Public Disclosure Authorized

USING BEHAVIORAL INSIGHTS TO INCREASE SAFER BIRTH DELIVERIES IN HAITI

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Contents

Acknowledgements

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1. Introduction

Haiti has the highest maternal and neo-natal mortality rates in the Latin America and Caribbean region. Although there has been a decline since 1990, the latest data (2015) shows that maternal and neo-natal mortality rates remain high, at 529 deaths per 100,000 live births, and 24 deaths per 1,000, respectively (IHE and ICF 2018, World Bank 2017). These two measures of mortality are five and three times higher than regional averages. Based on current trends, Haiti will probably not meet the United Nations' Sustainable Development Goals (SDGs) to reduce the maternal mortality ratio to less than 70 maternal deaths per 100,000 live births by 2030 (World Bank 2017).

Low rates of prenatal and postnatal care, and institutional births, contribute to high levels of maternal and neo-natal mortality rates. While in Haiti 91 percent of women go at least once to a health institution for prenatal care, only 67 percent made the four recommended visits, and only 33 percent go to a postnatal visit within 48 hours of delivery (IHE and ICF 2018). Furthermore, less than 40 percent of births take place in a health facility, compared to 70 percent in other low-income countries (World Bank 2017). Worldwide, 15 percent of pregnancies develop complications that can lead to death.[1] However, most high-risk pregnancies show early warning signs, and receiving professional care before, during, and after childbirth has proven effective in reducing death rates.

In Haiti, most women – especially the poorest – deliver at home with the help of a *matron* (traditional birth attendant). *Matrons* have little formal training, and often receive knowledge from their elders. Of the overall 20 percent of poorest mothers, 13 percent delivered in a health facility compared to 78 percent of the 20 percent richest mothers (IHE and ICF 2018).

The objective of this diagnostic is to use a behavioral methodology to uncover the drivers to increase safe birth deliveries in Haiti. The diagnostic aims to:

i) Identify structural and behavioral barriers preventing women from attending prenatal care visits, and to deliver at a health institution, and
ii) Explore behaviorally informed interventions to nudge pregnant women to attend the recommended prenatal care visits to ensure detection and special care of high-risk pregnancies.

The novelty of this diagnostic relies on the use of behavioral science techniques to examine a wider set of influences, paying attention to the social, psychological, and economic factors that affect what people think and do. Using the behavioral methodology, the diagnostic aims to understand how pregnant women, matrons, and health practitioners think automatically, socially, and with mental models (World Bank 2015). Through behavioral science, the diagnostic assesses how the framing of the problem (unsafe birth deliveries), the context in which decision-making takes place, and the details of the design of an intervention each play an essential role in determining behaviors; and that ignoring these behaviors can result in an ineffective intervention. Behavioral insights for this diagnostic come from qualitative research based on extensive desk review and analysis of primary qualitative data**.**

The behavioral methodology identifies barriers interfering in the decision-making process of pregnant women when seeking, reaching, and receiving care. While the diagnostic reports

[1] Derived from an interview with *Médecins sans frontières (MSF)* in CRUO hospital, Port-au-Prince on April 2018.

common structural barriers that can be overcome with behavioral insights or monetary incentives, main behavioral barriers found include:

(1) When seeking care, women suffer from "optimism bias," as they do not think any complication will happen to them; thus, they do not see the need to seek care at health institutions.
(2) When reaching care, women face barriers such as transportation, safety, and time constraints. There are limited cars available, and most women must rely on motorcycles, which can be (correctly) perceived as dangerous when pregnant given the bumpy state of roads and associated risk of miscarriage.
(3) When receiving care, women suffer, among other threats, "stereotype threat," as they feel they might be judged negatively by doctors for their poverty and lack of medical knowledge.

This note is structured as follows: section two outlines background and context, while section three explains the methodology followed in this diagnostic. Key insights are presented in section four. Section five provides key solutions to improve safe birth deliveries. Finally, section six concludes with a short description of a potential intervention.

2. Background and context

In Haiti, structural barriers to maternal care such as limited access and high cost prevail. There is insufficient health infrastructure, limited healthcare workforce, and medical resources while health services are expensive considering the socioeconomic levels. Distances to health centers are long and at a high cost due to poor road conditions and limited access to transportation.[2] In addition, hospitals receive little financial support from the Government of Haiti (GoH), with less than five percent of the budget spent on health (World Bank 2017), which results in poor quality of healthcare.

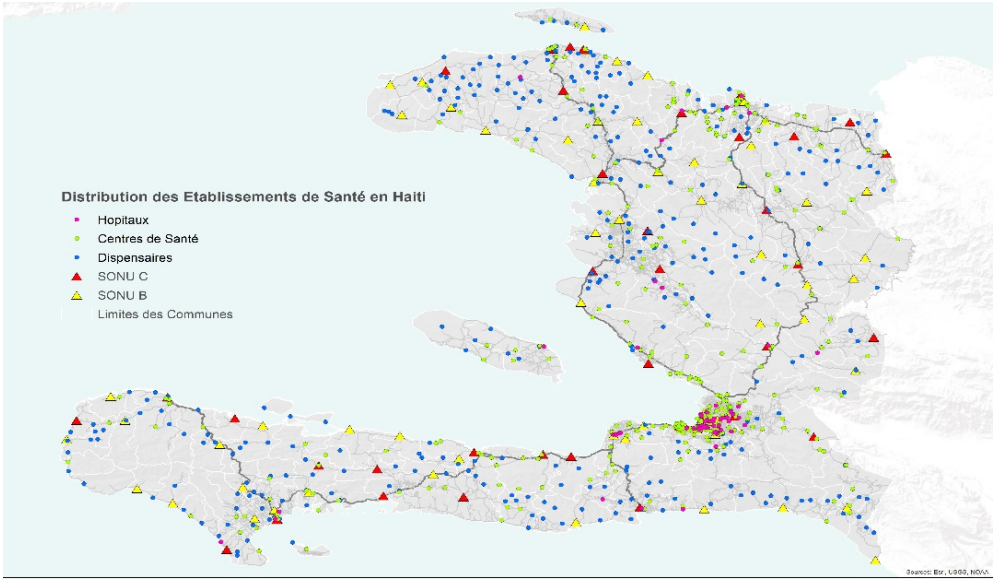
The *Ministère de la Santé Publique et de la Population* (MSPP) and its department divisions oversee all 1,048 health institutions serving a population of 10.7 million (see map 1) (MSPP 2014). The health system is organized in three levels classified by the services they offer (MSPP 2015):

1. The primary level includes Community Health Centers (*Centre de santé communautaire*, CSC) or dispensaries, Health Centers (*Centre de santé*, CS) with or without beds, and Community Reference Hospitals (*Hôpital Communautaire de reference*, HCR).
2. The secondary level includes Departmental Hospitals (*Hôpital Départemental*, HD).
3. The tertiary level includes University Hospitals (*Hôpital Universitaire*, HU) and specialized hospitals.

In all three levels, health institutions can be classified as SONU-B (*Soins Obstétricaux et Néonataux d'Urgence de Base*) when prepared to address births with moderate risk, or SONU-C (*Soins Obstétricaux et Néonataux d'Urgence et Complets*) when prepared to address high-risk births. In 2017, there was a total of 59 health facilities considered SONU-B, and 41 considered SONU-C (see map 1). Health facilities can have a public, private (for profit or not), or mixed level status.

[2] In US$, transport costs are around $8, a simple delivery less than $20 and a cesarean around $100. 59 percent of the population live on less than $2.50 a day.

Map 1. Distribution of health facilities in Haiti



Source: (DSF 2017). Carte SONU. Provided by the WB Health team.

Women are encouraged to attend prenatal consultations at the primary level, while women with complications are referred to a higher level. Regular pregnancy and follow-up consultations are usually sent to Community Health Centers, which are administered by nurses and auxiliary nurses who provide basic care to the population. When there are some complications, women are referred to Health Centers where general practitioners and midwifes are better equipped to assess and manage high-risk pregnancies and follow-up complicated deliveries. For the most serious cases, patients are referred to Community Reference Hospitals and up, where family physicians, anesthesiologists, and specialized doctors can be found.

Table 1. Distribution of maternal health activities, by type of institution

Activities	Level				
	1			2	3
	CSC	CS	HCR	HD	HU
Prenatal consultations					
▪ Regular pregnancy consultations and monitoring	√	√	√	√	√
▪ Assessment and management of risk pregnancies		√	√	√	√
Birth assistance[3]					
▪ Vaginal birth with low-risk		√	√	√	√
▪ Vaginal birth with moderate risk and / or complication (SONU-B)		√	√	√	√
▪ Childbirth with risk and / or serious complications (SONU-C)			√	√	√
Postnatal consultations					
▪ Follow-up of normal deliveries	√	√	√	√	√
▪ Follow-up of complicated deliveries		√	√	√	√
▪ Management of abortions	√	√	√	√	√

Source : Own calculations, extracted from *Manuel du Paquet Essentiel de Services* (2015).

[3] Including immediate care for the newborn and the mother.

Recent efforts

Most of the work to date by the GoH and its partners has focused on addressing structural barriers, such as the financial costs of and physical access to health care. In the *EMMUS* 2006 dataset,[4] over 78 percent of women said they could not seek health care in facilities due to user fees, and over 42 percent mentioned distance to a health center as a barrier (Cayemittes, et al. 2007). In response to this, in 2008, donors such as the United Nations Population Fund (UNFPA) and the Canadian International Development Agency (CIDA) designed the "*Soins Obstétricaux Gratuits*" program, which provided free maternal health services to low-income women in selected health centers. The program ended in 2013 following funding cuts. However, needs were still high, as the EMMUS 2012 dataset reports that 76 and 43 percent of women report user fees or distance to health centers as main barriers to seek health care, respectively (DSF 2017). Moreover, NGOs such as Midwives for Haiti (MFH) and UNFPA have explored solutions to the problem of physical access to maternal health care by bringing mobile prenatal clinics to the population living in remote areas without access. However, these efforts have proved insufficient, ultimately acting more as pilot projects than large interventions.

Other programs focus on the supply side and offer midwifery trainings and technical assistance to hospitals. There is only one midwifery education program in Haiti, *Institut National Supérieur de Formation Sage Femme* (INSFSF), in Port-au-Prince, and Haiti counted only 211 midwifes throughout the country in 2013. Haiti's midwife workforce can provide care to only 10 percent of the population.[5] To solve this problem, since 2006, MFH has been training nurses and auxiliary nurses through a 14 month-long training (not certified by the GoH) to increase the number of skilled midwifes. Other NGOs, such as The Foundation for Advancement of Haitian Midwifes (FAHMINC) focus on promoting continued education for official midwives once they have received their diploma. The United States Agency for International Development's (USAID) Maternal and Child Survival Program provides technical assistance to hospitals in the hopes that improving hospital quality will incentivize women to utilize services. However, the current workforce remains insufficient to meet demand, and the quality of care remains low.

In the past, the GoH formalized and certified *matrons* to reduce maternal mortality rates. Trainings were done for nine months only, which proved to be insufficient to provide the cognitive skills needed to manage complicated cases. Contrary to reality, matrons felt empowered and overconfident, and tried to handle complicated cases instead of referring those to health institutions, leading to an increase in maternal mortality rates. Other organizations, such as *Médecins du Monde (MDM)* decided to pay *matrons* 750-1,000 HTG ($1=65 HTG)[6] for each pregnant woman brought to the hospital. To our knowledge, since 2017 *matrons* no longer receive a fee or materials when they bring pregnant women.

Rigorous evaluations of these approaches are missing. Data scarcity and the absence of strong monitoring and evaluation characterize most programs and interventions in Haiti. The EMMUS datasets of 2006, 2012, and 2017 are the most reliable source of information; according to these datasets, institutional births increased from 25 percent in 2006 to 36 percent in 2012, and to 39 percent in 2017 (IHE and ICF 2018). While some of this change could result from these

[4] EMMUS – Enquête Mortalité, Morbidité et Utilisation des Services

[5] The WHO estimated a need of at least 2,200 to lower maternal deaths. Retrieved June 27, 2018, from /news/midwives-offer-care-dignity-and-lifeline-Haiti's-mothers.

[6] Exchange rate as of May 2018.

programs, these nationally representative datasets are not collected for monitoring and evaluation purposes. Impacts are not well measured and attributions to the programs cannot be proved.

3. Methodology and description of data

The evidence of this diagnostic is based on qualitative research: desk review, key-informant interviews, and qualitative fieldwork. The diagnostic started with an extensive desk review of existing literature and reports to define the problem in the Haitian context. To better understand the complex nature of the issues surrounding birth deliveries in Haiti, the team interviewed key informants such as health practitioners, national counterparts at the MSPP and other ministries, international partners working in health in Haiti (UNFPA, USAID, Red Cross), and NGOs. All of these interviews were conducted in Port-au-Prince and its surrounding vicinity.

Qualitative fieldwork was later conducted to capture individual experience, choices, perceptions, and attitudes towards birth deliveries in Haiti. Fieldwork aimed to understand how pregnant women make decisions by exploring: pre- and postnatal care behaviors, attitudes and opinions around institutional delivery, perceptions, social structures, and relationships, among other contributing factors. The instruments chosen for this study were focus group discussions (FGDs) and semi-structured interviews (SSIs) with a purposively selected range of actors: pregnant women*, matrons*, health workers, family members, community health workers (CHW), and community leaders (CASEC and ASEC).[7] All interviews and discussions were recorded, transcribed, and translated from Creole into French. Data was coded using Nvivo qualitative data analysis software.

Sites and respondents were intentionally selected to answer our research questions best. As is common with qualitative research methods (Tracy 2010), site selection was done through a two-stage process. The first stage consisted of selecting the department with the highest presence of hospitals with obstetrician care per women, and a high rate of institutional births and of births attended by a skilled provider (DSF 2017, IHE and ICF 2018). The second stage controls for availability of a SONU-B or SONU-C and identifies communal sections with a low (high) percentage of births at an institution.[8] Respondents were recruited based on their role in the decision-making process of pregnant women. Six types of respondents were identified: pregnant women*, matrons*, health practitioners and community health workers (CHW), family members, and community leaders (CASEC and ASEC) (see box 1).

Box 1. Profile of the participants interviewed:

- **Pregnant women.** *Young adults (28 years old on average) with two to four children each*. They have limited financial means, but manage to get money for transport, hospital or *matron* fees, often through family or neighbors' support. A few of them work as *marchandes* (petty traders), but the majority is unemployed.
- **Matrons.** *Men and women of all ages, illiterate in general, and rooted within the community*. The majority become *matrons* early in life either through learning from their elders, or revelation in a vision or dream. Most are religious; they believe God decides if pregnant women go to the hospital and divine signs help them see this. Most *matrons* are farmers or have small businesses; few of them are only *matrons*.

[7] CASEC : Conseil d'Administration de la Section Communale and ASEC : Assemblée de la Section Communale.
[8] People whose uncommon but successful behaviors or strategies enable them to find better solutions to a problem than their peers, despite facing similar challenges and having no extra resources than their peers (Wikipedia, 2018).

- **Maternal health workers.** *Gynecologists, pediatricians, midwifes, and nurses*. Doctors usually work in a variety of health centers (public and private) at the same time. Nurses oversee prenatal consultations and childbirth, while gynecologists and pediatricians manage the complicated cases. All of them act as counselors giving advice to women regarding any complications that may occur, and healthy habits; they also encourage pregnant women to complete prenatal care and delivery at a health institution.
- **Family members.** *Husbands, mothers, and mothers-in-law of all ages.* Husbands usually advise pregnant women to go to the health centers for prenatal care and sometimes even accompany them and buy the medicine and inputs needed. Husbands tend to have a strong preference (and often the ability to enforce it) for health centers as delivery site. After delivery, mothers and mothers-in-law take care of the new moms.
- **Community Health Workers (CHW).** *Men and women with formal training for their tasks (formally recognized by the MSPP).* Rooted within their community, CHW work in one or multiple communal sections and report to a health center. They seem to wear different hats; some are field agents and some even practice as *matrons* when needed. They claim to have no monthly salary, but instead get fees for specific activities.[9] They lead awareness and vaccination campaigns, make monthly health reports to the health center, conduct educational sessions, and serve as recruiters and trainers of *matrons*.
- **CASEC** (Community leader) and **ASEC** (Sub-Community leader). Administrative figures of the communal section. Elected by the community, they are responsible for one communal section and are key actors for mobilizing the population. Besides this administrative function, they perform other tasks, such as pastors, electricians, or plumbers.

Following the selection criteria, the Nippes department (south west of Port-au-Prince) was preferred. In this department, the fieldwork took place in 2ème Fonds-des-Nègres (Fonds-des-Nègres) (pop. 12,000) with the lowest percentage of births at an institution, and in 1ère Chalon (Miragoâne) (pop. 34,000) (Institut Haitien de Statistiques et d'Informatique 2015), the highest percentage of births at an institution. Twenty semi-structured interviews and nine focus groups discussions were conducted with a pre-mobilized sample of respondents in a public space in each communal section. Field observations were done in two health facilities: Ste-Thérèse Hospital, a public Community Reference Hospital (HCR) in 1ère Chalon (Miragoâne), and Bethel de L'Armée du Salut private Health Center (CS) in 2ème Fonds-des-Nègres (Fonds-des-Nègres) (see map 2).

[9] Vaccination campaign: 250-350 HTG per day ($1=65 HTG).

Map 2. Ste-Thérèse Hospital, Bethel de L'Armée du Salut and St Boniface

Source: *World Bank*

Analyzing qualitative data brings in-depth details to the experiences, attitudes, and perceptions. While research themes and questions were defined to design the interview guides, qualitative data analysis allows researchers to uncover unexpected themes during the analysis (Fusch and Ness 2015, Tracy 2010). Although qualitative data analysis does not claim for number of statements but rather for richness and details, a rule of data saturation was followed here. This rule consists to say that data were fully explored when no new themes can be identified (Fusch and Ness 2015).

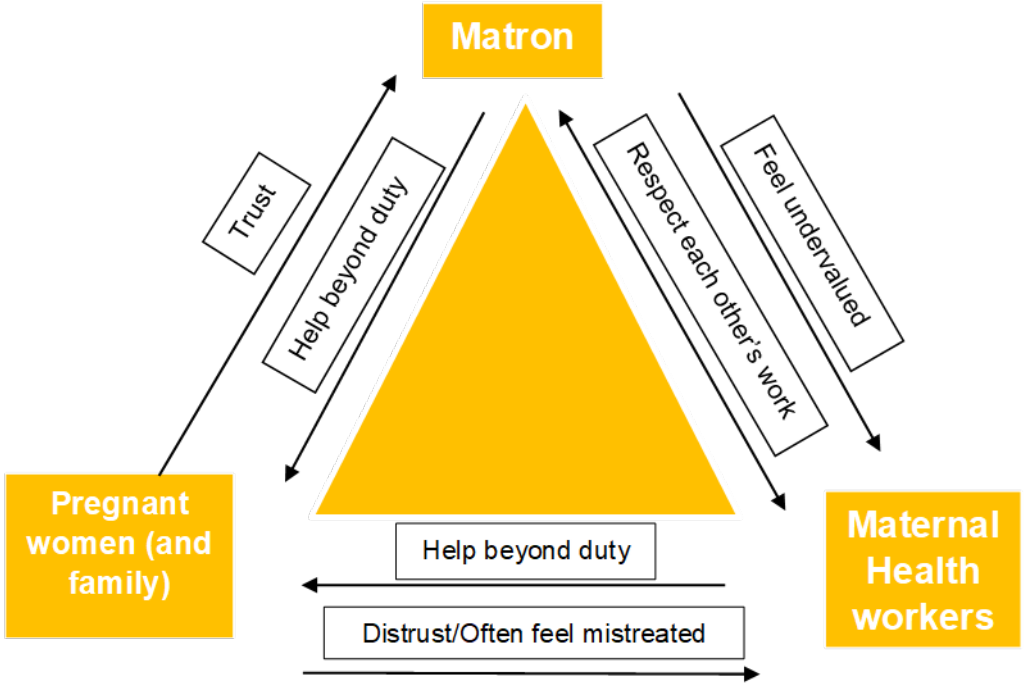
As is common in qualitative research, our study has some limitations. Too many participants were present during the first FGDs, which made the discussions hard to maneuver**.** Also, the sample is not and does not pretend to be representative of the whole population. The objective is not to test causal links or to generalize findings, but to capture views and experiences of people and the way they express them.

4. Findings

Interactions and relationships

Pregnant women make their decisions towards deliveries not only based on personal beliefs, but also on social empirical beliefs. Women decide to do prenatal and postnatal care visits based their relationships and interactions with *matrons* and health workers. Their decisions are also influenced by the relationships and interactions their families and communities have with these actors. Finally, women are influenced in their choices by the knowledge of the relationship between *matrons* and health workers (figure 1).

Figure 1. Interactions and relationships between the main actors involved in the decision-making process of pregnant women



Trust links *matrons* and pregnant women… *Matrons* are long-standing, respected members of their communities, and are known by everyone. The relationship between pregnant women and *matrons* starts even before pregnancy. The *matron* is the first person called once a woman notices pregnancy symptoms. From there, they conduct short, regular visits to see how she feels. There does not seem to be a preference for female/male *matrons,* although some women mentioned they preferred female *matrons* but accept men when there is no choice. When in pain, if they fall, or once in labor, pregnant women usually seek a *matron*'s advice first and then follow their advice as to whether they should stay at home or go to a health center.

… While distrust towards medical staff prevails. While some pregnant women feel welcome in health centers and describe the care they receive as good, others report mistreatment and distrust. This is in part explained by the perceived lack of warmth projected by medical staff: "*There are nurses who are angry, especially in free hospitals. They say, it's because the hospital is free that you're always pregnant" (FGD, pregnant women, Fonds-des-Nègres)*. Women often think doctors keep the hospital fees they pay. When a death occurs at a hospital, the family blames the medical staff.

Both *matrons* and maternal health workers claim they go beyond their duty. *Matrons* claim they do more than assisting women during pregnancy and labor. If they refer women to a hospital and her family refuses to go or cannot afford transport fees, *matrons* claim they try to convince them and sometimes even contribute financially. When women return from the hospital, if mothers or mothers-in-law are absent, *matrons* help wash their clothes, clean their house, cook, and look

after their other children. Doctors also claim to care about their patients' health and safety. When pregnant women must be transferred to another hospital, but the family lacks the means to pay, doctors say they sometimes pay with their own money. While some pregnant women mentioned that in the absence of economic means doctors do not intervene, medical staff claimed that when a patient has no money to pay the hospital fees, the administration accepts the amount she has and releases her.[10] Although this seems to be rare, when it happens, and as a token of appreciation, pregnant women select a godmother for the baby from the medical staff.

Mutual respect and knowledge for each other's work limits and capabilities. On the one hand, *matrons* acknowledge their medical limits, fear the death of women, and understand that the medical staff are better prepared to save lives, especially in risky situations. Sometimes they even prefer that their own daughters deliver at a hospital rather than with a *matron*. However, *matrons* feel nurses are not as patient with pregnant women as they are and believe patience can sometimes save lives. On the other hand, medical staff (nurses and doctors) respect *matrons*. They know *matrons* are needed in Haiti and that *matrons* are the ones referring the risky cases to the hospitals.

Matrons* feel they are doing a lot for nothing in return**. In a region with high transport fees and a limited number of hospitals – where those that exist are often far from communities and understaffed – *matrons* are aware of their worth: **"We do a great service in the community" (FGD, matrons, Miragoâne)*. They are asked to refer pregnant women to hospitals; they sometimes pay the transport fees while claiming to receive nothing in return. *Matrons* feel undervalued and mistreated by medical staff. Despite this perceived lack of recognition, *matrons* continue referring women because it is in their interest to save lives, and they feel proud and happy when they bring a risky case to the hospital.

A strong community of support prevails. In addition to doctors and *matrons*, CHW also help beyond their duty. Not only do they sometimes accompany pregnant women to the hospital, but they also pay for the transport costs when women lack the means. Neighbors and family members also contribute to transport and hospital fees when needed (upon repayment).

Barriers to safe birth deliveries

Medical research has shown that most maternal deaths related to pregnancy and childbirth are preventable. For those pregnancy and labor complications from which women usually die, most can be detected and treated if pregnant women attend the four recommended prenatal care visits, receive skilled cared during labor, and postnatal care after childbirth.

The steps to safer birth deliveries seem to be well known by the communities, but not put into action as barriers to seek, to reach, and to receive care exist. The fieldwork informs that pregnant women, their families, and *matrons* know the importance of prenatal care, although knowledge does not often translate into action. Conversations with several actors yielded key insights that help us understand barriers in the decision-making process of pregnant women. A widely used framework known as the three-delay model groups barriers in three different moments: (i) barriers to seek care, (ii) barriers to reach care (including transport to a health center), and (iii) barriers to receive adequate and appropriate care (Thadeuss and Maine 1994).

[10] Based on anecdotal evidence from our fieldwork. However, we acknowledge that this is not the norm in other hospitals, especially in urban private ones, where pregnant women have to pay before being attended.

Obstacle 1. Pregnant women do not SEEK prenatal care[11]

The World Health Organization (WHO) and the Ministry of Health (MoH) of Haiti recommend that pregnant women make their first visit in the first trimester of pregnancy and attend at least four prenatal visits during pregnancy. However, not every pregnant woman goes to prenatal care, and only 67 percent (MSPP, 2017) complete the recommended four visits throughout their pregnancy. The first step to attend prenatal care is to acknowledge its importance and to decide to go. Some barriers to seeking care are identified as:

- **Barrier 1. Optimism bias.** When it comes to predicting what will happen to us tomorrow, next week, or fifty years from now, most humans overestimate the likelihood of positive events, and underestimate the likelihood of negative events (Sharot 2011). Pregnant women in Haiti similarly underestimate the probability of having a high-risk pregnancy, and do not expect a bad outcome. For instance, if they are not experiencing pain and their pregnancy seems to be normal, women skip prenatal consultations: "*If they notice that everything is fine, they decide not to come" (FGD, health workers, Fonds-des-Nègres)*. In addition, both *matrons* and CHW do regular visits to pregnant women, which can cause a false sense of security.
- **Barrier 2. Uncertainty aversion.** People tend to favor the known over the unknown, including known risks over unknown risks. In Haiti, in addition to the consultation fees (if any), pregnant women must pay for laboratory tests and medicines required, so the final cost of one prenatal care visit is usually uncertain, interfering in their decision to seek care. We found in the data that women prefer to come when their pregnancy is evident (three months or more) to avoid paying for the pregnancy test.

Obstacle 2. Pregnant women do not REACH prenatal care

Even in cases where pregnant women manage to overcome optimism bias and uncertainty aversion, they encounter structural barriers related to transportation that impede their ability or willingness to reach care.

- **Barrier 3. Transport, safety and time constraints.** Health centers are usually far from the population and finding a vehicle to go to the health institution is not easy. There are limited cars available, and most women must rely on motorcycles, which can increase risk of miscarriage. On average, it takes 1.5 hours to get from some communities of 1ère Chalon to Ste-Thérèse Hospital, and Bethel de L'Armée du Salut is even further (2 hours). Transport fees are also a barrier mentioned by many. Depending on location, prices can be between 100-500 HTG one way. While women in Chalon know that in St Boniface Hospital, in *Fonds-des-Blancs*, both the consultations and exams are free, transport costs prevent them from going to this health center (see map 2). Various actors wished they had a health center in their community to avoid transport costs.

Obstacle 3. Pregnant women do not RECEIVE prenatal care

When pregnant women manage to arrive to a health center for prenatal care, they experience other barriers related to the human treatment they receive.

- **Barrier 4. Stereotype threat.** Stereotype threat refers to situations in which individuals feel they might be judged negatively because of a stereotype. Often this type of threat has shown

[11] We learned that contrary to prenatal consultations, doing follow-ups is not the norm in Haiti. Although most barriers apply to both pre and post-natal check-ups, further research should be made to better understand barrier to post-natal check-ups.

to compromise performance, evoke anxiety, and deplete effort (Schmader, Johns and Forbes 2008). Data shows that pregnant women fear being judged negatively by nurses, as they are asked many questions at registration, including some on their sexual habits: "*We are asked many questions. For example, are we married? Do we live with our husband? What's our job? Are we only living with our husband? If we have other boys outside our home? We are asked how many men we are in a relation with" (FGD, pregnant women, Miragoâne).* Since most of the pregnant women are young, they may not understand the purpose of the questions, and may perceive them as judgements.

Obstacle 4. Pregnant women do not SEEK institutional delivery

Despite most women recognizing that it is safer to deliver at a health institution, the majority (over 60 percent) deliver at home with a *matron*. As seen before, the first step to deliver at a health institution is to decide to do so, and to plan accordingly. Some of the barriers to seeking institutional delivery are:

- **Barrier 5. Status quos bias.** Humans often unconsciously prefer certain things based on previous choices, beliefs, and traditions, instead of making a rational choice based purely on fact. Often, pregnant women in Haiti prefer to deliver at home because their mothers and relatives had also delivered at home. To the question: *Where did your mother gave birth?* "*Surely, it's at home, at the time there was no health center nearby nor means of transport like today. Women gave birth at home" (Interview, pregnant woman, Miragoâne)*.
- **Barrier 6. Availability bias.** People make judgments about the probability of an event based on how easily an example or case can be brought to mind (Tversky and Kahneman 1974). In Haiti, there are rumors that many women die in hospitals, thus facilitating the link between labor at hospitals and death. In reality, *matrons* often wait too long until they bring a complicated case to the nearest health center, leaving little time for the doctors to save her life.
- **Barrier 7. Uncertainty aversion.** Not only is delivering at a health institution expensive, but the final cost is highly uncertain. Women must pay for the delivery (around 1,000 HTG for a vaginal birth, and between 7,000-12,000 HTG for a cesarean section), and for the medicines and equipment used, which are always uncertain. When referred to another health institution, fees for an ambulance increase to 1,500 HTG. *Matron* fees also vary, but a normal delivery of a boy costs between 500-1,500 HTG and the price for a girl is between 250-1,500. In addition, *matrons* charge between 250-500 HTG for the traditional "bath of leaves" after delivery. *Matrons* charge a fixed price and allow payment installments (on credit), while costs must be paid in full at hospitals.

Box 2: *Matrons'* optimism bias and lack of trust in health institutions interferes with pregnant women's decision as to whether to seek institutional delivery

Matrons, who are fully trusted advisors to pregnant women and called when the time of delivery arrives, also suffer from optimism bias; they underestimate the probability of a risky delivery. They usually wait until it is too late to ensure effective medical intervention, and they rarely refer a pregnant woman to a health center where they haven't been or built a relationship with in the past.

Obstacle 5. Pregnant women do not REACH institutional delivery

Even in cases where pregnant women plan to deliver at a health center, they end up delivering at home, as getting to a health center while in labor is a challenge.

- **Barrier 8. Transport, safety and time constraints.** In addition to the barriers mentioned in the previous section, given the bumpy state of the roads, traveling on a motorcycle during labor is frightening, and women suffer. According to a doctor, women are not aware of their delivery date and for some, delivery signs appear shortly before they deliver; often there is no time, so women end up delivering at home or on the way: "*Sometimes they give birth on the way" (Interview, pediatrician, Fonds-des-Nègres*). A pregnant woman talked about her experience: *"It was already 4pm, I was giving birth on the way. I did not arrive at the hospital" (FGD, Fonds-des-Nègres).*

Obstacle 6. Pregnant women do not RECEIVE institutional delivery

Finally, when they reach a health center to deliver, they experience other barriers that discourage them or other pregnant women from delivering at an institution.

- **Barrier 9. Discomfort with the model of care received at hospitals.** Labor and delivery can be frightening, particularly so for first-time mothers. Often women are afraid of the model of care received at hospitals. Contrary to hospitals, at home, pregnant women can give birth in the position they want "I *myself would like to give birth at home because there is always a murmur that when we delivery in the hospital they use the so-called "ti bourik"* (birth delivery bed)" *(FGD, pregnant women, Miragoâne).* Moreover, some are scared by the noise that the medical instruments make, or of the cry of other women giving birth. They also fear the medicines provided such as Pitocin[12] *"We think that Pitocin can drive a person crazy, because a lady was beating her buttocks after taking Pitocin" (FGD, pregnant women, Miragoâne).* They usually do not like the idea of giving birth alone: "*I was afraid to give birth in the hospital because of rumors that we have to give birth alone in a room while at home we are surrounded by the family"* (*interview, pregnant women, Miragoâne*).
- **Barrier 10. Lack of trust in medical staff.** Trust in strangers is key for moving from intention to action, and lack of trust inhibits many desired behaviors. Rumors about medical staff negligence circulate around the community: "*When I arrived (to the hospital), all the nurses were sleeping, shortly after a nurse came in to tell that when we see the baby's head we could call her. Finally, I pushed the baby alone" (FGD, pregnant women, Fonds-des-Nègres).* Another participant: *"I saw with my own eyes a case where they operated a lady and then they left with the baby because he had difficulties. Since the mother was left alone in the wild, she caught cold and died three days later" (FGD, family members, Miragoâne).* Although nurses do internships at hospitals, family members and pregnant women often think that *matrons* can do better than trained nurses.
- **Barrier 11. Mistreatment**. While some pregnant women have good experiences with medical staff, others experience mistreatment, and perceive that medical staff do not really care about them. Participants mentioned: *"The hospital staff do not care about us... at delivery, they say with a funny tone; 'Madame open your feet.' Sometimes they hit us in the buttocks and that hurt us,"* or *"'…Hey madame! You make too much noise there during (your) delivery" (FGD, pregnant women,* Fonds-des-Nègres*).* Pregnant women mentioned they would like to receive good care, that they value cleanliness, and that they would like to receive food, which is not generally provided by the hospital.

Box 3. *Matrons'* lack of incentives and feeling of mistreatment also limits pregnant women from receiving institutional care

[12] A medication used to cause contraction of the uterus to start labor, increase the speed of labor, and to stop bleeding following delivery (Wikipedia, 2018).

Lack of incentives. When *matrons* refer women to hospitals, they no longer receive any money. Economically speaking, the costs outweigh the benefits of referral. However, it is in their interest to save lives. *Matrons* fear the death of a women not because the family will blame them - *"it is God who decides the fate of people*" - but because the community will blame them given that they are not supposed to do home deliveries anymore. *Matrons* claim not to have monetary incentives, but instead God and saving souls is what drives them. As one *matron* put it: "*Myself, when I give birth, I do it to help people in my community. It's not the money that motivates me to do it" (FGD, matron, Fonds-des-Nègres).* Another one mentioned: "*When you do a job, it's not just the person who can reward you, but God can reward you as well. Now, many children who greet me on the street are children of women who have given birth and who have not paid me anything" (Interview, Matron, Fonds-des-Nègres).* However, and despite not admitting it, even small rewards do seem to motivate *matrons*, such as transport fees, delivery kits, and being recognized.

Mistreatment. *Matrons* sometimes feel undervalued and mistreated by medical staff. While in some cases nurses treat them well, in others they look down on them and ask them to wait outside. As one *matron* put it: *"Sometimes, some nurses are very hostile. Once you arrive with the patient, she is received, and you are expelled. When the woman has difficulties, some nurses accept that I help them. But often, they expel you without asking you for information about the woman you took" (FGD, matrons, Miragoâne).*

5. Twelve unique solutions to improve safe birth deliveries

In a context like Haiti where large structural barriers prevail, a simple awareness campaign of the need of prenatal check-ups, and the need to refer pregnant women at risk to health institutions, is not going to be enough to change behavior; people seem to understand the issue and know the procedures needed to increase safer delivery outcomes. The following key insights from pregnant women, *matrons*, and from health workers could be considered when designing an intervention.

Prenatal check-ups				
Behavior	Barrier	Targeted agent	Ideas for intervention	Behavioral tool
Seek care	**Optimism bias**	Pregnant women, *matrons*	1. Provide materials with benefits of prenatal care, and help pregnant women form concrete intentions to complete the recommended visits	Persuasion messages, commitment devices
	Uncertainty aversion	Pregnant women, health workers/ institutions	2. Make consultation packages and prices available in advance	Information sharing, simplifying information
Reach care	**Transport, safety, and time constraints**	Pregnant women	3. Bring mobile clinics once a month to each communal section	Reducing hassle (transport) costs

Receive care	**Stereotype threat**	Health workers, Pregnant women	4. Train medical and admin staff on how to make pregnant women feel comfortable/ welcome[13] 5. Information on what to expect from a health visit and what questions to ask	Customer and unconscious bias training Information sharing

Institutional deliveries				
Behavior	Barrier	Targeted agent	Ideas for intervention	Behavioral tool
Seek care	**Status quos bias**	Pregnant women	6. Personalize the model of care respecting Haitian traditions at hospitals. Hang behaviorally-informed posters in hospitals (know your rights/ type of care to expect)	Cultural awareness
	Availability heuristic	Pregnant women	7. Provide information about the dangers of not delivering in institutions	Information sharing
	Uncertainty aversion	Pregnant women, health workers/ institutions	(Same as # 2) Make delivery packages and prices available in advance	Information sharing, simplifying information
	***Matrons'* optimism bias and lack of trust**	*Matrons*	8. Help them become familiar with the closest health center (SONU-C) and team-up health workers and *matrons*[14]	Relationship building
Reach care	**Transport, safety, and time constraints**	Pregnant women	9. Help pregnant women set-up a plan with concrete strategies on how to access the hospital when at 35 weeks of pregnancy (35w) 10. Waiting spaces. Nudge community members to host pregnant women 35w and up	Planning set-up, community participation

[13] Unconscious bias. Health workers do not seem to be aware that both pregnant women and *matrons* often feel mistreated in health centers. Various *matrons* mentioned that they do not feel welcome in the health institutions when they bring pregnant women, and some pregnant women described their experiences at the hospital as lacking warmth. Nurses seem to be the ones looking down upon *matrons* when they come to hospitals. Doctors, although they value the work *matrons* do and know *matrons* collaborate with their hospitals, do not usually have direct contact with them.

[14] Community health workers (CHW) are a notable example where someone rooted in the community is also formally linked to the health system. Because they do door-to-door awareness and vaccination campaigns in the community, they are known throughout the community (like *matrons*). In addition, they are formally attached to a health center where they must report activities conducted and plan with the nurses each month's work plan. At last, they know *matrons* in their communities by their names because they lead *matron's* training sessions and are the ones that personally invite them to attend.

Receive care	**Discomfort with the model of care received at the hospitals**	Health workers	(Same as # 6) Personalize the model of care respecting Haitian traditions at hospitals	Cultural awareness
	Lack of trust in medical staff	Pregnant women	11. Invite pregnant women to health centers to feel the delivery experience ahead of labor	Live the experience
	Mistreatment	Health workers	(Same as # 4) Train medical and admin staff on how to make pregnant women feel comfortable/ welcome	Unconscious bias training
	Lack of incentives, mistreatment	*Matrons* Health workers	12. Socially recognize *matrons* when they refer women to a health institution, "The *matron* of the month" type of prize (Same as # 4) Train medical and admin staff on how to make *matrons* feel comfortable/welcome	Non-monetary incentives: Social recognition Unconscious bias training

6. Conclusion

Pregnant women in Haiti face barriers at every step of their decision-making process concerning pregnancy and delivery. Pregnant women underestimate the probability of experiencing a high-risk pregnancy and thus limit their visits to the health center. Moreover, care at health centers is relatively expensive, and women rarely know in advance the amount they will pay. In addition, access to health centers is not only logistically difficult, but also expensive relative to their socio-economic situation. Once at the health center, pregnant women often feel misjudged and mistreated by medical staff, and most fear the model of care practiced at hospitals. In this context, the role of *matrons* is crucial. *Matrons* are trusted members who live in the communities and provide a different (traditional) model of care; one that includes warmth, massages, "baths of leaves" after delivery, flexible payments, and all this within more reasonable prices.

However, *matrons* do not usually have appropriate incentives to refer women to health centers. When a high-risk case presents itself at labor, *matrons'* knowledge is often not enough to guarantee a safe delivery, and often it is too late to access the health center. It is therefore necessary to nudge pregnant women to attend at least the four recommended prenatal visits. This is the only way medical staff can diagnose and monitor a risk pregnancy. But the challenge does not end there. Once a high-risk case is diagnosed, it is necessary to make sure all stakeholders will help bring the high-risk case to deliver at a health institution, consequently minimizing the risk of death. This involves finding ways to incentivize *matrons*, family members, and pregnant women to deliver at a health institution, and to plan these visits in advance (both logistically and economically). It also involves making the medical staff conscious of the importance of treating patients well. Finally, to guarantee safer deliveries, postnatal checkups must become the norm.

Helping pregnant women deliver safely in Haiti is complex. Given the variety of barriers constraining the decision-making process of pregnant women, any solution must consider at least one, if not all, the barriers explained in this note. Our team is planning to undertake a pilot experiment with the objective of finding positive, scalable results. We will nudge pregnant women to be screened and monitored with behaviorally informed pregnancy risk messages, and to incentivize *matrons* through social recognition to refer pregnant women to health institutions. The selection was based on foreseen feasibility, including ease of finding the actors, simplicity, and cost-effectiveness, and potential impact on the population.

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Appendix. Diagnostic Activities

Preliminary diagnostic work. Between April 2th and 6th, 2018, a team from the WB comprised by Emilie Perge and Jimena Llopis (from eMBeD and Poverty) conducted seven semi-structured interviews with key informants. In addition, the team visited CRUO health center and a community where matrons were found (see table 1).

Table 1. Activities conducted, and locations visited during the preliminary diagnostic work

Date	Activity	Details/ Main topics discussed	Contact details
April 03	**Interview with Margareth Mallet** (ex COP projet MSH (USAID), Directrice FONDEFHle	• *Matrons*	malletmargareth@yahoo.fr
April 03	**Interview with Solange Sainvil (MSPP)**	• Relation MSPP-*Matrons*	miesolsain@yahoo.fr
April 03	**Interview** with Jean Marie Boisrond **(FAES)**	• Health insurance system	jeanmarie.boisrond@faes.gouv.ht
April 04	**Field visit** to Institution Mission Baptiste de Fermathe and **interview with Dr Champagne**	• Focus group with matrons; their knowledge and needs	champagnefrantz@yahoo.fr
April 04	**Field visit** to CRUO hospital **and interviews** with health facility staff **(MSF);** Dr. Rodnie Senat-Delva, Deniz Inal, and Judy McConnery	• Hospital: observation of installations, meetings with health care providers	delmas-mtl@oca.msf.org haiti-hao@oca.msf.org delmas-pc@oca.msf.org
April 05	**Interview** with Vavita Leblanc **(UNFPA)**	• *Matrons* • Ongoing research and programs on maternal health	leblanc@unfpa.org
April 05	**Call** with James Maloney and Stephane Morisseau **(USAID)**	• *Agents de Sante Communitarie* (ASC) • Programs at USAID	jmaloney@usaid.gov smorisseau@usaid.gov

Diagnostic work. Between May 15th and 18th, 2018, a team from the WB comprised by Emilie Perge, Jimena Llopis, Tania Mindy Mathurin, Louise Estavien, and four local consultants; Fleurimonde Charles Joseph, Rose Mayerline Antoine, Donald Antoine, and James-son Vamblain conducted diagnostic work in 2ème Fonds-des-Nègres (Fonds-des-Nègres) and 1ère Chalon (Miragoâne). In total, nine focus-group discussions and 20 semi-structured interviews were

conducted with *matrons*, health workers, pregnant women, family members, community health workers and community leaders (CASECs and ASECs) (see table 2).

Table 2. Interviews and FGDs conducted and locations during the diagnostic work

Date	Agent	Instrument	Location	# people
May 15	Health workers; nurses, midwife nurses	FGD	Fonds-des-Nègres	7
May 17	Family members	FGD	Fonds-des-Nègres	8
May 18	Matrons	FGD	Fonds-des-Nègres	9
May 18	Pregnant women	FGD	Fonds-des-Nègres	6
May 15	Health worker: Gynecologist	Interview	Fonds-des-Nègres	1
May 17	CASEC	Interview	Fonds-des-Nègres	1
May 17	Community Health Worker (ASC)	Interview	Fonds-des-Nègres	1
May 17	Community Health Worker (ASC)	Interview	Fonds-des-Nègres	1
May 17	Community Health Worker (ASC)	Interview	Fonds-des-Nègres	1
May 17	CASEC	Interview	Fonds-des-Nègres	1
May 17	ASEC	Interview	Fonds-des-Nègres	1
May 18	Matrons	Interview	Fonds-des-Nègres	1
May 18	Health worker: Pediatrician	Interview	Fonds-des-Nègres	1
May 15	Health workers; nurses, auxiliary nurses	FGD	Miragoâne	7
May 16	Pregnant women	FGD	Miragoâne	9
May 16	Matrons	FGD	Miragoâne	8
May 16	Family members	FGD	Miragoâne	10
May 16	Pregnant women	FGD	Miragoâne	7
May 15	Health worker: Obstetrician/ gynecologist	Interview	Miragoâne	1
May 15	Health worker: Obstetrician/gynecologist	Interview	Miragoâne	1
May 16	Pregnant women	Interview	Miragoâne	1
May 16	CASEC	Interview	Miragoâne	1
May 16	ASEC	Interview	Miragoâne	1
May 16	Matron risk case	Interview	Miragoâne	1
May 16	Matron risk case	Interview	Miragoâne	1
May 16	Matron	Interview	Miragoâne	1
May 16	Family member (male)	Interview	Miragoâne	1
May 16	Community Health Worker (ASC)	Interview	Miragoâne	1
May 16	Community Health Worker (ASC)	Interview	Miragoâne	1

Field visits: In addition, the team visited Ste-Thérèse Hospital and Bethel de L'Armée de Salut Health Center.

Ste-Thérèse Hospital (1ère Chalon, Miragoâne). Ste-Thérèse is a SONU-C public Community Reference Hospital (HCR) that operates 24/7 and plays the role of a HD, although not meeting the criteria. The gynecology department is comprised of five gynecologists (two of them part-time), five midwife nurses and seven nurses. MSPP pays staff salaries.

Nurses/midwife nurses normally conduct prenatal care consultations unless it is a high-risk pregnancy, which are referred to a gynecologist. Consultations last about four hours and include: registration,[15] HIV testing, vaccination, and the actual consultation. Consultation is free[16] but laboratory tests and medicines are not; sonography costs 500 HTG. A fee of 50 HTG is paid to make the file. Most tests are available at the hospital but for specialized exams such as the serologic tests, pregnant women must go to another health institution. Unless pregnancy is evident, it is compulsory to take the pregnancy test (150 HTG). Home visits are not made except through the *Prévention de la Transmission Mère-Enfant* program (*PTME*) where pregnant women with HIV are visited if they miss the appointments. After labor, women are checked twice –after six and after 72 hours.

While nurses or midwife nurses deliver babies when no complications occur, gynecologists deliver pregnancies with risks. The price paid is 1,000 HTG and 7,000 HTG for a cesarean section (medicines and equipment always excluded). On average, the hospital delivers 70 newborns per month. The hospital has the capacity to manage certain birth complications including pre-eclampsia, eclampsia, fetal deaths and non-massive hemorrhages. For cases that require a neonatologist, women are referred to Nos Petits Frères et Sœurs Hospital or Médecin Sans Frontiers (MSF), both in Port-au-Prince (at least three hours by car) or to St Boniface Hospital in Fonds des Blancs (30-45 min by car). In case of referral, transportation fees are paid by the pregnant women (1,500 HTG).

Bethel de L'Armée du Salut Health Center (2ème Fonds-des-Nègres, Fonds-des-Nègres). Bethel is a SONU-B private health center (CS) with 42 beds. The staff consists of four physicians: one medical doctor, one gynecologist, one pediatrician and one doctor in social service[17]- two doctors in social work, nine nurses and ten auxiliaries. Staff is paid by the Catholic Medical Mission Board (CMMB).

Prenatal consultations are conducted by the gynecologist, but only part-time (Tuesday-Thursday) as he also works in another hospital in Port-au-Prince. When he is absent, the nurses or the pediatrician consult pregnant women. Consultations cost 200 HTG and do not include laboratory tests or medicines. Routine examinations can be performed, but for specialized exams such as sonography, pregnant women must be referred to a higher-level institution. Home visits are not made except through the *PTME* program. Pregnant women at Bethel are also asked for contact details during registration. Women are checked six hours after delivery and then 48 hours after.

Deliveries with no complications are conducted by the gynecologist and cost 1,000 HTG (medicines and equipment excluded). The center delivers on average 12-20 deliveries per month. Despite the presence of specialized staff, Bethel can only take deliveries with no complications because there is no surgical room. Women are referred to St Boniface Hospital or Ste-Thérèse (within 30 to 45 minutes by car or moto) when the pregnancy is high-risk. Women must find and pay for transportation, although sometimes they can use a vehicle from the center that acts as ambulance (for 1,000 HTG).

[15] During registration, pregnant women are asked name, last name, address and telephone number, among others.
[16] The following notice was posted: For the 1st prenatal visit, a package of 500 HTG applies: Preliminary assessment (complete hgram, blood group, glycemia, sickling test, urine, pap test, drops, HIV / RPR).
[17] The doctor in social service is graduated but has not yet his license which will be given to him after the social service.