

**Final Report to Center for Conflict and Development**  
**Submitted by**  
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**Project Title, Overall Objectives and Methodology**

**Project Title**

TextIT Message Program Targeting Adolescent Mothers and Breastfeeding in El Salvador

**Overall Objectives**

Adolescent pregnancy is a public health concern, especially in post-conflict countries where challenges with accessing prenatal and postnatal care often exist. Despite the steps some NGOs and government sectors have taken to empower women with information on reproductive health, El Salvador reported the highest rate of teenage pregnancy in Latin America, with 32% of all pregnancies belonging to adolescents (Quiñónez, 2013). According to the World Bank approximately 20% of sexually active adolescent girls reported experiencing forced sex (World Bank, 2015). Also according to the Observatory of Gender Violence, adolescent girls between 12 and 18 years are more likely to be victims of sexual violence (World Bank, 2015). In addition, the Salvadorian Institute for Development of Women reported that between 2008 and 2009, girls 10 to 14 years of age were most likely to be raped (World Bank, 2015). While official statistics on rape and sexual violence tied to adolescent pregnancy are hard to find in El Salvador, Amnesty International reports there is an alarmingly high rate of sexual violence against girls and young women, combined with lack of contraceptives results in pregnancy and a risk to their health and lives (Amnesty International, 2014)

The Hogares de Espera Materna (HEMs) are maternal safe houses within the Fondo Solidario para la Salud (FOSALUD) funded by the Ministry of Health of El Salvador, which house pregnant women experiencing inequities and barriers to maternal care. HEMs have reported that 34% of the pregnant women they see are teenagers (El Blog, 2013). El Salvador also has a lower than average early initiation breastfeeding rate at 32.8% compared to the Latin America average of 48.8% and an exclusive breastfeeding rate of 31.5% compared to the Latin America average of 37.9% (WHO, 2013). Not only are these rates lower than the Latin America averages, but they are much lower than the Pan American Health Organization recommended early initiation rate for all newborns and the 50% exclusive breastfeeding rate goal set by the World Assembly (WHO 2014, Schultink, 2015).

Breastfeeding has been shown to play a key role in reducing disparities in infant health, maternal health, and gender. Studies have shown that adolescent mothers are less likely to breastfeed than older mothers and tend to decide to discontinue breastfeeding at a faster rate as well (Smith, Coley, Labbok, Cupito, & Nwokah, 2012). The World Bank attributes

poor infant feeding practices as one of the main reasons for child deaths and underlying health issues among newborns and mothers. Therefore, it recommends a solution consisting of supporting women and their families to learn and practice optimal breastfeeding and to introduce nutritious complementary foods when children are six months of age, while still breastfeeding.

The TextIT Message Program Targeting Adolescent Mothers and Breastfeeding in El Salvador addressed three of the five Con Dev primary areas of interest for populations threatened or affected by conflict: nutrition, public health strategies for youth, and public health services in remote or disadvantaged communities. An innovative approach was taken to create a short messaging service (SMS) mHealth tool to improve intent to and knowledge of breastfeeding among adolescent pregnant mothers. The objectives of the study were to determine if mHealth education and support tools were effective in increasing perception, knowledge and intent surrounding breastfeeding in pregnant adolescent females ages 10 – 19 in El Salvador. Additionally, the study sought to increase a pregnant adolescent's perception of whether she is allowed to make decisions about the health of herself and her child.

## **Methodology**

A cross-sectional study was conducted between November 2016 and October 2017 in two urban and two rural Hogares de Espera Materna (HEMs) of the Fondo Solidario para la Salud (FOSALUD) in El Salvador. The HEMs coordinate with various levels of health care centers to direct women to the health services required for the mother and newborn. In addition, they coordinate transportation for the pregnant mothers to and from the hospital for delivery services. The two urban and two rural locations were selected based on similarities in rurality and the percentage of poor households. The two urban locations were La Palma HEM and Coatepeque HEM. The two rural locations were the Puerto La Libertad HEM and the Perquin HEM. Participants from one urban and one rural HEM location were chosen to participate in the experimental group. The experimental group received the SMS messaging intervention through a mHealth tool called LactaConnect. The other urban and rural HEMs served as the control groups receiving no intervention other than the traditional education received at the HEM sites. The inclusion criteria were: adolescent mothers who were 10 to 19 years of age; 12 to 30 weeks (3 to 7 months) into their pregnancy; had access to a cellular phone; and were followed by one of the four HEMs chosen for the study. 252 adolescent pregnant mothers were enrolled in the study. A total of 116 participants were enrolled in the experimental group and 136 participants were enrolled in the control group.

A baseline survey was administered to participants in both the control and experimental groups at their designated HEM sites. The baseline survey included demographic information and questions about the participant's perception, knowledge, and intent to breastfeed. The survey was administered to all participants during and before their second trimester. For one week, participants in the experimental group received five text messages a day that contained educational information on breastfeeding. The participants were also asked to provide feedback about the usability of the mHealth tool in real time. No charges were incurred by participants using the messaging service. In August the message stage of the project was concluded, and the administration of the post-test survey was begun.

## **Key Activities**

This study tested multiple hypotheses. Researchers measured changes in perceptions of breastfeeding practices, changes in knowledge about breastfeeding, and lastly, changes in the intent to breastfeed among adolescent mothers exposed to an educational text messaging program on breastfeeding.

To test these hypotheses, the research team conducted the following key activities:

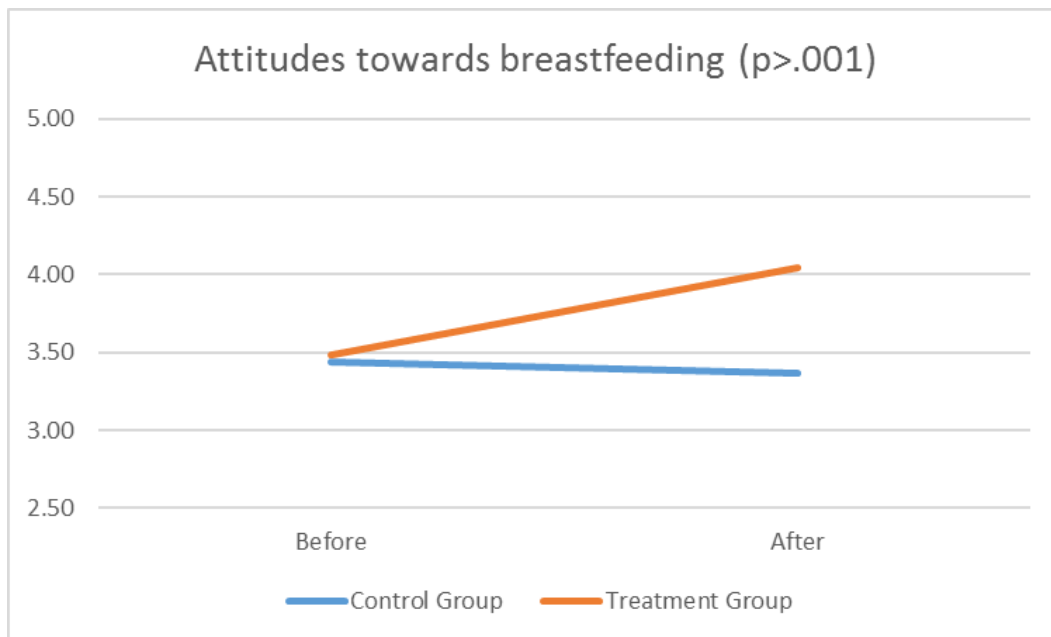
- Developed a relationship with FOSALUD through Dr. Cristina Vega.
- Trained Licenciadas in CITI and their role in data collection for the project.
- Developed a standard operation procedure (SOP) for the field.
- Created breastfeeding messages in English and translated those messages into Spanish.
- Developed and delivered a mobile app to disseminate breastfeeding messages.
- Provided data plans to participants to receive for delivery of messaging.

## **Key Project Achievements / Major Results**

Initial analysis of the results shows that, after baseline and post-intervention surveys were collected, those who participated in the mHealth intervention had improved attitudes toward breastfeeding and knowledge about breastfeeding over the control group. There was no impact on intent to breastfeed, as all of the respondents stated that they already intended to breastfeed in the baseline survey, and repeated this response in the posttest.

252 pregnant adolescents participated in the baseline survey in four different health centers (2 each in matched rural or urban settings). 47% were in urban clinics. The average age was 17.6 years old. 67% reported being either married (9%) or living with a partner (58%). 86 were lost to follow-up. Unfortunately, only 34 individuals that completed the posttest participated in the intervention. Control variables such as age, education, marital status, and urban/rural differences were not significant in regression models.

Difference-in-difference models showed that average attitudes towards breastfeeding (based on the Iowa Infant Feeding Attitude Scale Mora et al., 1999) improved by 18.5% ( $p < .001$ ) for those who participated in the intervention (the treatment group), with knowledge scores improving by 6.7% ( $p < .05$ ) for that group over the control group. The intervention also seemed to marginally increase the likelihood respondents claimed to be able to make decisions regarding their baby's welfare by themselves by 9.7% ( $p < .10$ ).



## Engagement of Partners and Other Actors (non-USAID)

### FOSALUD

Fondo Solidario para la Salud (FOSALUD) was created in 2004. FOSALUD is the technical arm of the Ministry of Health. It is funded by taxes levied on products deemed harmful to society such as tobacco and alcohol. Currently, FOSALUD operates 160 primary care units, along with ten sanitation offices in the 14 states of El Salvador. It supports the policies and reforms developed by the Ministry of Health in the areas of pediatrics, gynecology, oral health, immunization and tobacco cessation. The organization has been instrumental in training and managing nursing professionals at the Casas de Espera Materna (Maternal Houses), initiating the emergency program between the hospital and the health centers and overseeing the Mobile Unidad.

Our engagement with FOSALUD began by studying the Salvadoran health system and searching for the maternal child programming department. After some preliminary calls to establish a sense of partnership, FOSALUD agreed to be the field partner for this Project. A relationship with the in-country project leader, Dr. Vega, was established and FOSALUD agreed to partner with the research team, providing Licenciadas to serve as the field researchers for this Project.

### CALMA

CALMA is a nonprofit organization in El Salvador, working on breastfeeding policies and practices. They are nationally recognized for their policy work to establish standards in business to give women time to breastfeed.

CALMA provided researchers cultural competence and in-country policy expertise regarding lactation practices in El Salvador. The CALMA breastfeeding educational brochure served as a basis for the messages developed and delivered for this project

## **USAID Engagement**

This study was not associated with any branches, bureaus, or offices of USAID.

## **Lessons Learned / Best Practices**

1. Study staff made an assumption that the Licenciadas would have a basic understanding of smart-phone technology. Although most of the Licenciadas had a smartphone (some had two phones, a flip phone, and a smartphone), the Licenciadas were not able to troubleshoot errors in installing, uninstalling, and reinstalling the application. Nevertheless, researchers at the School of Public Health were able to assist in troubleshooting errors by using screenshots of the mobile application to provide step by step instructions to the Licenciadas via WhatsApp group chat. In addition, researchers answered questions on downloading and using the application.
2. This project was funded as a seed or pilot project. In order to meet the deliverables required, it was necessary for the School of Public Health Office of Special Programs and Global Health to provide significant personnel support. It also required in-kind personnel support from the in-country partner, FOSALUD.

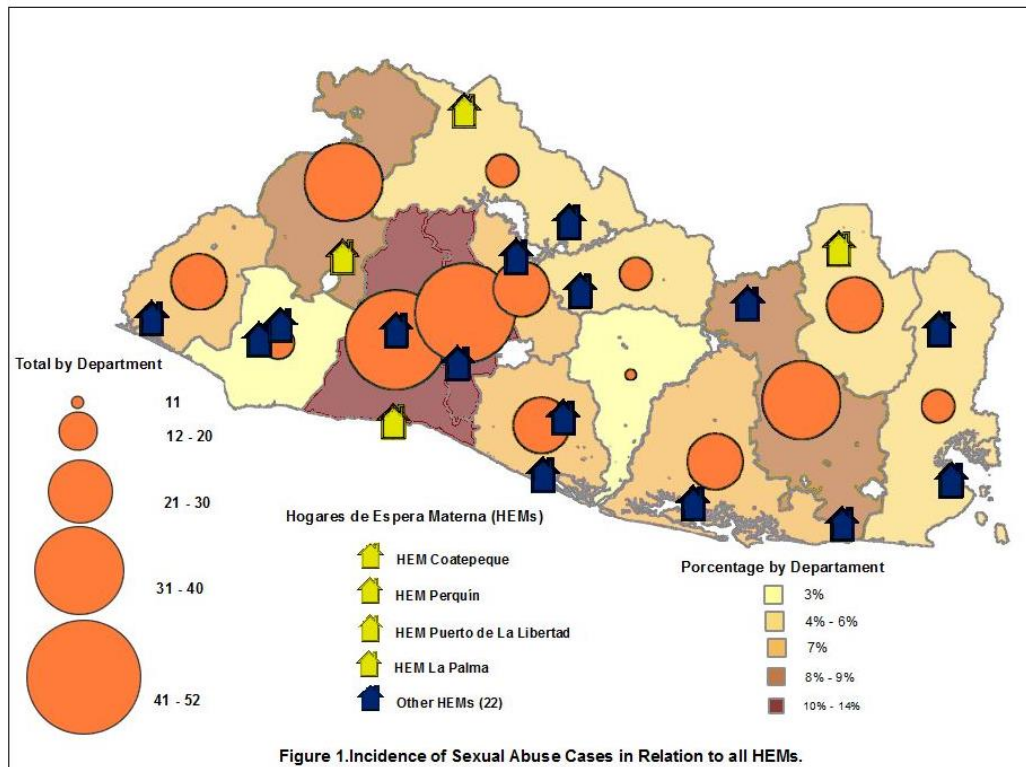
Given the scope of the project and the limitations of funding and time, the project proved successful:

- an excellent partnership was developed with an in-country agency;
- field staff from an in-country agency received training on research protocol and technology;
- the messaging app showed significant improvement in the attitudes of participants within the experimental group;
- the researchers showed it was possible to conduct this type of research off-site; and
- an mHealth app was developed which can be used for future implementation as a tool to deliver messages on myriad public health topics.

## **Future Activities**

- Present findings through presentations and publications.
- Continue to work in El Salvador by furthering the work on breastfeeding among adolescent pregnant mothers based on what we have learned from this project. )Figure 1, Incidence of Sexual Abuse in Relation to all HEMs, highlights other potential collaborations where areas of high incidence of sexual abuse overlap with HEMs caring for adolescent pregnant females.)
- Expand research in El Salvador by targeting other public health issues that are susceptible to mHealth messaging programs.
- Extend mHealth messaging programs to other countries in Central and South America.

**Figure 1**



## Risks/Issues Mitigation

There were several issues that temporarily inhibited the progression of the study, posing challenges that took various strategic approaches to mitigate. The issues included the following categories: change in technology, message implementation, data plans, logistics of study materials, the safety of the in-country research team and other social factors.

### 1. Issue/Risk

#### *Change in technology*

In the initial stage of the project, the intervention was designed to use TextIT, an interactive SMS (short messaging service) software to build messages. This required a connection with a telecommunication carrier in El Salvador through a gateway company. There are three different telecommunication companies operating in El Salvador. When researchers tried to initiate TextIT, this approach became problematic because of time constraints for development and beta testing of this SMS software as well as lack of economic incentives for carriers to provide small data plans.

#### *Mitigation*

The feasible alternative was to contract with a mobile application development agency to develop a mobile application and a dashboard that allowed for messages to be sent and received by smart phones. Though the mobile application had its constraints, such

as accessibility only through a data plan and Wi-Fi connection, it could be developed and implemented within the project timeline allotted for the intervention.

## 2. Issue/Risk

### *Messaging Implementation*

In order to successfully complete the registration process and receive the messages, participants had to complete a 3-step process as part of the mobile application. First, they had to look for the LactaConnect application in the Google Play Store; second, the LactaConnect application had to be downloaded and installed. Third, the participant had to register with name, telephone number, and an email. This 3-step process may have led to fewer study enrollees accessing the messaging, either because of a technical glitch or a usability problem not detected during beta testing. For example, only 33 participants downloaded, installed and used LactaConnect, although 197 unique visitors downloaded the application from the Google play store. It is not clear why 164 participants did not or could not complete the final step in the registration process that provided access to the messages.

### *Mitigation*

Researchers provided the Licenciadas with screen captures of each step to ensure understanding of the process and facilitate registration. In future research, streamlining this 3-step process by increasing time for beta testing with proxy participants may improve usability of the application.

## 3. Issue/Risk

### *Data Plans*

Many of the participants who enrolled in the intervention had insufficient data coverage to download and send messages through the mobile application.

### *Mitigation*

Researchers resolved the issue by providing sufficient data plans through a telecommunication company. Unfortunately, the plans came with limitations. The data plans had limited coverage and were valid for a maximum of 30 days. This was not a sufficient amount of time for participants to complete the intervention as originally designed. To prevent incurring additional costs for the repurchasing of data plans, the SMS messaging intervention through LactaConnect was expedited so that participants received five text messages a day for 7 days instead of the planned three messages a week for seven weeks.

#### 4. Issue/Risk

##### *Logistics of Study Materials*

Because of customs issues during the recruitment phase of the project, FOSALUD was not able to receive the study materials promptly. This delayed the recruitment process by approximately 3 to 4 weeks. The FedEx office in El Salvador refused to release materials unless taxes were paid by FOSALUD.

##### *Mitigation*

Researchers worked through the FedEx office in the U.S who consulted with authorities at the FedEx office in El Salvador to create an exemption that allowed for the materials to be delivered to the Licenciadas without taxation.

#### 5. Issue/Risk

##### *Safety of Local Research Team*

The high incidence of violence in many of the communities in which the Licenciadas and participants were located, made it risky to travel from one place to another.

##### *Mitigation*

To ensure their safety, the Licenciadas and participants were advised to send messages via mobile phone to prearrange meeting times and locations in order for the Licenciadas to safely assist the girls in downloading the mobile app and filling out study surveys.

#### 6. Issue/Risk

##### *Social Factors*

There were two social factors that influenced the project results: rural town accessibility and a male dominated culture. The Licenciadas at the rural HEM sites had difficulties recruiting participants. Rural towns were harder to reach. In addition, El Salvador is a male-dominated culture and some of the girls had to share phones with their partners. As a result, three men registered for the intervention.

##### *Mitigation*

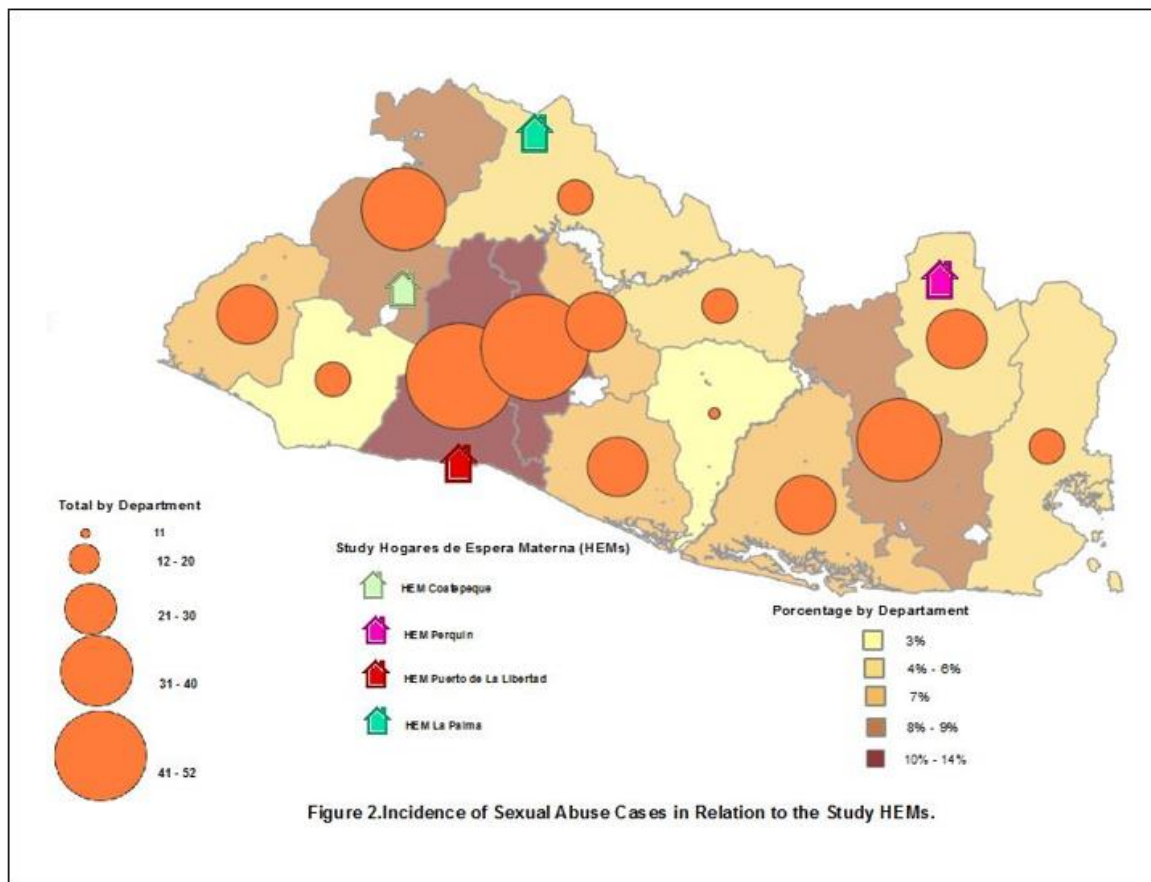
In an effort to resolve rural access issues, the Licenciadas participated in events hosted by Club Embarazadas (a club for pregnant women) in order to recruit participants. Licenciadas also assisted researchers to identify the girls associated with the three men who registered for the intervention in order to include them in the study.



## Environmental Monitoring

Monitoring the social environment was an important part of the project. The physical safety of the Licenciadas working environment was of paramount concern and researchers were careful not to pressure the Licenciadas in obtaining data and risking their safety to carry on the activities of the project. Figure 2 provides a snap shot of the incidence of sexual abuse cases in areas served by the HEMs in the project. (See figure 2 for Incidence of Sexual Abuse in Relation to Study HEM Sites). Monitoring the Licenciadas through various communication channels such as email, WhatsApp, Skype and Syncplicity, and communicating with the in-country project officer bi-weekly helped to mitigate these safety concerns.

**Figure 2**



## Other

Included in this report are:

- A picture of the in-country research team of Licenciadas.
- A photo of the HEM in Coatepeque.
- Screen capture of mobile application.

