Que Vivan Las Madres: Scaling Up an Integrated Approach to Reduce Maternal and Perinatal Mortality in Northern Guatemala

Section I

Our Idea

We propose to scale up a groundbreaking collaborative intervention to decrease maternal and neonatal mortality in Guatemala's Northern departments, integrating: 1) a low cost simulation-based training program (PRONTO) using a low-tech birth simulator (PartoPants™) to teach provider teams emergency management during childbirth, 2) a research-driven social marketing campaign encouraging women to give birth in clinics rather than at home, and 3) professional midwife liaisons charged with connecting traditional birth attendants to the formal health care system. We expect this effort will catalyze critical practice changes in maternal and newborn care and increase the proportion of births attended in clinics, thereby saving mothers' and newborns' lives in indigenous communities. This project is a joint effort of the Center for Epidemiologic Research in Sexual and Reproductive Health (CIESAR), PRONTO International, and the University of Washington (UW). Additional primary project partners include the Guatemalan Ministry of Health (MOH), the Professional Midwifery School with an Intercultural Focus (PPEI), and APROFAM, with secondary support provided by a network of non-profit community-based health service providers (PEC) and ALAS Guatemala.

Our idea represents a creative and unconventional approach to improving childbirth outcomes because it combines several evidence-based strategies that work together synergistically to attack a difficult problem. Guatemala has one of the highest national maternal mortality ratios in Latin America at 149 per 100,000 live births,[1,2] Guatemala's northern departments are known as the "corridor of death" for their extremely high maternal mortality ratios: up to 260 per 100,000 in some northern departments.[2] Neonatal mortality is also unacceptably high, at 23 per 1000 nationwide[3] and 52 per 1000 in the rural north.[4] 75% of neonatal deaths in Guatemala occur during the early neonatal* period.[5] Although skilled birth attendance is critical to saving women's and babies' lives, only 31% of deliveries in Guatemala have a skilled birth attendant present.[6] Since early 2004 the Guatemalan government, with help from the World Bank, has invested heavily in building and updating clinics with capacity to attend deliveries 24 hours per day in the rural north, increasing the number of facilities from 11 to 63 in four departments: Alta Verapaz, Huehuetenango, Quiché, and San Marcos. It was expected that by providing increased access to institutional birth, rates of maternal and neonatal mortality would decrease.

Unfortunately, as of 2012, there was no observed decrease in maternal or newborn death. This is likely due to a number of factors, including the limited capacity of personnel within the clinics to handle obstetric and neonatal emergencies, lack of a critical mass of mothers seeking institutional delivery care, and a lack of cultural acceptability of institutional delivery care as it is currently provided, including, but not limited to, the exclusion of traditional birth attendants. This led us to design the package of interventions proposed here for scale up. Our combined intervention package has been successfully implemented and is currently being evaluated at small scale in a cluster randomized implementation trial in 15 communities with 15 control communities in the aforementioned four northern departments (see protocol published in BMC Pregnancy Childbirth).[7] Specifically, we combine strategies to strengthen facility-based obstetric and neonatal emergency response during childbirth, increase demand for facility-based birth, and forge ties between traditional birth attendants and the formal health care system. The intervention package includes the following three components:

1) An obstetric and neonatal emergency training curriculum (PRONTO) that integrates highly realistic simulated emergency scenarios with team training and communication skills, activities that catalyze quality improvement and a shift toward more respectful, culturally appropriate care, and provider-driven

* When referring to neonatal mortality in this proposal, we are generally referring to the very early neonatal period (including fresh stillbirth and neonates within 48 hours of birth), which is when we expect our combined intervention to have the greatest impact. This overlaps with the perinatal period, defined by WHO as between 24 weeks gestational age and 7 days of age. Depending on the information source, data we are able to gather often reflect events in the perinatal period. We have attempted precision in our language with regards to this issue and welcome any clarifying questions from the committee.

system change. Simulation training is considered the gold standard for preparing medical professionals to respond to rare but life-threatening obstetric and neonatal emergencies, but is often deemed inaccessible to low-resource settings because of its high cost.[8,9] PRONTO International (http://prontointernational.org) uses our own low-tech, low-cost (approx. $15 US), highly realistic birth simulator (PartoPants™) integrating a patient actress, Laerdal's NeoNatalie® low-cost resuscitation mannequin, and locally available materials, to deliver simulation training in any clinical setting, including remote, rural, and low-resource clinics. PRONTO is unique in the field of childbirth emergency training as it is designed to break traditional training silos by integrating maternal with newborn health, emergency care with normal birth practices, doctors with nurses and assistants, and clinical management with culturally relevant and respectful care.[10]

PRONTO training takes place over the course of 3 days; our trainers deliver the first 2 days of training and then return 2-3 months later for the final training day. PRONTO covers four key content areas for obstetric and neonatal emergency response: obstetric hemorrhage, neonatal resuscitation, preeclampsia/eclampsia, and shoulder dystocia; additional content developed for the Guatemalan context includes retained placenta and chorioamnionitis. Several characteristics of PRONTO make us unique, and particularly well-suited to the rural Guatemalan context:

- PRONTO is **delivered *in situ***, where clinicians practice every day. We designed our program specifically to be portable. Providers are more likely to do the right thing at the right time during an emergency if they practice with the personnel and resources with whom they work every day.
- We use **more *highly realistic* simulation scenarios** than any other training program. Providers must practice their skills in 9 different simulated scenarios, beginning with practicing and establishing institutional norms for care during normal birth and then progressively moving through scenarios in which mother, baby, or both develop life-threatening complications.
- Our facilitators are experts in **video-guided simulation debriefing**. Debriefing sessions are the key to learning; providers reflect on their actions and those of their colleagues, and identify strengths and areas for improvement for the care team. Our facilitators film the simulated scenarios using low cost video cameras and/or cell phones, and use the films to guide the group through the debrief.
- PRONTO uses an **interprofessional team training model**— health care professionals who attend deliveries together practice emergency management together, regardless of their professions. We have adapted the Team STEPPS curriculum[11] for low-resource settings, to teach the teamwork and communications skills that are critical to maximizing available personnel in an emergency. Team training also breaks down the professional hierarchies that can prevent providers from taking appropriate action in an emergency.
- We reinforce **best practices for normal delivery care,** such as alternative positions for childbirth, Active Management of the Third Stage of Labor (AMTSL), delayed cord clamping, immediate skin to skin contact, and breastfeeding. We recognize the important role of routine care for both emergency prevention and for a positive birth experience and outcome.
- PRONTO guides participants through a series of activities designed to **promote humanized birth**. This portion of the PRONTO training was developed specifically for the Guatemalan context and emphasizes culturally sensitive care[12].
- PRONTO facilitates a **strategic planning session**. After the first 2 days of training, participants identify specific, feasible changes they want to make to improve the quality of care in their facility. Often participants identify latent errors during the simulated emergency scenarios, such as improperly stored medications, a lack of an alarm system to summon help during an emergency, or others; the strategic planning session gives participants the opportunity to set specific goals to address these issues. In Guatemala, we found that participants often set goals related to providing more culturally appropriate care – offering hot liquids or inviting in birth companions, for example.

2) A carefully designed social marketing campaign, "¡Que Vivan Las Madres!" *("Long Live the Mothers!"), encouraging women, their families, and their traditional birth attendants to go to the nearest clinic for childbirth.* Although social marketing campaigns have often been used effectively to encourage behavior change on a large scale at a relatively low cost,[13] a review of the scientific literature revealed no other attempts to develop and test a social marketing campaign to increase institution-based delivery care. Our approach and messaging was developed in 2011 through extensive qualitative formative research in consultation with social marketing experts. We conducted over 30 interviews and 13 focus groups in Spanish and three indigenous languages with multiple stakeholders (women, health care providers, and traditional birth attendants) assessing perception of risk associated with home birth, perception of institutional delivery, and most effective modes of communication with each group. We then pilot tested three different core messages with local indigenous communities, with "Que Vivan Las Madres" emerging as preferred message of the target population of rural indigenous women. The materials were developed in Spanish and seven indigenous languages. Community messages were transmitted via radio, clinic-based DVD players, print and other media.

Qualitative research revealed that clinicians and community members felt that changes required to increase facility deliveries are a "two-way street" – not only do women need to arrive at facilities to deliver, but clinic staff also share responsibility for providing high quality, dignified, respectful care. A secondary "internal" social marketing message was therefore developed specifically aimed at clinic staff and based on research with this group. This aspect of the campaign emphasized a different message: "Cambiemos Por la Vida" ("Let's Change for Life"). The aim of this part of the social marketing campaign is to promote a provider motivated movement to offer kinder and more respectful care for mothers delivering in their clinic facilities. This message is reinforced by the PRONTO methodology of encouraging reflection on kind and respectful care among clinic staff; PRONTO works to ensure that the promise of high-quality, life-saving care promoted in the social marketing campaign is delivered when women arrive at the clinics, creating a positive feedback loop within the community.

3) A corps of professional midwives reaching out to traditional birth attendants (TBAs) in the community to foment ties with the formal health care system. TBAs play a critical role in Guatemalan women's experience of birth, and in childbirth decision-making.[14] Extensive training of lay midwives in Guatemala by various organizations and the MOH has been well-documented[14–19] but with no appreciable decrease in maternal mortality. This led us to develop and test a new approach, now in collaboration with the Professional Midwifery School with an Intercultural Focus (PPEI). Professional midwives serve as community-based liaisons between clinics and active TBAs. This activity has two primary goals: to encourage TBAs to refer deliveries to clinics, and to sensitize health care personnel to the midwifery model of care, including the integration of TBAs into clinic-based deliveries.

To date two professional midwives trained at the CASA Midwifery School in Mexico, one of whom is a member of the Kaqchikel community in Guatemala, have been working as liaisons. They have identified and developed relationships with "active" TBAs (attending at least 6 deliveries per year) in intervention communities, and are now working to increase their referrals to clinics for childbirth. Their primary activities include assessing TBAs' risk perception with regards to home-based delivery, and delivering targeted content to fill gaps in their knowledge of the most common obstetric emergencies to increase the perceived seriousness of these risks. These strategies are based on Rosenstock's health belief model of behavior change.[20] The professional midwives' interactive activities with TBAs reinforce their knowledge of obstetric hemorrhage, preeclampsia and post-partum infection, and are delivered in local indigenous languages or in Spanish with an interpreter. Core messages include: 1) all pregnancies carry risk; 2) transfer patients to the clinic before it is too late; and 3) make the referral decision quickly. We see these activities as an important first step toward encouraging TBAs to refer more women to clinics for childbirth. We are currently developing additional activities to serve as "cues to action" to the TBAs to refer their patients.

The next step for this activity is to further promote greater understanding of the midwifery model of care among MOH and clinic staff, in order to encourage a combined model of care that incorporates TBAs and midwives, promoting culturally respectful and dignified treatment. Specifically, our professional midwives, with support from CIESAR, will begin a negotiation process with the Ministry of Health aimed at involving PPEI students in clinical rotations in the local MOH clinics where we are working. This work would be supervised by the project's professional midwives, with the goal of demonstrating the midwifery model of care and also modeling the incorporation of TBAs in clinic-based deliveries. We believe that this activity has great potential to complement our current outreach work to TBAs, to increase TBA referrals to clinics, and improve TBA-MOH relations as the project moves forward. Meanwhile, during their ongoing fieldwork, PPEI students will support and further develop the TBA outreach side of the project, building on our current activities and involving their own TBA counterparts in outreach activities to MOH clinics.

A model of care inclusive of TBAs is further reinforced during PRONTO trainings. We incorporate local TBAs in each PRONTO training so that TBAs and clinic staff can practice a collaborative model of care within the context of simulations.

Proof of Concept

This three-part "Que Vivan Las Madres" intervention package has shown positive preliminary results in Guatemala at small scale; final results will be available in early 2014. **With results through 7-months post-intervention, the intervention caused an increase of 9.4%** (95% C.I. : 1.3, 18.3%: p=0.022) **in the number of births occurring in the intervention clinics.** The impact estimate was obtained by fitting a longitudinal random-effects Poisson model to monthly birth count data from the clinics, using a difference-in-differences approach. Complete results including analysis of the remaining post-intervention period (through one-year) will be available later this year.

Additional process measures for each of the three project components are also encouraging. To date PRONTO has trained 218 Guatemalan clinic providers (125 auxiliary nurses, 39 professional nurses, 35 general physicians, 14 traditional birth attendants, and 5 other specialists such as obstetricians and pediatricians) from 15 clinics. We administer pre-and post-tests in all core topic areas; participants demonstrated significant improvements in knowledge and self-efficacy for all areas (Table 1).

Table 1: Change in knowledge and self-efficacy for obstetric hemorrhage and neonatal resuscitation pre/post Module I and Module II of Guatemala PRONTO training

	Obstetric Hemorrhage*		Neonatal Resuscitation*		Shoulder Dystocia**		Pre-eclampsia**	
	Knowledge	Self-Efficacy	Knowledge	Self-Efficacy	Knowledge	Self-Efficacy	Knowledge	Self-Efficacy
Pre Score	48.0	81.7	39.5	75.9	41.5	58.4	34.2	72.1
Post Score	65.0	89.9	64.0	90.8	53.7	87.2	43.2	86.8
Change	17.1	8.2	24.6	16.4	11.6	28.8	9.0	14.8
P-Value	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001

*Pre/Post Module I results **Pre/Post Module II results

Guatemalan clinics achieved an average of 63% of system change goals set during training; examples of goals achieved include practicing and disseminating the PRONTO communication concepts, instituting routine feedback sessions (debriefs) on each shift, posting algorithms for neonatal resuscitation, APGAR, and management of obstetric hemorrhage, offering delivery in the position of the patient's choice, and inviting traditional midwives into the delivery room with the patients.

Additional evidence for PRONTO's effectiveness comes from Mexico, where PRONTO was developed. The National Institute for Public Health in Mexico is concluding a cluster randomized trial of PRONTO's impact on perinatal mortality in 12 intervention hospitals (with 12 control hospitals). Impact results from this study are very encouraging. Our recently obtained final difference-in-differences impact estimations suggest that **perinatal mortality rates in intervention hospitals decreased by 44% at 8 months after the intervention (95% CI: 13, 64%; p=0.010)**. Positive impacts were also documented during delivery observations, where we saw increased use of the first step of AMTSL (+32%, p = 0.08) and decreased use of routine uterine wiping (-30.1%, p = 0.02) in intervention hospitals.

Evaluation of the social marketing campaign in Guatemala is ongoing. Nearly 600 individuals from local clinics and community-based NGOs participated in the 15 program launch meetings held in September 2012 (an average of 38 individuals per site) and each individual received print materials and CD's containing the radio and television content. A total of 15 standing banners, 1510 community posters (700 in Spanish, 810 in indigenous languages), 250 internal posters for health institutions, 5000 balloons, 2500 bracelets, 600 audio CDs in Spanish and indigenous languages, and 45 DVDs in Spanish and indigenous languages were distributed in the 15 intervention health institutions and communities. We are currently collecting data on penetration, absorption, perceptions, and intentions to act on the messages at varying distances from the clinics; results of these surveys will be available later this year, and will be helpful in informing the scale-up phase of the social marketing campaign.

Similarly, evaluation of the professional midwife liaison activity is also ongoing. Professional midwives have engaged 145 of the 285 active TBAs in the intervention communities in interactive knowledge refreshment/risk perception activities. Though not measured by the same rigorous standards as other project assessments, casual pre- and post- assessments of recognition of risks associated with maternal complications showed that significantly more TBAs recognized these risks after the activities.

Potential Scale and Impact

The preliminary results of our cluster randomized implementation trial in Guatemala and evidence from Mexico confirm that this package of interventions deserves to be carried out at larger scale. During the proposed project period of three and a half years, we expect to deliver PRONTO training to 675 clinic personnel attending approximately 20,160 deliveries, at least 3024 (15%) of which are expected to have maternal or neonatal complications requiring critical interventions. These estimates are based on current delivery volumes in the target sites, and preliminary data on complication rates. In addition, we expect our social marketing message to reach at least 324,800 residents in the 2 target departments (an estimated 20% of population), and we expect to work with approximately 400 TBAs and 50 clinic personnel to encourage TBA referral and strengthen TBA-MOH linkages.

Section II

Executing and Testing Our Plan

Our goal is to decrease perinatal mortality by 35% in both departments, from approximately 52/1000 to 33.8/1000 live births. We also expect to decrease severe maternal and neonatal complications (by 45%), and increase the proportion of such complications that are resolved effectively (by 50%). These estimates are based on analyses from PRONTO's Mexico study. We expect to increase the rate of institutional birth by at least 15%, based on currently available data and considering the longer time for a cultural shift within a 3.5 year scale up. Based on our team's experience implementing epidemiologic studies in this region, we believe that these achievements in perinatal mortality and institutional delivery can be measured within the 3.5 year timeframe of this proposal.

We will use a stepped-wedge design to evaluate our impact. This study design ensures that all communities in these two districts receive the intervention in a step-wise fashion, while allowing for a

rigorous impact evaluation. With 80% power, an alpha of 0.05 and assuming 75 deliveries per year per facility in 39 facilities (a low estimate based on current delivery volume), this study is powered to measure a 35% decrease in the risk of perinatal mortality in six steps, with four months between each step in the stepped-wedge design.

The primary outcome indicators for this project are: 1) perinatal mortality rates from clinics and civil registries; 2) severe maternal and early neonatal morbidity as measured using a modified "near miss" approach based on the WHO model, completed for every obstetric event including normal deliveries and complications such as obstetric hemorrhage, preeclampsia/eclampsia, meconium aspiration, and infection; and 3) rates of institutional delivery. We have experience collecting all of these kinds of data.

Process indicators that will be measured throughout the course of the project include changes in knowledge and self-efficacy among providers trained, strategic goal achievement through PRONTO trainings, distribution and reach of the social marketing campaign materials, number of TBA and health care personnel contacts made by the professional midwives and PPEI students, and number of TBA referrals to clinics for childbirth.

In addition to these process indicators, the project will be monitored for achievement of specific interim objectives and milestones. These include: 1. Initiation of baseline data collection by January 1, 2014; 2. Development of a specific rollout schedule for the stepped-wedge study by March 2014; 3. Roll out of the first step by August 2014; 4. Completion of a PRONTO Train-the-Trainer by March 2014; 5. Completion of project rollout (all components in all steps) by July 2016; 6. Completion of end line data collection by October 2016; 7. Publication and dissemination of all program results by April 2017 (see the Gantt Chart in Table 2). Our stepped-wedge design allows for sufficient time for baseline and follow-up data collection necessary to carry out this project in 3.5 years, and our previous experience implementing the proof of concept allows us to accurately estimate our budgetary needs as we scale up.

Table 2: Gantt Chart of expected scale up activities

	2013	2014				2015				2016				2017
Activity	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1
Project planning and hiring	X+	X+*												
Ongoing data collection (baseline = B, endline = E)		B	B	X	X	X	X	X	X	X	X	E	E	
Stepped wedge implementation				X	X	X	X	X	X	X	X			
Partner Meetings	X	X	X	X		X		X	X	X		X	X	X
Dissemination complete														X

+Scale up strategic planning process *PRONTO training of trainers

Organizational and Partner Capacity

CIESAR, PRONTO International, UW, and the MOH of Guatemala have a history of collaboration beginning in 2010. CIESAR's expertise lies in epidemiologic study and instrument design, data collection and analysis. CIESAR has close ties with the MOH that long pre-date the beginning of this project, including promoting and institutionalizing quality of care improvements for maternal health within the Guatemalan MOH. PRONTO has four years of simulation training experience in low resource settings, including rural clinics and hospitals in Guatemala, Mexico and Kenya. PRONTO's track record includes bringing innovations to the field of low-tech simulation and rigorously testing the impact of these innovations. PRONTO's expertise in implementation research is enhanced by its close collaboration with UW, a world-class research institution. The Guatemalan MOH has shown its dedication to maternal and neonatal health through various investments in infrastructure and staffing, and has consistently provided support to project partners in the form of staff time, transportation, and access to records and data. MOH department chiefs generally attempt to minimize medical stock outs; our own study's facility

inventory confirms this, and while the medical supply chain is not problem-free, lack of basic supplies is not expected to present a barrier to implementation.

Over the course of the initial implementation trial, and in preparation for this proposal, critical new primary project partners involved in the scale up have been identified and incorporated: PPEI and APROFAM. PPEI brings strong leadership in developing professional midwifery in Guatemala, and on intercultural work with Guatemalan TBAs. They recently enrolled their first 18 midwifery students, who will be conducting extensive practical, community-based work throughout their three year degree program; during their community rotations students work hand in hand with a community-based TBA mentor, and PPEI envisions these TBA-student pairs working closely with our professional midwives. PPEI is also committed to continuing to advocate for integration of the midwifery model of care into MOH clinics after the project has ended, thus moving our joint efforts forward. APROFAM, a Guatemalan NGO with 48 years of on-the-ground experience in sexual and reproductive health, has expressed a strong interest in supporting our efforts to institutionalize PRONTO in Guatemala. APROFAM has an extensive network of health care professionals and health educators in the target departments, and is interested in collaborating with us to train and retain local PRONTO trainer teams.

Secondary project partners include a large network of small NGO service providers (Coverage Extension Program – PEC) in Alta Verapaz and Huehuetenango departments, as well as ALAS Guatemala, which has a growing presence in Alta Verapaz. Together these organizations have on-the-ground presence in the form of health educators, health promoters and outreach workers in nearly all of the small, rural communities that comprise these two departments. The leadership of several of PEC, and the leadership of ALAS, have indicated that they will support scale up of the "Que Vivan Las Madres" social marketing by distributing these materials in their many target communities alongside their other related educational messages. These primary and secondary partnerships are critical to the success and long term impact of this project.

Critical Decision Points

We have identified several challenges and critical decision points that may impact project rollout. We are using the WHO/ExpandNet's tools for developing scaling-up strategies to identify and plan for overcoming these challenges; Table 3 is an excerpt of a chart illustrating some of the components of our scaling-up strategy and our degree of readiness to carry out these components:

Table 3: Project readiness to complete specific actions required for sustainable scale up

Category	Recommendations	Readiness
Streamline/simplify the innovation; assure shared vision; clarify expectations	Meet with stakeholders (MOH, clinicians, PPEI, APROFAM, ALAS, other NGOs) to identify opportunities to simplify the innovation package, and assure buy in and support.	Very ready, see letters of support.
Increase the capacity of the user organization	• Train a cadre of local PRONTO trainers. List of candidates has been generated. Move forward with incorporating APROFAM as Guatemalan institutional home for PRONTO. • Train more MOH and NGO service provider colleagues in best practices for wide distribution of the social marketing campaign.	Very ready. See letter. Somewhat ready
Anticipate environmental constraints	Plan for events/changes, i.e. of department level MOH leadership. Plan mechanism to regularly reassess opportunities and constraints within the political, policy, health sector and other players that will impact implementation and sustainability.	Somewhat ready
Strengthen the resource team	• Form a technical advisory committee for scale up, including members of the MOH, NGOs, other partners. • Identify and cultivate "champions" for scale up.	Ready Somewhat ready

Category	Recommendations	Readiness
Additional advocacy and outreach to support vertical scale up (institutionalization)	• Invite additional members of MOH, NGOs, USAID, Helping Babies Breath, Salud Mesoamérica 2015, etc. to visit existing project sites. • Organize roundtable meetings to disseminate pilot project findings and cultivate support for long-term institutionalization, led by technical advisory committee members from the user organization. • Publish pilot project results.	Very ready Not ready Ready
Involve new partners to support horizontal scale up	Engage additional community-based NGO service providers working in target departments. Seek out other key NGOs or organizations working in maternal neonatal health in Guatemala.	Ready

We recognize the need to develop our capacity to meet all of these recommendations, and others important to project scale up. CIESAR coordinated a scaling up processes in the past, "Expanding Options in Reproductive Health" (a collaborative project funded by WHO and the Panamerican Health Organization),[21] and thus has contacts working with ExpandNet. We have been in touch with these contacts and included a scale up consultant in our budget, allowing us to fully engage in the process of identifying and addressing barriers to successful expansion and institutionalization of this intervention.

Our Integrated Approach

Our integrated solution is unique in that it acknowledges that improved quality of care and demand creation go hand in hand. Improving physical infrastructure without addressing emergency care or culturally appropriate care has not generated demand for institutional birth. Table 4 illustrates how the various project components work together to improve neonatal and maternal outcomes.

Table 4: Mechanisms by which the intervention package reduces neonatal mortality and maternal morbidity

Problem	Contributing Factors	Intervention	Objective	Result	Impact
Poor maternal and neonatal outcomes (including early neonatal mortality)	Insufficient capacity within the health system to offer effective emergency care	PRONTO training (maternal and neonatal) for normal and complicated birth	Improve quality of both routine, emergency obstetric and neonatal care	Mothers and babies receive more effective life-saving care Families encourage neighbors and other women to use clinic-based care Institutional delivery increases	Early neonatal mortality decreases Severe maternal complications decrease
	Lack of coordination between TBAs and MOH health system	Professional midwife links TBAs to formal health system	Strengthen the community and TBA relationship with the health care system		
	Societal factors discourage women from utilizing MOH delivery care services	"Que Vivan Las Madres" social marketing campaign	Change behavior by promoting the advantages of institutional birth		

PRONTO training improves quality of both emergency and routine care to save lives and drive demand; promotion of institutional delivery via the social marketing strategy broadcasts these changes to the community; and midwife liaisons strengthen the TBA-MOH relationship. If this scale up project is successful, we aim to partner with the MOH and other stakeholders to implement this package of interventions in other departments in rural Guatemala, starting in San Marcos and Quiché.

Section III

Sustaining Health and Development Impacts

We expect that our strategy will have lasting health impacts. Our strategy is a comprehensive effort to catalyze a cultural shift so that more women (and thus their babies) consistently seek life-saving care long after the project has ended. Although the process of cultural change is slow, we believe this combined effort will push northern Guatemala toward an eventual tipping point where skilled birth attendance, delivered in a culturally respectful way, can become the norm.

The MOH Department Chiefs of Alta Verapaz and Huehuetenango have expressed their strong desire to expand this project throughout their departments. The Health Area Directors for these departments have committed to providing space for trainings, to participating actively in scale up and implementation, and to incorporating their staff into PRONTO trainings.

APROFAM is interested in incorporating PRONTO training expertise into its portfolio by recruiting, helping to train, and retaining Guatemalan PRONTO trainers. APROFAM sees itself as an entity that helps to institutionalize reproductive health projects in Guatemala that have demonstrated effectiveness. Specifically, APROFAM is interested in maintaining the local PRONTO trainer teams and continuing to offer PRONTO training to MOH and other clinical institutions into the future, including maintaining quality standards with periodic oversight by PRONTO International. Historically, APROFAM has provided technical assistance to the Ministry of Health in basic maternal health functions, and sees PRONTO as a good fit for expanding its technical assistance expertise specifically in maternal and neonatal mortality prevention. They have also offered meeting and storage space for PRONTO trainers and equipment in their departmental offices. PRONTO International's simulation tools and curriculum are much more cost-effective than those of its competitors, using local, low-cost resources. Costs to replenish simulation supplies are minimal. Once the initial investments associated with training a local cadre of trainers are made, costs to maintain the local PRONTO training team are small, and APROFAM is likely to be able to recover these costs by charging a fee for delivering PRONTO trainings. PRONTO's experience in Mexico leads us to believe that as impact results of the preliminary and scale-up studies become widely known, there will be significant demand among MOH and others for PRONTO trainings.

In response to a demand that we have already seen from trained sites in Guatemala, we will leave a PRONTOPack™– a complete simulation training kit with curriculum – at each site where we train so that providers can continue to practice simulated scenarios on their own, after the project is over and even in the absence of a PRONTO trainer. The PRONTOPack™ is designed for multiple uses and includes all of the basic supplies needed to carry out emergency obstetric and neonatal simulation in any setting; it includes an instructional video and user manual that teaches the basics of simulation and debriefing.

Our social marketing and low-cost dissemination strategies have already been tested and proven effective in the Guatemalan context for engaging pregnant women and their families. As a result, costs of further replicating this campaign are minimal. We believe that as more NGO and PEC service providers in Guatemala become involved in distributing materials for the campaign and continue to develop associated best practices, it will be even easier for other entities across Guatemala that wish to replicate this strategy to emulate these successes.

PPEI is also interested in continuing to work carry out community-MOH linkage activities as part of their practice rotations even after the conclusion of this project. As mentioned previously, one of their long term goals is to institutionalize the midwifery model of care within the MOH; this project brings them a step closer to that goal, which they will continue to strive for after the project has finished. In short, PPEI views our joint work as a catalyzing force that will enable them to more effectively link the community with the MOH for the betterment of maternal and neonatal care over the long term.

We strongly believe in the long-term life-saving potential of our project, and welcome the opportunity to discuss it further at the DevelopmentXChange.

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