infrastructure, supplies or technology), issues related to time or workload, and/or access to the necessary information that would enable or prevent the occurrence of something (i.e., data collection).

Normalization of birth as a barrier to data collection, it is being understood as the process by which birth and the potentially negative consequences of birth (i.e., maternal and infant mortality) have become normalized within a culture and a sort of resignation regarding these anticipated consequences has set in. Note that although maintaining the normalcy of birth is a desired aspect of an effective intrapartum care strategy, it is also vital that patients are able to understand and take seriously signs and symptoms of risk.

Postpartum data about women's pregnancies is any information collected at Hospital St. Therese (HST) about past or current pregnancies, including the prenatal, intrapartum, and postpartum periods, as well as any health-related information that occurred prior to, during, and/or after a patient's most recent pregnancy.

Program implementation is the stage or process during which a plan or project is brought into existence or realized.

Program planning and development are the stages during which a program is created and/or improved.

SMART objectives are specific, measurable, attainable, realistic, and time-bound.

Traditional medicine will be defined according to the World Health Organization's definition, which is "the sum total of the knowledge, skills, and practices based on the theories, beliefs, and experiences indigenous to different cultures, whether explicable or not, used in the maintenance of health as well as in the prevention, diagnosis, improvement or treatment of physical and mental illness" (World Health Organization, 2000, p. 1).

A Review of the Literature

This literature review is a broad and somewhat comprehensive look at maternal mortality used to identify where gaps in the literature align with the needs of Midwives for Haiti. Since 1986, the assertion has been made that 88 to 98% of maternal deaths are preventable (Campbell, Graham, Ronsmans, & Borghi, 2006; Maclean, 2010; World Health Organization (WHO), 1986). A claim is also often made that what is needed to accomplish ambitious goals, like a 75% global reduction in MMR is known and agreed upon (Campbell et al., 2006). However, maternal mortality has yet to be sufficiently reduced, pointing to the need for additional research and renewed focus. Understanding the problem can be challenging due, in part, to an inconsistency in the availability and quality of surveillance data (Ronsmans & Graham, 2006). Furthermore, it is a complex issue, which needs local and organizational level evaluation to be successfully addressed. This review of the literature on maternal mortality will identify gaps in the literature and provide an overview of some of the essential frameworks for understanding the issue, the contributing known and potential factors associated with the issue, and the interventions and strategies being utilized to reduce maternal mortality:

- Common Theoretical Framework
- Traditional Medicine in Haiti
- Skilled Birth Attendants
- Intervention Prioritization
 - Intrapartum care strategy
 - Emergency obstetric care
 - Antenatal care
 - Postpartum care

- Midwives for Haiti postpartum care structure
 - Family planning and safe abortion
- Quality
- Midwifery
 - Midwives for Haiti skilled birth attendant (SBA) training and curriculum
- Program Evaluation
 - Process evaluation
- Conceptual Framework

Common Theoretical Framework

Remarkable disparities in maternal death exist between countries, but also within them (Ronsmans & Graham, 2006). Disparities exist based on location (i.e., rural vs. urban residency) and income (Koblinsky, Matthews, Hussien, & Mavalankar, 2006). However, poverty does not always adequately explain these disparities (Ronsmans & Graham, 2006). For example, as noted by Ronsmans and Graham (2006), despite the similar economic status of blacks and Hispanics in the United States, blacks experience substantially higher rates of maternal mortality.

Additionally, the aforementioned authors point out that physical barriers to service utilization (such as distance and mountainous terrain) only explain some of the reasons for the disparities between urban and rural populations, as residents of some urban areas also experience high maternal mortality rates.

One of the traditional conceptual frameworks for addressing maternal mortality is the “three-delays” approach. Thaddeus and Maine (1994) conducted a multidisciplinary literature review of maternal mortality focusing on the timeframe from the onset of a complication to the eventual outcome and proposed the “three-delays” framework commonly used today. The three

phases of their presented framework are: (a) delay in deciding to seek care, (b) delay in reaching a quality facility, and (c) delay in receiving adequate care once arriving at a facility. A great deal of research using this framework has been conducted, most of which is beyond the scope of this paper.

Pacagnella et al. (2012) call for an expansion of the original framework by adding an analysis of near-miss cases, as well as a fourth phase of delay which they associate with the consequences of survival. Women who survive severe pregnancy complications are far more likely to experience clinical conditions, additional complications, and even early death, which can perpetuate cycles of poverty (Pacagnella et al., 2012). The utilization of these additional approaches may help researchers overcome some of the limitations of the “three-delays” framework, which Pacagnella et al. refer to as an explanatory model with limited capacity to interpret the entire complex phenomenon of maternal mortality. However, this framework does reinforce the reality that maternal death has a great deal to do with human right’s violations (Jat, Deo, Goicolea, Hurtig, Sebastian, & Samhallscentenskaplig, 2015; Pacagnella et al., 2012).

Traditional Medicine in Haiti

There is a long, rich history of structured traditional medicine in Haiti that includes shaman (hougan—male, mambo—female, and bokor—subclass), herbalists (doke fey), traditional birth attendants (TBAs) (called matron’s or famn saj), bonesetters, and injectionists (Barnes-Josiah, 1998). Delivery at home with a TBA or family member is still the most common birth practice in Haiti, especially in rural areas (Babalola, 2014; O’Mallory Floyd & Brunk, 2016). Traditional birth attendant practices vary with experience and training. There has been some efforts to provide skill’s training to TBAs but these initiatives have been mostly viewed as unsuccessful (O’Mallory Floyd & Brunk, 2016; Barnes-Josiah, 1998). However, O’Mallory

Floyd and Brunk (2016) argue that little attention has been given to cultural context or respect for TBAs or the quality of the training provided, and that TBAs were not incorporated into the healthcare system. In light of evidence that women continue to prefer TBAs over professional care, O'Mallory Floyd and Brunk contend that true collaboration with TBAs is still needed.

Traditional birth attendants have typically been considered very cautious and even hands-off, especially prior to labor and delivery, because they do not want to be blamed for complications or deformities (Berggren et al., 1983; Barnes-Josiah, 1998). There is a history of superstitious beliefs and Voodoo (or Vodou) practice that has often guided the practices used by TBAs (Berggren et al., 1983). Berggren et al. (1983) provide the following examples: avoiding “light” by delivering and even cutting the cord under a sheet and keeping mother and baby inside for a week after delivery, burying the placenta beneath the doorway at the site of the birth, discarding the “first milk” (colostrum), and having the mother eat “white foods” or in other ways restricting (sometimes quite severely) the diet of the mother. Also, traditionally much attention is given to the umbilical cord stump, considered the “doorway to the body,” and ointments and dressings are often applied (Berggren et al., 1983). This was/is a contributing factor in cases of neonatal tetanus. Berggren et al. found that many TBAs have superstitious beliefs about providing prenatal care and rarely have much contact with their patients prior to labor and delivery. Becoming a TBA is sometimes conceived of through a dream or spiritual experience, and often passed down from generation to generation (Berggren et al., 1983).

There is also a tradition of humoral medicine in Haiti (Wiese, 1976). Humoral theory is defined by the Farlex Partner Medical Dictionary:

The ancient Greek theory of the four body humors (blood, yellow bile, black bile, and phlegm) that determined health and disease. The humors were associated with the four elements (air, fire, earth, and water), which in turn were paired with one of the qualities (hot, cold, dry, and moist). A proper and evenly balanced mixture of the humors

characterized health of body and mind; an imperfect balance resulted in disease. Temperament of body or mind also was supposed to be determined, for example, sanguine (blood), choleric (yellow bile), melancholic (black bile), or phlegmatic (phlegm). (2012)

One of the negative consequences of this understanding of the body is the restriction of women's diets during lactation, which contributes to infant malnutrition and even mortality (Wiese, 1976).

One final element of traditional medicine that may impact pregnant and postpartum women is a condition often considered pathological or somatic called *move san*, which means "bad blood" (Farmer, 1988). It has been described as a common response to emotional upset or an experience caused by emotional distress. Pregnant women and nursing mothers are considered the most vulnerable, as *move san* is believed to cause breast milk to go bad (Farmer, 1988). According to Farmer (1988), this commonly results in early weaning, which can be a matter of life or death for infants. Evidence indicates that this phenomenon subjects women to "public scrutiny" (Farmer, 1988, p. 62). The roots of this phenomenon are likely deep and many medical anthropologists, including Farmer, argue that it should be understood as a complex illness that is not merely psychosomatic but a result of malignant emotions—"anger born of interpersonal strife, shock, grief, chronic worry, and other affects perceived as potentially harmful" (Farmer, 1988, p. 63). Awareness of traditional beliefs and practices is an important first step in improving maternal and neonatal outcomes in Haiti.

Skilled Birth Attendants

One of the primary areas of research on maternal mortality in recent years has focused on the importance of skilled birth attendants. A skilled birth attendant (SBA) is defined by the World Health Organization (WHO) as someone who is "trained to proficiency in the skills needed to manage normal (uncomplicated) pregnancies, childbirth and the immediate postnatal period, and in the identification, management and referral of complications in women and

newborns” (World Health Organization (WHO), 2004, p. 1). Whether or not there is an SBA at each birth is one of the most important evidence-based process indicators utilized and one of the emphasis areas for addressing maternal mortality most agreed upon by safe motherhood advocates (Freedman et al., 2007; Maclean, 2010). Low rates of SBA utilization significantly correlates with high rates of maternal mortality (Campbell et al., 2006; Renfrew et al., 2014; Speakman, Shafi, Sondorp, Atta, & Howard, 2014).

Despite a slow but overall global trend toward facility births, the statistics on SBA utilization in developing countries has changed very little since the 1990’s, and nearly one in four women are still giving birth either alone or with a relative or community member (Koblinsky et al., 2006). In many places the statistics are far worse (Kamal, 2012; Seraphin et al., 2015; Speakman et al., 2014). Research indicates that there are vast disparities in the utilization of SBAs both between countries and within them, and large disparities are often based on rural-residency and poor economic status (Koblinsky et al., 2006). However, as previously mentioned, some urban areas also have low rates of utilization, indicating other barriers to service use (Kamal, 2012).

Some research has linked antenatal care (ANC) with SBA utilization. One study on the determinants of facility delivery in Haiti found that women who received at least one ANC visit were over three times more likely to deliver at a medical facility (Seraphin et al., 2015). Another study on factors associated with the utilization of maternal health services in Haiti from 2007-2012 also found that receiving ANC correlates with use of an SBA at birth (Babalola, 2014). Babalola (2014) found that receiving at least four ANC visits doubled the likelihood of SBA utilization and receiving ANC care that was of high quality increased SBA use by 50%.

However, uptake of ANC is substantially less impacted by poverty than SBA utilization is, and the overall impact of ANC on maternal mortality is limited (Campbell et al., 2006).

Some community-level interventions that can address both community-level and individual barriers to SBA utilization have been found effective (Koblinsky et al., 2006). This points to the importance of community- and context-based analysis to inform intervention development and implementation. One area of research that is seemingly obvious but lacking is determining where and with whom women would like to give birth (Koblinsky et al., 2006). Koblinsky et al. (2006) argue that increasing the utilization of SBAs at all births must start with a realistic evaluation of current coverage and an understanding of the context-specific barriers to improvement. They also state that more research, looking at both those who are unable to access care and those who are able and chose not to, is needed.

One study examined the barriers to SBA utilization based on women's perceived authority during childbirth (Kempe, Alwazer, & Theorell, 2010). Kempe et al. (2010) researched perceived authority according to three influences: intrapartum factors, the level of training of staff, and women's social and demographic backgrounds. Kempe et al. emphasize the need to think beyond health services provision and understand the community context (perceptions, beliefs, practices, health-seeking behaviors, etc...). They also assert that women with no formal education and a traditional belief system will use skilled care if their needs are met. In this study, traditional birth practices (i.e., to give birth alone) serve to both provide women with a place for the assertion of authority and power and to maintain the restrictive perspective of linking women's identity with childbearing. However, the incorporation of traditional practices and knowledge into caring for women during childbirth can help facilitate these culturally valued "tools of resilience" and may also increase utilization of SBAs (Kempe et al., 2010, p. 133).

Another important area of research related to the utilization of skilled care at birth is understanding the context-specific health-seeking or care-seeking behaviors of pregnant women. Global initiatives, such as the Safe Motherhood Initiative, do not sufficiently address the context-specific historical, biological, geographic, economic, and social variables that impact health outcomes (Ronsmans & Graham, 2006). The “three-delays” framework has often been used to better understanding care-seeking behaviors. However, this approach is limited because it is retrospective and only addresses emergency obstetric care (Pacagnella et al., 2012). Place-based analysis of barriers to seeking care is essential to understanding what needs are being missed.

There are a variety of economic, cultural, geographic, and personal factors that may influence health-seeking behaviors. However, much of the research on the health-seeking behaviors of pregnant women points to the influence of limited education (Babalola, 2014; Kamal, 2012; Kuruvilla et al., 2014; Maclean, 2010; Mseu, Nvasulu, & Muheriwa, 2014; Pacagnella et al., 2012; White et al., 2006), and decision-making authority (Jat et al., 2015; Koblinsky et al., 2006; Maclean, 2010; Mseu et al., 2014; Pacagnella et al., 2012; White et al., 2006). The inverse correlation between women’s education and maternal mortality is strong (Maclean, 2010). Research indicates that education’s influence on health/care-seeking behaviors and maternal and child health (MCH) services utilization may play a role (Babalola, 2014; Kamal, 2012). However, without decision-making authority, educated women are still limited by their environment. There is a need for increased educational initiatives that target families and communities, not just pregnant women (Jat et al., 2015; Pacagnella et al., 2012; Urrutia, R. P. et al., 2012; White et al., 2006).

Intervention Prioritization

Prioritization of interventions is another area of research that is important for addressing maternal mortality. Intervention prioritization based on cost-effectiveness is a strategy sometimes employed, especially in resource-poor settings (Kuruvilla et al., 2014; Prata, Sreenivas, Greig, Walsh, & Potts, 2010). Although 18 priority single interventions (known as the Mother Baby Package) have been identified by the World Health Organization (WHO), this package does not adequately empower individual countries (or communities) with limited resources to maximize the use of these interventions (Prata et al., 2012). Prata et al. (2012) devised three models based on country-level income to determine how to cost-effectively implement interventions. They found that many of the interventions were more effective at reducing infant mortality than maternal mortality. According to Prata et al.'s projections, the most cost-effective interventions (from the Mother Baby Package) for reducing maternal mortality (regardless of country-level income) are family planning and safe abortion, antenatal care with the use of misoprostol to prevent hemorrhage, and treatment for sepsis and facility-based management of hemorrhage.

Cost-effectiveness analysis based on country-level income and single-interventions is insufficient for reducing maternal mortality in any substantial way, however beneficial and essential this information might be for program planning (Campbell et al., 2006). For instance, safe abortion and family planning are the most cost-effective regardless of context, but there are substantial cultural and political barriers in most places of the world that impact their use (Prata et al., 2010). Furthermore, major regional differences in maternal mortality, which vary substantially (Say et al., 2014), are often not explained by economic differences (Ronsmans & Graham, 2006). Local variance may be more important than assumed. If a significant local factor

impacting maternal death is not detected and addressed, emphasis on efforts to address other factors may have little power to create change. Ultimately, reducing maternal mortality cannot be achieved by any one intervention and the mechanisms for doing so are often context-specific (Campbell et al., 2006; Kempe et al., 2010).

Given inevitable resource limitations, Campbell et al. (2006) offer what they refer to as a “research-informed viewpoint” on what works to reduce maternal mortality (p. 1284). They conducted a systematic review of the literature on both single interventions and program evaluations and emphasize that there is no single intervention that can effectively reduce maternal mortality on its own. From a treatment standpoint, a variety of interventions are required to address numerous potential complications (Campbell et al., 2006). With regards to “best bet” strategies, or strategies that are most likely to be implemented and have an effect, research indicates the importance of focusing on the intrapartum period, or the period of time from the onset of labor until the delivery of the placenta, as well as the immediate 24 hours postpartum (Campbell et al., 2006, p. 1290; Ronsmans & Graham, 2006). Thus, Campbell et al. assert that the priority for reducing maternal deaths should be to develop an intrapartum-care strategy.

Intrapartum care strategy. Campbell et al. (2006) call for the prioritization of context-informed health center intrapartum care strategies, complimented by four other strategies outside the intrapartum period, which may also improve maternal outcomes: antenatal care (ANC), postpartum care, family planning, and safe abortion (when legal). Emergency obstetric care is also a crucial element of any strategy to reduce maternal deaths (Campbell et al., 2006; Freedman et al., 2007; Hounton et al., 2005). The intrapartum-care strategy that Campbell et al. recommend would target all intrapartum women (not just those at risk of complications),

maintain the normalcy of birth, emphasis non-intervention and appropriate observation, and preserve the psychosocial benefits of a positive birth experience. Ideally, this would take place in a setting where most women give birth in a facility with a midwife assisted by a team (Campbell et al., 2006).

Campbell et al. (2006) acknowledge that some women will, regardless of access, choose to give birth at home, and provide considerations about three other strategies: skilled attendants at home births, using community health workers (CHWs), and training traditional birth attendants (TBAs). They argue that the first strategy, skilled attendants at home births, is limited by necessary linkage and transportation to a facility with comprehensive emergency obstetric care. The second strategy, use of CHWs, will not sufficiently improve maternal health outcomes unless CHWs are trained to the extent that SBAs are (Campbell et al., 2006). Additionally, Campbell et al. point out that unless CHWs are present during labor and delivery, they will have very little impact on reducing maternal mortality. Lastly, a systematic review of TBA training programs found that trained TBAs without access to skilled emergency care support have no impact on maternal mortality rates (Alisjahbana et al. (1995) & Greenwood et al. (1987) as cited in Campbell et al., 2006).

Emergency obstetric care. Access to basic and emergency obstetric care is an essential aspect to any effective intrapartum-care strategy and is one of the three essential services unanimously supported by the safe motherhood community (Campbell et al., 2006; Freedman et al., 2007). Emergency obstetric-care strategies that focus on increasing family awareness of danger signs are not particularly effective at reducing the Maternal Mortality Rate (MMR), in part because signs and symptoms are often difficult to understand (Campbell et al., 2006). Campbell et al. (2006) found that there has not been vigorous evaluation on how emergency

obstetric-care strategies (either with or without the removal of barriers) impact MMR.

Additionally, most accessibility and utilization barriers are context-specific.

Ahluwalia, Schmid, Kouletio, and Kanenda (2003) conducted an evaluation of an initiative called Community Capacity Building and Empowerment part of the Community-Based Reproductive Health Project in northwestern Tanzania. They found that the provision of a transport system was a valuable tool for increasing the rate at which women presented to a health facility for emergency obstetric care. Additionally, research indicates that inadequate emergency obstetric training or experience by providers will have an impact on both outcomes and utilization of services (Jat et al., 2015). This highlights the importance of developing and implementing appropriate mechanisms to ensure accountability (Jat et al., 2015). Accountability is important at every level of maternal and child health (MCH) service-delivery, but particularly important for emergency obstetric care. The four other complimentary non-intrapartum strategies recommended by Campbell et al. (2006)—antenatal care, postpartum care, family planning, and safe abortion—all serve to improve the health outcomes of women and have various levels of impact on maternal mortality. These strategies will each be discussed in more detail.

Antenatal care. Antenatal care (ANC) has long been recognized as an important component of improved MCH outcomes. There are many factors that influence utilization of services, and this is one area always in need of more research, especially on the local- and district-level where programs are implemented (Freedman et al., 2007). Babalola (2014) studied factors associated with services utilization in Haiti and found that women’s education was an important variable linked with both ANC and the use of an SBA at delivery. Antenatal care is also an opportunity to educate women about pregnancy and birth, signs and symptoms of risk, and the importance of delivering at a health facility (Babalola, 2014). Three groups of women

identified as priority populations in Babalola's study are multiparous, the uneducated, and the poor. Seraphin et al. (2015) also identified older women as a priority population for ANC. Older women and multiparous women have been identified as priority populations in many studies because they are more likely to deliver at home and less likely to receive early prenatal care or the recommended number of visits (Kamal, 2012; Seraphin et al., 2015; White et al., 2006).

Kamal (2012) identified parity to be a factor in service utilization in an urban slum in Bangladesh and looked at how often safe motherhood practices were being utilized and the factors associated with utilization. The primary reasons for not receiving ANC were the belief that it was not beneficial, that it was too expensive, and ignorance about the need of service. Education was a leading factor associated with service utilization in general, and women were far more likely to use an SBA or other MCH services for their first child than subsequent. What was perhaps most striking about Kamal's findings, especially given its urban setting, was that although over 67% of the women received ANC from a doctor, nurse, or midwife, only one-fifth of the women delivered with an SBA, and only 13.6% delivered in a hospital. The connection between receiving ANC and SBA utilization is not firmly established in the literature. Furthermore, although ANC is important, especially for the neonate, many women do not receive enough visits or quality care, and there is little evidence that ANC has direct impact on maternal mortality (Campbell et al., 2006).

Postpartum care. Postpartum care and its impact on maternal mortality is an area in need of research prioritization (Campbell et al., 2006). According to Campbell et al.'s (2006) review of recent research, the highest level of postpartum risk is clearly within the first 24 hours, and risk is steadily reduced at two days postpartum. Most deaths occur between the onset of labor and one week postpartum (Ronsmans & Graham, 2006). However, optimal methods and

timing of postpartum care remain unclear (Campbell et al., 2006) Furthermore, evolving research indicates that the risk of death is elevated for as long as six months after giving birth (Ronsmans & Graham, 2006). This raises concerns over the data on postpartum care utilization rates. While ANC utilization has increased worldwide, postpartum care is underused and its importance and impact unclear (Koblinsky et al., 2006).

Kamal's (2012) research found that only 21% of the women in the study received postpartum care and level of educational attainment was a strong predictor of receiving care. Given that hemorrhage (particularly postpartum) is the leading cause of maternal death in developing countries, postpartum care and utilization need to be a priority focus of research (Khan, et al., 2006; Say et al., 2014). As previously discussed, Prata et al.'s (2010) cost-effectiveness evaluation for reducing maternal mortality within restricted budgets found that the most cost-effective interventions (aside from family planning and safe abortion) were antenatal care, which included misoprostol distribution for postpartum hemorrhage, then sepsis treatment, followed by facility-based postpartum hemorrhage management. These findings reemphasize the importance of the postpartum period for reducing maternal deaths, especially in resource-scarce settings.

The postpartum period is an especially critical period of time for women who experience pregnancy or childbirth complications, such as preeclampsia (Firoz & Melnik, 2011). Firoz and Melnik (2011) discuss how hypertension and elevated protein in the urine, the most common indicators of preeclampsia, can continue for weeks or even months postpartum. They also emphasize that some women may even experience hypertension or preeclampsia for the first time after delivery. Women with preeclampsia are also at an elevated risk for cardiovascular disease. According to the Pan American Health Organization, eclampsia, a complication of

preeclampsia involving seizures, is a leading cause of maternal mortality in Haiti (as cited in Small et al., 2005). Despite uncertainty about exactly how often to follow up and what type of care to provide, it is clear that women are often discharged prior to the peak of postpartum blood pressure, which generally occurs between the third and sixth day postpartum, and far before blood pressure normalizes (Firoz & Melnik, 2011). Raghuraman et al. (2014) found that most of the women in their study who experienced postpartum eclampsia had given birth at home. This also emphasizes the importance of additional research to increase the utilization of postpartum follow up care, as well as skilled birth attendants. In addition, Firoz and Melnik emphasize that postpartum care creates an ideal opportunity to gather information about a woman's pregnancy and deliver interconception and family planning education. They argue that taking advantage of this opportunity could increase the odds of a better outcome for subsequent pregnancies and empower women to make lifestyle changes to improve their overall health.

Midwives for Haiti postpartum care structure. Midwives for Haiti has incorporated a data-driven structure for postpartum care provision that provides care at six hours, six days, and six weeks postpartum (N. Brunk, personal communication, June 17, 2015). The World Health Organization recommendation for postpartum follow-up care includes at least three postpartum consultation after being released from the hospital: on day 3 (48–72 hours), between days 7–14 after birth, and six weeks after birth (World Health Organization, 2014). Risk of death is significantly higher during the immediate postpartum period indicating the need for close monitoring, especially if there is postpartum hemorrhage or hypertension (Campbell et al., 2006). However, significantly elevated risk continues throughout the first week after delivery (Ronsman & Graham, 2006). The American College of Obstetricians and Gynecologists recommends that mothers receive a postpartum care visit 4-6 weeks after delivery (U.S. Department of Health and

Human Services, 2013). At six weeks postpartum, remaining symptoms of hypertension may indicate an underlying health concern that if not addressed increases continued risk of complications and early death, and which may have devastating consequences for future pregnancies (Firoz, Fellow, & Melnix, 2011). This six week checkup may also be an ideal opportunity for family planning education.

Family planning and safe abortion. The most cost-effective methods for reducing maternal mortality, as identified by Prata et al. (2010), are family planning and safe abortion. Reproductive health services, including family planning and safe abortion, have been identified as important mechanisms for improving maternal outcomes (Maclean, 2010). Globally, 41% of pregnancies are unplanned and 22% result in induced abortion (The Alan Guttmacher Institute, 1999 as cited in Campbell et al., 2006). About 13% of global maternal deaths each year are the result of unsafe abortion (The Alan Guttmacher Institute, 1999 as cited in Campbell et al., 2006). Family planning utilization rates vary but in many settings remain low regardless of level of awareness (Ministry of Public Health and Population, 2013), indicating the need for more research on barriers and how to increase utilization rates.

In Haiti, despite high levels of awareness about family planning methods, only 31% of married women and 35% of unmarried women use modern methods (Ministry of Public Health and Population, 2013). According to the 2012 Haiti mortality, morbidity, and service utilization survey, modern method's utilization increases with level of education. More than half of married women who participated in this survey reported that they do not want more children, and 28% reported wanting to wait at least two years before their next child. Furthermore, this survey found that in 2012, only 40% of abortions that took place in Haiti (where abortion remains illegal) took place in a facility. Death from unsafe abortion is highest in Latin America and the

Caribbean (Khan et al., 2006). Reducing unwanted pregnancies by educating women about family planning, as well as legalizing abortion, are two vital (albeit controversial and sometimes culturally rejected) methods for decreasing maternal mortality rates (Pacagnella et al., 2012).

Quality

Quality medical care is another key component for reducing maternal deaths (Ronsmans & Graham, 2006). Ronsmans and Graham's (2006) overview of the literature on maternal mortality indicates that access to hospital care is vital to improved outcomes and has played an important role in reducing maternal mortality over the last 35 years. However, they also point out that many deaths actually occur in hospitals. The third phase of the "three-delays" framework has to do with delays in receiving care at a facility, which are often related to staff shortages (Pacagnella et al., 2012). In their review of the literature on the "three-delays" framework, Pacagnella et al. (2012) indicate that quality of care can contribute both directly (i.e., hospital-acquired complications) and indirectly (i.e., deterring patients) to maternal death. Quality may also be a factor in the relationship between ANC and SBA utilization. Although ANC utilization has increased almost everywhere, there is a large discrepancy between women who actually receive the recommended four or more visits and those who do not, as well as whether or not the care received is of quality (Koblinsky et al., 2006).

One study on maternal health services utilization in Haiti found that receiving high-quality ANC increased the odds of using an SBA by 50% (Babalola, 2014). An older study on the pregnancy-related deaths of 12 women in rural Haiti also found that, although cost and distance to facilities were additional barriers to care-seeking, poor care quality (or perceptions about quality) was a predictive barrier to seeking care in nearly all 12 cases (Barnes-Josiah et al., 1998). There is a scarcity of context-specific research on how to effectively scale-up quality care,

especially in resource-scarce settings (Koblinsky et al., 2006). The need for quality improvement also importantly extends to the need for increased quality and availability of data (Say et al., 2014).

Midwifery

Midwifery is one of the mechanisms more recently recognized as beneficial for increasing both access to and quality of care (Hoope-Bender et al., 2014; Ronsmans & Graham, 2006; Speakman et al., 2014). In the late 19th century, maternal mortality was cut in half mostly as a result of increased utilization of professional midwifery care at births (Ver Lerberghe & De Brouwere, 2001 as cited in Ronsmans & Graham, 2006). In a historical overview of the first two decades of the Safe Motherhood Initiative, Maclean (2010) claims that investing in midwives is in many situations an essential component of improving maternal morbidity and mortality rates, especially in relationship to sustainable progress. Although midwifery training is not standardized, the World Health Organization (WHO) has developed technical manuals to increase the evidence-based training of professional midwives (Maclean, 2010). One evaluation of a safe motherhood project in Malawi discovered the importance of training community midwives to educate women and to create a bridge between patients and healthcare facilities (Mseu et al., 2014). Building trust between the healthcare system and the community has often been identified in research as an unmet need (Barnes-Josiah et al., 1998; Maclean, 2011). Research also indicates that this need may be met through increased training and utilization of midwives (Barnes-Josiah et al., 1998; Mseu et al., 2014).

Evidence indicates that the implementation of educated, well-trained, and valued certified midwives working with a team of professionals is associated with both quick and continuous improvements in maternal outcomes (Campbell et al., 2006; Koblinsky et al., 2006; Renfrew et

al., 2014). Therefore, scaling up midwifery care has the potential to substantially reduce maternal mortality (Homer et al., 2014; Hoope-Bender et al., 2014). This approach is also known as task shifting—“shifting tasks from one level of caregiver to another to increase access to care” (O’Mallory Floyd & Brunk, 2016, p. 104). According to the World Health Organization (2008), key factors for successful task shifting include the following: training and supervision, access to necessary supplies, clearly defined roles and responsibilities, adequate salaries and working conditions, and careful consideration of local context, particularly with regard to referrals (as cited in O’Mallory Floyd & Brunk, 2016). In a case study of Hospital St. Therese (HST) in Haiti, O’Mallory Floyd and Brunk (2016) found that task shifting increased demand for and utilization of services, including facility deliveries, and also increased referrals.

Task shifting, as a method for scaling up care, has the potential to dramatically reduce maternal mortality rates over time. Hoope-Bender et al. (2014) created a model and found that in resource-scarce settings a 10% increase in intervention coverage through midwifery care over 15 years has the potential to reduce maternal mortality by 27%. A 25% increase in coverage from baseline estimates could result in a 50% reduction in maternal deaths. Their assessment provides evidence that the education and deployment of community-based midwives could have a return on investment comparable to vaccination (Hoope-Bender et al., 2014).

One study by Speakman et al. (2014) looked at the development, implementation, and acceptance of the Community Midwifery Education initiative in Afghanistan. They found that all key informants pointed to an increased number of midwives as a key contributor to the reduction of maternal deaths. The estimated reduction in MMR since the implementation of the initiative is as high as a reduction of 1273 per 100,000 live births, though the accuracy of this estimate has been contested (Speakman et al., 2014). The Community Midwifery Education initiative is just

one example of the midwifery training programs that have been developed and implemented worldwide. O’ Mallory Floyd and Brunk’s (2016) case study of the midwifery training program in Haiti also indicates the success of this model.

Midwives for Haiti SBA training and curriculum. Professional education is central to increasing quality and coverage (Frenk, Chen, Bhutta, et al., 2010 as cited in Hoope-Bender et al., 2014) In order to address the gap between the attributes of quality care and the reality on the ground, Midwives for Haiti (MFH) is working to increase internal capacity in Haiti through midwifery training of auxiliary nurses and empowering skilled midwives to practice at their full capacity to reduce inefficiencies (Hoope-Bender et al., 2014; O’Mallory Floyd & Brunk, 2016). The Midwives for Haiti SBA training program is a collaborative effort with the Ministry of Health in the Central Plateau region, the society of Haitian Obstetricians and Gynecologists, and the Association of Infirmiere Sage Femmes (nurse-midwives) (O’Mallory Floyd & Brunk, 2016). According to O’Mallory and Brunk (2016), the Ministry of Health signed a contract stating that HST could be used by MFH as a clinical training site for advanced obstetrics for nurses with valid diplomas.

The SBA training program is a culturally appropriate and challenging 12-month curriculum with a foundation of volunteer professional midwives and medical professionals who visit Haiti and supplement the student's skills development and learning. The primary text book for the midwives-in-training is *A Book for Midwives: Care for pregnancy, birth, and women’s health*, which has been translated into Creole (O’Mallory Floyd & Brunk, 2016). The initial instruction materials in 2006, when the program began, were: WHO midwifery education modules, White Ribbon Alliance materials, and a French language copy of the first edition of the

American College of Nurse-Midwives Life Saving Skills modules (O'Mallory Floyd & Brunk, 2016).

These instruction materials were updated in 2009 to incorporate the global standards for the initial education of nurses and midwives as the framework and to include the WHO/ICM core abilities of skilled birth attendants (O'Mallory Floyd & Brunk, 2016). Additional updates include the utilization of treatment protocols from *Pregnancy, Childbirth, Postpartum, and Newborn Care: A guide for essential practice* (Midwives for Haiti website, n.d.). Student achievement is measured according to the World Health Organization's list of the required skills and abilities of an Advanced Skilled Birth Attendant (MFH website, n.d.).

Program Evaluation

A final area of research on safe motherhood that is lacking is community-based or context-specific program evaluation (Freedman et al., 2007). Furthermore, much of the program evaluation that is published lacks clarity and detail (Milne et al., 2004). One study designed to create descriptions of safe motherhood programs in Burkina Faso identified the following gaps: (a) despite defined health outcomes, measuring these outcomes was rarely addressed; (b) none of the programs had undergone a formal stakeholder analysis; (c) all programs had completed a situation analysis or needs assessment, but only two had gathered baseline data and monitoring measures prior to implementation; and (d) little planning for evaluation existed (Hounton et al., 2005). Milne et al. (2004) argue that publishing evaluation results and providing details about the approach used is important for the improvement of future evaluations of safe motherhood programs. Continual evaluation and research is a necessary component of successfully reducing maternal mortality (Kuruvilla et al., 2014). However, literature on how to successfully evaluate community-based safe motherhood programs is scarce.

Furthermore, the formula for program success depends on context, making local research and evaluation a high priority (Kuruvilla et al., 2014). For example, in order to improve SBA utilization, a key variable for reducing maternal deaths, a representative evaluation of current care coverage and barriers to progress must be conducted (Koblinsky et al., 2006). All “good practice” requires evaluation (Maclean, 2011, p. 814). In a discussion of midwifery consultancy, Maclean (2011) argues that good practice means asking how it will be known that a program or intervention is successful and identifying how things can be improved. Though there are multiple approaches to evaluation, much of research indicates the importance of remembering that the true experts are often times local community members (Chambers, 1981 as quoted in Maclean, 2011). Therefore, all stakeholders, including community members, should be included in the process of setting evaluation priorities whenever possible (Madi et al., 2007).

Process evaluation. Maternal and child health initiatives are typically complex interventions, which can be challenging to implement and evaluate. Process evaluation is an essential part of overall evaluation which can help to ensure the validity and usefulness of future evaluations. Although process evaluation has been deemed important by the research community, there is a significant shortage of examples in the literature, particularly for complex interventions such as safe motherhood initiatives (Moore et al., 2014). The lack of guidance available makes planning for this type of evaluation an improvised process. Therefore, process evaluation of safe motherhood initiatives is another identified gap in the literature.

This literature review provides an overview of issues related to maternal mortality and addresses both known and unknown contributing factors to maternal death. It identifies the expansiveness and complexity of the issue, as well as the tangible steps that research indicates are necessary. One of these essential steps is evaluation. Limitations in this review of the

literature include time, the necessary exclusion of research in languages other than English, methodological imperfections of selected research, and the small sample sizes of some of the studies included.

Conceptual Framework

The conceptual framework for understanding potential barriers and facilitators to collecting postpartum data is in part related to the barriers and facilitators to maternal health services utilization. A starting place for the development of this framework is the “three-delays” approach developed by Thaddeus and Maine (1994). The three phases of their presented framework are: (a) delay in deciding to seek care, (b) delay in reaching a quality facility, and (c) delay in receiving adequate care once arriving at a facility. Pacagenella et al. (2012) expanded upon the three-delays framework to include the outcomes of survival in near-miss cases. These outcomes are namely the perpetuation of poverty and the increased long term risk experienced by mothers who narrowly escape dying, which include continued complications, chronic illness, and early death. The addition of this fourth delay helps us to better understand potential barriers to receiving care, especially postpartum care. What this potentially and logically translates into is that when women do not present for postpartum care because of logistical barriers midwives are unable to collect data from them.

The MFH postpartum program at Hospital St. Therese uses a three-6’s approach to care provision, providing postpartum care at six hours, six days, and six weeks postpartum (N. Brunk, personal communication, June 17, 2015). If there are logistical barriers to receiving care, this likely translates into less women receiving care at six days than six hours, and significantly less women showing up for the six week exam, especially if they do not perceive there to be any problems. This concern was also communicated to me by MFH’s former Masters in Public

Health intern who is now the organization's monitoring and evaluations and operations manager. Tusing communicated that women generally understand postpartum services as "important if they are having troubles" (B. Tusing, personal communication, July 17, 2015). It was also communicated to me by Tusing that birth is a normalized process in Haiti, and the risks of birth are in many ways normalized, as well.

Beliefs and social norms also likely influence postpartum services utilization. White et al. (2006) found that some women may not have health decision-making authority and may rely on their husbands for both decision-making and survival. This is likely an important factor for delays in deciding to seek care. Another important non-logistical factor that influences whether or not women seek care is level of education. Kamal's (2012) research in an urban slum in Bangladesh found that only 21% of the women in the study received postpartum care, and one of the strongest predictors was level of educational attainment.

Perceptions about the quality of care provided and lengthy wait times are also commonly associated with delays in care-seeking (Barnes-Josiah et al., 1998). Perceptions about hospital care was also mentioned in previous conversations with MFH staff members. Tusing stated that the hospital is often viewed as "where people go to die" (B. Tusing, personal communication, July 17, 2015). Additionally, there is a deeply rooted history of traditional medicine in Haiti. In one exploratory study of services utilization by Haitian immigrants in the United States every focus group identified successful use of traditional medicine as a barrier to utilization of "western" health services, and use of western health care was considered "a last resort" by many Haitian participants (Allen et al., 2013, p. 111).

Barriers to the utilization of postpartum care services translate into barriers to collecting data. There are also likely barriers that midwives experience as a result of both external and

personal factors. Additional potential barriers to data collection might be that the midwives do not understand the importance or purpose of the data being collected or of data collection in general, they may be too busy or overworked to take time to collect data for each patient, there may be too many distractions or interruptions during patient appointments to accurately collect all of the information, they may not have been properly instructed on how to collect the information, and patients may be unwilling or unable to accurately provide all of the information requested. It is possible that this additional task is viewed as less important than patient care and/or a burdensome task by the midwives. Furthermore, the data collection instrument itself may be a barrier to data collection if it is too lengthy, unclearly labeled, or again, if how to fill out the form was not properly explained to them. See Figure 1 for a diagram of potential barriers.

There will likely also be some facilitating factors identified through observation and interviews. Possible facilitators of data collection include the following: the provision of trainings about the purpose and importance of data collection, how to fill out the form, how to get the data (i.e., from the patient, from the hospital staff, at etc....) and when to get the data (i.e., at the 6 hour examination, the 6 day examination or the 6 week examination, as well as at what point in the patient appointment); oversight and monitoring of data collection practices; and feedback and reinforcement about data collection (i.e., routinely aggregating the data and sharing the information with the midwives). Additionally, it is assumed that alleviation of barriers to services utilization would result in an increased likelihood that data would be able to be collected. These facilitators are not capable of eliminating the busyness of a midwives day or other external factors, such as interruptions to patient appointments. However, they may increase the likelihood of prioritization and compliance. Clearly defined purpose and procedures would also likely facilitate data collection. See Figure 2 for a diagram of potential facilitators.

A conceptual framework involves connecting outcomes with potential mediating and moderating factors that either hinder or facilitate those outcomes. The desired outcome is consistent and accurate postpartum data collection about women's pregnancies, and the use of that data in a way that that will ultimately lead to reduced maternal mortality. There are many factors that also influence maternal mortality outcomes, which will likely have a more significant impact on whether or not a mother dies. Therefore, data collection and the appropriate use of that data is viewed as only one of the important factors for improving outcomes. Data collection and the use of that data to make decisions about women's healthcare needs may empower midwives to address the specific needs of each patient. However, it is understood that there are many mediating and moderating factors that will likely inhibit or prevent this from taking place. Highlighted variables were identified as factors in this evaluation and will be discussed later.

Figure 1. Conceptual Framework: Barriers to Data Collection

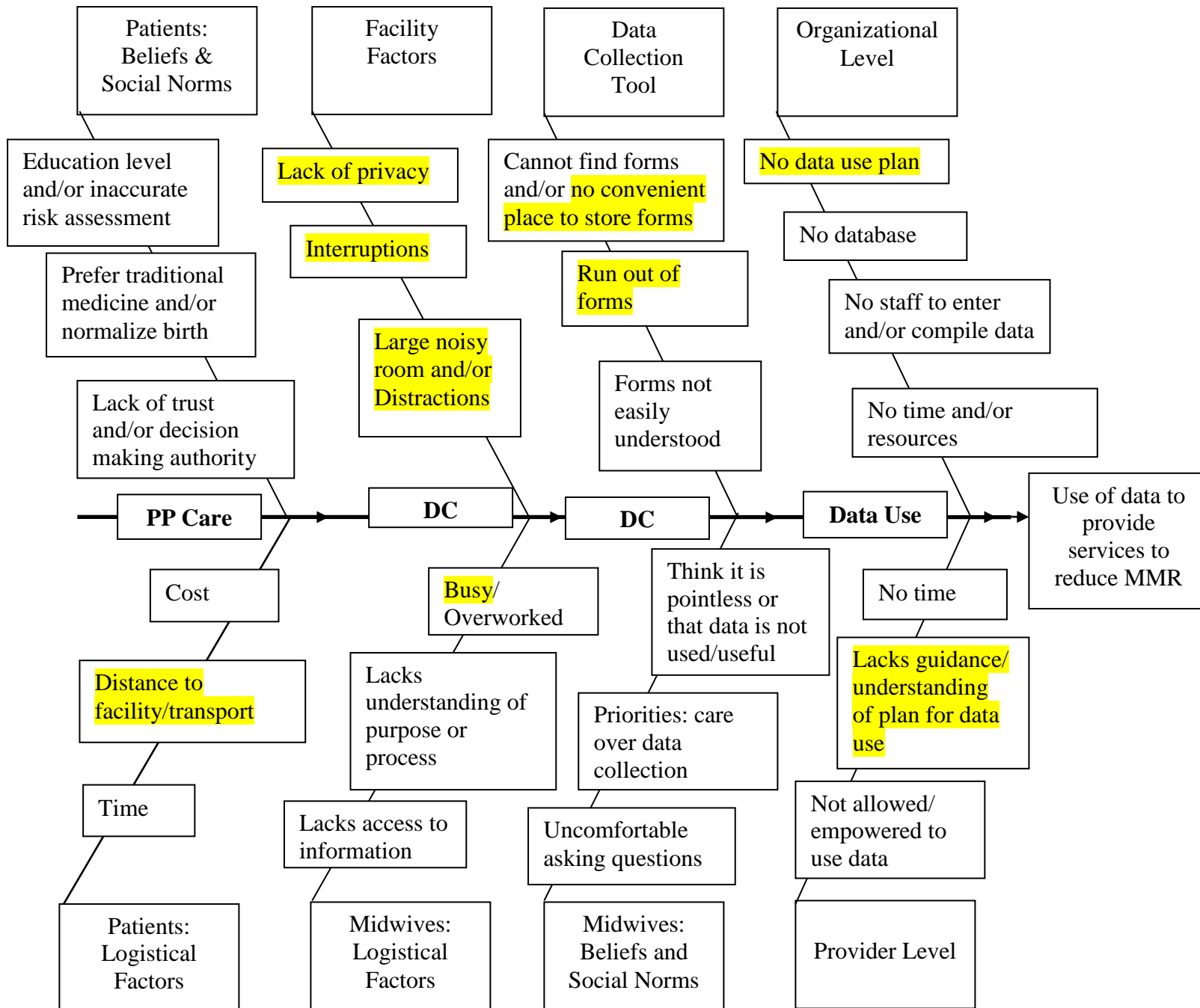
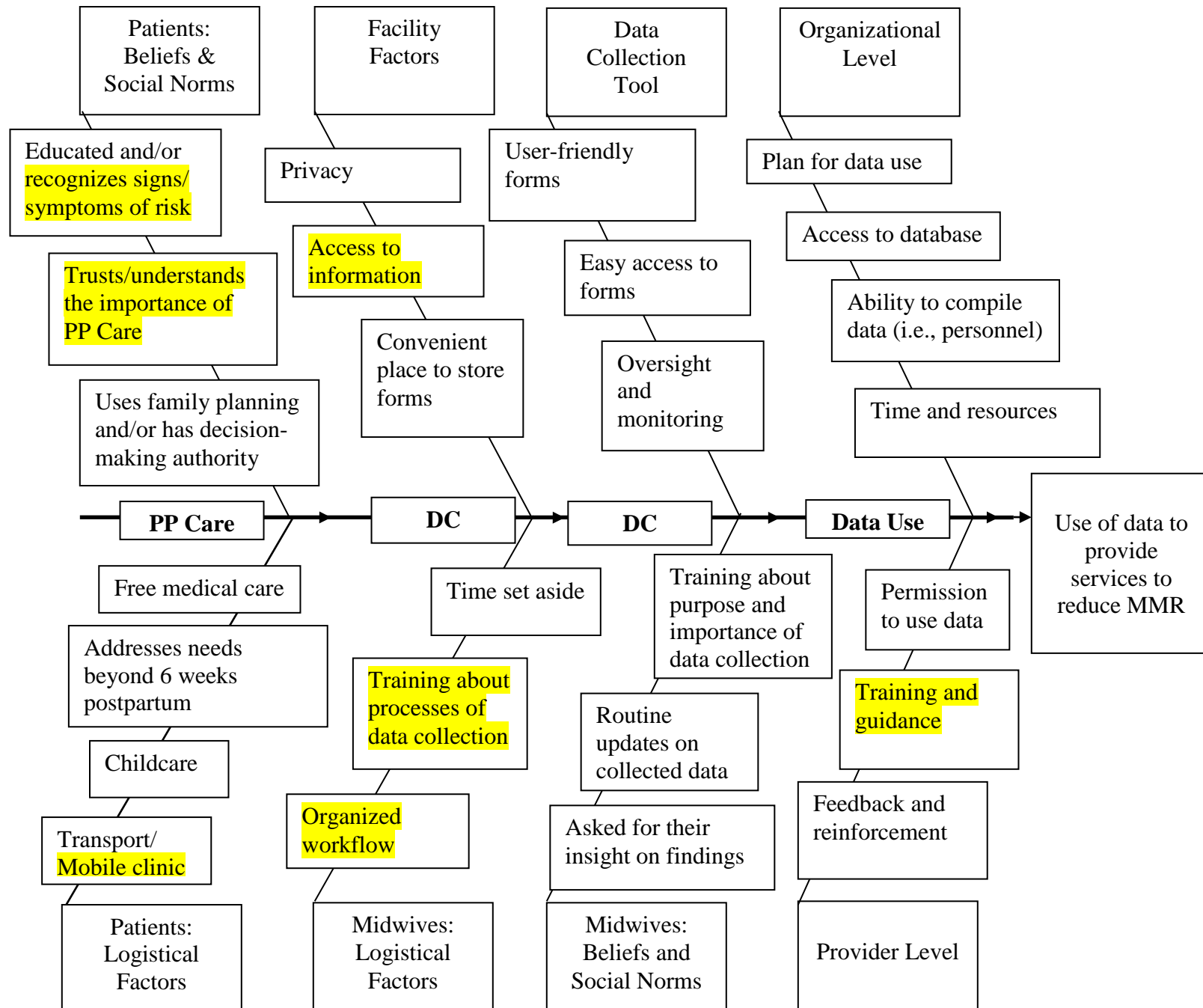


Figure 2. Conceptual Framework: Facilitators to Data Collection



How Previous Research Relates to the Current Study

Previous research on safe motherhood initiatives and the reduction of maternal mortality reveals that although many aspects for effectively addressing maternal mortality are known, a remarkable level of disparity continues to exist both within and between countries (Ronsmans & Graham, 2006). It also reveals several gaps in the literature. A great deal is known about the importance of antenatal or prenatal care, but the impact that it has on maternal mortality is minimal (Campbell et al., 2006). Furthermore, postpartum care is considered important, but less understood, significantly less utilized, and access to it is much more influenced by poverty (Koblinsky et al., 2006). Utilization of skilled birth attendants, which is also impacted by poverty, is considered the most significant factor for the prevention of maternal death (Freedman et al., 2007; Maclean, 2010). However, many women throughout the world are still dying in hospitals and health care facilities (Ronsmans & Graham, 2006).

One of the most foundational deficits in the literature on safe motherhood initiatives and maternal mortality is program evaluation (Freedman et al., 2007). Evaluation at the community and organizational levels is essential for effectively addressing context-specific needs and contributing factors. Organizations in developing settings with complex interventions and numerous needs, such as safe motherhood initiatives, may overlook the importance of evaluation or be unable to prioritize planning and budgeting for evaluation. The first step in program evaluation, especially when data collection and process evaluation has not been sufficiently planned for, is to conduct an evaluation of data collection processes. This enables an organization to better understand how data is actually being collected and whether the data being collected is useful. This evaluation contributes to the literature by providing an example of how to conduct a case study evaluation of data collection processes.

Methodology

Haiti has the highest rate of maternal mortality in the western hemisphere (Jacobs, Judd, & Bhutta, 2016). Published process evaluations of safe motherhood initiatives, particularly postpartum programs, are few and far between. Midwives for Haiti developed and implemented a postpartum care program at Hospital St. Therese in 2014, and there has not yet been any evaluation of the program. The first step to determining the true effectiveness of a program's interventions is to evaluate what data is being collected, how data is being collected, and whether or not it is being collected and can be used as it is intended to be. This process evaluation sought to determine whether or not data was being collected and used as intended, as well as to identify the barriers and facilitators to quality data collection.

Process Evaluations as Case Study

This process evaluation is a case study utilizing interviews, observations, and document review. Case study evaluation is a qualitative approach that permits the use of multiple data collection methods, which can create a more complete picture of what is being assessed. Traditional evaluation methods, like the randomized control trial, assume that programs are implemented in predictable, consistent, and measurable ways (Balbach, 1999). Cases studies, by contrast, allow evaluations to be viewed as “a series of events, each of which calls for new strategies” (Balbach, 1999, p. 5). A case study is considered an appropriate method for conducting a process evaluation of the postpartum program at Hospital St. Therese for the following reasons: (a) the program is unique and implemented in an unpredictable environment, (b) it is premature to establish impact measures, (c) the projected program effects (i.e., reduction of maternal mortality) are impractical or too difficult to measure, and (d) understanding implementation processes in detail may inform future program evaluations (Balbach, 1999). This

evaluation may also inform changes or adjustments to MFH's data collection processes. The intended steps for this case study evaluation are:

1. Gain access (acquire letter from medical director)
2. Conduct formative interviews (B. Tusing, N. Brunk, J. Schultz, S. Rapp)
3. Interview three postpartum midwives
4. Transcribe interviews as time allows
5. Conduct hospital observations: Map out hospital, general observations, and semi-structured observations
6. Type up detailed observation notes daily

Accessing Data in Haiti

Despite intentions and attempts to gain approval to access data (i.e., a letter of approval from HST) prior to arriving in Hinche, this was unable to occur until after my arrival. After I arrived in Hinch, I went to Hospital St. Therese (HST) with the Program and Partnerships Director, and brought a copy of a letter explaining my project, which had been translated into French. I spoke with Dr. Prince, the medical director and with Dr. Milsoir, the hospital's board member responsible for ethical conduct. Official access from HST was gained on June 17, 2016 (see Appendix C). The letter of approval was emailed to a representative of Grand Valley State University's IRB, and as a quality assurance project, this evaluation was deemed to not be researched covered by human subject's protection (see Appendix D).

I was able to take limited group Creole lessons prior to arriving at MFH, but did not have time to continue taking lessons once I arrived in Hinche and began my project. There was only one document in French, which I had access to prior to arriving in Haiti. This data collection sheet, the pregnancy history form (PHF), was translated by myself using Google translate prior

to leaving the United States and translation was verified with one of the translators upon my arrival in Haiti. The majority of essential documents were in English or had an English version already, including the program proposal, the maternal examination checklist, and other program development papers and correspondence. I did not need additional document translation services while in Haiti. I was able to address occasional questions about document translation through the use of my translators (i.e., patient registers).

Research Participants and their Selection

Two types of interviews occurred in this evaluation: formative interviews with staff or volunteers who were previously involved with the development and implementation of the postpartum program or who are currently involved with the program, as well as interviews with the three postpartum midwives at HST. Participants were selected based on either their past or present role and the insight they may be able to provide about the development and implementation of the program, the intentions for data collection and the intended use of that data, how data is being collected, barriers and facilitators to data collection at HST, and future goals or objectives regarding postpartum data collection. All but one of these participants were selected for participation prior to the start of the evaluation. The program and partnerships director was identified as a valuable participant after interviewing two of the midwives. These interviews revealed that her role was to help manage some of the logistics of the program and that she had also been involved with data collection form updates. Participants are discussed based on the order in which they were identified and selected for participation.

Postpartum Midwives at HST. Two of the postpartum midwives were able to interview with me separately on the same day on the balcony of the MFH house. Both of the midwives were trained by MFH and have been with the postpartum program since its inception. The third

midwife was interviewed on a separate date at HST (due to her schedule and other familial responsibilities and so that she did not have to figure out transportation to MFH). She was hired as the third midwife in the winter of 2015 and was also trained by MFH and was previously a labor and delivery midwife at HST (N. Brunk, personal communication, June 21, 2016). This third midwife's interview has the most significant potential for bias due to the location of the interview (HST), which had a greater degree of disruption and distraction and less privacy, and also due to when the interview took place. The interview with the third midwife took place after observations had begun and after the other two midwives had already been interviewed, which created an opportunity for communication to occur between the third midwife and the two who had already interviewed. The postpartum midwives were selected for participation because they are the individuals most directly involved with postpartum data collection at HST. They also participated by being observed while doing patient consultations, education, and data collection at HST.

Monitoring and evaluation and operations manager. The woman overseeing operations for MFH worked previously as the in-country coordinator when that position was a more all-inclusive in-country management role at MFH (B. Tusing, personal communication, June 13, 2016). During the summer of 2015 she completed her MPH practicum at MFH in Haiti (B. Tusing, personal communication, 2015). A few months prior to this I was able to begin email correspondence with her. After completing her MPH, she became the Monitoring and Evaluation and Operations Manager for MFH in Richmond, VA (B. Tusing, personal communication, January 14, 2016). Her position entails monitoring and evaluation of all of the organization's programs and initiatives, creating donor reports, donor management, writing grants, and making all of the organizations processes more efficient and effective (B. Tusing, personal

communication, June 13, 2016). She was selected to participate in this study because of her past experience with the organization, which includes in-country management during the planning stages of the postpartum program, as well as her current role of monitoring and evaluating all of the organizations programs. She has familiarity with MFH and HST prior to the development and implementation of the postpartum program and was able to provide insight on the organizations current intentions and desires for data collection.

Founder and executive director. Midwives for Haiti was founded in 2006 and this year celebrated their 10th anniversary. The founder and executive director is a Certified Nurse Midwife (CNM) who after visiting Haiti decided to start a non-profit organization to train and empower Haitian nurses to provide skilled maternity care. I contacted her by email in the spring of 2015 about doing a research project with the organization. We then spoke over the phone about the organizations progress and needs. One area of potential need that I identified from that conversation was to take a look at postpartum follow-up care. She informed me that while they had been able to radically increase “6 hour” and “6 day” follow-up, only about 30% of patients were returning for their “6 week” appointment (N. Brunk, personal communication, June 17, 2015). Although I was not able to look into this specific concern, I was able to look at the process of collecting data postpartum. The executive director was able to provide me with insight on the organizations development and mission, as well as their intentions and hopes for data collection. She was also able to provide me with a programmatic perspective on the planning and initial development of the postpartum program at HST.

American midwife responsible for postpartum program development and implementation. The final interview that I conducted was intended to be the first. Delays in gaining access and scheduling conflicts delayed this interview until later in the project. However,

I was able to conduct several days of observation after interviewing her, which enabled me to follow-up on any new concepts or questions that came up in her interview. This interview was foundational to understanding the postpartum program's planning, development, and implementation, as the interviewee was the facilitator for most of these stages of the program (J. Schultz, personal communication, July 1, 2016). She facilitated much of the negotiations between HST and MFH and helped to ensure collaboration took place between these two organizations, as well as the two organizations that were pledging to fund the salaries of two of the postpartum midwives. She also created the curriculum for training the midwives on providing thorough postpartum care (N. Brunk, personal communication, June 21, 2016; J. Schultz, personal communication, July 1, 2016). All of the program development documents used for this evaluation were create by and acquired from this interviewee, including a summary of email correspondence about early stage intentions for data collection.

Program and partnerships director. The program and partnerships director (previously titled the in-country coordinator) was not originally planned to be one of the formative interviewees. However, soon after I started the evaluation it became clear that she played an important role of logistical oversight for the program and was the primary contact person for the postpartum midwives when they had issues or concerns to address. At the time of our interview, she had been working in Hinche with Midwives for Haiti for just over a year (S. Rapp, personal communication, June 30, 2016). I interviewed her fairly late into the project but was able to follow-up on a few questions that emerged during midwife interviews and observations at HST. She was also able to provide me with insight on changes that had been made to the pregnancy history form (PHF) and concerns or issues that the midwives had brought to her attention.

Data Collection Instruments

Interview guides. Two separate interview guides were created prior to starting the evaluation. One was intended to provide direction for the formative interviews with the monitoring and evaluation and operations manager, the founder and executive director, and the midwife responsible for the development and implementation of the postpartum program at HST (See Appendix F). An additional formative interview was also conducted with the program and partnerships director. The second interview guide was created to provide guidance for the interviews with the three postpartum midwives who work at HST (See Appendix F). These guides were intended to serve as a starting place for interviewing participants. Additional questions were sometimes added when it was appropriate or necessary to do so in order to gain clarity or obtain a more comprehensive understanding.

Observation questionnaires. In addition to interview guides, a semi-structured observation questionnaire was created to help me better understand the daily workflow of the postpartum midwives. This questionnaire (see Appendix G) served as a starting place for organized observation and facilitated the process of comparing the intended patient consultation or visit flow with the actual flow of patient consultations.

Tools and Materials

- Informed Consent Statement (See Appendix E)
- Recording devices: cell phone and portable RCA recorder
- Technology: Amazon Fire tablet (Skype) and laptop (Microsoft Office and internet access)
- Notebook(s), lined paper, clip board, ink pens
- Portable USB device, email, Google Drive

Data Collection

Observation (free writing). After receiving official access I was able to begin observations at HST. I conducted general observation at the hospital to better understand the work flow and context in which data collection processes are occurring. I was also able to visit or observe many of the programs being run by MFH, including midwifery education (although they were almost completed with their training), the mobile prenatal clinic, Zika education outreach, the birthing center in Cabestor (I was only able to visit), and the postpartum program at St. Therese. After seeking the advice of participants, I decided to conduct observations between 8 am and 11 am—when most data collection and patient consultations take place. General observations provided me with a preliminary understanding of the evaluation site and the opportunity to map out the hospital.

Key informant semi-structured interviews. I conducted semi-structured interviews with the key informants previously described. The purpose of these interviews was to better understand the postpartum program's formation and implementation and how the program fits into the overall organizational plan. These interviews also provided necessary information about intended data collection processes and the intended use of collected data, which informed observations and made comparison between intended data collection processes and use and actual data collection processes and use possible

These interviews were intended to take place prior to my departure to Haiti. However, delays in gaining access occurred, which could not be resolved until my arrival in Hinche. All but one of the formative interviews were conducted via Skype and audio recorded (after receiving permission to do so) and transcribed as soon as possible. The interview with the program and partnerships director was conducted in person at the MFH house. Prior to each

interview, the participant was read a statement of informed consent and asked to confirm their willingness to participate and to okay the use of an audio recorder. All interviews were audio recorded. See Appendix F for the semi-structured interview guide for formative interviews.

Observation (semi-structured). After the completion of general observations and mapping out the hospital, I used a semi-structured questionnaire (Appendix G) to help guide my observation of the postpartum data collection processes. Observation with a structured questionnaire enabled me to gather more specific information about data collection processes and assisted me in answering two of my secondary questions: How is the information about women's pregnancies being collected by the postpartum midwives, and what are potential barriers to collecting data about women's pregnancies as intended? From these more structured observations I was able to better understand the actual flow of patient consultations and data collection. I conducted eleven 2-3 hour structured observations. All but one observation took place during a weekday and was conducted with the same translator. I conducted one observation with a different translator on a Saturday morning.

I was also able to observe the structure of care used by MFH, in addition to the data collection processes of the postpartum program. A structure of three postpartum appointments at six hours, six days, and six weeks is followed. This is the care structure standard of Haiti's Ministry of Public Health and Population (MSPP). Observation was the primary method for identifying how data is being collected and what data is not being collected by the postpartum midwives. Observations concluded when no new information was being observed and when all of the important variables identified in the interviews had been observed.

One note to make regarding observation is that, as previously described, the postpartum room is a large open space with 11 beds and limited privacy. The expectation of privacy is very

low and my presence did not appear to be seen as intrusive or unique. This was expected given the number of American volunteers and midwifery students the hospital has on a regular basis.

Midwife semi-structured interviews. I also conducted one semi-structured interview with each of the postpartum midwives to better understand how they perceive data collection and its purpose, how they perform data collection processes, and any barriers to following those processes as intended. I conducted two of the three interviews on the same day, back-to-back. The third interview had to be conducted on a separate day and took place at HST. The interviews helped inform semi-structured observations. I was able to follow-up with each midwife throughout the evaluation to clarify or seek out additional information.

Each of the three midwives were interviewed separately to help avoid social desirability bias. Each interview was scheduled according to the availability of the participants. The two interviews that took place at the MFH house were conducted prior to starting observations at HST. This provided a more private and comfortable atmosphere than the busy hospital environment. The third interview has the most significant potential for bias due to the location of the interview (HST), which had a greater degree of disruption and less privacy, and also due to when the interview took place, which was after observations had begun and after the other two midwives had already been interviewed. All three interviews were conducted with the same translator (a different translator than the one used for observations). These interviews were one mechanism used to better understand actual data collection processes and to help identify potential barriers and facilitators to collecting data as intended. Prior to each interview, the participant was read a statement of informed consent and asked to confirm their willingness to participate and to okay the use of an audio recorder. All interviews were audio recorded. No personal information was collected. An interview guide can be found in Appendix F.

It is important to address the role of the translator and their potential impact on the evaluation results. Using Haitian translators who are familiar with MFH and with whom the midwives are familiar and trust has its advantages. However, the translators are employed by MFH and likely invested in the organization's goals and objectives, which lends itself to the possibility of either intentional or unintended translation bias. Two approaches were used to address this concern. Translators were given clear verbal instructions and a description of the purpose of the evaluation prior to both observations and interviews. Additionally, upon returning to the States I have had each interview checked for translation issues by a Haitian Creole translator who is also fluent in English.

Audio recorded interviews were stored in a password locked smart phone. A portable recording device was also used to ensure backup. All interviews were saved on Google Drive. Written documentation were kept in a binder, which was kept in a suitcase with my personal belongings at the MFH house or on my person. All transcribed interviews and typed up notes were stored in a password locked laptop. Additionally, to avoid the potential loss of data, all typed up documents and recorded interviews were saved to a reliable USB device and routinely emailed to myself.

Document review. Additionally, I reviewed program formation and implementation documents, the data collection forms used by the postpartum midwives, and any additional applicable documents. The additional documents, which proved to be important when I began the evaluation, were patient records (namely the delivery chart (DLC) and admissions intake form (AIF)), patient registers, data collection reports used by MSPP, and MFH's annual report from 2015.

I collected some program design and implementation documents prior to leaving for Haiti. These documents informed semi-structured interviews with key informants and also greatly informed codebook development.

Chart review was not conducted retrospectively, but took place during observations of the data collection process. The purpose of chart review was to help me identify any discrepancies between intended data collection and actual data collection. I also sought to identify where and how both blank and filled out charts were stored. This helped me to identify potential barriers to actually using the forms for data collection and to using the data being collected. Some unanticipated variables were also revealed through the process of document review. For a detailed table of the evaluation timeline and schedule of activities see Table 1 in Appendix A.

Analysis Steps and Procedures

1. Preliminary read-thru of interview transcription and observation notes.
2. Open coding of each document. Coding was initially done at the word-level.
3. Re-read through all formative documents and data collection sheets (PHF and MCL).
4. Created concepts based on indicators identified in the data collection sheets (i.e., types of information being collect by MFH) and codes that could be grouped together.
5. Created or identified categories based on concepts (i.e., indicators) and other secondary research questions (i.e., how is data being collected, and what are the barriers and facilitators to data collection?).
6. Compared MFH data collection tools (PHF and MCL) to MSPP Patient Registers (Labor and Delivery and Postnatal) for indicator duplication.

7. Compared intended patient consultation flow (as describe in patient visit flow document) with actual patient appointment flow for both inpatient and outpatient postpartum appointments (including key concepts of patient education).
8. Identified in coded text which codes were answering or related to which secondary research questions.
9. Compared data collection and use intentions with actual data collection and use.

Summary of Methodology

This case study evaluation involved interviews with administrative staff, those involved with past or present aspects of the postpartum program, and the three postpartum midwives at HST. It utilized observation on 11 separate days, as well as the review of documents, including program planning and development documents (i.e., program proposal, patient visit flow, midwifery education curriculum, and a summary of email correspondence regarding data collection), data collection forms, and patient registers. The triangulation of methods (i.e., interviews, observations, and document review) contributes to the overall internal validity of this evaluation. These three methods were used concurrently, which allowed for the continuous development of questions to address, as well as ongoing analysis throughout the study. This case study evaluation utilized grounded theory and content analysis. These methods of analysis enable the researcher to identify and conceptualize unanticipated or atypical variance in results.

Results

The results of this case study evaluation will be presented according to both the identified concepts and categories, as well as the problem statement and primary and secondary research questions. Intended data collection and use and actual data collection and use (the primary research questions) will be discussed according to the following categories and concepts, which were identified as important over the course of this evaluation:

- **Organizational/Programmatic:** Program development, implementation, and evaluation; Program efficiency and effectiveness of interventions
- **Monitoring and Evaluation:** Intentions for data collection and use; Quality of data collection; Barriers and facilitators of data collection
- **Patient Care:** Pregnancy history; Prenatal care; Patient consultation flow; Quality of care and patient satisfaction

Organizational/Programmatic

Program development, implementation, and evaluation. The MFH's postpartum program was developed and implemented during the summer of 2014. It was a collaborative effort between MFH, Hospital Saint Therese (HST), two organizations that were willing to pay the salaries for two midwives, and the Ministry of Health. Jenna Schmitz facilitated much of the programs planning, development, and implementation. She developed a curriculum based on World Health Organization standards around postpartum/postnatal care (J. Schultz, personal communication, July 1, 2016). This curriculum helped to train the midwives on thorough head-to-toe postpartum examinations for both mothers and newborns (N. Brunk, personal communication, June 21, 2016). A training plan and schedule was created, and after conducting interviews, two midwives were hired (J. Schultz, personal communication, July 1, 2016).

Training was conducted by Jenna Schultz, Rebecca Barlow (a midwife with many years of clinical maternal and obstetrical nursing experience), the Ministry of Health, and volunteer clinicians. After several days of training, “a clinical integration period” took place during which the postpartum midwives cared for patients while supervised (J. Schultz, personal communication, July 1, 2016). When it became clear that they would need to hire a third midwife to ensure that quality care could be provided to all postpartum patients, Rebecca Barlow returned to MFH to train the additional midwife (who was formerly an HST labor and delivery midwife) (N. Brunk, personal communication, June 21, 2016).

Jenna also developed patient data forms for the program, which at the time were a maternal assessment checklist (MCL) and a newborn assessment checklist (NCL). The pregnancy history form (PHF) was originally intended to be used by the labor and delivery midwives. Due to the insufficient quality and quantity of the data being collected it was eventually made the responsibility of the postpartum midwives (N. Brunk, personal communication, June 21, 2016). The database into which the PHF data was entered was not created and used until the spring of 2015 (N. Brunk, personal communication, 2016). Although data collection has been occurring, the postpartum program and the data collection being done by the postpartum midwives has never been evaluated. Additionally, evaluation questions were never created to guide the selection of indicators being looked at (B. Tusing, personal communication, June 13, 2016).

Program efficiency and the effectiveness of interventions. One of the goals of monitoring and evaluation is to improve the efficiency and effectiveness of a programs interventions (B. Tusing, personal communication, June 13, 2016). Therefore, as indicated by my conversation with the executive director, one of the key values of data collection is to learn how

to use available resources more efficiently (N. Brunk, personal communication, June 21, 2016). One of the examples she provided was when the data helped them to realize that the gonorrhea tests were being done incorrectly, because everyone was testing positive. Improving the efficiency and effectiveness of interventions is one of the main roles of the monitoring and evaluations and operations manager. Working in an under-resourced country and having limited funding makes improving efficiency and effectiveness a high priority.

Monitoring and Evaluation

Intentions for data collection and use. Prior to the implementation of the program the intentions for data collection for the postpartum program were discussed between Jenna Schultz, Nadene Brunk, the founder and executive director, and Stephen Eads, the medical director of the U.S. board of directors. However, there was never a clear plan for data collection, especially for data use, analysis, or reporting (B. Tusing, personal communication, October 11, 2016). Some outputs have been monitored for the purposes of reporting to donors and being included in the annual report (B. Tusing, personal communication, June 13, 2016). Additionally, because there was essentially no postpartum care at HST prior to the implementation of this program (i.e., about 1% of patients received some postpartum care), there was very little, if any, baseline data for the program (B. Tusing, personal communication, June 13, 2016). For a comparison of intended data collection indicators and actual data collection indicators see Table 1.

Table 1

Data Collection Indicators

<p>Intended Data Collection Indicators (MCL)</p>	<p>Actual Data Indicators Being Collected (MCL)</p>
<p>Average # of days postpartum (PP) women are being seen for visits.</p>	<p><i>Average # of days PP women are being seen for visits</i> can be extracted from MCL but the MCL is not currently being collected by MFH.</p>
<p>Average # of hours after birth women are being seen for “first” visit.</p>	<p>The # of women seen 0-6 hours after birth, 7-72 hours after birth, 3 days to 6 days after birth, and 7 days to 42 days after birth is recorded in the Postnatal Register (MSPP).</p>
<p>Average # of visits patients are coming in for (including special visits).</p>	<p><i>Average # of visits patients are coming in for</i> can be extracted from MCL but the MCL is not currently being collected by MFH.</p>
<p>If and where patients received prenatal care (PC) ^a.</p>	<p>MSSP tracks whether or not a patient received any prenatal care (yes or no), which is also a data point on the MCL. Whether prenatal care was received at HST, a MFH mobile clinic, or another clinic is recorded on the MCL but the MCL is not currently being collected by MFH.</p>

<p># of patients who birthed at the hospital and were not scheduled for a follow-up appointment because they lived too far away.</p>	<p>Whether or not a patient was scheduled for a follow-up appointment can be recorded on the MCL. However, there is only one space to indicate whether or not a follow-up appointment was scheduled (and at least two opportunities to schedule a follow-up appointment), there is not a clear place on the data sheet to indicate the reason an appointment was not scheduled, and the MCL is not currently being collected by MFH.</p>
<p><i>Presumptive complications</i> extractable from the MCL based on signs and symptoms: preeclampsia, uterine subinvolution, heavy bleeding, uterine infection, infection in incision, infection in vaginal tear/repair, vaginal hematoma, UTI, kidney infection, urinary dysfunction, bowel dysfunction, anemia, mastitis, nipple damage, thrush, thrombophlebitis, respiratory infection, respiratory distress, poor nutrition/hydration, lack of support, and postpartum depression.</p>	<p>Some symptoms are being recorded using the MCL but symptoms and the list of <i>presumptive complications</i> have never been used to help identify what complications are being caught by midwives. Again the MCL is not being collected by MFH.</p>

Referrals: # of women referred, where referred, reason for referral, and the # of days PP at which a referral was made.	Referral information is being recorded on the MCL but the MCL is not being collected by MFH.
Intended Data Collection Indicators (PHF)	Actual Data Indicators Being Collected (PHF)
What <i>complications</i> are arising?	<i>Complications</i> (especially prenatal complications and pre-existing conditions) are inconsistently recorded on the PHF due to limited access to prenatal care and patient history information. Additionally, this data collection sheet (PHF) is no longer being used by MFH.
How are midwives handling those complications (i.e., <i>interventions</i>)?	The following <i>interventions</i> are recorded on the PHF: the use of instruments (forceps, vacuum), C-section, induction (including reason and method), augmentation, placental extraction, sulfate magnesium, antibiotics, antihypertensive IV, blood transfusion, episiotomy, and laceration repair. However, this data collection sheet (PHF) is no longer being used by MFH.

What are patient <i>outcomes</i> ?	Complications-->Interventions--> <i>Outcomes</i> is used as a theoretical proxy for MMR. This data collection sheet (PHF) is no longer being used by MFH.
<p><i>Note.</i> The PHF was originally intended to be used by the labor and delivery midwives. Data collection quantity and quality was insufficient so the responsibility was transferred to the PP midwives.</p> <p>^a MSPPS collects whether or not a patient received PC but not location of care or number of visits.</p>	

Some important considerations regarding intended indicators versus actual indicators, as outlined in Table 1, include: (a) the maternal examination checklist (MCL) data is currently kept with the patient record at HST after the completion of the 6 week postpartum examination, (b) the MCL was previously collected by MFH, but the information has never been entered into a database, (c) MFH recently decided to stop using the pregnancy history form (PHF) and the database is not currently being used, and (d) the current monitoring strategy being used by MFH is to look at the data being collected in the handwritten patient registers at HST and cross-checking it with Haiti’s Ministry of Public Health and Population’s (MSPP) online database (B. Tusing, personal communication, September 13, 2016).

Data collection processes. The intended processes for collecting data were also compared to the actual processes of data collection (see Table 2). Most of the intentions for how data would be collected by the postpartum midwives were established prior to the addition of the pregnancy history form (PHF). Specified intentions were primarily identified through review of

program development documents and interviews with Nadene Brunk and Jenna Schultz.

Although the initial plan for data collection and use was limited, it was always intended that the midwives would rely on the patient record (PR) to gather most of the information. However, access to prenatal care information remains restricted to patients who received prenatal care at HST. Patients are interviewed to verify and gather information not found in the PR (or if the PR is missing).

The PHF, which is not currently being used by MFH, was collected and entered into a database. However, this data was not being compiled or analyzed. The MCL has never been entered into a database and a decision was recently made to leave these data sheets with the PR. Access to the PR itself is sometimes challenging and access to prenatal care information via the PR is also limited. Barriers to collecting data as intended will be discussed later on in this chapter.

Table 2

Data Collection Processes

Intended Data Collection Processes	Actual Data Collection Processes
<p>Postpartum (PP) midwives would get a lot of the patient information from the patient record (PR) (including the delivery chart (DLC) and the admissions intake form (AIF)).</p>	<p>PP midwives are often unable to get prenatal care information from the PR. The PR is sometimes missing and/or access to the PR is sometimes delayed (i.e., if the PR has not been pulled from the chart building).</p>
<p>PP midwives would interview patients to get information not found in the PR and/or to verify PR information.</p>	<p>PP midwives interview patients to both verify and gather information. Patients sometimes cannot recall LMP, gestational age, or prenatal care information.</p>
<p>Checklists for patients scheduled for postpartum follow-up at HST would be held onto until after the 6 week appointment and then taken to the chart building.</p>	<p>Checklists (and full PR's) are kept in the PNC until after the 6-week appointment and then returned to the chart building.</p>
<p>Checklists for patients who live too far away to be scheduled for postpartum follow-up at HST would be given to MFH soon after delivery.</p>	<p>Checklists for patients who are not scheduled for postpartum follow-up were initially picked up with the PHF by MFH. However, none of the checklists are currently being collected by MFH. Checklist information has also never been entered into the database.</p>

<p>The PHF for all patients were to be collected by MFH and the data was to be enter into the database.</p>	<p>The PHF for all patient was being collected by MFH and the data (inconsistently) entered into the database. However, the PHF is no longer being used by MFH.</p>
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One final aspect of data collection intentions looked at in this evaluation was intentions for data use. For a comparison of intended data use and actual data use see Table 3. Although data use was not clearly defined prior to the postpartum programs implementation, some intentions were vaguely understood. The intentions most clearly defined included monitoring outputs to disseminate information to funders and in the annual report, gathering patient level information to ensure patient care quality, and monitoring patient examinations and education through the use of the checklists. These more clearly defined intentions were the data use intentions most likely to be followed as intended.

Despite the absence of a clear data collection and use plan, there were some consistent intentions that emerged during the formative interviews. There is an MSPP postnatal register, which the postpartum midwives are responsible for filling out. MFH has easy access to the information in this register. Therefore, for the purposes of simplification and efficiency, the removal of duplicative data collection was often mentioned. In addition, the desire to identify what complications were being caught and which interventions were being used to address those complications was also a very consistent theme in the formative interviews. Although the checklists were originally intended to be used to identify and track presumptive complications, they have never been used in this way (J. Schultz, personal communication, July 1, 2016).

Table 3

Date Collection Use

Intended Data Use	Actual Data Use
Monitoring Outputs	<p>Monitoring Outputs for funders and annual report. Annual report data includes the following (based on the 2015 annual report):</p> <ul style="list-style-type: none"> - # of skilled birth attendant graduates - # of patient visits delivered - # of deliveries attended - # of prenatal care visits - # of volunteers and % of volunteers who were returning volunteers - % of mothers and infants who received postpartum care at HST - # of prenatal and postpartum care visits provided by the mobile clinics - # of births managed by students and graduate staff at HST - Funding (revenue and expenses)

<p>Monitoring Outcomes/Linking Complications with Interventions</p> <p>Note: Complications → Interventions → Outcomes is intended to be used as a proxy for maternal mortality rate (MMR).</p>	<p>The PHF was able to capture some information about complications and interventions. However, it did not successfully enable them to monitor outcomes.</p>
<p>Quality of Care Assurance/Fidelity of Implementation</p>	<p>Being used as intended with some limitations (e.g., a continuing education on calculating Apgar scores was initiated when the data being collected indicated that Apgar scores were not being determined correctly).</p>
<p>Monitoring Patient Education and Head-to-Toe Examinations</p>	<p>Being used as intended with some limitations.</p>
<p>Improve Workflow to Decrease the # of hours at birth PP Patients are seen for their first visit (“6 hour”)</p>	<p>Unclear on whether they have been able to use the data to improve workflow.</p>
<p>Improve PP Follow-up Presentation/ Compliance (especially for the 3rd visit (“6 week”))</p>	<p>Follow-up presentation for the “6 day” examination has improved.</p>
<p>Increase Effectiveness and Efficiency</p>	<p>Has been occasionally helpful for improving effectiveness and efficiency.</p>
<p>Track patient care throughout pregnancy and from pregnancy to pregnancy</p>	<p>Unable to successfully track patients at this time.</p>

There are several important indicators that MFH would no longer have easy access to (i.e., indicators not collected in the MSPP patient registers) without the continued use of the pregnancy history form (or something to replace it). These indicators include the following: previous cesarean sections, the number of prenatal care visits received, pre-existing conditions and prenatal complications, labor and delivery complications (of both current and previous pregnancies), and postpartum complications experienced in previous pregnancies.

Quality of data collection. The quality of data being collected has a significant impact on its usefulness. Without evaluation and monitoring quality cannot be determined. Quality data collection at HST has been a challenge for several reasons. One of the reasons is that patients may not know what happened to them during their pregnancy or labor and delivery (N. Brunk, personal communication, June 21, 2016). Another reason is that when the postpartum midwives are collecting pregnancy history information, it is not at the point of care (N. Brunk, personal communication, June 21, 2016). Additionally, some of the self-reported information is being collected far after the actual experience, which lends itself to recall bias. Lastly, the inefficiency of patient record's management was an often cited (and observed) reason for data quality concerns. Therefore, one of the intentions identified for future data collection is to create a mechanism to better ensure the quality of the data being collected so that they know the data is reliable (B. Tusing, personal communication, June 13, 2016). However, the mechanism and indicators for ensuring data quality have not yet been defined.

Barriers and facilitators of data collection. There are a great number of possible barriers to collecting data, especially in an under-resourced or developing setting which regularly experiences humanitarian crises. The individuals most likely to be aware of the on-the-ground realities of collecting data in this kind of setting are the postpartum midwives. They identified

several key indicators that are often challenging to obtain: last menstrual period, gestational age, prenatal care information, and pre-existing conditions. These indicators were identified as challenging to obtain from either the patient, who may not know or recall the information, and/or from patient records.

Prenatal care information can only be found if a patient received care at HST. Last menstrual period, one of the most common methods for determining gestational age, is self-reported data, which the patient may not recall. Ultrasound is another method for determining gestational age, but the procedure is rarely utilized. Other barriers to the actual process of collecting data include: running out of data collection forms and if a patient record has not been pulled by the chart building staff or cannot be located. Facilitators of data collection discussed by the midwives included having access to copies of the data collection sheet, improvements to the data collection sheet, if a patient lives close and is easily able to return for postpartum follow-up, and if a patient's record has been pulled by the chart building staff. Barriers and facilitators of data collection will be discussed in greater detail in chapter five and are also described in the conceptual framework fishtail diagrams in Figures 1 and 2 in chapter 2. The highlighted variables in these figures were identified in this evaluation as factors which impact data collection.

Patient Care

Pregnancy history. The interventions that have been developed and implemented by MFH, although disjointed and at this point unable to provide patients with continuous care, cover the entire childbearing year (N. Brunk, personal communication, date?). The childbearing year is understood to include the full term of pregnancy and at least six weeks postpartum. Collecting data on a patient's pregnancy history, specifically past and current complications and

interventions, is one of the intentions of postpartum data collection (B. Tusing, personal communication, June 13, 2016); S. Eads, personal communication, June 21, 2016; J. Schultz, personal communication, July 1, 2016). Midwives for Haiti wants this information to better understand the complications and needs of patients and to enable them to make changes that will allow them to increase the quality of patient care at HST.

Prenatal care. Prenatal care information remains the most challenging data for the postpartum midwives to access, particularly if the patient did not receive care at HST. Access to this information was expressed as important for understanding what complications might occur during a given patient's labor and delivery or during the postpartum period (personal communication, June 20, 2016). One of the reasons that access to this information is limited is because MFH's mobile clinic data is not stored at HST or accessible to patients (S. Rapp, personal communication, June 30, 2016). However, MFH mobile clinic patients are just one small segment of the maternity patients at HST. Another barrier to accessing information, which if addressed may help midwives improve patient care, is that patient's chart are sometimes missing or have not been pulled by the chart building staff. If a patient's chart is lost a new patient chart is started, interrupting the continuity of care.

Patient consultation flow. The primary activities of the postpartum midwives include: data collection/charting, patient education, maternal and newborn examinations, writing prescriptions, and reviewing/ordering lab tests (see Table 4). The order of activities is generally the same but may be influenced by several factors, primarily whether patient education was conducted individually or to a group of patients and whether or not the midwives have access to the full patient record. The order of primary activities is data collection, patient education, maternal and newborn examinations, and prescriptions and lab tests.

Table 4

Activities of postpartum midwives

Primary activities of the postpartum midwives:
a. Data collection: (i) MFH pregnancy history (PHF), (ii) maternal checklist (MCL), (iii) newborn checklist (NCL)
b. Education: Group Education and/or Individual Education
c. Examination (includes vital signs)
d. Prescriptions for labs and medicine ^a
Determining factors for the order of activities:
a. If group education (GE) is used, then education is done prior to data collection (DC) with the patient, examinations, and prescriptions/lab work.
b. If individual education (IE) is used, than data collection with the patient typically begins prior to education.
c. The order is also influenced by whether or not the midwives have access to the patient's complete patient record (PR). If they are waiting to get the PR or if they need go to labor and delivery to get the delivery chart (DLC) and admissions intake form (AIF), then they may start DC with the patient instead of using the PR.
<i>Note.</i> Activities a–c are not distinctly separate.
^a The protocol discharge prescription is Tylenol, antibiotics, iron, folic acid, a multivitamin and vitamin C. The standard protocol for lab tests is HIV, syphilis, and hemoglobin, upon admission or every three months.

The postpartum program at HST uses the scheduling standard for postpartum follow-up established by MSPP: 6 hours, 6 days, and 6 weeks. This means a desired average of one inpatient (6 hours) and two outpatient (6 days and 6 weeks) visits for each patient. However, significantly fewer patients return for the 6 week follow-up appointment than the 6 day (N. Brunk, personal communication). Examination of the mother is tracked at each of these three appointments on the same maternal examination checklist (MCL). The PP midwives also encourage patients to return to HST for care whenever they or their newborn has signs or symptoms of risk. These visits are called special visits. The checklists were previously picked up with the pregnancy history data form, but checklist data has never been entered into the database. Therefore, the program and partnerships requested that the checklists stay with the patient's hospital records instead.

Jenna Shultz defined the intended flow for both inpatient (6 hour) and outpatient (6 day and 6 week) consultations prior to the implementation of the postpartum program. Although there is some variance in the order of activities, the midwives are generally able to maintain the intended consultation flow. A comparison between intended patient consultation flow and actual patient consultation flow can be found in Table 5. Further improvement and simplification of patient consultation flow and all processes is one of the intentions of data collection, monitoring, and evaluation identified in this project (J. Schultz, personal communication, July 1, 2016).

Table 5

Flow of Patient Consultations

Intended Patient Consultation Flow	Actual Patient Consultation Flow
1. Identify patients flagged/ready for discharge.	1. Identify new patients.
2. Check the patient records.	2. Check patient records (PR).
3. Ask the patient how they are feeling, how their baby is doing and if they have any concerns?	3. Begin charting/data collection with PR.
4. Maternal and newborn exams.	4. Greet patient and ask how they are feeling, how their baby is doing and if they have any concerns?
5. Lab tests: Review/order.	5. Maternal and newborn examinations/data collection.
6. Medications/supplements.	6. Patient education.
7. Patient education.	7. Lab tests: review/order.
8. Make appropriate referrals.	8. Medications/supplements.
9. Schedule follow-up appointment.	9. Make appropriate referrals.
10. Charting.	10. Schedule follow-up appointment.

Identify patients. The postpartum midwives start their day around 8 or 8:30 am by getting their supplies from a locked cabinet in the storage room in Labor and Delivery (LD). Supplies are transported in shallow plastic trays. In the Postnatal Clinic (PNC) room there is a file cabinet, which is also kept locked, and the top and bottom drawers contain supplies. If a

midwife is scheduled to work in the postpartum (PP) room she will give a general greeting to her patients when she enters the room and get patient files out of an unlock desk drawer. She may approach new patients individually to verify their names or call out names from the desk.

Check the patient's records and begin charting. Sometimes a patient's Admission Intake Form (AIF) and Delivery Chart (DLC) are still in LD. Sometimes the patient record (PR) has not been pulled from the chart building or is missing (i.e., can't be found). The midwives usually have access to the PR, but it is not uncommon for them to have to wait for it to be located or for a new PR to be started if the old one cannot be located. If the PR has not been pulled the midwives can send a family member to the chart building to try to retrieve it.

Ask/greet the patient. Patients are greeted individually and asked how they are feeling, if they have any pain, and how their baby is doing. They are also often asked about when they were admitted and/or when they gave birth.

Maternal and newborn exams and patient education. Maternal and newborn exams are interwoven with each other and with both data collection and individual patient education (see Table 6 for a list of patient education indicators). Examinations of the mother and newborn includes taking vital signs. The checklists are a comprehensive tool to follow for the completion of thorough head-to-toe examinations.

Table 6

Midwives for Haiti Patient Education Indicators

Breastfeeding
Danger Signs (Mom/Baby)
Uterine/Bleeding Care/Breast Health
Nutrition
Newborn Care
Hygiene
Family Planning
Importance of PP Follow-up
Risks of some Traditional Practices: hot pots, closing up the house, etc...
Vaccination for the Baby

Lab tests and medications/supplements. Lab tests for HIV, syphilis, and hemoglobin levels are supposed to be done when the patient is admitted. If lab tests were not completed (and it has been more than three months) and if the patient either did not receive prenatal care at HST or their PR cannot be located then these lab tests must be run again before the patient can be released. A standard prescription for antibiotics, pain medication, and supplements is written for each patient. Any additional medications are also prescribed and the patients or their family members are directed to the pharmacy, which is on hospital grounds.

Outpatient appointments. After the first inpatient postpartum exam (“6 hour” exam) the midwives schedule the first follow-up appointment by putting the patient’s name and the date of the appointment on a little slip of paper. Outpatient postpartum follow-up appointments take

place in the postnatal care (PNC) room, which is also often used for prenatal care appointments. Postpartum appointments in the PNC are scheduled for Mondays, Wednesdays, and Thursdays. Patients are not given a specific time for the appointment, but expected to show up first thing in the morning and wait their turn (first come, first served).

In the PNC, follow-up appointments are scheduled in the same manner as they are in the postpartum room, using the appointment card. After the “6 day” appointment a final follow-up appointment is scheduled at “6 weeks” postpartum. The midwives call in each patient from the waiting area as they arrive. The building that houses the PNC consultation room is also used for prenatal care, vaccinations, and family planning. There are usually a lot of prenatal care patients in the waiting area, as well as a separate area for the vaccination program. The patient consultation flow for PNC (outpatient) visits is more susceptible to interruptions and there is generally more than one patient being seen or in the room at one time.

Quality of care and patient satisfaction. Another intention mentioned by nearly all participants was to use data to improve the quality of patient care (or the *fidelity of implementation* as the monitoring and evaluation and operations manager refers to it). Are patients receiving enough care and are they satisfied with the care they are receiving? The postpartum program has lacked consistent upkeep because it is a primarily self-sufficient program (B. Tusing, personal communication, date?). Additionally, Tusing also mentioned that MFH’s role at HST is not clearly defined. However, MFH hopes to be able to continue to help improve the services that HST provides patients (N. Brunk, personal communication, June 21, 2016). One of the ways that they would like to be able to do this is to hire a midwife to do intake, pull patient records, and collect comprehensive patient data upon admission (N. Brunk, personal communication, June, 21, 2016).

Patient satisfaction was also discussed as a high priority for MFH (B. Tusing, personal communication, June 13, 2016; N. Brunk, personal communication, June 21, 2016). Patient satisfaction is not currently being measured. However, Brunk attributes the high number of patients returning for their six day follow-up appointment to the connection midwives are making with their patients and to quality patient education regarding the importance of bringing newborns back to be weighed (personal communication, June 21, 2016).

Midwives for Haiti Postpartum Data Collection

Midwives for Haiti's pregnancy history form (PHF) collects the following types of information: demographic, previous pregnancies, gestational age of current pregnancy, prenatal care, pre-existing conditions and prenatal complications, labor and delivery outcome information, labor and delivery complications, interventions, and postpartum complications (see Table 2 in Appendix B). Midwives for Haiti recently stopped using the PHF and are not yet sure if they will be replacing it with another data collection instrument (B. Tusing, personal communication, September 14, 2016). The maternal examination checklist (MCL) also collects whether or not the patient received prenatal care and whether care was received at HST, MFH's mobile clinic or another clinic (see MCL indicators in Table 3 of Appendix B). Postpartum signs of pre-eclampsia are identified and the examination itself may provide some understanding of the patient's current health status, including whether or not they are currently feeling happy or have support at home. Haiti's Ministry of Public Health and Population (MSPP) also collects some labor and delivery and postpartum data, which MFH has relatively easy access to. For a list of MSPP data collection indicators see Table 4 in Appendix B.

Data duplication. There is some information or data collected by MFH that is also being collected by MSPP. This data is being collected in the labor and delivery (LD) and postnatal

(PN) patient registers. The removal of data duplication was identified as one of MFH's intentions or objectives for data collection improvement. Of the indicators collected by MFH, MSPP also collects the following information in their labor and delivery register: demographic information, previous pregnancy information (miscarriages, gravida, para, and children alive), gestational age at birth, whether or not the patient received prenatal care, HIV and syphilis testing dates and status, and current pregnancy information (stillborn, neonatal demise, gender, weight, Apgar, status at birth, maternal mortality, and cesarean section) (see Table 7). Important indicators that are not collect by MSPP and no longer collected without the use of the PHF include: previous cesarean sections, the number of prenatal care visits received, pre-existing conditions and prenatal complications, labor and delivery complications (of both current and previous pregnancies), and postpartum complications experienced in previous pregnancies (see Table 7).

Table 7

Data Duplication

For Pregnancy History Form (PHF)
Name
Age
Residency
Miscarriages
Gravida
Para
Children Alive
Gestational Age at Birth
Prenatal Care (yes or no?)
HIV Status or Testing
Syphilis Status or Testing
Stillborn (current pregnancy)
Neonatal Demise (current pregnancy)
Baby's Gender (current pregnancy)
Baby's Weight (current pregnancy)
Apgar (current pregnancy)
Status at Birth (current pregnancy)
Maternal Mortality
C-Section (current pregnancy)
PP Complications (current pregnancy) ^a

For Maternal Checklist (MCL)
Patient Name
Delivery Date
Prenatal Care: Yes or No?
<p><i>Note.</i> MSPP collects data on the following but it is the responsibility of the postpartum Midwives:</p> <ul style="list-style-type: none"> • # of postpartum hemorrhage • # of postpartum infections • # of laceration repairs <p>^a There is a place in the postnatal (PN) Register for the midwives to write in this information for each patient.</p>

Barriers to data collection. There were several barriers to collecting quality postpartum data observed (see Table 8). Identified barriers are also shown in the diagram in Figure 1. Highlighted variables in this diagram are anticipated barrier which were identified as actual barriers in this evaluation. These barriers are related to components of the (a) patient consultation or appointment, (b) the data collection forms, (c) hospital policies and procedures, including patient records storage and management, and (d) program planning and execution. In relationship to patient consultations, there is a seemingly unavoidable lack of privacy during patient appointments due to the absence of individual patient rooms. There are also many different types of patients often in the same rooms (e.g., postpartum patients and intrapartum or post-op patients placed in the postpartum room), as well as multiple rooms that accommodate postpartum

patients. Distractions and interruptions are common place, and patients are often unable to recall details such as last menstrual period (LMP), gestational age, and prenatal care information.

Cultural differences regarding how a patient's age and place of residency are recorded was also observed. Patient's birthdates are not recorded and residency does not refer to an address but a locality such as a village or community. Additionally, at times an unexpected influx of patients will increase the business and chaos of the daily routine. An additional barrier related to patients also mentioned during interviews and observations was distance and lack of transportation to follow-up appointments.

Barriers related to the data collection forms themselves include running out of forms, the absence of a convenient or orderly place to store blank forms separate from completed forms ready for pick up, lack of access to information when a patient record has not been pulled or is missing, and the inability to easily record some information (i.e., the reason(s) a C-section was preformed, the use of uterus review and the administration of oxytocin for reasons other than induction). The PHF was modified on several occasions. The most recent modification occurred to make the forms more user friendly by reorganizing the sequence of information so that the categories are listed sequentially (i.e., pregnancy history, gestation age (of current pregnancy), prenatal care, pre-existing conditions and prenatal complications, labor and delivery, labor and delivery complication, interventions, and postpartum complications). The program and partnerships director made these modifications after seeking the insight of the three postpartum midwives.

Hospital policies and procedures also have a significant impact on data collection. The primary area of concern here is related to patient records storage and management. Patient records are intended to be pulled by the chart building staff so that midwives (labor and delivery,

as well as postpartum) have access to them. However, this is sometimes delayed. Other times, patient records are not able to be located. When a patient record is missing a new record is started. Furthermore, if a patient received prenatal care someplace other than HST, prenatal care information and any complications that occurred during the patient's pregnancy are not included in the patient's record. There is no electronic health records system at HST and the chart's building is a large disorderly space of shelves filled with disheveled file folders.

A final primary category associated with barriers to quality data collection is program planning and execution. The urgent need for a postpartum care program at HST took precedence over detailed planning and implementation for data collection. A database was not created until spring of 2015 and it was changed several times, but remained inadequate and inconsistently (or inaccurately) utilized. Prior to the recent addition of the role of the monitoring and evaluation and operations manager, MFH did not have a public health professional to develop, implement, and monitor data collection processes.

Table 8

Barriers and Facilitators to Data Collection and Use

Barriers	Facilitators
Lack of privacy.	Prenatal care (PC) chart are kept in the Patient Record (PR) of all patients who received PC at HST.
Running out of forms.	Delivery date and time, placenta information, LD complications and interventions, PP complications that occur in the immediate PP period (i.e., hemorrhage), laceration and repair, Apgar, birth weight, gender, birth presentation and status at birth can all be found in the Delivery Chart (DLC).
No convenient place to store forms.	The DLC and Admissions Intake Form (AIF) both include demographic information.

No clear data use plan.	Previous pregnancy information (Gravida, Para, Miscarriages, and Children Alive) are recorded in the DLC and the Labor and Delivery Patient Register.
Inadequate database.	If a patient reports last menstrual period (LMP), it is recorded in the PR (DLC or AIF).
Inconsistent data entry.	If a PR has not been pulled by chart building staff, a family member can be sent to pick it up.
Multiple types of patients in the same room and multiple rooms with PP patients (i.e., postpartum room, post-op, and intrapartum).	In addition to the training that all MFH midwives receive, PP midwives have been trained in the following: <ul style="list-style-type: none"> -postpartum care based on WHO standards and comprehensive head-to-toe examination of mothers and newborns -Interviewing patients and filling out data forms (checklists) -Patient education
Distance/lack of transportation for patients.	Patients are educated on the importance of PP follow-up care and on danger signs for both mom and baby.

Midwives are busy (i.e., time constraints).	Patients are educated on the importance of bringing their baby back to the “6 day” visit to be weighed.
Distractions and interruptions are commonplace.	Patient Satisfaction (observation of this was limited).
Insufficient guidance on how to use the data.	
Lack of access to information (e.g., when patient record is not pulled or missing).	
LMP is often not recalled by patients or may be inaccurately reported to LD midwives while patient is in active labor.	
Self-report data (such as required when patient does not receive PC at HST) is inherently prone to inaccuracy and bias.	
Data is not always measured or reported in a standardized way (e.g., gestational age may be recorded and reported according to LMP, fundal height, ultrasound or self-reported month of conception).	
Prenatal complications are self-reported if (a) PC was not at HST or (b) PR is missing and a new PR is started.	

<p>The MFH data collection forms do not have a place to easily record the following: reason(s) for a C-Section, Uterus Review (a standard protocol for hemorrhage), the administration of oxytocin for reasons other than induction.</p>	
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Facilitators to data collection. Facilitators to quality postpartum data collection observed during this evaluation are related to the following categories: (a) patient records (including the admissions intake form and delivery chart) data and data collected by MSPP, (b) training received by the postpartum midwives, (c) patient education, and (d) patient care quality (see Table 8). Identified facilitators are also shown in the diagram in Figure 2. The highlighted variables in this diagram indicate anticipated facilitators that were identified as actual facilitators in this evaluation. In relationship to patient records, the following factors facilitate data collection: prenatal care charts are kept for all patients who receive prenatal care at HST, some key information can be found on the admissions intake form or delivery chart, and if a patient record has not been pulled by chart building staff a family member may be sent to retrieve it. Haiti’s MSPP also collects information on several key indicators which are recorded in the patient registers (labor and delivery and prenatal).

Training received by the postpartum midwives also facilitates data collection. This training includes postpartum care provision based on WHO standards and comprehensive head-to-toe examination of mothers and newborns, how to interview patients and fill out data forms (checklists), and patient education. Quality patient care also facilitates data collection. The comprehensive and compassionate patient care training received by the postpartum midwives

was evident in the way they interacted with their patients and in the way the patients responded to the care they received.

Patient education, which is very much intertwined with data collection and maternal and newborn examinations, is a key component to data collection quality. Patients are educated on the importance of follow-up care and danger signs for both themselves and their newborns, as well as the importance of bringing the baby back for the “6 day” appointment to be weighed and vaccinated, which may increase the likelihood that they will seek out postpartum follow-up care. Patient education is intended to empower mothers to properly take care of their newborns and themselves and to self-identify danger signs and symptoms so that they know when they should return to the hospital or a clinic for care. The midwives are thorough and concise in the education they provide. Although the same basic topics are almost always covered, individual patient needs influence what the midwives include and emphasize.

There is very little variance between the intended education topics and the topics actually covered by the postpartum midwives. The midwives actually expand on the list of intended topics to include addressing some of the potential risks of some traditional practices (e.g., using hot pots or vaginal steams after giving birth and blocking light from coming in the house). The importance of vaccinating newborns is also mentioned at all three postpartum appointments, not just the 6 day and 6 week appointments as intended.

Summary of Results

Midwives for Haiti developed and implemented the postpartum program at HST with limited planning for data collection and use. However, some intentions and hopes for data collection were clearly identified in this evaluation. The consistent expectations for data collection identified were to better understand which complications are occurring and the

interventions used to address those complications, to increase the efficiency and effectiveness of all of the organization's programs, to improve the quality of patient care, and to simplify processes by creating one system of data collection, which avoids indicator duplication.

Barriers and facilitators to data collection and using collected data as intended were also identified. Barriers were primarily related to the patient consultation or appointment, the data collection forms, hospital policies and procedures (e.g., patient record storage and management), and program planning and execution. Patient consultations are often interrupted and lack privacy. It is challenging for the midwives to collect data when they run out of forms and difficult for them to know when they will run out. The primary hospital policy or procedure that impacts data collection is the storage and management of patient records. The postpartum midwives are often waiting for patient records to be pulled by chart building staff and sometimes patient records are missing all together. The most challenging information of importance for the postpartum midwives to obtain is last menstrual period/gestational age and prenatal care, including the number of visits received, gestational age for the first prenatal care visit, and pre-existing conditions and prenatal complications.

Identified facilitators to data collection and being able to use the data as intended are related to patient records (including the admissions intake form and delivery chart) and the data being collected by MSPP, the comprehensive training received by the postpartum midwives, and the provision of quality patient education and care. Patient records, although sometimes challenging to obtain, can provide demographic and delivery information, as well as prenatal care information if the patient received care at HST. The MSPP patient registers are a limited but sometimes helpful way to access information about a patient's labor and delivery and some

limited information about past pregnancies (i.e., gravida, para, miscarriages) and prenatal care (only whether or not the received any care). Patient education is viewed as an important component of empowering patients to return for postpartum follow-up and to self-identify signs and symptoms of risk.

Discussion and Conclusions

This evaluation creates a clearer picture of the data collection processes of MFH's postpartum care program at Hospital St. Therese (HST). It also contributes to the literature on maternal mortality and safe motherhood initiatives by providing an example of how to use a case study to conduct a process evaluation. This evaluation clarified what maternal indicators were being collected by MFH's postpartum program at HST. It identified duplicative indicators being collected by both MFH and Haiti's Ministry of Public Health and Population (MSPP), as well as what key indicators would be lost without the continued use of the pregnancy history form (PHF). It also identified barriers and facilitators to collecting data and using it as intended.

Midwives for Haiti's "mission is to increase access to skilled care throughout the childbearing year, and the childbearing year includes the postpartum period" (N. Brunk, personal communication, June 21, 2016). Brunk considers the postpartum program to be one of the most important services MFH is providing at HST (personal communication, June 21, 2016). Midwives for Haiti's postpartum program provides patients at HST important care, which only an estimated 1% of postpartum patients were previously receiving. The urgent need for the addition of this essential service took necessary precedence over planning for data collection and program evaluation. Furthermore, during the program's development and implementation the organization did not have a public health professional on staff to help guide the formation of an evaluation plan. However, despite these circumstances and obstacles, some preliminary expectations for data collection were outlined and some patient forms (i.e., checklists) were created. After the implementation of the program, a database was created and an additional data collection form (i.e., PHF), which was previously the responsibility of the labor and delivery midwives, became the responsibility of the postpartum midwives. However, there was never a

plan for how data would be used, especially with regards to analysis and reporting (Tusing, personal communication, October 11, 2016).

Despite the absence of a clear plan, this evaluation reveals several areas of intention for data collection and use. These intentions are related to organizational factors, evaluation and monitoring processes and indicators, and the barriers and facilitators to data collection. The organization's mission is to increase access to skilled care at every stage of the childbearing year, which includes the postpartum period. The value of collecting postpartum data is the ability to obtain patient level information from prenatal care through postpartum care, which can help to inform some of the larger scale decisions that MFH makes. As the organization continues to develop and improve monitoring and evaluation of their programs, one of the objectives most consistently mentioned was the identification of complications and interventions used. Data collection intentions, though impacted by revealed barriers, are most immediately connected to the desire to improve patient care at HST.

Organizational Factors

Research on the utilization of program evaluation for safe motherhood initiatives have found that although health outcomes may be defined, how to achieve these outcomes is often unaddressed (Hounton et al., 2005). Midwives for Haiti has loosely define the achievement of their long-term health outcomes (i.e., reducing maternal and infant mortality) based on the implementation of interventions that they have identified as life-saving (N. Brunk, personal communication, June 21, 2016). Another common occurrence in safe motherhood program evaluation is the absence of baseline data (Hounton et al., 2005). In the case of the postpartum program at HST, MFH was unable to gather baseline data because, for the most part, the services their program provides were not previously provided at HST.

A third common reality of program planning amongst safe motherhood initiatives is the absence of an evaluation plan (Hounton et al., 2005). Midwives for Haiti's evaluation plan was very limited and unclear prior to the implementation of the postpartum program. Tusing communicated to me that the absence of a plan for data use, particularly for analysis and reporting "is certainly part of why the sheets (i.e., pregnancy history form) failed" (personal communication, October 11, 2016). Review of program design and implementation planning documents revealed that process evaluation was not part of program design and implementation planning. Process evaluation findings also indicate that despite intentions to evaluate, evaluation had not taken place for a variety of reasons, including limited personnel expertise in evaluation prior to the recent addition of the monitoring and evaluations and operations manager. Local research and evaluation and understanding local variance in complications and outcomes is important and may define the success of a program (Kuruvilla et al., 2014). Program evaluation influences an organizations ability to improve the efficiency and effectiveness of its interventions and will enable MFH to even more successfully accomplish their goals.

Data Collection Processes

Although data collection and evaluation planning was limited, some of the processes for collecting data were identified prior to implementation of the postpartum program (i.e., midwives would use the patient records to gather most of the information). Midwives for Haiti recently decided to stop using the pregnancy history form (PHF) and the database is also not currently being used. The data indicators on the maternal examination checklist (MCL), which is the only maternal postpartum data sheet currently being used by MFH, are limited in their ability to provide insight to MFH. The current monitoring strategy being used by MFH is to look at the data being collected in the handwritten patient registers at HST and cross-check it with Haiti's

Ministry of Public Health and Population's (MSPP) online database. This may not provide them with adequate patient-level data, which was indicated as important for the improvement of patient care. This also underscores the importance of clarifying which indicators are of most importance to the organization and what information is needed to enable continuous progress toward the long-term health outcome objective of reducing maternal mortality. The recent addition of a public health professional to oversee monitoring and evaluation will aid in this process.

Important Data Collection Indicators

Indicators that MFH no longer has easy access to without the use of the pregnancy history form (i.e., indicators not collected in the MSPP patient registers) include: previous cesarean sections, the number of prenatal care visits received, pre-existing conditions and prenatal complications, labor and delivery complications (of both current and previous pregnancies), and postpartum complications experienced in previous pregnancies. This information is particularly important at the patient-level. One study in Latin America using the World Health Organization's 2005 global survey on maternal and perinatal health, used near-miss cases as a proxy for maternal death (Souza et al., 2010). They defined near-miss cases as pregnant woman admitted to the ICU, or undergoing a hysterectomy, or receiving a blood transfusion, or presenting a cardiac or renal complication, or having eclampsia. These patients were all considered to be at a significantly increased risk of dying during pregnancy, childbirth, or in the early postpartum period. This study found that patients who had experienced a cesarean section during a previous pregnancy were at an increased risk of severe morbidity (and by proxy of mortality), and this remained true regardless of whether they received a cesarean section for

their current pregnancy. This indicates the importance of collecting data about previous cesarean sections.

Although the direct impact of prenatal care (or ANC) on maternal mortality reduction is limited (Campbell et al., 2006), the number of prenatal care visits may be an important indicator for understanding or predicting utilization of a skilled birth attendant, which is understood as the primary protective factor for the prevention of maternal death (Freedman et al., 2007; Maclean, 2010). Additionally, the prediction of intrapartum and postpartum complications can be challenging. Having access to information on the types of complications women have experienced in the past will likely enable the postpartum midwives to more quickly identify patient's current complications, and also better inform the organization's intervention and training prioritization.

The concept of maternal near-miss was recently defined by the World Health Organization (WHO), as “the near death of a woman from a complication during pregnancy, childbirth or within 42 days after the termination of pregnancy” (Souza et al., 2010). Women who survive severe pregnancy complications are far more likely to experience clinical conditions, additional complications, and even early death, which can perpetuate cycles of poverty (Pacagnella et al., 2012). Furthermore, studying women who survive severe complications during pregnancy, labor and delivery, and the postpartum period can provide a better understanding of the circumstances and preventable causes that result in maternal death (Pattinson, Buchmann, Mantel, Schoon, Rees, 2003 as cited in Souza et al., 2010). Using labor and delivery and postpartum complications, or near-miss cases, as a proxy for maternal deaths is a valuable method that MFH can utilize to better understand their outcomes and impact. Using near-miss cases as a proxy for maternal mortality outcomes is in some ways similar to using

signs and symptoms to identify presumptive complications, which was originally intended to be done with the maternal examination checklist. However, using near-miss cases is a more explicit and narrowly defined evidence-based method. This data collection and analysis method aligns with MFH's intentions to track complications and interventions to predict outcomes.

This evaluation did not include the identification of important indicators not collected by MFH. However, the emphasis of the organization's mission is that they continuously increase access to skilled care. When attempting to increase access and utilization rates there are many variables to consider, as Tusing states:

If we want our care to be accessible...I think that means there has to be some sort of behavioral component that encourages women to come and we're not measuring anything behavioral right now. We're providing education and that is important. But we're missing a lot of women for their 6 week appointment. Almost every single woman is seen you know within 2 days of delivery. But few, fewer women come for their 6 days visit and even fewer come back at their 6 week visit. So I would really like to include that in our data collection. (personal communication, June 13, 2016)

Research indicates that education is a strong predictor of maternal and child health care utilization (Babalola, 2014; Kamal, 2012). It is essential that "patient's [feel] empowered to come back into the health center and [know] when they need to come back...because it might not be something that's discovered within 6 hours of delivery" (J. Schultz, personal communication, July 1, 2016).

Barriers and Facilitators to Collecting and Using Data as Intended

Creating effective programs and interventions requires a realistic evaluation of needs and an understanding of the context-specific barriers to improvement (Koblinsky et al., 2006). Some

of the barriers to improving data collection are outside the control of MFH. Midwives for Haiti implements programs and interventions in a highly unpredictable and under-resourced environment, which sometimes necessitates prioritizing basic functionality over collecting quality data. However, some of the barriers identified in this evaluation are within the power of the organization to change. The small, but important daily factors include ensuring that midwives have access to data forms and that they have a convenient place to store blank forms separate from completed forms. The area in which MFH has the most power to change or improve data collection is creating a clear and realistic data collection and use plan.

Creating a data collection and use plan (or a plan for monitoring and evaluation) means determining which indicators (not accessible to MFH via the MSPP patient registers) are the most important for the organization to accomplish the intentions identified in this evaluation. The following intentions for data collection were identified: measure outputs, remove duplicative data collection indicators, identify complications being caught and interventions being used to address complications, and improve the quality of patient care. Additionally, the overall outcome goal of the organization is to reduce maternal and infant mortality. Therefore, it is important to determine short term objectives that will help them identify whether or not they are progressing in ways that will enable them to accomplish this long-term goal. One aspect of determining these short-term goals is identifying how each component of the organization (e.g., the postpartum program at HST) can uniquely contribute to improving outcomes.

Potential facilitators of collecting data and using collected data as intended, which were *not* identified during this evaluation, include: oversight and monitoring, a clear plan for data use, and an adequate and accessible database. These basic features provide a strong foundation for an effective and efficient monitoring and evaluation plan. Additional potential facilitators are

teaching the midwives about the plan for data collection, providing them with updates on the compiled data, seeking their insight on findings, and giving them consistent feedback and reinforcement. Some of the facilitators of data collection and use identified in this evaluation were educating patients about the signs and symptoms of risk and the importance of postpartum follow-up (which may empower them to seek care), organized workflow despite an unstructured and often chaotic environment, and comprehensive training, which includes how to interview patients and fill out data collection forms. Education initiatives should include family members or supportive community member whenever possible (Jat et al., 2015; Pacagnella et al., 2012; Urrutia, R. P. et al., 2012; White et al., 2006). The inclusion of family members during patient education is one intention of the patient consultation observed to be inconsistently implemented.

Conclusions

This evaluation reveals both the strengths and limitations of current postpartum data collection at HST. The next step to improving data collection is the development of a clear program logic model and evaluation plan, as was also discussed by the monitoring and evaluations and operations manager. The logic model should include SMART short-term, mid-term, and long-term objectives. If these objectives are not specific, measurable, attainable, realistic, and time-bound, they are unlikely to be achieved. Research indicates that how an organization intends to reach their long-term objectives is rarely addressed (Hounton et al., 2005). Although it is difficult to determine an actual reduction in maternal mortality rates, the use of near-miss cases as a proxy may enable MFH to better understand the types of cases and complications that are occurring and how the postpartum program may be improving outcomes. It is important that MFH addresses how they intend to accomplish their long-term objectives by

determining measurable ways to track the effectiveness and impact of the program. The variables that were identified as barriers to data collection must also be addressed.

Modifiable barriers identified in this evaluation include: running out of forms, not having an organized place to store blank forms separate from completed forms, distractions and a lack of privacy, the absence of a clear plan for data collection and use, limited inclusion of the postpartum midwives in the process of developing a plan for data collection, and insufficient monitoring and support of the program. Possible solutions to these barriers to data collection include: (a) creating a scheduled restocking cycle for data collection sheets, (b) providing the midwives with two stackable and portable file boxes (one for blank sheets and one for completed) with labeled file folders for each of the different data sheets, (c) raising funds and coordinating with HST to create agreed upon environmental modifications to increase privacy and reduce distractions (e.g., installing curtain barriers around each patient bed), (d) creating and implementing a clear plan for data collection and use and including the postpartum midwives in the planning process, (e) training the postpartum midwives on the updated plan for data collection and use, (f) informing the postpartum midwives about data collection progress and findings through routinely scheduled updates and (g) providing the program with ongoing monitoring and support, which could include both planned and unplanned visits, as well as anonymous evaluation questionnaires on a routine basis.

The absence of a patient's record and the inability to get comprehensive prenatal care information unless a patient received care at HST has the potential to significantly impact the accuracy and comprehensiveness of postpartum data collection. Additional efforts by MFH to improve overall data collection at HST could beneficially include hiring a midwife to do intake, as was suggested by Brunk:

One of the things that I would love to see, especially when they open that new unit, is a triage area. And in the triage area there would be a midwife full time who does the intake for anyone who comes into labor and delivery. And she would be the one responsible for pulling any prenatal records that are available from the hospital prenatal clinic. (personal communication, June 21, 2016)

Based on the observations and interviews in this evaluation, as well as the literature on maternal mortality and safe motherhood initiatives, there were several potential areas for future study identified. These research possibilities include: (a) an analysis of the barriers to attending the six week appointment and/or the identification of effective incentives for increasing the number of patients who present for this appointment, (b) family planning utilization rates and identifying which methods women want to use/are most likely to use, (c) evaluating the effectiveness of patient education, and (d) assessing where and with whom women (especially at the mobile clinics) want to give birth.

This evaluation revealed that, as is often true for safe motherhood programs in developing and humanitarian settings, sufficient planning for evaluation did not occur prior to the implementation of the postpartum program. However, many aspects are already being addressed to help ensure continued improvement in the monitoring and evaluation of this program. The recommendations made as a result of this evaluation begin with the development of a clear and realistic plan for data collection and evaluation, which should include a program-level logic model, SMART objectives, and an adequate database. Additional recommendations include addressing the barriers discussed above, training someone in-country to oversee some aspects of monitoring and evaluation, using near-miss cases as a proxy for maternal mortality, and identifying the barriers and facilitators to patient presentation at the six week appointment.

Appendix A

Table 1

Evaluation Timeline and Schedule of Activities

6/4/16	Arrived at Midwives for Haiti in Hinche with Study Abroad Students
6/6/16	Follow-up Email Sent to Formative Interview Participants Note: Program and Partnerships Director (i.e., facilitator for gaining access at the hospital) was out of the country until 6/10/16
6/7/16	MFH Mobile Clinic and Zika Outreach Observation
6/8/16	Wrote Informed Consent Statement
6/10/16	Met with Program and Partnerships Director re: Gaining Access Plan; Observed MFH Midwife Continuing Education Session
6/11/16	Visited MFH Birth Center in Cabestor
6/12/16	Hospital (HST) Tour
6/13/16	Interviewed Monitoring and Evaluations Manager via Skype and Started Interview Transcription; HST visit with Program and Partnerships Director—Met Medical Director and Ethics Representative
6/14/16	Introduced myself and project to key Maternity Ward hospital staff with MFH Translator; Letter of Permission to be received by 6/17/16; Interview Transcription
6/16/16	HST Visit and Follow-up
6/17/16	Official Letter of Approval from HST received; Granted approval from GVSU to begin hospital observation
6/20/16	Interviewed 2 of the 3 PP midwives with translator at MFH house
6/21/16	Interviewed MFH executive director via Skype; First general observations at HST (Started map of HST)
6/22/16	Midwife Interview Transcription; Finish Mapping out HST

6/23/16	Continued Interview Transcription; HST Observation and Typed up Detailed Observation Notes
6/24, 6/27-29, 7/1-2, 7/4-7	HST Observation and Typed up Detailed Observation Notes
6/27/16	Interviewed 3 rd midwife (at HST) with Translator; Interview Transcription
6/30/16	Interviewed Program and Partnerships Director at MFH house; 3 rd Midwife Interview Transcription
7/1/16	Interviewed American Midwife who developed and implemented PP program at HST via Skype
7/4/16	Started Program and Partnerships Director and American Midwife Interview Transcription Note: Transcription of these last two interviews was delayed due to time constraints. Transcription was completed in August.
8/10/16	Sent Preliminary Report to MFH Program and Partnerships Director

Appendix B

Table 2

Pregnancy History Form (PHF) Data Collection Indicators

Demographic
First and last name
Age (Not birthdate)
Zone/Village/“Address”
Previous Pregnancies
of pregnancies (G)
of births (P)
of births to term (T)
of preterm births (P)
of miscarriages (Ev)
of living children
of babies born at home
of babies born at a hospital
of C-sections
Fetal death
of neonatal deaths
Gestational Age: LMP and method for determining gestational age
Prenatal Care
Gestational age for first visit
of visits
Location of care
Pre-existing Conditions and Prenatal Complications
Childbirth (also referred to as Labor and Delivery)
Childbirth Complications (also referred to as Labor and Delivery Complications)
Interventions
Postpartum Complication

Table 3

Maternal Examinations Checklist (MCL) Data Collection Indicators

Patient Name
Delivery Date and Time
Number of PP visits
Patient received prenatal care (Y or N) and whether or not it was at HST or MFH MC or other
Vital signs: Blood Pressure, Pulse, Temperature
Signs of pre-eclampsia: Protein, headaches, vision changes, swelling
Evaluation of Patient's Current Status Based on the following:
Bleeding
Uterus
Vagina and Perineum
Urinary
Bowel Movement
Color
Breasts and Nipples
Legs
Respiratory
Nutrition/Hydration
Activity
Emotions/Support
Scheduled for follow up? (Yes or No) (Note: there is only one space on the data sheet to answer this question.)
Referral: Maternity HST, Family Planning at HST, MFH Mobile Clinic, Other Health Clinic
Reason for referral: Preeclampsia, uterine infection, heavy bleeding, uterine subinvolution

Table 4

MSPP Maternity Data Collection Indicators

MSPP Postnatal Register Indicators
Name (first and last)
DOB (just year)
Age (<25 or >25)
Address
Community (Hinche)
Gravida (G)
Para (P) (number of pregnancies that have resulted in the birth of a viable offspring)
Date of Delivery
Location of delivery (HST)
Vitamin A
Iron
Arm circumference (maternal)
Baby weight
Place to write in postpartum complications
of Patients seen: 7 days to 42 days 3 days to 6 days 7 hours to 72 hours 0 hours to 6 hours
MSPP Labor and Delivery Register Indicators
Patient Record Number
Name
DOB (not recorded)
Age
Address (just the name of the village or town they live in)
Community (if the patient lives in the community of Hinche)
Maternity Code
Prenatal Code
Prenatal Care (PC) (Y or N?)
G (# of pregnancies)
P (# of births)
A (# of miscarriages)
EV (# of children alive)
Gestational Age at Birth (recorded either in weeks or months depending on if patient knows LMP, i.e., 40 weeks (knew LMP) or 9 months (did not know LMP))
Date for HIV testing and status
Date for Syphilis testing and status

Maternal Vaccinations (not filled out)
Referrals (REF) by a matron (not filled out)
Date and Time of Delivery
Delivery Information: Vaginal (V), C-S, or use of instrument (instrument not tracked)
Partogramme (sheet) used (Y or N?)
Delivery of Placenta (Oxytocin (standard) or Complication)
Intrapartum and Postpartum Complications (not filled out)
Live Birth or Infant Death at Birth (stillbirth)
Sex of Baby
Weight of Baby
Kangaroo Care Used?
APGAR
Mother's Status after Delivery (Alive, Transferred to another hospital or Deceased)
Mom Vitamin A (Y or N?)
Status of Infant on discharge (Alive, Transferred, Deceased)

Appendix C



REPUBLICQUE D'HAÏTI
MINISTÈRE DE LA SANTÉ PUBLIQUE ET DE LA POPULATION
DÉPARTEMENT SANITAIRE DU CENTRE
HOPITAL SAINTE THERESE DE HINCHE

Hinche, le 17 Juin 2016

Madame Denielle Riley
Etudiante à l'UGVS

Madame,

La Direction de l'Hôpital Sainte Thérèse de Hinche vous présente ses compliments et a l'avantage de vous informer que votre demande de recherches à la Maternité a été agréée.

La Direction vous prie de Recevoir, **Madame**, ses salutations.

Dr. Prince Pierre Soncon, Chirurgien Cardio Thoracique
Directeur médical de l'HSTH



Appendix D

June 20, 2016
Denielle Riley, MPH Student
Grand Valley State University
301 Michigan Street, NE
Grand Rapids, MI 49503

Dear Denielle,

Upon review of the aims and description of the project you are planning entitled, “Midwives for Haiti: Process evaluation of postpartum data collection” it does not meet the definition of covered research. This definition states that research is, “...a systematic investigation, including research development, testing and evaluation, designed to develop or contribute to generalizable knowledge...” (Code of Federal Regulations, Subpart A, Section 46.102 (d), 2005, 2009).

The determination of this project as **not being research** is based on my review of the materials you submitted, which included a protocol indicating that your proposed project meets the criteria of a program evaluation of the postpartum data collection conducted by midwives in one hospital in Haiti. In addition, you have provided documentation from Dr. Prince Pierre Soricon, Medical Director of the Hospital Sainte Therese in Hinche, which states that you have approval to conduct your program evaluation. **Because it is not federally covered research, submission to GVSU’s Human Research Review Committee (HRRC) is not necessary.** You may proceed with this project.

As you move forward, you are cautioned that your project should not be referred to as research when you discuss it with others. Should you change the aims and activities of your project such that it would then meet the definition of research as quoted above, please cease any contacts with potential human subjects until such time as you submit the project protocol to the HRRC and receive the committee’s approval to proceed.

Good luck with your project.

Cordially,

Theresa Bacon-Baguley, PhD, RN
Professor & Associate Dean for Research
College of Health Professions
Grand Valley State University
Grand Rapids, MI 49503

Cc: Dr. Jody Vogelzang
CC: Dr. Lara Jaskiewicz

Appendix E

Informed Consent Statement

Midwives for Haiti: Process evaluation of postpartum data collection

My name is Denielle Riley and I am a public health graduate student at Grand Valley State University in Michigan, in the United States. During my time in Haiti I will be looking at how data about women's pregnancies is being collected postpartum. The purpose of this project is to better understand how data is being collected, what information is being collected, and potential barriers to collecting data. This information will be helpful for future evaluation about the program's effectiveness because it will help to ensure that the intended data is actually being collected and that the data being collected is useful information, which can be used for its intended purposes.

Participation in this project is voluntary. Please let me know if you have any questions or concerns at any time. Your participation will be beneficial for Midwives for Haiti and for the women served by MFH. You have been selected for participation because your insight will make a valuable contribution.

An MFH translator will assist me during both observations and interviews. You will be asked for permission to be audio-recorded. The questions will be about your job and how you collect information about women's pregnancies. No personal information will be used. All responses will be kept confidential and stored securely. A portion of each interview will be check for translation quality and consistency by a Haitian translator in the United States.

Before we proceed, do you have any questions?

Do you voluntarily agree to participate in this project?

Appendix F

Interview Guides

Formative Interviews

Noted: These questions may be altered to more specifically apply to each of the following individual's role or level of involvement (past and present) in the postpartum program.

B. Tusing (monitoring and evaluation operations manager)

N. Brunk (Executive Director)

J. Schultz (midwife/volunteer who developed postpartum program)

S. Rapp (program and partnerships director)

Objective of interviews: To obtain a greater understanding of the development and implementation of the postpartum program and the intended data collection processes and intended data use.

How much involvement did you have with the development and implementation of the postpartum program? What was your role?

Was a plan for data collection developed prior to the implementation of the postpartum program? If so, when was this plan developed and how was it developed? Who was involved?

Was a plan for data use established prior to the implementation of the postpartum program? Who was involved in this planning process? What did the planning process look like?

What are the intended purposes for postpartum data collection?

What is your vision for future data collection?

Postnatal/Postpartum (PN/PP) Midwife Interviews

PN/PP midwife #1

PN/PP midwife #2

PN/PP midwife #3

What does your daily work look like? Explain to me how you do your job and what your responsibilities are?

Are you familiar with this form? (Bring a blank copy of the form)

Who fills out this form?

When are these forms being filled out? When do you fill out this form during a patient's appointment?

Is this form filled out for each patient? Why or why not?

What have you been told about filling out this form?

What is the purpose of gathering this information?

How do you fill out this form? Can you explain or demonstrate for me how you get this information?

How do you collaborate with the rest of the staff? Are any other hospital staff responsible for collecting this information about women's pregnancies?

How is your daily work impacted by filling out this form?

Is there an ideal time for filling out these forms/data collection? When? Why?

What are some of the obstacles that make it difficult for you to fill out this form completely?

Do you tell your patients anything about this form? What do you tell your patient's about this form?

Do your patients provide you with the information you need to fill out this form? Why or why not? What information are they unable to provide you? Are you able to get this information from someplace else? How are you able to get this information?

Appendix G

Semi-structured Observation Questionnaire

To help answer the following: What does the PN/PP midwives' daily workflow look like?

How does the midwife start her shift?

What happens next?

When she receives her first patient, what happens first?

What happens next?

How does she end the appointment with her patient?

What activities take place between patients?

What unexpected or unplanned events (i.e. interruptions) take place between patient appointments? During patient appointments?

At what point in the patient appointment does data collection begin?

How does the midwife start data collection? What does she say?

Does she ask or fill out each question on the form in the order that it is written?

Does she skip any questions? Why? Does she return to these questions? When does she return to these questions (during the appointment, after the appointment, at the end of the day, etc.?)

Appendix H

Pregnancy History Form (PHF)



Données Maternelle et Néonatale Hôpital Sainte-Thérèse

Date d'admission _____

Démographique

Nom de Famille _____ Prénom _____

Age _____ Zone/Village/Adresse _____

Grossesses Précédentes

G ___ P ___ T ___ P ___ Av ___ Ev ___ Mort Fœtal ___ Décès Néonataux

Combien de : Naissances à domicile _____ Naissances à l'hôpital _____ Césariennes
précédentes _____

Âge Gestationnel

DDR : _____ Meilleure estimation de l'âge gestationnel : _____ semaines et
_____ jours

Méthode pour déterminer l'âge gestationnel : DR Taille de l'utérus

Echographie

Soins Prénatals

Âge gestationnel a la première visite prénatale : _____ Nombre de visites prénatales : _____

Localité de consultations prénatale : _____

Saj Fanm Clinique Mobile HST Sacre Cœur Dr. Celestin

Matrone Autre _____

Conditions Préexistantes et Complications Périnatales (marquez toutes qui sont applicables)

- Anémie Pre-éclampsie Hypertension Chronique
- Hypertension Gestationnelle SIDA
- Syphilis Gonorrhée Chlamydia Paludisme
- Diabète Diabète Gestationnel
- Bactérienne Vaginale IGU Moniliasis Trichomonas
- Autre _____

Accouchement

- Naissance Vivant Mort-né Apgar : _____ 1 min. _____ 5 min. Poids : _____ gm.
- Masc. Fem. Réanimation Transféré Céphalique
- Sièges Jumeaux Décès Néonatal Cause de la mort : _____
- Mortalité Maternelle Cause de la mort : _____

Complications de l'Accouchement

- Prolapsus du Cordon Éclampsie Détresse Fœtale Travail Dystocique
- Hémorragie

Lacération Travail Préaturé Fièvre maternelle Rupture prolongée des membranes

Rétention du Placenta Autre _____

Interventions

Accouchement Physiologique Césarienne Forceps Vacuum

Curetage

L'induction du travail Raison : _____

Ocytocine Misoprostal

Augmentation du travail Extraction Manuelle du Placenta Sulfate de Magnésium

Antibiotique Antihypertenseur IV Transfusion Épisiotomie

Réparation de Lacération

Complications Postpartum

Hémorragie Éclampsie Infection Fièvre Autre

Sage-Femme

Nom et prénom : _____ Date : _____

Maternal Examination Checklist (MCL)

Maternal Postpartum Assessment Patient Name _____

Date Delivery _____ time _____ / V1 _____ time _____ / V2 _____ / V3 _____

Patient received prenatal care? YES NO HST MFH MC

Other _____

Vital Signs

BP: 1 _____ 2 _____ 3 _____ Pulse: 1 _____ 2 _____ 3 _____ Temp:

1 _____ 2 _____ 3 _____

Sx Preeclampsia: Protein Headaches Vision Changes Swelling

Lochia (Lochi)

- Lochia is like a light period Patient is having heavy bleeding
- Patient is changing < 6 pads per day Patient is changing > 6 pads/ day
- Lochia is dark red, brown or pink Lochia is bright red
- Lochia has a normal odor Lochia smells bad
- Patient has some small clots Patient is passing large clots
- Lochia has stopped Amount of lochia increased after it had slowed down or stopped

Uterus (Matris)

- Uterus is firm Uterus is not contracted
- Uterus is midline Uterus is displaced to one side
- Uterus is not sensitive to the touch Uterus is sensitive when touched
- Uterus is measuring normal for days PP Uterus is not measuring normal for days PP
- Incision healing well Incision appears infected

Vagina and Perineum (Vajen ak Perine)

- Vagina and perineum are not painful Patient has pain in vagina/perineum
- Secretions are a normal odor Secretions smell bad
- Tear appears to be healing well Tear does not appear to be healing well
- Patient has some swelling in vagina/perineum Patient has a lot of swelling in vagina and/or perineum

Urinary (Irinè)

- Patient peed within 24 hours after birth Patient has not peed since birth
- Patient does not feel pain with urination Patient feels burning with urination
- Patient feels an urge to pee Patient does not feel an urge to pee
- Patient can hold urine in Urine leaks out, patient cannot hold it in
- Urine has a normal odor Urine smells bad
- Patient peeing a lot in first 5 days PP Patient has other signs of a UTI
- Patient has back pain or tenderness

Bowel Movement (Twalèt)

- Patient had BM within 48 hours after birth Patient has not had a BM since birth
- Patient is not having any pain with BM Patient is having pain with BM
- Patient can hold stool in Patient cannot hold stool in

Color (Kourlè)

- Patient's conjunctiva are pink Patient's conjunctiva are pale
- Patient's gums and palms are pink Patient's gums and palms are pale

Breasts and Nipples (Tete ak Pwent Tet yo)

- Breasts have no pain Breast is painful
- Nipples have no pain Nipple is painful
- Breasts are engorged Nipple has cracks or blisters
- Patient reports milk has come in Breast is red and hot
- Breast has red line
- Breast has a rash

Legs (Janm)

- No pain in leg Pain in one or both legs
- Legs not hot One or both legs hot
- Legs not red Redness in one or both legs
- Negative Homan's Sign Positive Homan's Sign

Respiratory (Respiratwa)

- Patient is breathing normally Patient appears to have difficulty
- Lungs sound clear breathing
- Lungs sound wet

Nutrition/Hydration (Nitrison / Idratasyon)

- Patient has appetite and is eating well Patient does not have appetite
- Patient is drinking enough water Patient reports that she is not eating well
- Patient reports that she is not drinking enough water
- Patient appears dehydrated

Activity (Aktivite)

- Activity level appropriate for days PP Activity level not appropriate for days PP

Emotions / Support (Emosyon / Sipo)

- Patient reports that she is happy Patient reports that she is unhappy
- Patient appears happy Patient appears unhappy
- Patient reports that she has support at home Patient reports that she does not have enough support at home

Patient scheduled for follow-up visit? Yes No

Referral (Refrans)

Maternity HST FP HST MFH MC Other Health Clinic

Reason for Referral (Rezon pou Refrans)

Preeclampsia Uterine infection Heavy Bleeding Uterine Subinvolution
 Severe Anemia Fever Other:

V1 _____
 V2 _____
 V3 _____

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