Traditional Birth Attendant Education in Fondwa, Haiti
Program and Evaluation Plan
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INTRODUCTION

Haiti has the highest maternal mortality ratio in the Western Hemisphere, estimated at 300 deaths per 100,000 live births.\(^1\) Though Haiti’s mortality data are difficult to assess due to missing and inaccurate death reports, the burden of suffering due to maternal mortality in Haiti is estimated to be great; 1/93 women die of pregnancy or childbirth related complication in Haiti, compared to 1/2900 in Europe and 1/140 worldwide.\(^1\)

In a systematic review of studies of maternal mortality by the WHO, severe bleeding, hypertensive diseases, obstructed labor, abortions, and sepsis were the dominant causes of maternal mortality in Latin America and the Caribbean.\(^2\) Eighty percent of cases cluster around labor, delivery, and first 24-48 hrs postpartum. Most life-threatening obstetric complications cannot be predicted or prevented in the antenatal time period, therefore the entire population of pregnant women is at risk.\(^3\) For example, at least two thirds of post partum hemorrhages occur in the absence of any risk factors.\(^4\) Approximately 15% of pregnant women will need emergency obstetric care (EOC) to manage life threatening complications to the mother and child.\(^5\) The access to these services is what may determine the outcome of a complication.\(^6\)

Approximately 53% of Haiti’s 9.65 million people lives in rural areas,\(^7\) and in these regions fewer than 40% of Haitians have access to basic health services.\(^8\) With little public transport and many roads in poor condition, an estimated 76% of mainly rural Haitian women deliver at home attended by a traditional birth attendant (TBA).\(^9\) In Haiti, available evidence suggests the most effective strategy at this time lies in training TBAs, who are the ready health force, in safe practices at delivery and in recognizing signs for referral.\(^10\)
Family Health Ministries, a non-governmental organization (NGO) based in Durham, NC, has been working in Haiti in the cities of Port-Au-Prince, Leogane, and the area of Fondwa in the Leogane Commune for over 10 years. The NGO began its work with cervical cancer screening and prevention, and has since expanded its programs to include nutrition, education, and other women’s health issues. FHM conducted focus groups with women in the area of Leogane and Fondwa, Haiti in 2009, and discovered reducing infant and maternal mortality was of high priority to these communities. They consequently developed plans for a Safe Motherhood Initiative, the goal of which is to reduce maternal and infant mortality and morbidity in the Leogane Commune by 1) building a referral research and health center and by 2) improving outcomes in home deliveries. The second part of this goal will be partially addressed by evaluating ways that TBAs might be able to participate in improving rural birth practices. This TBA evaluation / education program will take place in the Communal Section of Fondwa, part of the Leogane Commune. Fondwa is a mountainous region in southern Haiti, home to approximately 8,000 inhabitants and is in the referral area for Leogane.

The TBA evaluation program will consider ways of reducing the most common causes of maternal mortality, specifically focusing on hemorrhage, postpartum infection, preeclampsia, and obstructed labor. The program also will specifically address the prevention of two causes of newborn death: birth asphyxia and tetanus. The program will be conducted over four weeks, with verbal and visual teaching to accommodate different literacy levels. After completing the course, the TBAs will receive a birth kit with all of the supplies necessary to put into practice the skills they have learned. Our hypothesis is that the TBAs will be able to contribute to a positive effect on birth outcomes in the Fondwa community.
Evaluation of the program will take place at several levels. We will assess how well the TBAs learn and retain information through identical tests given before and after the program. Additionally, we will gather survey data from women in the community to determine mortality rates and rates of indicators of mortality to discover whether or not the program has had a positive impact. We will also conduct focus groups with the TBAs and community members to determine how to improve the program. The TBAs will also be asked to report on the outcomes of the births they attend to form a birth registry.

The first section of this paper is a systematic review of the literature that identifies TBA training programs that are similar to our Haitian TBA educational program. This section attempts to describe lessons learned from the strengths and weaknesses of each study. The second section describes the program plan, providing an overview, the program context, the Health Belief Model theoretical basis for the program, and details goals, objectives and plans for implementation. The third section of the paper outlines the plan for evaluating the program, including the rationale for the evaluation, the approach to the evaluation, the study design, methods, and planning tables, and discusses the plan for disseminating the results of the evaluation. The last section offers a discussion of the program as a whole, our expectations of the outcomes of the program, lessons learned, and suggestions for future policy.
SYSTEMATIC REVIEW

Introduction

The purpose of this systematic review of the literature is to recognize programs that are similar to our TBA education program in Haiti, with the purpose of learning from these programs to improve our own. Comparable programs should incorporate the elements that are essential to the Haitian TBA program, which include:

1) Population: traditional birth attendants (TBAs) or lay healthworkers in developing countries
2) Intervention: educating traditional birth attendants or lay healthworkers in safe birth practices to improve birth outcomes
3) Outcome: improving skills, reducing maternal and neonatal morbidity and mortality
4) Focus on preventing 5 main causes of maternal mortality: hemorrhage, obstructed labor, infection, complications from abortion, and preeclampsia and on preventing causes of neonatal mortality: sepsis, asphyxia and tetanus.
5) Comparable intervention and control groups for evaluation purposes

Programs that are identified as comparable to the TBA education program in Haiti will be analyzed, and strengths and weaknesses discussed. The conclusion to this analysis will discuss incorporating lessons learned into our Haitian TBA education program to improve its effectiveness.
Methods

Research Question: I searched to literature with the following question in mind: What can be learned from previous and existing TBA education programs that share central elements with our program? Programs must contain elements 1, 2, 3, and 5 above to be considered for review. At least one part of element 4 should be the focus of the program.

Search Strategy: I conducted a search of the PubMed database to identify articles describing similar programs. The search (("Midwifery"[Mesh]) AND ("Developing Countries"[Mesh] OR "Rural Health Services"[Mesh])) AND "Education"[Mesh] identified 212 articles. Hand searches through Cochrane review articles were also conducted. Inclusion criteria to further narrow the search were:

1) The article is in English.
2) The article is available in full text format.
3) The article describes a program that has been, or is currently, implemented and is not solely a case study or a pilot study.
4) The program shares central elements with the Haitian TBA education program, including elements 1, 2, 3, and 5, and at least one part of element 4.

Exclusion Criteria: Outcomes not measured in our own study were excluded (e.g. sickle cell identification). Studies only reporting on subset populations, such as low birthweight infants, were excluded. Training programs for accredited healthcare workers who do not fall under TBA or lay healthworker status were excluded. Additionally, the study design for the included studies must provide for comparison groups (such as RCT, cluster randomization, time series or
before/after design) as described in element 5. Any articles that did not include a description of the training were excluded.

After inclusion criteria 1) English, and 2) full text were used, 57 articles remained. Abstract review narrowed the search to 6, and after full text review, 3 articles remained from the original PubMed search. An additional 2 articles were identified through hand searches, for a total of 5 studies that met inclusion criteria. These studies are summarized and analyzed below, and also are presented in Table 1 (Appendix).

### Summary of Comparable Programs

**Bang, et al. (1999). Management of neonatal sepsis in India**

This program addresses the problem of high neonatal mortality in rural areas of India. The group identified a lack of attention to neonatal sepsis, which is a major cause of death in the neonatal period, especially when hospitalization rates are low. The study was completed in 39 intervention and 47 control villages in Gadchiroli, an extremely underdeveloped district where roads, communications, education, and health services are poor. SEARCH (Society for Education, Action, and Research in Community Health) trained and supported female village health workers in the intervention area to take histories of pregnant women, observe the process of labor, examine neonates, and record findings. In the first year of the intervention the village health workers trained in this manner performed these tasks and followed the neonates for 28 days after birth. In the second year of the study, the village health workers were trained in the home-based management of neonatal illnesses. In the third year, health education for mothers and grandmothers about care of pregnant women and neonates was added to the program. Sepsis
was the most common cause of death for neonates in the first year of the study, so early detection and treatment became the focus of home-based neonatal care. The management of sepsis included: advising parents to hospitalize the child, and if the parents were unwilling, antibiotic treatment for the child at home. Recording of births and child deaths was conducted during 1993–98 by an independent set of workers in the intervention and the control areas.

The primary outcome was the effect of intervention (trained village health workers attending to neonates) on neonatal mortality rate; the secondary outcome measures were the infant and perinatal mortality rates. Neonatal, infant, and perinatal mortality rates in the intervention area (net percentage reduction) compared with the control area, were 25.5 (62.2%), 38.8 (45.7%), and 47.8 (71.0%), respectively (p<0·001). Case fatality in neonatal sepsis declined from 16.6% before treatment, to 2.8% after treatment by village health workers (p<0·01). The number of deaths averted by the interventions was a total of 51 deaths. One death was averted for every 18 neonates receiving care.

A strength of this program and study was their use of intervention and control groups. Though the groups were not randomized due to feasibility reasons, the groups were similar in sociodemographic data and mortality rates. This design made it possible to directly compare the groups and draw some definitive results. One strength of this program, which is an aspect that could be applied to the Haitian TBA education program, is the third stage training of mothers and grandmothers on care and nutrition during pregnancy, initiating early and exclusive breast feeding, prevention of infection, etc. Another strength is the simplicity of the intervention. The diagnosis and management plans are easy to understand, and therefore are more easily reproducible. The low cost of neonatal care per neonate (US$5.3) observed in this study was much lower than the reported cost of hospital-based neonatal care in urban India.
Some weaknesses of this program were the necessary qualifications of the village health workers. The necessary attributes were literacy, village residency, acceptance by the community, and willingness to visit the home at the time of labor and in the neonatal period. Replicating all of these aspects, especially the literacy component, is not possible in the Haitian TBA study, as almost all of our identified TBAs are illiterate. Another weakness is the lack of quality control measures for the training period for the village health workers, and as such it is difficult to determine the differences in knowledge and skills before and after training.

Bullough, et al. (1989). Early Suckling and Postpartum Hemorrhage in Malawi

This study’s goal was to investigate reducing postpartum hemorrhage (PPH) with additional training for previously trained TBAs. The strategy for reducing PPH was to train TBAs in the practice of putting the baby to the breast immediately after delivery, as suckling stimulates uterine contractions in lactating women. There had been no previous trial on the effectiveness of this approach for reducing PPH, and this method was already being advocated without proof of its efficacy.

The study took place in the central region of Malawi, where about half of all deliveries occur outside of the hospital. Some of these births are attended by TBAs who had received a 4-week training, including instruction in carrying out normal deliveries and recognition of risk factors during antenatal care and in labor.

Researchers based randomization into intervention and control groups on TBA. All TBAs participated in a 2-day refresher course. The TBAs randomized to the intervention group received extra training in 1) management of third stage of labor through assistance in delivering the placenta, 2) measurement of blood loss at delivery, 3) immediate suckling after delivery, and
4) referral for third stage complications for bleeding and retained placenta. The record collection form contained drawings to represent the information required. Researchers made follow-up visits to the TBAs’ homes at every 4 or 5 weeks to assess their performance, reinforce teaching, and collect data forms. As most of the TBAs had no formal education, quality control mechanisms were put in place, consisting of a community midwife not involved in the research project visiting with each TBA. She asked about the methods used to collect blood for measurement and tested the TBA on measurement of blood loss.

The results from this study show the frequency of PPH did not differ significantly between the groups (suckling 167 [7.9%] vs control 178 [8.4%]; p > 0.6; 95% confidence interval suckling minus control = -2.1% to +1.2%).

A strength of this program was the inclusion of illiterate and innumerate TBAs. Low levels of literacy are common worldwide, so this makes this program more applicable to other countries as well. The authors documented careful teaching in measurement methods for the TBAs. Another strength was the prevention of reporting bias. The study coordinators took pains to ensure that the TBAs would not distort results; i.e. they were not told that the methods they were being taught would result in decreased PPH. An additional strength was the inclusion of follow-up visits to the TBAs homes, as it is essential for the program leaders to give continuing support to the trainees in the form of resources and additional teaching. We will attempt to do something similar in our study by having the TBAs come to one central location to meet for follow-up, resources, and instruction.

A weakness of this trial is the fact that, because there had been no definitive literature to support that suckling decreases PPH, it is difficult to determine whether it was the training that
failed to produce results or the fact that the methods taught do not in actuality produce these results. In fact, this study has been cited as a reference that suckling does not prevent PPH.\textsuperscript{13} Another weakness was that maternal mortality was not the endpoint, though PPH is one of the main causes of maternal death. There was only 1 maternal death from hemorrhage of the 4385 pregnancies in the study.

We learn from this study that it is important to be sure interventions actually produce the desired results before investing precious resources in an education program focused on these interventions. Our study likely will not include early suckling as a way of preventing PPH, though it is encouraged as a way to promote early bonding between mother and infant.

\textbf{Dickerson et al. (2010), Pregnancy and Village Outreach Tibet}

The Pregnancy and Village Outreach Tibet (PAVOT) program is a community- and home-based maternal-newborn outreach in rural Tibet.\textsuperscript{14} The program was developed to provide health-related services to pregnant women in rural Tibet who are at risk of having an unattended home birth. In rural Tibet, local health systems are weak, and healthcare access is difficult due to economic and cultural factors, compounded by rugged geography and poor transportation.

The focus of the PAVOT program is not to train TBAs, but to train outreach workers to then impart knowledge to women. The PAVOT program utilizes the train the trainers model in which experienced master trainers train rural healthcare workers and laypersons (called outreach providers) to outreach the homes of rural-living Tibetan women and families (called outreach recipients). The outreach providers relay to the recipients maternal-newborn health education, hands-on skills training, and material resources. The lessons imparted by the outreach providers are those that would be useful in the setting of training TBAs. These sessions include
information on antepartum and postpartum care seeking, nutrition, birth planning and danger sign recognition, clean delivery, umbilical cord care, postnatal care and prevention of PPH, birth asphyxia, hypothermia, and hypoglycemia. They also provided maternal micronutrient supplements and safe and clean birth kits.

The PAVOT program differs significantly from the Haitian TBA education program in that the trainees are outreach providers that relay information to the communities and do not directly participate in the birth process. In the course of the program it may be possible that those receiving information in the communities are the laypersons who regularly attend births, but this information was not possible to ascertain from the study, and was likely not measured. More than 960 pregnant women received outreach visits, with 92% of outreach recipients reporting receiving safe pregnancy and birth education, clean birthing skills training, uterine massage skills training, and clean umbilical cord care training. Nearly 80% reported basic newborn resuscitation skills training, and nearly 100% were given micronutrient supplements and birth kits. Most women (88.1%) reported that they received uterine massage after labor. Nearly all (96.9%) reported that a safe and clean birth kit was used during delivery. Nearly 95% of newborns were reported to have been dried and stimulated immediately after birth. More than half (58.5%) reported breast-feeding the infant within the first hour after birth, whereas about one-fourth (22.8%) reported initiation of breast-feeding after 24 hours.

Advantages noted were that the train the trainers method can be implemented in our Haitian study, as we will be in need of trainers for the TBAs. The study also identified useful information that is widely recommended such as birth plans. Also, the format of many of the lessons for the outreach providers is similar to that which we would like to impart to the TBAs. The technique of training the families and the women themselves could be an additional step in
our TBA program, which perhaps could be performed by the TBAs themselves. The strength of the overall report is the demonstrated feasibility of implementing such a program in rural areas such as Tibet.

One weakness to this study is that it did not report mortality data. Intermediate outcomes were reported, not all of which have definitive evidence for reducing mortality (i.e. antepartum and postpartum healthcare visits). Another drawback to this study was that it not as useful as expected to our study because the main focus is on training the women, not on educating the TBAs. The training program for the outreach providers did not have any assessment that was reported, so it is difficult to know how well the providers understood their training. Quality assurance data came from the outreach recipients, the rural Tibetan women, who may have been biased or unknowledgeable of the components of the study. Reporting of health-related behavior, such as clean births, was not confirmed by observation.

**Goodburn et al. (2000). Training Traditional birth attendants in clean delivery does not prevent postpartum infection**

The goal of this study was to compare postpartum infection rates of deliveries conducted by trained TBAs vs. those conducted by untrained TBAs. The study took place in rural Bangladesh, in an area in which the Bangladesh Rural Advancement Committee (BRAC) had trained TBAs in the “three cleans” (hand-washing with soap, clean cord care, clean surface). The outcome measure was postpartum genital tract infection diagnosed by a symptom complex of 2 out of 3 of: foul smelling discharge, fever, lower abdominal pain.

Researchers identified a total of 2099 pregnant women in the area. Mothers were visited within 5 days of the birth, at which time a history of the birth was obtained from relatives present
at the delivery. The mothers and relatives were also asked to identify the status of the birth attendant. If claimed to be a TBA, her training status was checked. The mothers or relatives who were present at the delivery reported symptoms, and follow up visits were made at 2, 6, and 12 weeks postpartum by lay health workers who recorded details of symptoms and did a brief physical exam. The mothers also provided data on whether or not the birth had been “clean”.

Trained TBAs were more than twice as likely as the untrained TBAs to perform a “clean” delivery. There were no significant differences between the two groups regarding manipulation of the baby during delivery, but the trained TBAs were significantly more likely to insert their hands into the mother’s vagina, the practice of which is associated with high rates of infection. Moreover, it was demonstrated that only 45% of trained TBAs were practicing clean deliveries, which could be considered disappointing considering that the BRAC training is carefully conducted and follow up is the norm. There was no demonstrated relationship between the training status of the TBA and maternal infection. The results also suggested that the most potent risk factor for postpartum infection is likely to be a pre-existing reproductive tract infection (RTI). Also, practicing a’ clean’ delivery by these standards might not in fact prevent infection when every surface is contaminated.

Strengths of this study include the use of comparison groups, and the range of data collected. The data suggest that the most potent risk factor for postpartum infection is a pre-existing RTI, leading to the conclusion that there may be more effective ways to prevent postpartum infection, such as eliminating infection through prenatal care. A large weakness of this study is the possible reporting bias by the women or families regarding the practices of the TBA, and also the symptoms of infection. An additional weakness is the lack of investigation as to why the trained TBAs were more commonly utilizing the unsafe practice of hand insertion.
The authors drew many conclusions from these results such as training for TBAs might not be as effective as once thought, but I have difficulty drawing any conclusions from this study due to possible biases and confounding factors.

Jokhio et al. (2005). TBAs and Perinatal and Maternal Mortality in Pakistan

The study’s focus was determining if the training program for TBAs in a rural district of Pakistan was effective in reducing maternal and perinatal mortality. The study was a cluster randomized design, with 7 villages (talukas) randomized into intervention and control groups. The intervention was training the TBAs in 3 of the 7 talukas by obstetricians and female paramedics. The training program consisted of three days and involved the use of picture cards containing advice on antepartum, intrapartum, and postpartum care; how to conduct a clean delivery; use of disposable delivery kit; when to refer women for emergency obstetrical care; and care of the newborn. They are supported by Lady Health Workers, women who are trained with 3-6 months of primary care and family planning knowledge who are based at primary health centers. Outreach clinics were organized in the areas of the intervention. In control clusters, the Lady Health Workers enrolled and followed up on all pregnant women in their catchment area in the course of their normal monthly home visits. The TBAs received no extra training, and there were no outreach clinics, as per “usual care”.

The cluster-adjusted odds ratio for maternal deaths in the intervention group, as compared with the control group, was 0.74 (95 percent confidence interval, 0.45 to 1.23). The odds ratio for perinatal death for the intervention group was 0.70 (95 percent confidence interval, 0.59 to 0.82). The intervention group had significantly lower rates of puerperal sepsis and
hemorrhage as a complication of pregnancy. Women in the intervention group were more likely than those in the control group to be referred to emergency obstetrical care for treatment. The overall conclusions from this study were that the use of trained TBAs was associated with significantly reduced perinatal mortality, but a non-significant reduction in maternal mortality.

Some strengths of this study include the integration of the TBAs with the existing health programs to improve birth outcomes. The technique of connecting TBAs with health systems has demonstrated to be effective in the past; however, it becomes a confounding factor and makes drawing conclusions about the efficacy of TBA training difficult. Another strength of the study was the study design. Control groups and randomization, combined with the large size of the study, make drawing more definitive conclusions possible. However, as the authors mention in their discussion, the study was still not powered enough to detect a significant decrease in maternal mortality. Of all those reviewed, this program is probably the most like the Haitian TBA education program, so much can be learned from the process. Unfortunately, this training program only lasted three days, compared to the four week program in our study. Also, they did not describe any measures to assure that the TBAs had learned the material well before sending them to actual deliveries, which will be a major component of our program.

**Analysis**

The picture of the effectiveness of TBA education is unclear after this review. Each study reviewed describes an entirely different approach to training, and draw different results from all studies. Studies are large\textsuperscript{15} or small,\textsuperscript{12} and some fully train the TBAs\textsuperscript{15}, others simply add an extra session to their curriculum,\textsuperscript{12} some train laypersons who will be not be attending the
 births. For this reason it is very difficult to draw conclusions about which program is most effective, and even if training TBAs is effective at all.

   The one training element that was present in all programs was prevention of infection. Some mentioned the “three cleans” (hand-washing, clean cord care, clean surface), but not all. Our program will also include a clean delivery section, and will hopefully be more effective than the intervention described in Goodburn et al.

   One problematic aspect of a few of these studies is that they do not fully describe the program components, which makes it difficult to analyze the successes of each program due to specific interventions, such as cleanliness. For example, in the Goodburn et al. study, there was concern over the trained TBAs practicing the unsafe behavior of inserting their hands into the vagina during childbirth. A description of the training program would be helpful in this case to determine if some part of the curriculum was misinforming the TBAs. Additionally, the length of the training programs varied widely, from 3 days to gradual training over years. This makes it difficult to predict the effect of our 4-week education program.

   Few studies described any measures taken to assure that the TBAs actually effectively learned what they were being taught. In our program, assessment of knowledge and skills will be a large component of the initial stages of the program. This step is essential in assessing the effectiveness of the teaching of the program content.

   Only one study included information on cost effectiveness. There has been much speculation about the comparative cost effectiveness of TBA training and other mechanisms of reducing maternal and neonatal mortality, but most studies in the literature do not present cost
effectiveness data. Our current plan does not include a cost effectiveness assessment, but it would be a good addition at a later date.

Evaluation differed in each study. All used control groups, which is a step toward good study design. Our study will use a pre- and post-test design, where the TBAs serve as their own controls before and after training. Consistent training and evaluation methods must be implemented, or we may never answer the question of whether TBA training is effective.

**Conclusion**

Many of these studies draw contradictory conclusions about TBA training and birth outcomes. Though the outcomes differ, lessons may still be learned from the individual studies. One lesson is the importance of implementing evidence-based interventions. As in the cases of suckling for PPH prevention\textsuperscript{12} and maternal infection rates\textsuperscript{16} it may not be cost effective to put much time and effort into training TBAs in an intervention that has no demonstrated ability to achieve anticipated results.

Another lesson that can be gleaned from these studies is the importance of avoiding reporting bias. Many studies relied on the mothers or the TBAs themselves to report on birth outcomes, which could introduce significant bias and make results unreliable. At the moment we have not identified who will gather results on maternal and neonatal morbidity and mortality in the community in general, but hopefully we will be able to find an impartial third party to do the data collection. Finally, it is clear that, to achieve any meaningful conclusions, the study must be designed well, with a control group, and large enough numbers of participants to detect a decrease in mortality.
PROGRAM PLAN

Program Overview

Family Health Ministries (FHM) conducted focus groups in the area of Leogane and Fondwa, Haiti in 2009 and discovered reducing infant and maternal mortality was of high priority to the communities. In response to this need, FHM is developing a Safe Motherhood program with the goal of reducing maternal and neonatal mortality; this includes building a hospital in Leogane and educating TBAs in the Fondwa area in safer birth practices. The education program curriculum for the TBAs instructs on these basic topics: 1) cleanliness, 2) pre-eclampsia, 3) fetal heart rate, 4) fetal position, 5) neonatal resuscitation, 6) hemorrhage, 7) clean cord care, 8) newborn assessment, 9) post partum infection, 10) maternal tetanus vaccination, and 11) birth registry development.

We will train an identified community leader to co-teach the program, and collectively teach the program to TBAs for 4 weeks. We will administer pre- and post-tests to the TBAs to determine their improvement in knowledge and skills. We will also gather baseline data on maternal and neonatal morbidity and mortality in Fondwa by conducting surveys of randomly selected households. Additionally, we will map surveyed houses and houses of trained TBAs using GPS technology, to later compare outcomes in a clustered design. The TBAs will also be required to report birth registry data, including births and deaths of mothers and neonates, to the community leader.

Program Context

Reducing maternal mortality has been a major focus of the global health community for nearly three decades. In 1987, the Safe Motherhood Initiative, a coalition formed by the WHO,
UNICEF, the World Bank and the United Nations Population Fund, was launched at a conference in Nairobi with the goal of reducing the number of maternal deaths by half by the year 2000. The United Nations Millennium Development Goals (MDGs), which outline a global action plan to achieve anti-poverty goals, evidenced commitment to women’s health by setting the target of MDG 5 as reducing the maternal mortality ratio by 75% from 1990 to 2015. These aims have proven more difficult to attain than initially anticipated, and MDG 5 is the goal towards which the least progress has been made. Since 1990, the number of women dying due to complications of pregnancy and childbirth has only decreased by approximately 34% (2008). As previously mentioned, the women who carry the greatest burden in the Western Hemisphere are the women of rural Haiti.

The WHO method of determining deaths attributed to childbirth and pregnancy in Haiti is calculated using national survey data in a multilevel regression model to adjust for underreporting and misclassification. Reporting the trends using the maternal mortality ratio (MMR) as opposed to the maternal mortality rate (number of deaths per 100,000 childbearing women) removes the effect of total fertility rate, which has been declining in Haiti from 5.02 in 2005 to 3.17 estimated in 2010. Haiti has experienced a decline in maternal mortality since 1990, from an MMR of 670 in 1990 to an MMR of 300 (lower estimate 180, upper estimate 520) in 2008. This translates to a drop in mortality by 55%, and an annual decline of 4.4%, which is closer to being on track for the MDG goals than the global rate of 2.3%. Still, the MMR of 300 stands in stark contrast to that of the rest of Latin America and the Caribbean, which averages an MMR of 85.

The Government of Haiti’s health program “Plan Stratégique National pour la Réforme du Secteur de la Santé” recognizes that maternal mortality in Haiti is a dire problem. The plan
specifies the most common causes of maternal mortality in Haiti are: hypertension/eclampsia, hemorrhage, anemia, infection, obstructed labor and complications of abortions. The government’s plan takes its goal for reducing maternal mortality from MDG 5.\textsuperscript{19}

Additionally, there are many non-governmental organizations (NGOs) in Haiti that have proposed solutions for reducing maternal mortality. Two of the more prominent institutions are discussed here. USAID’s program uses a strategy with three main focuses: deliver a basic package of health care services, provide support to the government of Haiti to increase its capacity to carry out the executive function of managing a national health care system, and mobilize private sector partners to improve the health sector in Haiti.\textsuperscript{20} The World Health Organization’s Free Obstetric Care project emphasizes payment to health facilities for pregnancy, birth and postpartum services; refunds to pregnant women of transport costs; and payment to traditional birth attendants who accompany pregnant women to the health institutions for birth.\textsuperscript{21}

\textit{Political Environment}

In the commune of Leogane, where the TBA education program will be implemented, the environment is very favorable towards the initiation of this program. As previously mentioned, before program planning began, focus groups of women in the Leogane Commune identified maternal and child health as priorities. When representatives of FHM met with the TBAs, their response to the suggestion of partnering with them was universally positive.

An additional consideration to the political environment of Haiti is the preponderance of NGOs. Prior to the earthquake of Jan, 2010, estimates of the number of NGOs in Haiti ranged from 3,000 to as many as 10,000.\textsuperscript{22} The plethora of NGOs operating in Haiti can at once be
beneficial, for sake of healthcare coverage, and detrimental due to lack of coordination. The large cadre of NGOs provides critical services such as healthcare, education, and job creation. The reality of the political climate is such that Haitians look to NGOs rather than to the government to provide their basic public services. FHM is a trusted NGO that has been providing public health, primary care, and women and children’s health services in the community for over 10 years.

Consistency with local, state, and national priorities

As mentioned previously, the community of Leogane itself identified maternal mortality as a priority. Reducing maternal mortality is also a national priority, as expressed in the “Plan Stratégique National pour la Réforme du Secteur de la Santé.” This plan is based on the goal 5 of the Millennium Development Goals, to reduce the maternal mortality ratio by 75% from 1990 to 2015.

Acceptability to providers and recipients

Local providers, the TBAs, unanimously approved the plans for a training program. They were especially enthusiastic about obtaining greater access to health care, education, and supplies. Additionally it appears that potential recipients (pregnant women) are favorable to outreach from the TBAs; in one study on TBAs in Haiti, most women reported wanting assistance from the TBAs. However, education of the TBAs is likely to change some of the customary practices surrounding delivery and postpartum care, such as treating the umbilical stump with charcoal or burned straw. Changes in practice may meet resistance from the recipients because the instructed techniques may differ from their traditional ways, but this has
not been documented. At this time, the program will service a mostly homogenous population of poor, rural, Haitian women.

Possible financial resources

The TBAs will be compensated with meals during training sessions. Those who successfully complete the program will receive a certificate of participation and a kit containing: gloves, soap, blood pressure cuff, urine test strips, fetoscope, self-inflating bag-and-mask, cord tape, tape measure, baby scale, thermometer, bulb syringes, maternity sanitary pads, gauze pads, and cotton caps, all of which will require significant financial resources. A local leader, serving as a program coordinator, will be compensated with a salary as well. Airfare and accommodations for trainers and evaluators will also be included in program costs.

Currently FHM is applying for a grant from the Bill and Melinda Gates Foundation. Additionally, travel scholarships from Duke University are being sought.

Technical feasibility

Adequately trained researchers from FHM will be available at the initiation of the education program, after which we will utilize a train-the-trainers model to provide in-country trainers for TBAs. These researchers will initially be responsible for most aspects of the program, from gathering the birth kit supplies to evaluation, but these responsibilities will ideally be transferred to the community leaders.

Measuring the effectiveness of this program will be a challenge. As of this point we have 14 TBAs registered, who each perform <20 deliveries per year. This will not allow us to measure outcomes such as mortality to a meaningful extent for some time. Powering studies to detect
these differences has been an issue in even large investigations. Intermediate outcomes, such as rates of infection and postpartum hemorrhage may be more feasible to measure in the short-term, and will be measured through community surveys.

**Stakeholders**

In addition to the women who will benefit from this program, the following stakeholders will serve an integral part of the program. FHM’s staff and in-country project coordinator are charged with developing and maintaining the quality of the program. Additional FHM research team members will be trained in conducting the evaluations of the TBAs, which will be an essential part of quality assurance. Community leaders also will invest time in promoting the program. The TBAs themselves are the most critical stakeholders of all, because the success of the program depends on their understanding of and performance after training.

**Theoretical Basis**

Our Haitian TBA education program does not fit neatly into a theoretical model due to the fact that the trained TBAs do not themselves experience the health benefits related to the training. Nevertheless, the education program does produce a health outcome, and the TBAs, as valued members of the community, are assumed to feel the need to improve the overall health of the community. The Health Belief Model is a theoretical model exploring people’s reasons for taking action to prevent, treat, or screen for disease. In our case, the TBAs will be acting to prevent morbidity and mortality of mothers and neonates. The model includes the constructs of perceived susceptibility, perceived severity, perceived benefits, perceived barriers, cues to action, and self-efficacy to explain health choices.
**Perceived Susceptibility**

The TBAs have a varying knowledge of the reasons for maternal and neonatal mortality. Most certainly know that mortality is possible during childbirth, but the extent to which it is known to be caused by biological and preventable causes is uncertain among TBAs. For example, among some who practice voodoo, there is superstition about having too much ‘light’ on the subject, and midwives perform complete deliveries and umbilical cord cutting underneath a sheet.\(^{23}\) The TBAs may completely lack knowledge of some fatal conditions. It is essential that the trainers realize this and are able to provide basic education on the causes of maternal mortality.

**Perceived Severity**

TBAs are much more likely to take action to prevent pregnancy complications if they believe the consequences of these complications are severe. TBAs likely are familiar with the consequences of mortality in a family, but may not be completely familiar with consequences of morbidity, such as a vaginal fistula, and may not connect certain conditions with risk of mortality. The educational curriculum should include information about possible consequences of these complications. We would hope that, though the consequences are not direct to the TBAs, they would feel obligated to prevent these consequences in the women in their community with whom they work.

**Perceived Benefits**

TBAs will be made aware of the benefits of decreased maternal and neonatal mortality and morbidity in the community, which include families with greater concern for preventative care for children, and less risk of a loss of a child under 12 years of age.\(^{24}\) The hope again is that
TBAs will perceive benefits to their community as a great enough impetus to change their behavior. Additionally, TBAs with good birth records will be more highly respected and their services requested in the community.

**Perceived Barriers**

Perceived barriers among TBAs include lack of resources, lack or difficulty of transportation in emergency settings, and lack of knowledge about a disease or risk of disease. The barrier of lack of resources will be addressed by giving TBAs who pass the course a safe delivery kit, to be resupplied when needed. The lack and difficulty of transportation is beginning to be addressed with FHM improvements in the community, such as new roads, but the best solution to this problem will come in a later stage of the project with the construction of a maternity hospital in Leogane equipped with an associated ambulance & all terrain vehicles.

**Cues to Action**

This construct refers to prompts that remind or encourage participants to take the recommended action. Strategies to activate the TBAs readiness will be practiced in the skills portion of the education sessions, so that when they are presented with a potentially life-threatening situation, they will respond appropriately.

**Self-Efficacy**

Self-efficacy is the confidence in one’s ability to take action. We anticipate that after completing the program and passing exams to an adequate level, the TBAs will have enough confidence in themselves and their skills to be able to practice them efficaciously. We will also
plan refresher courses after 1 year of practice, which will increase knowledge and confidence of the TBAs.

**Goals and Objectives**

**Goal:**
To reduce maternal and infant morbidity and mortality in the Leogane Commune.

**Short term objectives:**
By June 2011, the one chosen community leader will have completed the train the trainers program to be able to co-teach the curriculum.

By July 2011, at least 95% of TBAs will have completed the 4-week education program and be skills and knowledge competent at the 80% level.

By July 2012, birth registry and outcome data will be collected by the TBAs and effectiveness evaluation will be complete.

By August 2012, the FHM research team members in charge of evaluations will have completed evaluations on 100% of trained TBAs at 6 weeks, 6 mo, and 1 year post-education.

**Long term objectives:**
Within three years, the trained TBAs will have demonstrated competence at an 80% level after a refresher course.

Within three years, the referral rate from trained TBAs will be approximately 10%

Within three years, the postpartum infection rate will be <1%

Within five years, the case fatality rate will by <1% for mothers and neonates in Fondwa

Within five years, the original Haitian trainer will have trained an additional 3 trainers to begin TBA education programs in surrounding communities in the Leogane Commune

**Logic Model**

See Appendix, Figure 1
Implementation

The Family Health Ministries TBA education program is designed to give the TBAs of the Fondwa, Haiti knowledge and skills to safely deliver pregnancies. The ultimate goal of this program is to reduce maternal and neonatal mortality throughout Leogane, and, if successful, to expand this success to surrounding communities. The program will begin in the summer of 2011, and hopefully achieve sustainability and continue indefinitely. The overarching goal of FHM’s interventions in Leogane is to increase women’s access to and utilization of birth attendants with skills and knowledge of complications of labor, whether in the home or in a hospital.

Activities

Curriculum development

The curriculum for the FHM TBA education program will be unique in that it will be the first to teach TBAs to perform skills that are normally reserved for skilled birth attendants at an emergency obstetric care facility. Additionally, many of the TBAs are illiterate and innumerate, necessitating a curriculum that will accommodate with visual and verbal instruction. For these reasons, we will need to combine aspects of several programs. Our first step will be to collaborate with any NGOs in Haiti who have established TBA education programs. The NGO with an education program known to us at the moment is Partners in Health. We will contact this group to hopefully take advantage of their experience in and knowledge of training TBAs.

Two established programs for training home birth attendants are the American College of Nurse Midwives curriculum and the Helping Babies Breathe curriculum. We will take aspects from these curricula to make a comprehensive TBA training program.

The curriculum will cover these basic topics: 1) cleanliness, hand washing, and glove use; 2) pre-eclampsia, measuring blood pressure, measuring protein in the urine; 3) fetal heart
rate; 4) fetal position, breech birth, and shoulder dystocia; 5) neonatal resuscitation; 6) post partum hemorrhage; 7) umbilical cord care; 8) newborn/infant assessment; 9) post partum infection; 10) maternal tetanus vaccination; and 11) birth registry data.

Recruiting TBAs and recipients

Inclusion criteria for the TBAs will include women or men who currently work as TBAs for childbearing families in Fondwa, a part of the Leogane Commune. TBAs were recruited through word of mouth by a local Haitian nurse. Pregnant women (recipients) will be identified through surveys of the community every 3 months.

Education Program

The identified TBAs will participate in a 4 week education program co-taught by an identified community leader and the program developer. Training will be appropriate for the literacy level of the TBAs. TBAs who successfully complete the training will receive a safe delivery kit. Quality assurance measures include testing each TBA with a pre-test before beginning the education program and a post-test after completion. This test will be repeated at 6 weeks, 6 months, and one year post training. “Passing grade” will be 80%. FHM research team members will administer these oral tests. Continuing education: the TBAs will be invited back yearly for a refresher course and pre-and post-tests. At this point the TBAs will receive replacement supplies for their safe delivery kits.

Training trainers
A local leader will be identified by the in-country staff to be the co-leader for the TBA education program. A program leader from the US team will train the local leader in the essentials in a one-week program to familiarize her with the material and how to present it.

If this program is deemed successful at improving birth outcomes, the next step is to disseminate the program’s strategy through a train-the-trainers model. At this time the local leader identified in the first step will be able to conduct a one week education program similar to the one she received before beginning the program. Prior to initiating this train-the-trainers segment of the program, the initial local trainer will be evaluated in a TBA session to assess her preparedness to train additional trainers. Additional trainers will be identified by the local staff, and can be healthcare providers or TBAs.

**Resources**

Resources required for the function of this program include human, physical, and financial. Human resources required are an in-country program coordinator, a local leader, and the US staff working on applications and program assessment. Physical resources needed include safe delivery kits (to include: gloves, soap, blood pressure cuff, urine test strips, fetoscope, self-inflating bag-and-mask, cord tape, tape measure, baby scale, thermometer, bulb syringes, maternity sanitary pads, gauze pads and cotton caps), and education materials such as paper and printer, writing utensils, body models, and projector system. Financial resources required include plane fare for program leaders, salaries for the staff, compensation for TBA meals and for interpreters, and a salary for the local leader from FHM.

**Budget**
See table 2 (appendix) for an estimated budget for the initial 13 mo of the program.

**Timeline**
See table 3 (appendix) for a timeline for the first year of project implementation.
Strategies for Sustainability

The FHM TBA education program is expected to maintain moderate sustainability. As FHM continues its work in the Leogane Commune, including hospital construction, the education program can be expected to continue due to its modest use of resources and utilization of local staff. Important aspects of sustainability that must be considered to ensure that this program continues to function over time include a long-term vision and sustainability plan, results orientation, strategic funding, broad based community support, adaptability, and strong internal systems.

Vision

The overarching goal of the TBA education program is to make available trained TBAs to childbearing households until all births are taking place in a care facility. The construction of a nearby hospital is underway, but even after construction is completed, travel is so difficult and resources are so limited in this region that many women will continue to deliver at home. Therefore a reliable and continuing education program will be necessary in the area for some time. Continuing the train-the-trainers model will help quickly multiply the number of trained TBAs to cover more of the population and to develop a network of relationships between the TBAs and the new health center.

Results Orientation

Focusing on the results of reducing maternal and neonatal morbidity and mortality will keep everyone involved in the project working toward this goal. We will conduct frequent evaluations of progress which will help shape and refine the program for the best possible results.
Strategic Financing

FHM has some consistent financial backers in the United States, but sustaining this program may require additional resources. We will reapply to the Gates Grant, as well as search out additional non-profit organizations and international donors to keep the program funded.

Broad-based Community Support

In this area the program will excel, because the community has identified maternal mortality as one of their top priorities and almost all of the participants and staff for the program will be local. Still, it will be essential to monitor the community support and utilization of the program as it continues to grow.

Adaptability to Changing Conditions

FHM as a whole has already demonstrated its flexibility and adaptability to changing conditions in the months after the earthquake of Jan, 2010. For a few months, the organization changed from providing healthcare and preventative services to providing earthquake relief. Funding and staff utilization are very fluid, so changes to the system can be accomplished quickly. The program will need to be able to adapt to changes based on the results from the evaluation of the program, with the goal of improved quality of education and birth outcomes.

Internal Systems

FHM is an established organization in the Leogane Commune, having provided services for over 10 years. As a faith-based organization, the internal motivation is strong. The teams in the US and in Haiti work together well and complement the services of one another. The day-to-day operation of the TBA education program will mostly be run by the in-country staff,
supported by the US staff that works on the big picture projects, such as funding, evaluation and revision of the program.
EVALUATION PLAN

Rationale for the Evaluation

In evaluating this TBA education program we would like to determine its primary effectiveness in both educating TBAs and eventually improving birth outcomes, determine its ability to reach the target population in Fondwa, assess its acceptance and adoption by the community, evaluate its consistency and cost of implementation, and assess the maintenance of changes in the TBAs’ knowledge and skill over time. These evaluations will take place in a stepwise fashion over many years.

The primary evaluators in assessing the efficacy of the education curriculum will be the midwife who is the principal research investigator and myself. We determined that an internal evaluator would be appropriate at this stage of the investigation, due to the complex and very fluid nature of the program at this stage. We do see some of the problems with this approach, such as the potential for bias and the issues associated with the cultural barrier, but we feel that the need for an internal evaluator outweighs these problems. We did investigate the option of an external evaluator—a preferably Haitian medical professional who would have time to invest in learning the intricacies of the program and the exact skills needed for evaluation—but no person such as this is forthcoming. Later in the life of the program we hope to transfer some of the evaluation duties to an external evaluator.

The evaluators will need to have skill sets for each stage of the evaluation. For the educational programming evaluation, the evaluators will need to know how to administer the pre- and post-tests. The pre- and post-tests are evaluations of the knowledge and skills of the TBAs, so the evaluators will need to know the correct answers and techniques for skills in order
to assess the efficacy of the education program. For example, the evaluators will need to know
the proper technique for determining the position of the fetus, and additionally be able to actually
determine the position themselves through the gold standard of fetal ultrasound. We are currently
in the process of acquiring the skills to accurately evaluate the TBAs. For the second part of the
evaluation, evaluators will need to know how to assess for maternal and neonatal mortality and
morbidity. This involves skills in implementing a survey, the exact type depending on the
method chosen to determine morbidity and mortality. Throughout the evaluation process, the
evaluators must have the skills of adaptability and cultural sensitivity.

The key stakeholders in this program are the FHM staff and investigators, the community
and community leaders, the funders, and the TBAs themselves. Key questions from the FHM
staff are: what did the TBAs learn from the program, was what the matriculation rate, which
activities were delivered and were they delivered as planned, how the program can be improved,
and were there any unintended outcomes. Community leaders will ask: how many women were
reached by the trained TBAs, how did participants find out about the services, and how did the
project impact the community. The funders will ask: does the program work, how were funds
used and were they used effectively, and how can the program be improved. The TBAs will ask:
did the education improve their birth outcomes, are they satisfied with the program, and what
parts of the program worked well and what parts didn’t work well. All stakeholders will be
interested in knowing whether or not the program reduces mortality and improves the health
status of the community.

We anticipate some challenges to this evaluation. Firstly, the TBAs are mostly or totally
illiterate, so evaluating their knowledge will not be as straightforward as a written test. Also, the
TBAs will be requested to provide some of the data on birth outcomes, and this data is subject to
bias. The use of internal evaluators might also be suspect for introducing bias in the results. Additionally, assessing maternal and neonatal mortality is a very difficult process, and it is likely we will go through several methods of collecting this data before settling on the best approach.

**Approach to the Evaluation**

As the overarching goal of this program is to reduce maternal and neonatal mortality in Fondwa, the principal focus of the evaluation will be to determine if this TBA educational program has contributed to a reduction in mortality. All evaluations that take place for this project should keep this focus. Each step leading to this goal, even each education session, also needs to be evaluated, so each step may be adjusted for better efficacy in working toward reduced mortality rates.

**Evaluation Design**

In evaluating the Haitian TBA education program we will use Kirkpatrick’s Four Levels of Training Evaluation structure as a model.\(^{26}\) To accomplish this, we will use two recognized evaluation designs: one group pre- and post-test, and the other prospective cohort study.

*One group pre- and post-test*

Before beginning the education program we will give the TBAs a test of their knowledge and skill. Our purpose with this pretest is to have baseline comparison data with which we can compare individual post-test performance. We will look at both individual and group data to measure improvement in these areas. The amount of improvement from pre- to post- test will determine the efficacy of our instruction and curriculum in teaching the TBAs what we have determined is proper knowledge and skill for delivery.
One benefit of using the pre-and post-test design is that data can easily be analyzed for indications of the amount of change in participants. This allows for comparisons at the individual as well as population level. The outcome of whether or not the participants improved is easy to understand and to calculate with pre-and post-test data. Disadvantages of using this design in this setting are that, because of the low literacy levels of the TBAs, these tests will have to be scripted and verbally administered, which may be very difficult. This will increase the time and resources devoted to each test. There is also risk of a testing effect, in which the process of being involved in providing the pre-test data affects the post-test data, though we do not anticipate this will be a problem in our situation. One risk that we are wary of is instrumentation, in which differences in collecting the pre- vs. post-test data may account for differences in the outcomes. We are aware of this and have taken steps to ensure that this is not a problem (e.g. same evaluators, same exact test used for both).

Two-group prospective cohort study

We will use the prospective cohort study to determine whether the TBA education program is effective in producing the results that we desire, i.e. decreasing neonatal and maternal mortality. This step is essential in program evaluation to determine whether the program is effective in producing impact in our main long term objective in decreasing mortality. In order to determine impact, we will compare the trends in mortality in regions without the intervention to the trends in mortality in the regions with the intervention. Utilizing unblinded, nonrandomized comparison groups is the most rigorous study approach available to us at this time, and is a more thorough technique than many other studies of the effect of TBA training.
Advantages to the prospective cohort study are that data can be collected on key variables from members of the groups before the beginning of the intervention and after exposure to the program. Also, the design allows comparison between two groups, instead of simply before-and-after. Disadvantages to this design are the extended follow up period, which is especially difficult in unstable living environments, and the cost of time and resources associated with an intense and prolonged study.

Evaluation Methods

In evaluating this program we will attempt to assess all four components in the Kirkpatrick’s Four Levels of Training Evaluation. We will address: reaction, learning, behavior, and results.

Reaction to the TBA training program will be assessed by questioning the TBAs in a focus-group setting about if they enjoyed the training and if they considered it relevant and a good use of their time. We will also seek feedback on how to improve the course for the future. This will take place in qualitative interviews several weeks after the initial education sessions to get feedback on whether the training program was applicable to the TBAs’ work environments.

Learning of the TBAs in the program will be assessed through pre-and post-tests to determine whether they increased knowledge and skills in delivery practices. The pre-and post-tests will be conducted through both quantitative and qualitative data collection. This will allow us to determine whether the trainees learned what we intended to teach them.

We will assess behavior changes of the TBAs by speaking to the women of the community in focus group settings. We will ask through open-ended and closed-ended interview
questions what the birth practices of the trained TBAs are like out in the community setting, and whether the women of the community are satisfied with their behavior.

Results of the training will be assessed through the prospective cohort study. We will survey the randomly selected houses of the community to determine the initial maternal and neonatal mortality rate of the area, and to determine the rates of several indicators. While doing this we will GPS map the homes, and compare their location to the location of the service of the trained TBAs. After one year we will repeat the survey and compare the mortality and indicator data in areas that are serviced by the trained TBAs vs. areas that are not. We do not expect the mortality data to show improvement very quickly, but as the years progress we expect a decrease in the areas serviced by the trained TBAs.

**Evaluation Planning Tables**

Short Term Objective #1
By June 2011, the one chosen community leader will have completed the train the trainers program to be able to co-teach the curriculum.

<table>
<thead>
<tr>
<th>Evaluation Question</th>
<th>Participant</th>
<th>Evaluation Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>Have the program director and community leader completed the training? If no, why not?</td>
<td>Community leader and program director</td>
<td>Open-ended interviews</td>
</tr>
<tr>
<td>How much time did it take for the leader to learn and be able to teach the program, and was it the proper amount of time?</td>
<td>Community leader and program director</td>
<td>Open-ended interviews</td>
</tr>
<tr>
<td>Was the train-the-trainers method effective?</td>
<td>Community leader and program director</td>
<td>Open-ended interviews</td>
</tr>
<tr>
<td>Is the community leader able to correctly co-teach the program?</td>
<td>Community leader</td>
<td>Observation of teaching skills</td>
</tr>
<tr>
<td>Did anything unexpected happen?</td>
<td>Community leader and program director</td>
<td>Open-ended interviews</td>
</tr>
</tbody>
</table>

Short Term Objective #2
By July 2011, at least 95% of TBAs will have completed the 4-week training program and be skills and knowledge competent at the 80% level.

<table>
<thead>
<tr>
<th>Evaluation Question</th>
<th>Participant</th>
<th>Evaluation Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>Did 95% of TBAs complete the training after 4 weeks? If no, why not?</td>
<td>TBAs, trainers</td>
<td>Document review</td>
</tr>
<tr>
<td>What knowledge and skills have the TBAs learned in the program compared to their baseline?</td>
<td>TBAs, evaluators</td>
<td>Pre-and post-tests</td>
</tr>
<tr>
<td>Did the trainees like and enjoy the training?</td>
<td>TBAs</td>
<td>Open-ended interview</td>
</tr>
<tr>
<td>How appropriate was the length of the training?</td>
<td>TBAs, trainers</td>
<td>Open-ended interview</td>
</tr>
<tr>
<td>How understandable was the information presented to illiterate and innumerate TBAs?</td>
<td>TBAs</td>
<td>Open-ended interview</td>
</tr>
<tr>
<td>Did anything unexpected happen during the training?</td>
<td>TBAs, trainers</td>
<td>Open-ended interview</td>
</tr>
<tr>
<td>Were the TBAs satisfied with the program?</td>
<td>TBAs</td>
<td>Open-ended interview</td>
</tr>
<tr>
<td>Were the trainers satisfied with the program?</td>
<td>Trainers</td>
<td>Open-ended interview</td>
</tr>
<tr>
<td>How can the program be improved?</td>
<td>TBAs, trainers</td>
<td>Open-ended interview</td>
</tr>
</tbody>
</table>

Short Term Objective #3
By July 2012, birth registry and outcome data will be collected by the TBAs and effectiveness evaluation will be complete.

<table>
<thead>
<tr>
<th>Evaluation Question</th>
<th>Participant</th>
<th>Evaluation Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>Did the TBAs collect birth registry and outcome data by 2012?</td>
<td>TBAs</td>
<td>Document review</td>
</tr>
<tr>
<td>How well was the data collected?</td>
<td>TBAs, evaluators</td>
<td>Document review, open ended interview</td>
</tr>
<tr>
<td>Is the evaluation of these outcome data complete?</td>
<td>Evaluators</td>
<td>Document review</td>
</tr>
<tr>
<td>How many women were reached by the TBAs?</td>
<td>TBAs, women of community</td>
<td>Document review</td>
</tr>
<tr>
<td>Are women of the community satisfied with the TBA training and outcomes?</td>
<td>Women of community</td>
<td>Focus groups</td>
</tr>
</tbody>
</table>
How may this data collection process be improved?

TBAs, evaluators

Open-ended interview

Short term objective #4
By August 2012, the FHM research team members in charge of evaluations will have completed evaluations on 100% of trained TBAs at 6 weeks, 6 mo, and 1 year post-education.

<table>
<thead>
<tr>
<th>Evaluation Question</th>
<th>Participant</th>
<th>Evaluation Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>Were the evaluations completed on time?</td>
<td>TBAs, evaluators</td>
<td>Document review</td>
</tr>
<tr>
<td>What percentage of the trained TBAs were evaluated?</td>
<td>Evaluators</td>
<td>Document review</td>
</tr>
<tr>
<td>Were the evaluations successful in assessing the change in knowledge and skill level of the TBAs?</td>
<td>TBAs, evaluators</td>
<td>Focus groups, document review</td>
</tr>
<tr>
<td>Were the evaluations completed in a time- and cost-effective manner?</td>
<td>Evaluators</td>
<td>Document review, budgetary review</td>
</tr>
</tbody>
</table>

Long term objective #1
Within three years, the trained TBAs will have demonstrated competence at an 80% level after a refresher course

<table>
<thead>
<tr>
<th>Evaluation Question</th>
<th>Participant</th>
<th>Evaluation Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>Was a refresher course completed within three years? If no, why not?</td>
<td>TBAs, trainers</td>
<td>Open-ended interviews</td>
</tr>
<tr>
<td>What was the competency level of TBAs before and after the refresher course?</td>
<td>TBAs, evaluators</td>
<td>Pre- and post-tests</td>
</tr>
<tr>
<td>How well did the community leader teach the refresher course?</td>
<td>Community leader, TBAs</td>
<td>Observation, open-ended interviews</td>
</tr>
<tr>
<td>How effective was the refresher course in improving birth outcomes?</td>
<td>TBAs, evaluators, community women</td>
<td>Open-ended interviews, Document review</td>
</tr>
</tbody>
</table>

Long term objective #2
Within three years, the referral rate from trained TBAs will be approximately 10%

<table>
<thead>
<tr>
<th>Evaluation Question</th>
<th>Participant</th>
<th>Evaluation Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>What is the referral rate from TBAs, referral centers</td>
<td>Document review</td>
<td></td>
</tr>
<tr>
<td>Evaluation Question</td>
<td>Participant</td>
<td>Evaluation Method</td>
</tr>
<tr>
<td>-----------------------------------------------------------------------------------</td>
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<td>-----------------------------------</td>
</tr>
<tr>
<td>What is the postpartum infection rate within 3 years for mothers and neonates in Fondwa?</td>
<td>Community mothers, evaluators</td>
<td>Document review of community surveys</td>
</tr>
<tr>
<td>How has this changed from baseline?</td>
<td>Community mothers, evaluators</td>
<td>Document review of community surveys</td>
</tr>
<tr>
<td>Why has the postpartum infection rate changed, if at all?</td>
<td>Community mothers, evaluators, TBAs</td>
<td>Open-ended interview</td>
</tr>
<tr>
<td>Did the postpartum infection rate lead to maternal or neonatal deaths?</td>
<td>Evaluators</td>
<td>Document review</td>
</tr>
<tr>
<td>How was this data collected, and was it effective?</td>
<td>TBAs, evaluators</td>
<td>Open-ended interview</td>
</tr>
</tbody>
</table>

Long term objective #4
Within five years, the case fatality rate will be <1% for mothers and neonates in Fondwa

<table>
<thead>
<tr>
<th>Evaluation Question</th>
<th>Participant</th>
<th>Evaluation Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>What is the case fatality rate after 5 years for mothers and neonates in Fondwa?</td>
<td>Community mothers, evaluators</td>
<td>Document review of community surveys</td>
</tr>
<tr>
<td>How has this changed from baseline?</td>
<td>Community mothers, evaluators</td>
<td>Document review of community surveys</td>
</tr>
<tr>
<td>Why has the case fatality rate changed, if at all?</td>
<td>Community mothers, evaluators, TBAs</td>
<td>Open-ended interview</td>
</tr>
<tr>
<td>How was this data collected, and was it effective?</td>
<td>TBAs, evaluators</td>
<td>Open-ended interview</td>
</tr>
</tbody>
</table>

Long term objective #5
Within five years, the original Haitian trainer will have trained an additional 3 trainers to begin TBA education programs in surrounding communities in the Leogane Commune.

<table>
<thead>
<tr>
<th>Evaluation Question</th>
<th>Participant</th>
<th>Evaluation Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>Has the original trainer trained additional trainers? How many?</td>
<td>Original trainer, new trainers, program leaders</td>
<td>Open-ended interview</td>
</tr>
<tr>
<td>How have these additional trainers been trained?</td>
<td>Original trainer, new trainers, program leaders</td>
<td>Open-ended interview</td>
</tr>
<tr>
<td>How well have the new trainers learned the curriculum?</td>
<td>New trainers, program leaders, evaluators</td>
<td>Observation, pre-and post-tests</td>
</tr>
</tbody>
</table>

**Dissemination Plan**

Dissemination of the results of our program evaluation is essential for 1) improving the program itself, and 2) improving the broader knowledge base from which other similar programs can draw. The many stakeholders in the program have an interest in its continued success and we will respond by sharing all of the evaluation results with them.

Our plan for dissemination begins immediately after the initial TBA education session of four weeks. We will meet with the women’s group in Leogane to discuss the successes and difficulties of the 4-week education program, discuss our planned changes, and gather feedback from them on suggestions for improvement. We will also analyze data from the pre- and post-tests to determine if the program was successful in educating the TBAs, and with these results disseminate information on the effectiveness of this specific education program to stakeholders, including: FHM staff and investigators, the community and community leaders, the funders, and the TBAs themselves. Dissemination of information to FHM and funders will take place in debriefing meetings and a written report after the conclusion of one year of the program. The community and TBAs will be explained the results of the study through community meetings.
and focus groups, in which we will hope to get directed feedback. We will also write and submit an article to an international obstetrics journal detailing the program and its effectiveness.

Eventually, our plan is to analyze mortality data in areas with the program compared to those without. This information will help us assess whether the program is successful in achieving its overarching goal of decreasing mortality in the area. Once this data is analyzed, we will meet and communicate with community groups and funders to share the news about the program. We will also disseminate the results of the program in a global health journal article, whether results are positive or negative. If the program shows success, our hope is to broaden the program to more rural communities in Haiti by utilizing community leaders to train other leaders to teach the program.
DISCUSSION

The maternal mortality crisis continues in many countries around the world despite increasing worldwide attention to the problem. The situation in Haiti remains the worst of all its neighbors, and though it has seen modest reductions in its MMR in the last few years, it is not near achieving the MDG goal of 75% reduction of MMR by 2015.\(^\text{17}\) We know severe bleeding, hypertensive diseases, obstructed labor, abortions, and sepsis are the five most common causes of maternal mortality in Latin America and the Caribbean,\(^\text{2}\) and that most instances of maternal mortality cannot be predicted or prevented prenatally.\(^\text{3}\) Also, the prohibitive nature of the terrain and cost of travel prevent many Haitian women from seeking care at a hospital, even during complicated labor. For these reasons, we believe that this educational program for the TBAs of Fondwa, which focuses on safe delivery, emergency care and referrals, will positively impact maternal and neonatal mortality rates and increase awareness of safe delivery practices in the community.

The literature review was very useful to review strengths and weaknesses of other similar programs. One lesson learned from the systematic review was the importance of planning a program with evaluation in mind. It is very difficult to keep programs rigorous enough for evaluation if it is not built into the program plan. This involves setting goals and measurable objectives early in the planning stages of the program. We did look at several ways to evaluate the program early in development, which will allow us to draw stronger conclusions than if we had added on an evaluation plan as an afterthought. Another lesson learned, however, was the difficulty of assessing for maternal mortality. For example, one study with thousands of participants did not find a significant difference before and after implementation of the training program. Though we had planned on measuring maternal mortality as one of our major
outcomes, we learned to be flexible and reasonable in our expectations for this relatively small study.

Additionally, one helpful suggestion from the literature review was that community education could be provided by the TBAs. If we find motivated TBAs who are interested in teaching laypeople about pregnancy and birth, this could be very beneficial to the acceptance of the program in the community, and will contribute to improving the health of the community.

If our education program is successful, it will be the first program of its kind among TBAs. The subject matter is much more complex and training period longer than what was presented in the reports of other training programs. This program also has the potential to be cost-effective and sustainable, once it is transferred to the Haitian community leaders. The collaboration between the funders of FHM and local leaders is a step toward sustainability. If the program shows success, we plan to spread the program’s influence by expanding the train-the-trainers program to other sites.

Future suggestions for the program include greater collaboration with the other NGOs in the country that train TBAs, educating the TBAs in registering births with the governmental birth certificate (contributing to better reporting of births and deaths for national data), and training the TBAs in educating the community members about safe pregnancies and births. Eventually, we hope that the program can be completely Haitian-run, with support from a stronger local infrastructure.

There is potential for great progress in maternal health in Haiti, and we are hopeful that this program will improve maternal and neonatal birth outcomes in the area of Fondwa. Challenges to the success of this program will always be present, but with careful planning and
strong direction the program will have a well grounded beginning. Considering the recommendations presented here, and using a bit of tenacity, the program can set a trajectory to contribute to better health of mothers and babies in Fondwa well into the future.
Acknowledgements

This program plan is based on a plan formulated by Marnie Cooper-Priest (CPM) and developed further by a research team from FHM, to which I contributed. I wish to thank Marnie for her collaboration and friendship. I also want to thank Dr. David Walmer, who served as my research mentor this last year, for his guidance in developing this project and for helping me with this paper. Other contributing members of the FHM research team are Nicole Tinfo, Rachel Peragallo, Elizabeth Livingston, and Lauren Knelson. Thank you all very much! I am also greatly indebted to Diane Calleson and Pam Dickens for their help and guidance in developing and writing this program plan.
References

20. USAID. MCH Program Description. 2008.
27. Issel M. Health Program Planning and Evaluation: A practical, systematic approach for community health. Sudbury, MA: Jones and Bartlett; 2009.
Table 1: Summary of programs comparable to the FHM TBA Education Program

<table>
<thead>
<tr>
<th>Program</th>
<th>Goals</th>
<th>Implementation</th>
<th>Training Elements</th>
<th>Evaluation</th>
<th>Outcomes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bang et al. (1999). Effect of home-based neonatal care and management of sepsis on neonatal mortality: field trial in rural India.</td>
<td>Test effectiveness of a home-based neonatal care package to decrease neonatal mortality</td>
<td>Village healthworkers trained in neonatal care made home visits with assistance from TBAs</td>
<td>take histories of pregnant women, observe the process of labor, examine neonates, and record findings; birth asphyxia, premature birth or low birthweight, hypothermia, and breast-feeding problems, recognition and treatment of neonatal sepsis.</td>
<td>Neonatal, infant, and perinatal mortality rates in the intervention area (net percentage reduction) compared with the control area, were 25.5 (62.2%), 38.8 (45.7%), and 47.8 (71.0%), respectively (p&lt;0.001). Case fatality in neonatal sepsis declined from 16.6% (163 cases) before treatment, to 2.8% (71 cases) after treatment by village health workers (p&lt;0.01).</td>
<td>Neonatal, infant, and perinatal mortality rates and fatality from neonatal sepsis</td>
</tr>
<tr>
<td>Bullough et al (1989). Early suckling and postpartum haemorrhage: controlled trial in deliveries by traditional birth attendants.</td>
<td>Train previously-trained TBAs with additional information on suckling to determine whether this would decrease postpartum hemorrhage</td>
<td>In central region of Malawi, TBAs receive 4 wk training. This study trained a portion of these TBAs with additional information on suckling</td>
<td>Additional training: Management of third stage of labor, blood loss at delivery; immediate suckling after delivery, referral for third stage complications</td>
<td>Frequency of PPH between suckling and non-suckling groups</td>
<td>No significant difference between the groups (suckling 7.9% vs control 17.8%; p&gt;0.6 by chi sq test)</td>
</tr>
<tr>
<td>Dickerson et al. (2010). Pregnancy and Village Outreach Tibet: A descriptive report of a community-and home-based maternal-newborn outreach program in rural Tibet</td>
<td>Train outreach providers to outreach the homes of rural-living Tibetan women, to relay health information to eventually improve birth outcomes</td>
<td>The program is based on a training-of-trainers model in which experienced master trainers employed by One HEART train rural healthcare workers and laypersons (called outreach providers) to outreach the homes of rural-living Tibetan women and families (called outreach recipients). During outreach, providers relay maternal-newborn health education, hands-on skills training, and material resources directly to recipients.</td>
<td>Antepartum and postpartum care seeking, nutrition, birth planning and danger sign recognition, clean delivery, Prevention of: PPH, birth asphyxia, hypothermia, hypoglycemia, umbilical cord care, postnatal care</td>
<td>% of pregnant women who received outreach, and characteristics of outreach to these women</td>
<td>&gt; 90% reported 2 or more outreach visits. &gt; 92% of outreach recipients reported receiving safe pregnancy and birth education, clean birthing skills training, uterine massage skills training, and clean umbilical cord care training. Nearly 80% reported basic newborn resuscitation skills training. Nearly 100% of outreach recipients were given maternal micronutrient supplements and safe and clean birth kits.</td>
</tr>
<tr>
<td>Goodburn et al.</td>
<td>Compare clean</td>
<td>Local NGO (BRAC) training of “Three cleans”: hand-washing with</td>
<td>Measures: %</td>
<td>Trained TBAs &gt;2x more likely to perform</td>
<td></td>
</tr>
<tr>
<td>Year</td>
<td>Authors</td>
<td>Intervention</td>
<td>Methods</td>
<td>Measures</td>
<td></td>
</tr>
<tr>
<td>------------</td>
<td>----------------------------------</td>
<td>------------------------------------------------------------------------------</td>
<td>-------------------------------------------------------------------------</td>
<td>-------------------------------------------------------------------------</td>
<td></td>
</tr>
<tr>
<td>2000</td>
<td>Jokhio et al.</td>
<td>Training of TBAs in 3 intervention subdistricts, providing them with safe-delivery kits, and links with the established health care system</td>
<td>Training and provision of resources</td>
<td>Perinatal mortality: OR 0.70 (95% CI 0.59-0.82)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Maternal mortality: OR 0.74 (95% CI 0.45-1.23)</td>
<td></td>
</tr>
<tr>
<td>2005</td>
<td>Jokhio et al.</td>
<td>Reduce maternal and neonatal mortality in rural district of Pakistan, through TBA training and provision of resources</td>
<td>Training of pregnant women who had delivered with a TBA, both trained and not trained</td>
<td>Perinatal mortality: OR 0.70 (95% CI 0.59-0.82)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Comparison of infection rates between TBA and non-trained TBA deliveries: not significant</td>
<td>Maternal mortality: OR 0.74 (95% CI 0.45-1.23)</td>
<td></td>
</tr>
</tbody>
</table>

- **Training Traditional birth attendants in clean delivery does not prevent postpartum infection.**
- **Soap, clean cord care, clean surface**
- **Genital tract infection in TBA and nontrained TBA delivered women, clean and not clean delivery.**
- **Clean delivery (45.0 vs 19.3% p<0.001)**
### Table 2: Program Budget

**Budget Period:** May 1, 2011-May 31, 2012 (13 mo)

<table>
<thead>
<tr>
<th>Item</th>
<th>Details</th>
<th>Approx cost</th>
<th>Quantity</th>
<th>Totals</th>
</tr>
</thead>
<tbody>
<tr>
<td>Plane fare</td>
<td>round trips for program leaders</td>
<td>$ 800.00 per ticket</td>
<td>5</td>
<td>$ 4,000.00</td>
</tr>
<tr>
<td>In country travel</td>
<td>Port-Au-Prince to Fondwa, per trip</td>
<td>$ 175.00 per round trip</td>
<td>5</td>
<td>$ 875.00</td>
</tr>
<tr>
<td></td>
<td>40 miles</td>
<td>$ -</td>
<td></td>
<td>$ -</td>
</tr>
<tr>
<td></td>
<td>van</td>
<td>$ 150.00</td>
<td></td>
<td>$ -</td>
</tr>
<tr>
<td></td>
<td>checked bags</td>
<td>$ 60.00</td>
<td>3</td>
<td>$ 180.00</td>
</tr>
</tbody>
</table>

**Total travel** $ 5,055.00

<p>| Safe Birthing Kits            | Blood pressure cuffs                        | $ 210.00 per TBA | 15      | $ 3,150.00 |
|                               | Stethoscopes                                 |               |         |           |
|                               | Fetoscopes or Pinnard Horns                  |               |         |           |
|                               | Retractable tape measures                    |               |         |           |
|                               | Hanging baby scales 12#                      |               |         |           |
|                               | D ring flannel/cotton slings (for hanging baby scales) |     |         |           |
|                               | Bag and mask, Resuscitator Disposable Infant Mercury® |     |         |           |
|                               | Urine test strips (protein)                  |               |         |           |
|                               | Bulb syringes                                |               |         |           |
|                               | Gloves, nitrile powder-free sterile singles, Sm, Med, Lg |     |         |           |
|                               | Oral digital thermometers                    |               |         |           |
|                               | Maternity sanitary pads                      |               |         |           |
|                               | 3X3 Gauze pads (uncoated), sterile           |               |         |           |
|                               | Newborn cotton caps                          |               |         |           |
|                               | Paper cups for urine                         |               |         |           |
|                               | Cord tape                                    |               |         |           |
|                               | Razor blades (individually wrapped)          |               |         |           |</p>
<table>
<thead>
<tr>
<th>Description</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Birth bags</td>
<td></td>
</tr>
<tr>
<td>Training equipment</td>
<td></td>
</tr>
<tr>
<td>Posters</td>
<td>$20.00</td>
</tr>
<tr>
<td>Videos</td>
<td>$40.00</td>
</tr>
<tr>
<td>Total Equipment</td>
<td>$3,290.00</td>
</tr>
<tr>
<td>Office Supplies</td>
<td></td>
</tr>
<tr>
<td>copy paper</td>
<td>$50.00</td>
</tr>
<tr>
<td>writing utensils</td>
<td></td>
</tr>
<tr>
<td>printing ink</td>
<td></td>
</tr>
<tr>
<td>Total supplies</td>
<td>$100.00</td>
</tr>
<tr>
<td>Personnel</td>
<td></td>
</tr>
<tr>
<td>community leader</td>
<td>$25.00</td>
</tr>
<tr>
<td>compensation</td>
<td></td>
</tr>
<tr>
<td>TBA compensation</td>
<td>$10.00</td>
</tr>
<tr>
<td>Interpreters</td>
<td>$30.00</td>
</tr>
<tr>
<td>Interpreters</td>
<td>$30.00</td>
</tr>
<tr>
<td>Total Personnel</td>
<td>$2,000.00</td>
</tr>
<tr>
<td>Other</td>
<td></td>
</tr>
<tr>
<td>communications</td>
<td></td>
</tr>
<tr>
<td>cell phone plan</td>
<td>$80.00</td>
</tr>
<tr>
<td>internet</td>
<td>$5.00</td>
</tr>
<tr>
<td>Daily costs</td>
<td></td>
</tr>
<tr>
<td>room and board</td>
<td>$35.00</td>
</tr>
<tr>
<td>Total Other</td>
<td>$3,285.00</td>
</tr>
<tr>
<td>TOTAL COST</td>
<td>$13,630.00</td>
</tr>
</tbody>
</table>
Table 3: Timeline

<table>
<thead>
<tr>
<th>Activity</th>
<th>Staff involved</th>
<th>Dates</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grant applications</td>
<td>FHM US staff</td>
<td>Jan 2011-Mar 2011</td>
</tr>
<tr>
<td>Curriculum Development</td>
<td>Program Leaders</td>
<td>Oct 2010-Mar 2011</td>
</tr>
<tr>
<td>Recruitment of TBAs</td>
<td>In-country staff</td>
<td>Feb 2011</td>
</tr>
<tr>
<td>Recruitment/training of local leader</td>
<td>In-country staff, program leader</td>
<td>Mar/May 2011</td>
</tr>
<tr>
<td>Initial Training</td>
<td>Program Leader and local leader</td>
<td>May 2011</td>
</tr>
<tr>
<td>Quality assurance</td>
<td>Program Evaluators</td>
<td>May 2011, July 2011, Nov 2011</td>
</tr>
<tr>
<td>Refresher courses</td>
<td>Local leaders</td>
<td>Yearly, starting in 2012</td>
</tr>
<tr>
<td>Training trainers</td>
<td>Local leaders</td>
<td>May 2012</td>
</tr>
</tbody>
</table>
Figure 1: Logic Model

<table>
<thead>
<tr>
<th>Resources</th>
<th>Activities</th>
<th>Outputs</th>
<th>Short term outcomes</th>
<th>Long term outcomes</th>
<th>Impact</th>
</tr>
</thead>
<tbody>
<tr>
<td>In order to accomplish our set of activities we will need the following:</td>
<td>In order to address our problem or asset we will conduct the following activities:</td>
<td>We expect that once completed or under way these activities will produce the following evidence of service delivery:</td>
<td>We expect that if completed or ongoing these activities will lead to the following changes in 1–3 years:</td>
<td>We expect that if completed or ongoing these activities will lead to the following changes 3-5 years</td>
<td>We expect that if completed these activities will lead to the following changes in 7–10 years:</td>
</tr>
<tr>
<td>TBAs willing to be trained</td>
<td>Hold focus groups to recruit TBAs</td>
<td># of TBAs who agree to be trained</td>
<td>the community leader will have completed the train the trainers program to be able to co-teach the curriculum.</td>
<td>referral rate from trained TBAs will be approximately 10%</td>
<td>Increased awareness in the community of necessity of safe delivery</td>
</tr>
<tr>
<td>Trainers</td>
<td>Identify a community leader who is of good standing</td>
<td>One community leader trained to oversee project</td>
<td>Successful application</td>
<td>postpartum infection rate will be &lt;1%</td>
<td>Reduced maternal mortality</td>
</tr>
<tr>
<td>Community leader</td>
<td>Write grant.</td>
<td>Completed grant</td>
<td>100% of TBAs will have completed the 4-week training program and be skills and knowledge competent at the 80% level.</td>
<td>Within five years, the case fatality rate will be &lt;1% for mothers and neonates in Leogane commune</td>
<td>Reduced neonatal mortality</td>
</tr>
<tr>
<td>FHM support staff</td>
<td>Use focus groups and birth registries to gather preliminary data</td>
<td>Amount of preliminary data</td>
<td>the evaluators will have completed evaluations on 100% of trained TBAs at 6 weeks, 6 mo, and 1 year post-training.</td>
<td>the original Haitian trainer will have trained an additional 3 trainers to begin TBA training programs in surrounding communities in the Leogane Commune</td>
<td>Reduced morbidity</td>
</tr>
<tr>
<td>Financial support</td>
<td>Write Curriculum</td>
<td>Completed curriculum</td>
<td>100% trained TBAs will have demonstrated competence at an 80% level after a refresher course</td>
<td>100% trained TBAs will have demonstrated competence at an 80% level after a refresher course</td>
<td>Strengthening collaboration between NGOs in Haiti</td>
</tr>
<tr>
<td>Preliminary data on birth practices and outcomes for TBAs in the Leogane commune</td>
<td>Train TBAs in 4 week curriculum</td>
<td># TBAs completed training</td>
<td>preliminary data for program evaluation will be collected by the TBAs</td>
<td>Sustainable TBA training program</td>
<td>Sustainable TBA training program</td>
</tr>
<tr>
<td>Evaluators</td>
<td>Evaluate knowledge and skills of TBAs before and after training</td>
<td>Scores of TBAs in evaluations immediately post-training, 6 weeks, 6 mo, and 1 year post</td>
<td></td>
<td>100% trained TBAs will have demonstrated competence at an 80% level after a refresher course</td>
<td>Improved birth outcomes for deliveries performed by TBAs</td>
</tr>
<tr>
<td>Collaborate with other NGOs and Haitian Government</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>