Barriers and Facilitators Influencing Facility-Based Delivery in Rural Haiti: A Mixed Method Study With a Convergent Design

BARRIERS AND FACILITATORS INFLUENCING FACILITY-BASED DELIVERY IN RURAL HAITI: A MIXED METHOD STUDY WITH A CONVERGENT DESIGN

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Abstract

The maternal mortality rate in Haiti is high, at around 380 maternal deaths for 100,000 live births. Sixty-three percent of Haitian women continue to give birth at home,[1] placing them at higher risk for complications and maternal mortality. The strategy of facility-based delivery in resource poor settings should be centered around the intrapartum care of pregnant women at a facility.[2] This strategy needs to be accompanied by a network of facilities that can provide basic deliveries with skilled birth attendants, adequate supplies, drugs, and a referral system for more complicated deliveries.[3] This mixed method study used a convergent design to identify barriers and facilitators to facility-based birth in rural Haiti. Quantitative data were collected to describe the study population and multiple regression analysis was done to assess barriers to facility-based delivery.

Variables analyzed were places of residence, distances, levels of poverty, miscarriages, stillbirths, live births, and number of living children. Qualitative data provided a deeper understanding of the lived experience perceptions, beliefs, and desires in navigating the system. We found that several factors including distance, socioeconomic condition, and rituals influence the place of delivery. Many women concerned about complications and the safety of home-based delivery want to give birth at a facility. The pregnant women living in rural Haiti, particularly in Mirebalais, want to give birth at a hospital. These findings may help decision makers choose policies that increase facility-based deliveru in order to decrease maternal mortality in Haiti.

Table of Contents

Tables

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Part 1: Political Economy/Background

Introduction

Maternal mortality is a revealing element of the socio-economic conditions of a country as this element can provide insight into the history, sociology, economy, and the health situation of a country. Indeed, a high rate of maternal mortality is one of the worst indicators for poor countries. This is unfortunately the case for Haiti, whose maternal mortality rate is unacceptably high. Maternal mortality is an indicator of development that reveals the greater inequality between developed and developing countries.

Understanding Haitian history since independence and particularly in the aftermath that followed independence is a critical step towards understanding the policies and laws governing population health strategies and maternal health strategies. This is a unique opportunity to improve the former national strategic plan for reproductive health with analysis of the current social, economic and social situation of the country today.

While important progress has been made to reduce maternal mortality, the target established by the United Nations Millennium Development Goals—to decrease maternal mortality by 75% as projected—has not been achieved. Today, the Sustainable Development Goals (SDGs) set an ambitious goal of 70 maternal deaths per 100,000 live births by 2030.[1] Despite the efforts in the last ten years, the Haitian Ministry of Health could not reach Millennium Development Goal 5 because a majority of women continue to give birth at home, which puts them at increased risk of morbidity and mortality during childbirth. According to the Demographic Health Survey (DHS) Haiti 2012, 63% of Haitian women continue to give birth at home and 37% at the facility-level.[2]

The maternal mortality rate in Haiti is currently 380 maternal deaths per 100,000 live

births; this can be compared to two neighboring countries: the Dominican Republic, which has 92 maternal deaths per 100,000 live births and Jamaica, which has 89 maternal deaths per 100,000 live births.[3]

Haiti is the first independent black republic that freed itself from the yoke of slavery. Called at this time "The Pearl of the Antilles" this small colony whose economy was based on sugar, cocoa, and coffee generated significant wealth and happiness for its European colonizers. Adam Smith, considered one of the fathers of modern economic theory, once wrote that “Santo Domingo has been designated as the richest island of the Caribbean sugar colonies.”[4] The island of Santo Domingo was divided into two areas, of which two-thirds of the eastern part was governed by Spain.

In 1804, slaves rose up against white settlers to gain their independence. The country then paid a heavy price as France claimed compensation of 120 million francs as damages.[5] This was the first time that such a situation occurred in history. This debt started the ruin of Haiti, and for some time the Haitians have been demanding the return of these funds from France. Until 1825, the French recognized the independence of Haiti.

After the Independence**,** the Haitian state as in the early beginning was more concerned to preserve the integrity of the territory to a strong army. From time to time the former French metropolis considering reconquering its former colony. Mobilization of human resources and identify capital for military expenditures were the most challenging for the new leaders.

Economy

Haiti’s current economic situation is difficult. 70% of the population is unemployed, especially among young people. Those who are working are often unable to meet their needs.

Thus, it is difficult for a Haitian family to take care of a pregnancy and childbirth. According to the World Bank, Haiti ranked 22nd among the poorest nations in the world. With a Gini Index of 0.59 in 2012, Haiti is one of the most unequal countries in the region.[6] Haiti has a GDP of $8 billion with a per capita income of $800. Its economy is based on agriculture and 70 percent of the population is confined to rural mountainous areas.

The country does not spend enough resources to meet its health obligations. In 2016-2017 only 4% of the national budget was allocated to healthcare in Haiti.[7] The majority of the population is unemployed and are living in difficult conditions following the deterioration of the economy. According to the World Bank in 2017[8] in their annual report, this situation was worsened by the earthquake of 2010 which put the country on its knees. In addition, the last hurricane Mathieu which hit the South and Grande Anse regions in 2016 has added another blow to the economy.

Politics

Understanding the current state of maternal health in Haiti also requires a deep understanding of Haitian political history. Since independence, political structures have always been dominated by the bourgeoisie and the Haitian elite. Most of the periods the 1800's was marked by political instability. In the 1900's the Duvalier dictatorship, which lasted decades, further slowed the development of Haitian democracy. The democracy acquired in 1987 after the fall of the dictatorship of the Duvaliers over a period of 30 years delighted the hope of the Haitian people. However, since then, several coups d'etat have shaped Haitian political life. This permanent political instability makes it challenging to develop a modern healthcare system.

Because Haitian politics have always been dictated by the economic and political elite, policies have mostly focused on developing urban centers of power. Because of this, the social class structure in Haiti has not helped to change the living conditions of Haitian women, especially those living in rural areas. It is a patriarchal society where men have always kept their economic and social power and a large proportion of women are in extreme poverty.

What was the health policy of the Haitian state in the aftermath of independence?

There was not a clear maternal health policy after independence, however, there was a population birth rate policy to meet the needs of the moment, which were mainly focused on safeguarding independence by ensuring that there were enough soldiers to fight against declared and potential enemies.[5] Between 1804 and 1915, appears a phase of introduction of French medical science in the country, and the majority of health care professionals at this time were trained in France. According to Guy Despeignes[9] in his thesis for the doctoral degree in 2001 at the University of Montreal on the development of health care in Haiti from 1804 to 1915, he cited the Haitian scholars, historians and physicians like Rulx Leon, Ary Bordes, and Catts Pressoirs wrote a few reports on the implementation of health care in Haiti. The hospitals of the new Haiti were not well equipped with advanced technologies and they were not providing care to the whole population. Despeignes highlights these issues and the fact that healthcare delivery was mostly focused on Port-au-Prince: “The medical practice was very unequal, and Port-au-Prince as administrative and governmental capital benefited largely, to the detriment of the other Haitian cities, of medical and health resources concentration of clinicians, centers of care or practical teaching, particular attention for the Military Hospital of Port-au-Prince.” In this

context, the Polyclinique Pean, a private institution of the Haitian scientific community in Port-au-Prince was the first to be established for the training of midwives in Haiti.

Since the focus of Haiti's new health system was on ensuring a strong military, and centered in cities, little focus was placed on the health of rural women. In the book *Reimagining Global Health,* Paul Farmer points out "from the colony the health structure was rather accentuated on the strengthening of this native army which was on the defensive position to protect against the return of the French. The majority of health infrastructure was in cities, leaving a deficit for farmers to access health care."[10] The role of the healthcare system was shaped by military interests, with little care for the health of women.

In the 1930s, a group of Haitian doctors trained in France returned to Haiti and were recognized for their contributions to advancing the healthcare system. It was the beginning of the modern era of medicine in Haiti. A maternity hospital in Haiti located in Chancerelle, a northern suburb in Port-au-Prince, bears the name of these famous scientists including Léon Audain and Isaiah Jeanty (Maternity Isaie Jeanty and Leon Audain).

History of maternal health in Haiti: From the colonial period to the present day

During the colonial period, the island of Hispaniola had only 400,000 inhabitants. In terms of ethnicity, the island included, at that time, 350,000 people brought from Africa, and the rest were white settlers and a handful of small whites called "white mannan" and a few people of color called mulattoes.[5]

It is difficult to understand the full nature of the meaning of maternity for a slave because slaves were considered animals. As for other white women, they had access to healthcare from

the health officers in the colony, but it was difficult to understand how obstetric complications were addressed at that time.

According to George Anglade,[11] a Haitian geographer trained in France, far more fighters were needed to repel the invaders who swore by the return of slavery to the island. Women were encouraged to have many children in order to increase the ranks of the soldiers. From that moment on, we can understand that midwives (sages-femmes) have been at the forefront of helping pregnant women. Further George Anglade writes that**,**

> **"**These populationist measures favored during the 19th century a remarkable demographic growth. From 400,000 souls in 1804, the year of the independence, the population of Haiti passes to 500.000 souls in 1824. This country thus registered on 20 years a population surge of 25%. In 1864, the population reached 1 million, a population growth of 150% over 1804. Between 1804 and 1864, the population of Haiti more than doubled over a period of only sixty. It will be observed that in a century, i.e. for the period extending from 1790 to 1890, the population will have triple reaching a number between 1.2 and 1.5 million inhabitants."

We understand that the new republic was supportive to pregnant women and mothers through some measures and laws and attempts to organize and relocate midwives on different habitations. For example, in the law titled "Loi du 20 Avril 1807 sur la police des habitations, Article 13" (Law of April 20, 1807 on the policing of habitations, Article 13), we read that:

> "All field work is forbidden to pregnant women from the third month of pregnancy. They are also exempt from this work during the breastfeeding of their children. It is promulgated that the mothers resume work only after four months of deliveries and they will have to benefit from a reduced work schedule. Thus the new mothers are required to

begin work one hour after sunrise and not at daybreak as imposed on farmers and leave one hour before sunset"[9]

During the same period, abortion was condemned by the law, sanctioned by "The Penal Code of Boyer," which stated that: "doctors, surgeons and other health officers, as well as pharmacists who have indicated or administered the means of abortion."[12]

The Current State of Maternal Health in Mirebalais

This is a brief overview of the situation of women's healthcare in Haiti after independence. The commune of Mirebalais, which is the focus of this study has unfortunately not changed much in relation to development and socio-economic conditions described above.

This commune is one of twelve in the Plateau Central, Haiti; it is located 45 km from Port-au-Prince and 90 km from the border of the Dominican Republic. The city of Mirebalais is the hub of the Center Department and is situated between the upper and the lower Plateau. The commune was the starting point of the cholera outbreak which spread across Haiti in late 2010, killing thousands of Haitians.[13] The majority of the population is poor, from the surrounding remote mountainous area, and depends on subsistence farming. In addition to the main paved road, which connects Mirebalais to other departments, the secondary road networks of the commune are rudimentary and not paved, making some areas impassable during the rainy seasons. People ride on mules and on motorcycles when there is space. Outside Mirebalais hospital, the commune has 2 dispensaries, small health structures with limited human resources and equipment to offer services to the population. We hypothesize that this environment of poverty and bad conditions of the roads could be considered as factors influencing facility-based deliveries as demonstrated in some studies by Moyer et al. in Tanzania and Bostwana.[14]

To decentralize the health care system in Haiti after the earthquake, Zanmi Lasante, a local non-governmental organization, was requested by Haitian Ministry of Health (MOH) to build a new teaching hospital in Mirebalais. The hospital, a tertiary level facility, is a key part of the MOH's strategy to decentralize specialized care and train a new generation of Haitian health care professionals, and the hospital is inspired by the philosophy and values shared by Zanmi Lasante and the MOH. At 205,000 square feet, Hôpital Universitaire de Mirebalais (HUM), University Hospital of Mirebalais in English, is considered one of the largest health infrastructures works in Haiti. The facility has 300 beds and offers highly specialized care to a catchment area of more than 200,000 people. However, due to a lack of services elsewhere in the country, many patients come from a much wider area, including all of central Haiti and areas in and around Port-au-Prince, who can receive secondary and tertiary care. The hospital allows for training of Haitian physicians, nurses, and allied health professionals.[15] HUM also offers a higher level of obstetric care with six operating rooms, six full-time OBGYNs and 11 midwives trained at the National Nursing School in Port-au-Prince. Additional services include internal medicine, pediatrics, surgery, emergency department, and an Intensive Care Unit (ICU) for adults and infants; these are supported by a large technical platform, including a CT Scanner, X-Ray machine, ultrasound machines, and an advanced lab. This hospital attracts a significant number of deliveries and a high volume of pregnant women are seen for antenatal care. The goal of this study was to determine and to understand why women choose to deliver in this setting.

Contextualization of Barriers and Facilitators of Healthcare-based Delivery

More than 20 years ago, the World Health Organization (WHO) prioritized the strategy of facility-based delivery in resource poor settings and intrapartum care of pregnant women at

the facility-level.[16] But the strategy needs to be accompanied by a network of facilities which can provide basic deliveries called BEmOC (Basic Emergency Obstetric Care). The BEmOC is a basic maternity unit with skilled birth attendants and adequate supplies and drugs, which can address emergency complications with a referral to facilities for complicated deliveries called CEmOC (Comprehensive Emergency Obstetric Care) for women in need of a C-section and sometimes a blood transfusion.[17]

In 1996, the MSPP began training midwives to cover community health units (UCS) with support from UNFPA. The communal health units (UCS) were a group of municipalities which work in synergy for a better distribution of health care. A hospital with adequate capacity development in terms of material, human, and financial resources should be the UCS Community Referral Hospital. The National nursing school in Port-au-Prince had decided to train 60 nurse midwives every year, but in the long-term, the idea is that the nurses would cover more than 100 communes with the possibility of offering the essential package of services. At the end, the majority of health facilities have remained without nurse midwives because of a drastic reduction in international aid. In the meantime, other non-governmental organizations have come to support the strengthening of antenatal clinics. However, institutional deliveries had never increased.[18]

This study will look at how the geographical location, distribution, and number of health care facilities for basic and complicated deliveries in a commune influence the rate of facility-based delivery.

Before the January 2010 earthquake, Haiti had 900 health facilities, including: public, public/private, and private facilities (of which 90% where located in Port-au-Prince). The Haitian healthcare system is a hierarchical structure based on three levels: the primary care level, which

includes health centers and community referral hospitals that provide basic delivery at the BEmOC level. The second level is represented by the departmental level hospitals, with the capacity for more complicated deliveries, C-sections, and the availability of blood. This is normally the main referral center for the majority of emergency obstetrical complications, which is the CEmOC level. The third level is constituted by the teaching hospital. There are three teaching hospitals in Port-au-Prince, the capital of Haiti. Maternity Isaie Jeanty and the University Hospital in Haiti (HUEH) are two main maternity hospitals in Port-au-Prince.

As we have seen many times, when health care facilities in Haiti are concentrated in the capital city Port-au-Prince and the urban areas like the district hospitals,[19] the system cannot respond to the demands of maternal health for the population living in the rural areas. On the other hand, staffing with qualified and competent health care providers needs to be complementary to the BEmOc and the CEmOC to offer a comprehensive package for facility-based delivery.

Furthermore, since the implementation of the "Safe Motherhood Initiative" in Nairobi in 1987, there has been consensus around the need to ensure skilled attendance at birth for all women in resource poor countries.[20] In order to improve maternal health outcomes and reduce maternal mortality, pregnant women should receive care from a competent health care professional who has the required equipment and supplies during both delivery and postpartum care.[20] A skilled birth attendant is defined as a health care professional with qualified and competent skills, and delivery requires the accompaniment of support staff to work as a team. The trained nurse midwife is different from the Traditional Birth Attendant (TBA), called *matrons* in Haiti. A few studies show the training of TBAs is low quality and consequently not an effective intervention to reduce maternal mortality.[21]

It is obvious that the traditional birth attendants called matrons in Haiti are very recognized and respected in their community. These are usually elderly women and also a significant number of men who continue to deliver in rural villages. A whole generation of children in a village can be born in the hands of a single "matron." Sometimes a single matron supports a mother on a high number of pregnancies (my conversation with a mother of 10 children in a village of Mirebalais). They have a great reputation from many years of experience. Closer to the pregnant women and mothers in the community, not only they are at the frontline of the childbirth process, but they also provide moral and effective support to women. Sometimes traditional birth attendants get nothing back after work.[22] The lack of access to care and the precarious socio-economic conditions of these women favor their staying in the community. According to the 2005 WHO report, home-based childbirth, presents various risks for the child and the mother (maternal death, neonatal trauma, stillbirths, fistulas). A collaboration between birth attendants and health workers for a quick reference in case of complications is necessary to reduce negative impacts beyond maternal death. Monthly meetings at the institutional level should encourage TBAs to refer patients to a hospital.

Despite this, we note that an important number of women gave birth on their own and/or supported by a family member. Another group of women entering in labor during the night or did not have time to reach a health facility delivers on the road increasing the risks for complications and maternal death (WHO 2005). Then came the midwives who were auxiliaries or nurses trained to give birth, especially in health facilities. Now, with support from UNFPA there is a direct entry model for midwives. So far 450 nurses have been trained as midwives and 150 are currently in training (UNFPA 2005). In order to retain this workforce, transportation and accommodation are needed, particularly in rural areas, and incentives and other types of bonuses,

internet access, continuing education with training enhancement are also components of such a retention plan.

Moreover, the question of staffing in facility-based delivery is complex and few nurse-midwives are deployed outside of Port-au-Prince to cover the health centers in the rural areas. Recently the problem of shortage of midwives has been exacerbated by the large exodus of this group of professional to Canada and the U.S.[23] Most of the time the MOH does not have the capacity to hire and to accommodate them in the rural area. Therefore, this a vacuum left by the system where a TBA or a family member or a traditional healer can continue to practice delivery outside of a health facility.

Additionally, the number of trainees is completely insignificant to respond to the demand. Now the training is shifting to a model of direct entry where a student, upon graduating from high school, can enroll in a four-year degree program to study as a midwife.[24] The quantity of the skilled birth attendants now cannot respond to 250,000 deliveries a year.[25] The majority of the OBGYNs are located in the capital city and this leaves human resources for health gaps at the departmental hospital level. Furthermore, a scarcity of anesthesiologists to support the team for C-section led the Ministry of Health to train nurse anesthetists; however, the number is not adequate to respond to the 15% of all facility-based deliveries that result in C-sections, as defined by the WHO standard. We will study how inadequate care through unskilled care provider could be a barrier for facility-based delivery.

Besides the availability and the distribution of health centers and the presence or not of the skilled birth attendant for safe motherhood, there are many hidden costs which are due to a lack of supplies and medications. While public hospitals in Haiti do not charge pregnant women to deliver at the facility. All of these costs are in some form passed on to the patient.[19] Bohren et

al. conducted a few studies in low- and middle-income countries that consider the costs as barriers for facility based delivery.[26] In many cases, the patient is required to purchase everything from gloves to medicines, gauze, and stitches. Maternity wards do not provide food for the patient and this is the responsibility of the patient and their families as well. These expenses constitute one of the main barriers to prevent women from giving birth at the facility level.[21] The national strategy should consider these costs as barriers to accessing services offered for women. This study will look at the level of poverty of pregnant women living in the rural area and will assess the baseline poverty index described by the World Bank (head of household, status of the roofs the house, number of children in the house, have a stove, have a radio) to see how poverty influences facility-based delivery.

In addition, when women choose to deliver at home, she is surrounded by her family and relatives, while the hospital is not considered as a friendly environment.[27] A number of practical rituals like prayers and gestures are well described by Damus Obrillant[22] in his book *Les rites de Naissance en Haiti*. This study will also address the perceptions of pregnant women about the matrons in the community.

The lack of health care infrastructure in the rural area, the scarcity of staffing, the hidden cost, some of the belief perceptions through the matrons or the traditional healer, and the distance of a health facility to the residency of the pregnant women are not in favor for delivery at the facility level. Many of these factors explored in studies conducted in countries in sub-Saharan Africa by Moyer et al. are different from the local context of Haiti. This study conducted in Plateau Central Haiti will explore the perspective of factors influencing facility-based delivery.

While some factors such as women's parity, educational level, economic status, and

autonomy for making decisions apart from a spouse are considered individual factors, other factors such as accessibility, quality of services, cultural beliefs, taboos are considered as factors related to the environment. Gabrysh and Campbell grouped them into four categories : 1) Socio-cultural factors; 2) Perceived benefit/need of skilled attendance; 3) Economic accessibility; 4) Physical accessibility.[28] In addition, the model of the "Three delays" proposed by Thaddeus and Maine is used as a framework by the majority of the studies.[29] The first delay is related to appropriate decisions for searching health care; the second delay is when the decisions have been made and the access for transportation are not available, and the third delay is when the healthcare facility cannot respond on time.

The IHE (Institut Haitien de l'enfance), the Haitian equivalent of DHS study, focuses on antenatal care services to identify women with predisposing factors who will not give birth at the hospital. Also IHE adds in the study cultural beliefs in Haiti considered as an important factor that prevents facility-based delivery.[30] Using the model of the three delays, in 1998, Barnes-Josiah et al. performed verbal autopsies of 12 maternal deaths and found that the inadequate care in eight cases played a major role in delays of seeking care.[19] Elucidating this question with the healthcare providers in a study is crucial to improving the quality of services which can attract women for delivery at the hospital.

Seraphin et al. described how strengthening services of prenatal care and social determinants in rural area in Fond des Blancs, southern Haiti could play a major role in facility based delivery[31] but a few studies are referring to the quality of services provided at the prenatal care, which could be a barrier, instead a facilitator for facility-based delivery. Guyrlene et al. demonstrated that physical accessibility is a major obstacle to delivery at the hospital.[32] While the distance is important, "another key determinant of service utilization is the quality of care.

Families may bypass the nearest health facility when quality is an issue."[33] Wang et al. in 2017 linked health facility survey and population survey data to understand the barriers that women in Haiti face to giving birth at a health facility.[33] In a region with more than 90.000 inhabitants with only one facility based delivery we wonder if it's not a waste of money to conduct a large study to review the distance when it's clear that the lack of access is demonstrated.

In 2008, the WHO in cooperation with the Ministere de la Sante Publique et de la Population MSPP of Haiti rolled out a pilot program called "Soins Obstetricaux gratuits" (SOG) with an incentive scheme compensating both pregnant women and TBA. The SOG Program has brought an overall increase in deliveries at the public hospital in Haiti. On the other hand, the facility must be prepared, from sufficient bed spaces to adequate human resources and supplies.[20]

There is a clearly a lack of studies on barriers and facilitators for facility deliveries in Haiti. Numerous studies in low and middle countries vary depending on the countries and present different approaches depending on the context and local culture. This the first mixed method study on barriers and facilitators in Haiti taking not only into account the pregnant women but also the socio-cultural, economic, environmental factors. We expect that the results of this study will give us insight into barriers and facilitators to delivery in a healthcare setting, and therefore allow us to develop and implement pragmatic health policies to address this and improve access to and quality of obstetric care in Haiti.

Part 2: Barriers and Facilitators Influencing Facility-Based Delivery In Rural Haiti: A Mixed Method Study With A Convergent Design

Introduction

While important progress was made to reduce maternal mortality in Haiti, the United Nations Millennium Development Goal of decreasing maternal mortality by 75% by 2015 was not met. Home deliveries are still the predominant outcome for pregnant Haitian women who have reached the end of their pregnancies. This situation has a negative impact on maternal and neonatal mortality. Facility-based delivery has been promoted as the standard of care for reducing maternal and neonatal mortality and morbidity.[17] One reason for this is that emergency obstetrical complications can be addressed in a facility but not at a home delivery with a traditional birth attendant. It is particularly important that all births are attended by skilled health professionals,[20] as timely management and treatment can make the difference between life and death for both the mother and the baby.

A barrier to Haiti reaching the MDG target was that a majority of Haitian women, an estimated 63%,[2] continue to give birth at home, putting them at an increased risk for morbidity and mortality during childbirth. The maternal mortality rate in Haiti is 380 maternal deaths per 100,000 live births which is the highest rate in the western hemisphere, including the Caribbean region. Potential solutions to increase the facility-based delivery rate have been proposed by the Ministry of Health, international agencies, and NGOs and include reinforcing the quality of infrastructure, hiring more staff, and securing supplies and drugs. Efforts to improve the quality of care for women's health must start with an understanding of the problem.

In 1994, Thaddeus et al. published a framework that introduced the three delays which commonly prevent a pregnant woman from delivering in a facility.[29] Since then, numerous

studies have assessed the various components that contribute to each delay, such as the limited availability of skilled birth attendants[18] and the lack of affordable health care options.[34] Few studies have assessed the three-delays framework in the Haitian rural context—especially the factors that lead to the first and second delays: the delay in deciding to seek care and the delay in reaching adequate health care facilities with significant resources available.

Tremendous gains in the quality of care for women's health will need to be made in order to meet the ambitious target of 70 maternal deaths per 100,000 live births by 2030, outlined in the Sustainable Development Goals (SDGs).[1] These efforts must start with an understanding of the problem. With the overall goal of facilitating facility-based delivery and improving care for pregnant women and their infants, we conducted a mixed method to assess facilitators and barriers to facility-based delivery in rural Haiti. Specifically, we sought to understand the role of distance, access to transport, and the perceived quality of care received at the district hospital.

Materials and Methods

Ethics statement

The study protocol for quantitative data collection was approved by Partners Human Research Committee and the Haiti National Ethics Committee. The protocol for qualitative data collection was approved by the Harvard Medical School Institutional Review Board (IRB) and the IRB of Zanmi Lasante (Haiti). For qualitative interviews, an informed consent script was read verbatim to all potential participants, who provided indicated oral consent. All procedures were done respecting the confidentiality of the interviewees.

Study design and setting

We conducted a mixed method study using a convergent design.[35] To assess barriers and facilitators for facility-based delivery we conducted analyses of data from a prospective cohort of pregnant women who attended at least one antenatal care visit at Hôpital Universitaire de Mirebalais (HUM), a public teaching hospital managed by Zanmi Lasante (ZL, Partners In Health-Haiti). HUM is a 205,000 square foot, 300-bed teaching hospital offering highly specialized care to a catchment area of more than 180,000 people and providing access to Haitian physicians, nurses, and allied health professionals. HUM offers obstetric care with six operation theaters, obstetrical and gynecological ultrasound services, five full-time obstetricians and gynecologists, and six nurse-midwives.

In order to gain a deeper understanding of the lived experiences, perceptions, beliefs, and desires around decision making for a facility-based delivery, we used semi-structured interviews to collect qualitative data from women with recent facility-based or in-home deliveries. Both the qualitative and quantitative elements of the study included women from four communal sections of the commune of Mirebalais (Grand Boucan, Crete Brulee, Gascogne, Sarazin) in Haiti's Central Plateau.

Data collection

For the quantitative component, we analyzed a prospective cohort of women who attended HUM for a least one antenatal care visit participants were enrolled from May to December 2017 and followed until delivery. Study data were collected through interviews or abstracted from the medical record.

At the time of enrollment, we collected information about the participant's age, locality, history of alcohol use, and obstetrical history (number of prior pregnancies, live births, stillbirths, miscarriages, and abortions) using a structured survey instrument. We calculated the distance from the center of the participant's locality of residence to HUM. We used a previously validated poverty scorecard based on eleven indicators and specific to Haiti to estimate the likelihood that a participant's household had consumption below the national poverty line of 83.39 Haitian Gourdes per day (approximately $1).[36] These indicators include the household's administrative department, number of household members, number of household members aged 10 years or older who work, whether the female head of household works, literacy of the male and female heads of household, roof material, source of drinking water, source of energy for cooking, whether the household has a stove, and whether the household has a radio. Higher poverty scores indicate a lower likelihood of living below the poverty line. We assessed food insecurity using the Food Consumption Score (FCS), a measure of dietary diversity and food access that uses recalled consumption frequencies of eight food groups to generate a composite score.[37]

Qualitative data collection took place from July 2018 through January 2019. We interviewed 30 women from the Mirebalais commune who sought and received antenatal care and/or a facility-based delivery. 15 women who had more than one ANC visit, but did not return to deliver at HUM, and 15 women who gave birth at HUM after having at least one ANC visit. Following verbal informed consent, we conducted in-person, semi-structured interviews about participants' experience with health care during pregnancy and delivery. We utilized an interview guide with open-ended questions on pregnancy and antenatal care, barriers and facilitators to care for facility-based delivery, life history, and experiences in navigating the healthcare system for care during pregnancy.

Data analysis

For analyses of quantitative data, we calculated descriptive statistics for the study cohort and used univariable and multivariable logistic regression to identify risk factors for not having a facility-based delivery. We hypothesized that maternal age and factors related to geographical proximity to HUM (communal section of residence, distance to HUM), poverty (household hunger, poverty index line) and prior childbirth experiences (number of prior miscarriages, stillbirths, live births) may impact whether a woman has a facility-based delivery. Of these risk factors, identified *a priori*, we included in multivariable analyses those associated with facility-based delivery at a cutoff of $p< 0.20$ in univariable analyses. Results of the logistic regression analysis from the reduced model are expressed as adjusted odds ratios (OR) with respective 95% confidence intervals.

Qualitative analysis utilized an inductive, content-focused approach with category construction, comparison, and interpretation was used to analyze qualitative data. First, the interviews were transcribed, translated into English, and reviewed in detail. The text relevant to the research questions were identified and coded for the entire data set. The codebook included labels, definitions, and illustrative quotes with specific examples from the transcripts for each code. Similar codes were grouped into broader categories to characterize participants' experiences. Each category was labeled, elaborated, and illustrated with excerpts from the data. Categories were examined interpretively and grouped together, linking ideas to form a broader concept, from which arguments about the participants' experiences of accessing antenatal care and facility-based delivery, providing healthcare services, and other aspects of their lived experiences were developed.

Results

Quantitative analysis

From a cohort of 1713 women, we considered only those from the municipality of Mirebalais: reducing the number of observations to 1120 (67% of total). On average, women were 28 years old (standard deviation (SD): 6; range 16 to 50 years; Table 1). For more than one -third of women (n=388, 35%), the pregnancy was their first, and 6% of women lived further than ten kilometers from HUM. The mean poverty score is 54.65 (SD 13.9) and 4% of women met the definition for poor food security. In total, 774 women (68%) returned to HUM to deliver their baby while 346 (32 %) where at home or in another hospital. Of those who delivered at the HUM, 132 (21%) had a cesarean section.

Risk factors for facility-based delivery

In univariable analyses, women living in Gascogne were less likely to deliver at HUM (OR=0.45; 95% CI: [0.77-- 2.63]; p=0.003), relative to those who lived in Crete Brulee. Living more than 10 kilometers from the hospital was also associated with a reduced odd of giving birth at HUM (odds ratio [OR] =.52; 95% Confidence Interval [CI]: 0.32 – 0.86; P-value: 0.01): however, all of the women who lived more than 10 kilometers from the hospital lived in Gascogne, thus these variables were perfectly correlated Women with a higher poverty score, indicating a lower likelihood of living in poverty, were less likely to deliver at HUM (OR=01.02 CI [1.01 – 1.04] P <0.0001). Age and poor food security were not associated with returning to HUM for delivery. Communal section, first pregnancy, poverty score and food insecurity were included in the multivariable model. Residence in Gascogne, the communal section in which everyone was at least 10 kilometers from the hospital was associated with a lower risk of facility-

based delivery (OR=0.51; CI [0.29 – 0.88] P=0.01) relative to Crete Brulee. A higher poverty index score, indicating a lower likelihood of living below the poverty line, was associated with an increased likelihood of facility-based delivery (OR=1.03; CI [1.02 – 1.04; P<0.0001).

Table 1: Descriptive characteristics of Haitian women who resided in the Mirebalais commune and attended at least one clinic visit at HUM.						
	Total Population (N=1120)		Delivered at HUM (N=774)		Did not deliver at HUM (N=346)	
Mother/Infant Pairs	**N**	**%**	**n**	**%**	**n**	**%**
Communal section						
Crete Brulee	*321*	*29%*	*235*	*30%*	*86*	*25%*
Gascogne	*69*	*6%*	*38*	*5%*	*31*	*9%*
Grand Boucan	*395*	*35%*	*275*	*36%*	*120*	*35%*
Sarazin	*335*	*30%*	*226*	*29%*	*109*	*32%*
Age category (years)						
15-24	*436*	*39%*	*303*	*39%*	*133*	*38%*
25-34	*517*	*46%*	*351*	*45%*	*166*	*48%*
>35	*167*	*15%*	*120*	*16%*	*47*	*14%*
Distance between home and HUM						
< 10 km	*1,051*	*94%*	*736*	*95%*	*315*	*91%*
> 10 km	*69*	*6%*	*38*	*5%*	*31*	*9%*
First pregnancy						
Not first pregnancy	*731*	*65%*	*492*	*64%*	*239*	*69%*
First pregnancy	*388*	*35%*	*281*	*36%*	*107*	*31%*
Number of miscarriage/abortion (N=731)						
0	*641*	*88%*	*431*	*88%*	*210*	*88%*
1	*78*	*11%*	*52*	*11%*	*26*	*11%*
2 or more	*12*	*2%*	*6*	*1%*	*3*	*1%*
Living children (N=731)						
0	*58*	*8%*	*43*	*6%*	*15*	*9%*
1	*277*	*38%*	*187*	*38%*	*90*	*38%*
2	*179*	*24%*	*118*	*26%*	*61*	*24%*
3	*109*	*15%*	*72*	*15%*	*37*	*15%*
4 or more	*108*	*15%*	*72*	*15%*	*36*	*15%*
Stillbirths (N=731)						
0	*624*	*85%*	*421*	*86%*	*203*	*85%*
1	*78*	*11%*	*54*	*11%*	*24*	*10%*
2	*24*	*3%*	*14*	*3%*	*10*	*4%*
3	*5*	*1%*	*3*	*1%*	*2*	*1%*
Live births (N=731)						
0	*50*	*7%*	*36*	*7%*	*14*	*6%*
1	*266*	*36%*	*180*	*37%*	*86*	*36%*
2	*179*	*24%*	*125*	*25%*	*54*	*23%*
3	*111*	*15%*	*71*	*14%*	*40*	*17%*
4 or more	*125*	*17%*	*80*	*16%*	*45*	*19%*
Mean poverty score (SD)						
	54.65	13.9	56.15	13.85	51.69	13.56
World Food Program Food Insecurity Level						

Acceptable	957	85%	672	87%	28	82%
Borderline	119	11%	77	10%	42	12%
Poor	44	4%	25	3%	19	5%

Table 2: Univariable analyses of predictors of in hospital delivery among Haitian women with at least one antenatal visit

	Odds Ratio (OR)	**95% Confidence Interval (CI)**	**P-Value**
Communal section			
Crete Brulee	Reference		
Grand Boucan	0.84	0.60 – 1.16	0.29
Gascogne	0.45	0.77 – 2.63	0.003
Sarazin	0.76	0.54 – 1.06	0.11
Age Group (years)			
15-24	Reference		
25-34	0.93	0.70 – 1.22	0.60
>35	1.12	0.76 – 1.66	0.57
Distance between home and HUM			
< 10 km	Reference		
>10 km	0.52	0.32– 0.86	0.01
First pregnancy			
Not first pregnancy	Reference		
First pregnancy	1.29	0.99 – 1.67	0.06
Stillbirth?			
No	Reference		
Yes	0.86	0.56 – 1.32	0.51
Number of miscarriages/abortions			
No	Reference		
Yes	0.93	0.58 – 1.48	0.77
Poverty Index score			
	1.02	1.01 – 1.04	<0.0001
Food Insecurity Level			
Acceptable	Reference		
Borderline	0.80	0.54 – 1.19	0.272
Poor	0.57	0.31 – 1.06	0.075

Table 3: Multivariable analyses of predictors of in hospital delivery among Haitian women with at least one antenatal visit			
	Multivariable		
	Odds Ratio (OR)	**95% Confidence Interval (CI)**	p-value
Communal section			
Crete Brulee	Reference		
Grand Boucan	0.87	0.62 – 1.22	0.44
Gascogne	0.51	0.29 – 0.88	0.02
Sarazin	0.79	0.56 – 1.12	0.19
First pregnancy			
Not first pregnancy	Reference		
First pregnancy	1.24	0.95 – 1.62	0.12
Poverty score Index			
	1.03	1.02 – 1.04	<0.0001
World Food Program Food Insecurity Level			
Acceptable	Reference		
Borderline	0.89	0.59 – 1.34	0.59
Poor	0.60	0.32 – 1.12	0.11

Qualitative results

Of 1120 pregnant women seen at the Mirebalais maternity ward last year, 68% who had attended the antenatal clinic for follow-up had returned for delivery at the hospital. In our study, we interviewed 30 of those women and noted varying responses on a number of factors that could be described as barriers and facilitators. The interviews revealed facilitators and several significant barriers to prevent access to facility-based deliveries, at the same time showed how women are concerned by the complications and the well-being of their children and for themselves when taking the risks to give birth at home. Four main themes have emerged in this analysis and described in the next paragraphs

A. The matron (Traditional Birth Attendant) as "accompagnateur":

Women appreciate the comfort and care ease provided by home-based deliveries

A few women noted the emotional and physical support from the family and matron to "push" at home. A family member can hold her in the back and the matron in the front as one participant described. Women pointed out the advantage to give birth at home with the comfort of the family. From the psychological point of view, the woman feels relieved. They felt comfortable when they had to push and had one family member (who might be the mother, mother in law, sister, or cousin) and the matron in front helping to give birth. In a home birth, all of the family can participate in the delivery process done by the matron.

> *"Some of them are more comfortable at home because they are family members who touch their belly or doing massage at home and they have the matrons who are doing massage for them."*

Another participant spoke about physical and emotional support, using the phrase "the matron gives you strength."

> *"The matron touches you and asks you to push. In the hospital, they tell you to push too, but it's when they see the baby arrive. The matron gives you strength that's one of the reasons I love giving birth at home."*

Women explained that the matrons provide services that are important to the whole experience of giving birth. These practices are outside the realm of standard obstetric procedures; they are only practiced by matrons and family members when births take place in the home. These practices created a familiar, holistic and comforting environment for mothers giving birth. In some cases, this involved the provision of teas that women explained, could provide extra "strength" during childbirth.

"*For the tea, she[matron] boiled orange leaves, after that she mix different types of leaves, then she put a leave called "Fobazin" in it and then she boils it and gives you to drink. It's so that you can have strength. Like if you lack strength, the tea will help you."*

The matron is able to participate in important practices that would not be possible within a hospital setting. Women referred to various prayers and rituals that they associated with childbirth, that can only be performed by the matron. One such ritual involves care of the placenta after birth:

"The *matron digs a hole and buries the umbilical cord. After that they gave me a warm bath with papaya leaves and she gave me ginger tea to drink…*Sometimes *the matron searched a hole in front of the bed and put the placenta in there finally he burned it; after he tied the rest of the baby's umbilical cord, after she made prayers, but I cannot say what she said in the prayers."*

B. Access to hospital-based deliveries is shaped by distance and geographical access

The problem of infrastructure: distance and geographical access

Patients face many infrastructure problems in the remote's villages mostly in the communal sections. Haitian women living in the rural areas have to walk to reach the paved road. While the main road leading to the hospital is paved, the secondary roads to leave the village and to reach the paved road are difficult because of hills and mud where sometimes these paths are narrow and rocky, or you do not even see the road because of bush. To travel by foot to reach the main road is simply a nightmare where the road infrastructure is often nonexistent. One woman explained the number of hours to spend on the road before to reach the hospital: *"I spent*

2 hours walking from my house to the paved road and from the paved road it takes me another 2 hours to reach the hospital on autobus."

During rainy seasons, rivers and ravines are often flooded and women are blocked on the other side of the river. Bridges are non-existent and sometimes people who risk crossing over flooded rivers are swept away by floods and find themselves drowned and dead downstream of these rivers. If you are lucky to find an ambulance, it can reach only areas that are drivable. A woman explains why she stayed at home to give birth:

> *I have 4 children who were born at home…but the 3 children were born in Pouille (Boucan Carre) with the help of matron Simene Casseus. Pouille is in principle closer to Mirebalais but you have to cross the river. When the level of the river is high, there is no way to cross and pregnant women are blocked on the other side."*

Another question about this distance issue is that labor can begin in the middle of the night when it is difficult to find appropriate transportation and to find someone in the neighborhood to accompany you. When labor begins at night, it puts the woman in a difficult situation to get help in the middle of the night in true darkness. Nighttime travel is risky and because of the risk individuals are often unwilling to provide nighttime transport to women during evening hours. Sometimes the women must wait until the next day to go to the hospital. Women realize that the labor can progress quickly, and they simply stay at home:

> *"I was doing preparations to move to another house when I had contractions…and I did not have a chance to go to the hospital."*

> *"I spent all night with contractions and nobody wanted to give me a ride to go to the hospital any motorcycle was available at this time. I did not have enough money to rent a*

car. I get the pains during the night and I have to call the neighborhood and I had to stay until the morning and try to get money to reach the hospital."

"When it came time for me to go, I didn't have time, so I just stayed home."

C. Hidden costs associated with hospital delivery and hidden costs

Socioeconomic factors influence the choice of place of birth. Although there are no user fees at Mirebalais Hospital, women may struggle to find money for costs associated with hospital delivery: the transport to the hospital, the money to buy baby linens to prepare for the arrival of the baby, the money to buy food for those who accompany the women. Despite free healthcare at the hospital, these hidden costs together can become a significant barrier for women living on less than $2 a day. The arrival of the newborn requires expenses like layettes, towels, clothes, and toiletries:

"We could not do big, you know. I could not buy a suitcase, but we had prepared a small suitcase; we buy small things and we wash them, we iron them. If you will need a sheet to sleep on the floor you will need to think about that. We cannot afford to buy a lot of things. We buy small things like those that the poor can buy because we don't have money."

"When you're poor, you handle your poverty. Not too much means. But you know, when you're poor and you're pregnant, you know all the things you are going to need but you cannot afford them. Even if the father has to go sacrifice himself, he gives me what I need. He gives me the money to go buy the things I need."

Hardship for food

Parents must find money to buy food for the woman who is in the hospital because the hospital meal is not always ready in time, then when it is available it's not enough because only two meals per day are provided.

Another major expense is buying food for the family members accompanying the pregnant woman. Access to food is one of the challenges facing poor women in rural areas and one of them made this suggestion: *"Most of the times when they leave the hospital and have no way to eat at home. In this case, the hospital can give them some food before to leave. You know that the mother will not die of hunger."*

Costs for transportation

Numerous women are using motorcycles as mode of transportation. Taxi moto are becoming popular in the rural areas in Haiti. Women can walk from the mountains to reach the paved road where they can get access to a moto or a car, but the motorcycle is not appropriate to transport a pregnant woman in labor and in pain. When women are discharged from the hospital after delivery is another challenge in terms of transportation. The cost could be a hidden cost for the women in the rural area. Cost varies from 2 to 6 dollars US. Drivers ask for double, sometimes triple, the normal cost for transportation when they see that someone has an emergency. One woman explained their journey: *"I pay fifty gourdes to go and fifty gourdes to return. As long as it's the paved road, you pay fifty gourdes. But if it's from the village to the paved road, you can pay up to one hundred gourdes."*

As for the many children left at home during the stay at the hospital, the mother must find money for the kids left behind. A number of hidden costs are a major barrier for the poorest patients to leave the house and come to the hospital.

D. Hospital-based practices create a negative environment

Women experienced discomfort as a result of hospital procedures

Unfamiliarity with equipment in the delivery room. In the interviews women frequently reported feeling uneasy or uncomfortable having to labor on the delivery table. This was referred to as the "ti bourik" and women explained that they were uncomfortable with the position that they had to adopt when delivering on the table. One woman explicitly contrasted the experience of delivering on the table from the position she was able to adopt when giving birth at home accompanied by the matron or family members who would hold physically support her in a position that was comfortable and that afforded her privacy*:*

> *"I do not like the delivery table, but I am obliged, I do not like the position that we must take the head down and feet in the air and when we are on this table, we must do our possible for giving birth. But at home it's not the same you always find someone to support you."*

> *"In the delivery room, since that's where I spent all my time because there wasn't no room, and I had to stay on the "TI Bourik"(small donkey = delivery table) where I deliver my baby, they kept me on a bed a little higher but it was still the delivery bed, I had to stay on one, and the other women."*

Lack of space and beds at Mirebalais Hospital

Following delivery, women would usually be transferred to a bed in order to recovery. Women described that after giving birth, there often were not beds available for them. This interfered with their ability to rest and recuperate after delivery. Several women explained that shortly after delivering the staff explained that there were no beds for them. As a result, they had to recuperate with their newborns on the floor:

"The women who came deliver after me, they had to be on the floor… there were people on the floor…The people who delivered after me they were all on the floor."

"When I was in the labor room I suffered and stayed until midnight… [After the birth] there was no bed to put me in. My husband brought a sheet and we just laid down with the baby on the floor"

"There were no beds available because of too many people, they bring me 2 "domidous" (small mattresses) it's a big hospital I was getting care. God did not let me die."

Lack of respect from the staff

Some women noted that they felt they had been mistreated by some members of the hospital staff during labor and delivery. They explained that the staff did not tolerate the noise or cries that they would make during labor and delivery. Women reported that staff either reprimanded women for crying out, or in some cases made jokes at the womens' expense. One woman directly contrasted the privacy of home births with her experience of hospital delivery, noting that at the hospital her pain was the source of jokes and laughter by staff:

"When I give birth at home, no one sees me, and, in the hospital, people make fun of you, they laugh at you. The house is better (laughs!) At home, people do not hear me. The nurses are making fun of me. During my first delivery at the Mirebalais hospital, the nurses made fun of me but there were no problems with the delivery but after getting pregnant again I thought I was going to give birth at home because I did not really like the experience, it's not for nothing, the only thing I want is to stay at home."

Other women reported being harshly judged by the staff because of their physical appearance. They reported that nurses took note of women's clothing and general outward appearance, and would make fun of women who they judged to be "poor:"

"*Nurses are disrespectful and usually when the poorer are not looking good because they do not have a coat. The poor are humiliated because they do not wear clean clothes."*

"Some do not have enough financial means, others are afraid because of shame and humiliation of caregivers."

"They should be supervised the majority of nurses look at poor patients with disgust if they are dirty, poorly dressed. It never happened to me, but I have already witnessed this, especially the patients who come from far away."

E. Hospital based births are safest

Women overwhelmingly associated hospital-based births with "safety" and "security."

Women noted stories of friends and neighbors who had bad experiences and lost their babies during home deliveries. The importance of prenatal care is mentioned by some of them, in which case a number of visits and medical exams are recommended for a good management of the pregnancy. The delay taken by women when they are referred to the hospital by the matrons can be fatal when delivery happens at home

"Yes, I usually see women who live close to me and give birth at home and babies can die; I'm not going to say that the baby could not die at the hospital, but there are women who are not followed at the prenatal clinic."

"The matron tells that the child was 'blocked' in her belly and the matron did not want to keep her at home and she were going back home, and it was too late when a car come to pick her up, she died in the same time with the baby. After my experience at hospital, I advised them to go to hospital."

Women's decisions to give birth at the hospital were also related to families who encouraged them to pursue hospital births because they were safer. Families were an important source of advice and support for pursuing hospital-based births. Participants explained that family members cautioned them about the dangers of home-based births. Husbands were an important source of support too. The extended family also played a role in decision-making and could provide additional encouragement for women to pursue hospital deliveries. One woman explains how her extended family – including parents and in-laws – played a role in planning for their hospital-based birth.

"Well we have spoken to the family, my mother, my mother in law, sisters and brothers, they were all agreed for us to deliver at the hospital, because when you come, if you

happened to have any kind of problem, they will notice it and they will take care of it. To stay at your house, wait until the time is due, and never go for checkup and keep on thinking that you are alright, and you have some problems which is going to have some problems with the kid, and all that, they had advised us come to the hospital."

"We planned that when I started having pain that he would rush me to the hospital. We planned all of those things. Since the nurses told me not to deliver at home, my partner said he would not let me deliver at home. My partner said if the nurses kept telling me to come deliver at the hospital, maybe they knew something."

Specifically, women noted that hospitals had specialized knowledge about the process of labor, and staff could appropriately monitor the progression of labor, making women feel safe. Women knew that if they came to the hospital, nurses could physically monitor them, and make appropriate recommendations to ensure a safe delivery.

"There is more security at the hospital. As soon as you feel something hurts, there are nurses here that give really good care. But when you are at home, you can die easily. When you come to the hospital, as soon as something hurts, the nurse will take care of it. But when you are home, what can you do? You will just suffer. When you are at the hospital, the nurse consults you, monitors you, cools you down and then she sends you to walk around and once it's time to deliver, you just deliver. But when you are at home, who will cool you down? You have no idea what is going on. Even if someone helping you push, they can't tell you anything. The person can't tell you anything."

Women noted that they received care at the hospital, medications for pain, and IV solution (piki = injection). Women described the serum (intravenous solution) as a treatment when they are weak. Women who receive serum, pills, and injections at the hospital think that the hospital is better than the house because when they are weak and have hemorrhages, they will receive blood to give them strength.

"Pills can kill you at home; home is a risk; you can get eclampsia and you died. It's a risk if you give birth at home "

"If I had given birth in the hospital, I would be given serum to replace the blood I had lost. Because I had not given birth at the hospital they did not replace my blood. If I was in the hospital the doctor would give me remedies. Unfortunately, I gave birth at home."

Women are concerned to see blood during childbirth, and this signals a need to go to a hospital. They described how seeing amniotic fluid is a normal thing, compared to seeing blood in labor, which is a sign to rush to the hospital to prevent maternal complications that lead to death. Matrons use these signs to decide to refer a woman to the hospital. They are concerned about referral in time for malpresentations like breech presentation and for cases of dystocia requiring a cesarean section. You cannot have a cesarean section at home. The women rely on emergency procedures and medication provided at the hospital.

"I see that it is not [a] good idea to give birth at home because there can be a bad presentation of the child and the woman may die during childbirth but if it is at the hospital where there are doctors, they could intervene to save the lives of the baby and the mother."

"Sometimes the child arrives (by the back) with a breeched presentation and both feet are in front. If you have not died during childbirth, the baby may die during childbirth. If it is in the hospital the doctor will take care of you and give you medicine."

"If something is wrong at the hospital they will help you. That's why the hospital is better for you. If you can't deliver the child, they can do it. They can either practice a C-section or give you the scissors. But if you are at home, they won't be able to do anything for you. If you cannot push the child, people at home will not know to give you scissors or the C-section. It is at the hospital that the nurses will know what to do. If you stay at home, you will just die. That's why I would rather come deliver at the hospital."

Families were an important source of advice and support for pursuing hospital-based births. Participants explained that family members cautioned them about the dangers of home-based births. Husbands were an important source of support.

"We planned that when I started having pain that he would rush me to the hospital. We planned all of those things. Since the nurses told me not to deliver at home, my partner said he would not let me deliver at home. My partner said if the nurses kept telling me to come deliver at the hospital, maybe they knew something."

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stay at your house, wait until the time is due, and never go for checkup and keep on thinking that you are alright, and you have some problems which is going to have some problems with the kid, and all that, they had advised us come to the hospital."

Discussion of the results

We found that, although women associated facility-based delivery with safety and security, realizing a facility-based delivery required them to overcome a number of obstacles. In quantitative analyses we found that women living further from HUM were less likely to deliver there, while women with greater financial resources were more likely to deliver there. Qualitative results confirmed that structural barriers—in the form of distance, transportation challenges, and out of pocket costs—presented significant barriers for several of the women in our study. In a difficult economic context where more than 6 million Haitians live below the poverty line with less than US $ 2 per day[38] and an inflation rate of almost 15%[25] it is clear that poverty remains an important barrier to bringing women to give birth in hospital when they have to find money to prepare for the arrival of the baby, pay transportation costs, and also money to find food not only for the mother at the hospital but also for the family accompanying the mother.

Despite potential barriers, women and their families chose to deliver at HUM—68% gave birth at the hospital. This percentage is higher than the national average. According to the 2012 EMMUS V in 2012,[39] only 37% of women gave birth at the hospital. Pregnant women living in rural Haiti, especially Mirebalais, expressed a desire to give birth in the hospital despite the existing structural barriers. They expressed that they were afraid of complications and concerned for their safety and that of their baby by giving birth at home. Our qualitative data explains that

the safety of hospital-based deliveries is so valued that women and their families are willing to overcome the various challenges outlined above in order to ensure the safe deliveries.

We noted that women complain about the lack of respect from the staff who are not empathic about their pain and suffering when they are in labor. This same situation is described in some of the literature in sub-Saharan African countries on maternal health as evidenced by Moyer et al. [14] on the barriers and facilitators for hospital delivery in sub-Saharan Africa.

In the qualitative part of the study, women also expressed appreciation for the matron as an "accompagnateur"—the comfort and familiar care delivered by matrons during home-based deliveries. This contrasts markedly with their descriptions of hospital-based births. For women, the staff, structure and practices of delivery often left women feeling uncomfortable or ashamed. The women talked about the importance of accompaniment and how it affected them positively and the impact of not feeling this support. The belly massage, tea and herbal infusions, prayers for baby protection, and practical baths by matrons during and after delivery at home are practices sometimes related to religious rites and are part of the matron's accompaniment. The matrons have respect and authority in the community; they are called not only for deliveries but also for advice on other health problems, too. Sometimes the matron is a family member, too. While some women see a significant benefit in these practices, others take a critical look at these practices. In remote areas where there is no health facility, they are considered the only recourse for deliveries. These are cultural traditions well established around the birth of a baby. This led us to believe that in the light of the experience of lack of empathy and respect from the staff, the presence of the matron in the labor room next to the midwives should discourage this practice of mistreatment of women in pain in the labor room.

This corroborates with studies by Thaddeus et al.[29] and Gabrysch et al.[40] which constitute the references in the medical literature on facility-based deliveries versus home deliveries. On the qualitative part, the women clearly expressed their journey, their motives, their desire to reach the Mirebalais Hospital. In one hand, it has been noted that they appreciate giving birth at home because of the comfort at home around their family and the "matron" (traditional birth attendant) as physical and emotional support. On the other hand, they are aware of the dangers and complications that can occur when there is dystocia, hemorrhage, and malpresentation that would require a referral to the hospital for a cesarean section.

Finally, the complaints noted by women in the study, like lack of beds and space, must be placed in the context of the weakness of the Haitian health system. Indeed, Mirebalais Hospital is a tertiary care hospital and should be left for references and complicated cases. Health centers in communal sections should have the capacity to deliver normal deliveries; this would prevent an overload at the Mirebalais Hospital which performs about 5,000 deliveries a year: not only because it provides free care services but also because of the quality of services. In 2007, in a project called SOG (Soins Obstetricaux Gratuits, meaning Free Obstetrical Care) in Haiti, carried out by WHO,[41] we also noted a significant increase in the number of deliveries because of free medical care and incentives for the matrons to refer pregnant women to the hospital. In this sense, by encouraging women to come to the hospital, health facilities should be prepared in terms of staff and also access to materials and drugs at the hospital; otherwise we will jeopardize the safety of mothers at the hospital.

In conclusion, women living in rural Haiti, particularly at Mirebalais, are overcoming barriers like then distance and the poverty for facility-based delivery to prevent complications and are looking for safety and security for themselves and the well-being of their babies.

Pregnant women feel pulled between the emotional, the physical support at home and the obstetrical modern care. A strong collaboration between the matron and the midwives at the facility level will address the perception of the negative environment and the lack of empathy by the staff at the hospital.

Limitations

The interviews were conducted by a medical doctor who could influence the answer in terms of choice for place of delivery. To respond to this bias, the doctor has been able to put these women at ease because of a large field experience of more than 30 years in the area. Women may also have given birth at a facility other than HUM and we would not have known about it.

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