

# PY3 Annual Report

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## USAID Child Survival and Health Grants Program

**“Community-Based Impact-Oriented Child Survival in Huehuetenango, Guatemala”**

[Municipalities of San Sebastián Coatán, Santa Eulalia, and San Miguel Acatán]

**October 1, 2011 –September 30, 2015**

**Cooperative Agreement No: AID-OAA-A-11-00041**



*Support group for lactating mothers, Casa Materna, Calhuitz*



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## ABBREVIATIONS, ACRONYMS, and TRANSLATIONS

24/7	24 hours/day, 7 days/week
ACNM	American College of Nurse-Midwives
ADIVES	Life & Hope International Association of Integrated Development
ANC	Antenatal Care
ARI	Acute Respiratory Infection
AMTSL	Active Management of Third Stage of Labor
CBIO	Community-Based Impact-Oriented (Methodology)
CCM	Community Case Management
CF	Community Facilitator (Care Group Promoter)
CG	Care Group
COICAM	Institutional Council of the Casa Maternas
<i>Comadrona</i>	Traditional Birth Attendant
<i>Comunicadora</i>	Health Communicator (Care Group Volunteer)
CSHGP	Child Survival & Health Grants Program
EBF	Exclusive Breastfeeding
<i>Educadora</i>	Health Educator
ENA	Essential Newborn Actions (clean cord care/thermal care/immediate breastfeeding)
FGD	Focus Group Discussion
FP	Family Planning
<i>Hambrezero</i>	Zero Hunger Initiative
HBLSS	Home-Based Life-Saving Skills
IBF	Immediate Breastfeeding
KPC	Knowledge, Practice, and Coverage Survey
LOE	Level of Effort
MRC	Micro-regional Committee (directs Casa Materna for its catchment)
Mini-KPC	KPC survey using SRS, focused on only two or three indicators
MM	Maternal Mortality
MMR	Maternal Mortality Rate
MNC	Maternal and Newborn Care
MSPAS	Ministry of Public Health and Social Welfare (of Guatemala)
NGO	Non-Governmental Organization
OR	Operations Research
ORS	Oral Rehydration Solution
OSAR	Observatorio de Salud Reproductiva (Guatemalan NGO)
PD	Positive Deviance
PPC	Postpartum Care
PY	Project Year
RHV	Routine Home Visitation
SBA	Skilled Birth Attendant (Doctor, Nurse, Auxiliary Nurse, Professional Midwife)
SIAS	<i>Sistema Integral de Atención en Salud</i> (Integrated System of Health Care)
U5	Under-five (years of age)
U5MR	Under-five Mortality Rate
USAID	United States Agency for International Development
WRA	Women of Reproductive Age

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## I. Introduction, Key Progress, and Main Accomplishments

Curamericas’ CSHGP, “Community-Based Impact-Oriented Child Survival in Huehuetenango, Guatemala,” is being implemented in the three municipalities of San Sebastian Coatán, San Miguel Acatán, and Santa Eulalia with our in-country partner, Curamericas Guatemala. This isolated mountain region of overwhelming indigent Maya population exhibits some of the worst health indicators in Latin America, earning it the name ‘the Triangle of Death.’ Our objective is to significantly improve the health of 15,327 U5 children and 32,330 WRA with interventions in maternal/newborn health, nutrition, prevention and treatment of ARI and diarrhea, and immunizations, delivered through our combined Community-Based Impact Oriented (CBIO) and Care Group (CG) Methodologies, integrated into Guatemala Ministry of Health (MSPAS) initiatives. Our operational research (OR) will demonstrate how these methodologies can cost effectively reduce U5 mortality in this context. Key PY3 progress and accomplishments included:

Doubling Our Project Coverage: In PY3 we began Phase 2 of our project (PYs 3 and 4) and following our implementation and OR plans, we doubled the size of the project by adding 91 new Phase 2 communities from all three municipalities, with a total population of 44,371:

Table 1 – Distribution of services by municipality and Phase area

Indicator	San Sebastian Coatán	San Miguel Acatán	Santa Eulalia	Total
Total Population (both Phases)	25,259	26,015	36,622	87,896
Population Phase 1 communities	9,592	15,265	18,668	43,525
Population Phase 2 communities	15,667	10,750	17,954	44,371
Number of Phase 1 communities	29	26	34	89
Number of Phase 2 communities	18	27	46	91
Total communities	47	53	80	180

We added to our staff 16 new *Educadoras* (Health Educators) who recruited and trained 84 new Community Facilitators (Care Group Promoters). Ninety-one new communities were mobilized via trust-building community assemblies; implementing a community census and map; establishment of a community register to capture and share the community’s health data; performing a Participatory Community Health Diagnosis, and drafting a Community Health Plan to respond to the community’s health needs. Then we established the Care Group infrastructure in all 91 communities, with the recruitment and training of 259 *Comunicadoras* (Care Group Volunteers) and their creation of Self Help Groups (Neighborhood Women Groups), which began in July 2014. We’ve already reached 4147 Phase 2 mothers with life-saving health education, with a coverage of 71% of Phase 2 WRA. Already 77 of the 91 Phase 2 communities have established transport plans for obstetric emergencies.

Demonstrating Actual Impact- Our CBIO+Care Group methodology has the unique ability to monitor not just coverage of interventions but actual *impact* on child and maternal mortality. Community Facilitators and *Comunicadoras* gather and report vital events data in their communities – pregnancies, births, and maternal/child deaths. Knowing number of births and deaths enables us to calculate changes in child and maternal mortality. Deaths are investigated by staff with a verbal autopsy to determine the cause, which enables us to respond to the actual epidemiological priorities. The PY3 vital events data indicates that in our 89 Phase 1 communities we reduced U5 mortality by 37%, from 59.2 at the end of PY2 to 37.5; and maternal mortality by 63% from 1041 to 382. Our verbal autopsies show that in PY3 we halved child deaths from both pneumonia and diarrhea, especially in the 1-11 month age group, and eliminated eclampsia and infection deaths in women.

Empowering Women and Communities: Our OR provided clear evidence that we are successfully empowering the women of this extremely male-dominated Maya culture. Our OR KPC survey showed that the percentage of women in Phase 1 communities who participated actively in

community meetings and expressed an opinion increased from only 10% at baseline to 48%. Women’s participation in health-related decision-making also increased, particularly for place of delivery (from 68% to 86%). Our KPC data also showed how we are building social capital in these communities ravaged by the 30-year civil war: 66% of the mothers interviewed reported that their community had worked together in the previous month to achieve a community project (vs. 13% at baseline); 157 communities (87%) have established transport plans for obstetric emergencies; and 45 communities have built with their own hands Casa Maternas to provide clean safe births (see below).

Still Catalyzing a Difference: Casa Maternas – A high priority of MSPAS is reducing maternal mortality by dramatically increasing health facility births. This is impeded by inaccessibility and scarcity of health facilities in this remote mountain region; traditional home delivery preferences; and lack of culturally appropriate services in their language in MSPAS health facilities. Our Casa Maternas are community-built strategically-located birthing centers staffed by Auxiliary Nurses who speak the local Maya language and who attend deliveries 24/7 in culturally acceptable ways. This includes integration of the local *Comadronas*, who encourage the women to deliver in the Casa and accompany them there [see OR Report, Annex 4]. In PY3 we mobilized 26 new communities to build 2 new Casa Maternas in Tuxlaj, San Miguel Acatán, and Pett, Santa Eulalia. The Tuxlaj Casa began operating in May 2014, and with our already-operating Casas in Calhuitz and Santo Domingo, San Sebastián Coatán, in PY3 we were able to achieve 594 health facility births (31% coverage), 230 of those in the Casa Maternas; and save 17 maternal lives via timely referrals of obstetric emergencies to the hospital in Huehuetenango, dramatically reducing maternal mortality, as noted above.

A New Integrated Model: We launched this project with our unique methodology that integrates CPIO and Care Groups, seeking to test its efficacy with our OR. *Our PY3 results further confirm that the integration of the Ministry of Health’s SIAS program and the Casa Maternas into our methodology has created a new, even more powerful model.* SIAS brings basic health services such as antenatal care, treatment of diarrhea and ARI, and immunizations into the villages through Ambulatory Nurses. SIAS is implemented in the project area by Curamericas Guatemala, with SIAS, the Casa Maternas and CSHGP functioning as one integrated project. *The synergies have proved powerful: Care Groups change key health behaviors and generate demand for health services, and the CPIO methodology ensures equitable coverage and tracking of impacts; meanwhile, SIAS and the Casa Maternas fulfill this demand for services at the community level in culturally acceptable ways.*

Table 2: Summary of Major Project Accomplishments

Inputs	Activities	Outputs	Outcomes
1. Increase Access to Quality Maternal and Newborn Care			
<ul style="list-style-type: none"> <li>- <i>Guia</i> for Care Groups</li> <li>- <i>Manual de Capacitación</i> (Training Manual) for SBAs and <i>Comadronas</i></li> <li>-HBLSS Training materials and trainers (ACNM)</li> <li>-<i>Casa Materna Replication Manual</i></li> <li>-Community registers and maps</li> </ul>	<ul style="list-style-type: none"> <li>- Community selection of Community Facilitators</li> <li>-Recruitment of <i>Comunicadoras</i>, establishment of Care Groups and Self-Help Groups</li> <li>-Training of <i>Educadoras</i>, Community Facilitators, and <i>Comunicadoras</i> in maternal/newborn health</li> <li>-Care Group meetings</li> <li>- Self-Help Group Meetings</li> <li>-Mobilization of Casa Materna (CM) partner communities</li> <li>- Formation and training of Micro-Regional Committees (MRCs) using the <i>Casa Materna Manual</i></li> </ul>	<ul style="list-style-type: none"> <li>-18 Casa Materna staff, 38 <i>Educadoras</i>, 153 Community Facilitators and 738 <i>Comunicadoras</i> recruited and trained in maternal/ newborn health</li> <li>- 8025 women educated in MNC and HBLSS</li> <li>- 7803 women educated in Family Planning</li> <li>- 154 Health Committees educated in MNC and HBLSS</li> <li>-242 <i>Comadronas</i> trained in HBLSS, ENA, AMTSL</li> <li>-1077 women receive 4 antenatal care checks</li> </ul>	<ul style="list-style-type: none"> <li>-- Pregnant women with tetanus inoculation increased from 63% to 67% (mini-KPC survey)</li> <li>-Pregnant women who took iron supplement 90 days increased from 22% to 73% (mini-KPC)</li> <li>- Women who know at least 2 signs of danger in pregnancy increased from 22% to 58% (mini-KPC)</li> </ul>

Inputs	Activities	Outputs	Outcomes
<b>1. Increase Access to Quality Maternal and Newborn Care</b>			
<ul style="list-style-type: none"> <li>-Personnel: 30 Educadoras, 3 Educadora Supervisors, 3 Municipal Coordinators, 18 Casa Materna SBAs, 2 Casa Materna Supervisors, 170 Community Facilitators, 740 <i>Comunicadoras</i>, 3 SIAS Ambulatory Nurses, 242 trained <i>Comadronas</i></li> <li>- Casa Materna construction materials</li> <li>-Donated land for Casa Maternas</li> <li>-Volunteer community labor to build Casa Maternas</li> </ul>	<ul style="list-style-type: none"> <li>- Securing commitment from municipal governments for 2 new Casa Maternas</li> <li>-Construct and equip 2 new Casa Maternas</li> <li>-Train Casa Materna SBAs and <i>Comadronas</i> in ENA, AMTSL, and HBLSS</li> <li>-Train communities in HBLSS and establish community emergency transportation plans</li> <li>-Reporting of vital events (new pregnancies, births, maternal and neonatal deaths)</li> <li>-Home visitation in response to new pregnancies and to deliveries</li> <li>-Verbal autopsies and community assemblies to discuss maternal and child deaths</li> </ul>	<ul style="list-style-type: none"> <li>- 1099 pregnant women received tetanus vaccination</li> <li>-1402 pregnant women received Fe/folic acid</li> <li>- 594 health facility deliveries</li> <li>- 230 Casa Materna deliveries</li> <li>--1043 women received postpartum visits &lt;48 hrs</li> <li>-1706 women using modern contraceptive method</li> <li>-17 obstetric emergencies successfully referred</li> <li>-45 Casa Materna partner communities mobilized</li> <li>- 2 new Casa Maternas built; 3 Casas operational</li> <li>- 157 communities with emergency transport plan</li> <li>-109 verbal autopsies completed</li> </ul>	<ul style="list-style-type: none"> <li>-Health facility births increased from 16% to 28% (mini-KPC)</li> <li>-Deliveries with all 3 ENAs increased from 6% to 37% (mini-KPC)</li> <li>-Deliveries with 3 elements of AMTSL increased from 9% to 15% (mini-KPC)</li> <li>-Non-pregnant women using a modern contraceptive method increased from 36% to 37% [mini-KPC]</li> </ul>
<b>2. Improve Child Nutrition and Decrease Child Underweight in children 6-23 months</b>			
<ul style="list-style-type: none"> <li>- <i>Guia</i> for Care Groups</li> <li>- <i>Guia</i> for Positive Deviance intervention</li> <li>-Community registers and maps</li> <li>- Personnel: 30 Educadoras, 3 Educadora Supervisors, 3 Municipal Coordinators, 18 Casa Materna SBAs, 2 Casa Materna Supervisors, 170 Community Facilitators, 740 <i>Comunicadoras</i>, 3 SIAS Ambulatory Nurses, 242 trained <i>Comadronas</i></li> <li>-Scales for weighing children</li> <li>-Measuring boards for children</li> </ul>	<ul style="list-style-type: none"> <li>-Training of <i>Educadoras</i>, Community Facilitators, and <i>Comunicadoras</i> in nutrition</li> <li>- Establishment of Care Groups and Self-Help Groups</li> <li>- Care Group meetings</li> <li>- Self-Help Group Meetings</li> <li>-Positive Deviance Intervention: weighing/measuring; survey of positive deviants; design of menu and workshops</li> <li>-<i>Talleres Hogareños</i> (community workshops on complementary feeding)</li> <li>-Growth monitoring of children 0-23 mos</li> <li>-Vitamin A supplementation of children 6-23 months</li> </ul>	<ul style="list-style-type: none"> <li>-19 Casa Materna staff, 29 <i>Educadoras</i>, 84 CFs and 464 <i>Comunicadoras</i> trained in nutrition and Positive Deviance</li> <li>-4091 women educated in nutrition (IBF, EBF, IYCF)</li> <li>-4599 children receive growth monitoring</li> <li>- 3389 children receive Vitamin A supplementation</li> <li>-54 children treated for acute malnutrition</li> <li>-8343 household visits for child growth monitoring and Vitamin A dosing</li> <li>-555 children receive Positive Deviance intervention</li> </ul>	No survey data available
Inputs	Activities	Outputs	Outcomes
<b>3. Increase Prevention and Treatment of Diarrhea and ARI</b>			
<ul style="list-style-type: none"> <li>- <i>Guia</i> for Care Groups</li> <li>-Community registers and maps</li> </ul>	<ul style="list-style-type: none"> <li>-Training of <i>Educadoras</i>, Community Facilitators, and <i>Comunicadoras</i> in diarrhea and ARI prevention and care-seeking, hand washing, and water treatment/storage</li> </ul>	<ul style="list-style-type: none"> <li>-26 <i>Educadoras</i>, 76 Community Facilitators and 559 <i>Comunicadoras</i> trained in diarrhea and ARI prevention and treatment</li> </ul>	Children with symptoms of ARI referred to a health professional increased from 26% to 40% [mini-KPC]

Inputs	Activities	Outputs	Outcomes
<p>-Personnel: 30 Educadoras, 3 Educadora Supervisors, 3 Municipal Coordinators, 18 Casa Materna SBAs, 2 Casa Materna Supervisors, 170 Community Facilitators, 740 <i>Comunicadoras</i>, 3 SIAS Ambulatory Nurses, 242 trained <i>Comadronas</i></p> <p>Community pharmacies (<i>boutiquines</i>) with antibiotics and ORS</p>	<p>- Establishment of Care Groups and Self Help Groups</p> <p>- Care Group meetings</p> <p>- Self-Help Group Meetings</p> <p>-Provision of diarrhea and ARI treatment by SIAS staff</p> <p>-Provision of rotavirus and pneumococcus vaccine by SIAS staff</p> <p>-Provision of diarrhea and ARI treatment by Casa Materna staff utilizing community pharmacies</p>	<p>- 3764 mothers educated in proper hand washing, water treatment, feces disposal</p> <p>- 5755 mothers educated in dangers signs and treatment of diarrhea and ARI</p> <p>-2180 children with diarrhea received treatment with ORS</p> <p>- 234 children with ARI receive treatment with antibiotics</p>	<p>Mothers who washed their hands at all 4 critical moments increased from 1% to 33% [mini-KPC]</p> <p>Households with a hand-washing station increased from 2% to 35% [mini-KPC]</p> <p>Mothers who dispose of feces properly increased from 43% to 62% [mini-KPC]</p>
<b>4. Improve Coverage of Child Immunization</b>			
<p>- <i>Guia</i> for Care Groups</p> <p>-Community registers and maps</p> <p>-Personnel: : 30 Educadoras, 3 Educadora Supervisors, 3 Municipal Coordinators, 18 Casa Materna SBAs, 2 Casa Materna Supervisors, 170 Community Facilitators, 740 <i>Comunicadoras</i>, 3 SIAS Ambulatory Nurses, 242 trained <i>Comadronas</i></p>	<p>-Training of <i>Educadoras</i>, Community Facilitators, and <i>Comunicadoras</i> in immunizations</p> <p>- Establishment of Care Groups and Self Help Groups</p> <p>- Care Group meetings</p> <p>- Self-Help Group Meetings</p> <p>- Provision of immunizations by SIAS and MSPAS staff</p>	<p>-26 <i>Educadoras</i>, 152 Community Facilitators and 738 <i>Comunicadoras</i> trained in importance of immunizations</p> <p>-7906 mothers educated in importance and function of immunizations</p> <p>-1211 children vaccinated for measles</p> <p>-1247 children received all immunizations</p>	<p>No survey data available</p>
<b>5. Improve Participation of Women and Community Support of Maternal/Child Health</b>			
<p>-CBIO Manual</p> <p>-Vital Events Manual</p> <p>-Community registers and maps</p> <p>-Community Participatory Diagnoses</p> <p>-Community Health Plans</p> <p>-Personnel: 30 Educadoras, 3 Educadora Supervisors, 3 Municipal Coordinators, 170 Community Facilitators, 740 <i>Comunicadoras</i>, , 242 trained <i>Comadronas</i></p>	<p>Community assemblies</p> <p>-Formation of Community Health Committees</p> <p>-Mapping and census of communities</p> <p>- Participatory Community Diagnoses and drafting of Community Health Plans</p> <p>-Selection and training of Community Facilitators</p> <p>- Recruitment and training of <i>Comunicadoras</i></p> <p>- Establishment of Care Groups and Self Help Groups</p> <p>- Care Group meetings</p> <p>- Self-Help Group Meetings</p> <p>-Monthly community assemblies to discuss progress &amp; challenges</p> <p>-Establish Women's Support Committees</p>	<p>-333 community assemblies</p> <p>- 74 new Phase 2 Community Health Committees established</p> <p>-91 new Phase 2 Community Diagnoses/Health Plans</p> <p>-84 new Phase 2 Community Facilitators trained</p> <p>-259 new Phase 2 <i>Comunicadoras</i> trained</p> <p>-107 new Phase 2 <i>Comadronas</i> trained</p> <p>-8788 mothers educated in Self-Help Groups</p> <p>-45 Women's Support Committees established</p> <p>-165 communities with active Community Facilitator</p> <p>-180 communities with Care Groups and Self-Help Groups</p> <p>- 157 communities with emergency transport plan</p>	<p>- Women with contact with Self-Help Group in past month increased from 8% to 96% (mini-KPC)</p> <p>-Mothers participating actively in a community meeting in the past month increased from 10% to 48% [mini-KPC]</p> <p>- Community executed a community project in past three months increased from 13% to 66% [mini-KPC]</p> <p>Women who participated in the decision re: place of delivery increased from 68% to 86%</p> <p>-Women who participated in the decision re: Tx for child with ARI increased from 73% to 90%</p>

## II. Discussion of Implementation Activities and Results

### Objective 1- Increase access to quality maternal and newborn care (35% LOE)

With extremely high maternal and neonatal mortality rates in the project area, this is our cornerstone intervention. The key interventions are: 1) detection and reporting by Care Group Volunteers of all pregnancies and births so that all pregnant and postpartum women and newborns promptly receive MNC services; 2) stimulating demand for these services using Care Groups; 3) and fulfilling this demand by providing maternal health services via SIAS ambulatory nurses at Ministry health posts and via the Casa Maternas where women can receive antenatal and postpartum care, tetanus vaccine, Fe/folic acid, family planning counseling, and deliver with a SBA in a culturally acceptable manner. In Phase 1 communities, we have achieved the following coverages: 59% 4 ANC; 67% tetanus toxoide; 73% Fe/folate; 31% health facility deliveries; 37% deliveries with the 3 ENAs; 15% deliveries with AMTSL, 85% PPC with 48 hrs; and 37% WRA using a modern FP method.

The lessons of our Care Group Training Guide utilize participatory adult-education methods appropriate for non- or semi-literate learners. In PY3 we reached 8,025 women in our Self-Help Groups (Neighborhood Women Groups) with these lessons on maternal/newborn health, with all training done in their native Maya language. The 18 Casa Materna SBAs were trained in AMTSL and resuscitation by an Obstetric Nurse Supervisor, and in Home-based Life-Saving Skills (HBLSS) by a trainer from the American College of Nurse Midwives (ACNM). The Casa Materna SBAs, in turn, trained 242 *Comadronas* in HBLSS, the 3 Essential Newborn Actions and elements of AMTSL.

Sustainability is being developed through 1) the Care Groups, to achieve lasting behavior change; 2) the community ownership of the Casa Maternas; 3) integration of the *Comadronas* into the Casa Materna services; and 4) support from the municipal governments. We utilize our *Casa Materna Replication Manual* to train Micro-Regional Committees (MRCs) consisting of community representatives from the catchment communities served by the Casa. The MRCs direct the construction and operation of their Casa. All the Casas have been built with volunteer community labor. Three Casas were operational in PY3, in Calhuitz and Santo Domingo, San Sebastián Coatlán, and, starting in May 2014, in Tuxlaj, San Miguel Acatán. A fourth, in Pett, Santa Eulalia, was completed in PY3 and will operate in PY4. The municipal governments have donated the land for the Casas and have provided an ambulance to serve the 2 Casas in San Sebastian Coatlán.

What has facilitated this work is the CBIO methodology, which engages the communities from the start in improving their health; the integration of the *Comadronas*; and the municipal government support for the Casas. What has impeded the work has been 1) community discord and persistent male chauvinism which often impedes community mobilization and keeps women from attending Self Help Groups or using the Casas; and 2) the shut-down by MSPAS of the SIAS program during much of PY3 for lack of funds, with MSPAS cutting off both our supply of oxytocin and the funding for the SIAS Ambulatory Nurses who provide most of the antenatal and post-partum care. We are coping with these impediments by 1) starting Women's Support Committees to empower women in leadership roles and skills; 2) supporting the Institutional Council for the Casa Maternas (COICAM), which represents all the MRCs, to advocate for the Casas before regional and national Ministry authorities; and 3) finding alternative resources, including equipping the Casas with community pharmacies (*boutiquines*) with oxytocin and antibiotics, funded by the NGO Medicines for Humanity.

### Objective 2- Improve child nutrition (30% LOE)

The prevalence of child malnutrition in Huehuetenango Department is among the worst in the country. Our nutrition interventions are 1) utilizing our CBIO community registers to locate and do home-based growth monitoring for every under-2 child; 2) educating mothers in IBF, EBF and complementary feeding practices using the Care Groups; 3) utilizing the *Comunicadoras* to monitor proper feeding practices, especially EBF; and 4) the Positive Deviance (PD) intervention, which



identifies locally available foods to enrich the diet and provides timely nutritional intervention to the malnourished children identified during growth monitoring, using workshops (*talleres hogareños*) in which mothers of malnourished children learn to prepare and feed their child the locally available foods while continuing to breastfeed. Follow-up growth monitoring is done by *Educadoras*. At the end of PY3 prevalence of underweight in Phase 1 communities was 13% and coverage of EBF 39%. The success with EBF resulted in an underweight prevalence of only 6% in 0-5 month children.

The path to sustainability lies with the Care Groups, so new paradigms of nutrition can penetrate at the household level, and with the PD use of *affordable locally available foods*. What has facilitated the work has been 1) Community Registers and maps that allow us to locate and do growth monitoring of every under-2 child; 2) the PD methodology, with its reliance of locally available food, eliminating the need for unsustainable food supplementation with its costly logistical and warehousing challenges; and 3) the household-level surveillance done by the *Comunicadoras*, who monitor actual feeding practices, especially EBF. What has impeded the work has been 1) ancient beliefs that corn tortillas alone suffice, exacerbated by the ready availability of cheap junk food; and 2) the difficulty women experience in practicing EBF with little family support. We are addressing these impediments via 1) nutritional education in the Care Groups; 2) support groups for lactating mothers at the Casa Maternas; 3) utilizing the locally available foods identified by the PD study and teaching of the preparation of these foods in the *talleres hogareños*; and 4) family nutritional and EBF counseling, including husbands and mothers-in-law, whose support the mothers need.

In view of the current dysfunction of MSPAS, which has been crippled by lack of funds, and our inability to rely on its resources, and because our nutrition interventions require few external resources, and are urgent and sustainable, in PY4 we plan to redouble our nutrition efforts, including doing a Barrier Analysis to identify the current barriers to EBF and design appropriate approaches to eliminate those barriers using the Designing for Behavior Change (DBC) framework.

### **Objective 3 - Increase prevention and treatment of ARI (15% LOE) and diarrhea (15% LOE)**

Our verbal autopsies show that ARI is a main cause of U5 deaths (38% in PY3) and that diarrhea killed another 10% and underlies much malnutrition. Our key interventions are: 1) education of mothers via the Care Groups on prevention, danger sign recognition, and care-seeking/proper treatment of ARI and diarrhea; 2) case detection by *Comunicadoras* and CFs; and 3) utilizing the SIAS Ambulatory Nurses and our project RN Institutional Facilitators (IFs) to provide timely treatment. In PY3 Phase 1 communities, our indicator coverage was 33% mothers washing their hands at the 4 critical moments; 35% households with a hand washing station; 62% of mothers disposing of feces correctly; and 40% of mothers correctly care-seeking for symptoms of ARI. As a result, in PY3 we cut U5 deaths from both pneumonia and diarrhea in half in Phase 1 communities.

Training has focused on the Care Groups, with *Comunicadoras* teaching the mothers how to recognize the danger signs (e.g. breath counting, sunken fontanel) and promptly respond with treatment and/or appropriate care seeking. Facilitating the work is the household case detection and reporting done by the *Comunicadoras* and CFs, who also encourage care seeking; and the treatment provided by the SIAS Ambulatory Nurses and our IFs. Impeding the work is poor access to remote MSPAS health facilities in the difficult mountain terrain; and the dysfunction of MSPAS, which has created serious lapses in the treatment services from the SIAS Ambulatory Nurses and has left certain areas without any SIAS coverage at all. We are responding by 1) reinforcing the training via the Care Groups; 2) reinforcing case detection and reporting by *Comunicadoras* and FCs; 3) improved coordination with the mobile SIAS nurses (when/where they are available); 4) utilizing our IFs to provide treatment; and 5) installing in the Casa Maternas community pharmacies (*boutiquines*) funded by Medicines for Humanity so that Casa Materna Auxiliary Nurses can provide treatment for ARI and diarrhea. Our OR data indicate that our project area is ripe for Community Case Management of ARI; in PY4 we will see if Casa Maternas are an effective avenue to provide CCM.

#### **Objective 4 – Increase coverage of childhood immunizations (5% LOE)**

The key interventions include: 1) education of mothers taught via Care Groups; 2) closely coordinating with the SIAS Ambulatory Nurses who provide immunizations in the communities. Training has focused on teaching mothers the purpose and timing of immunizations in the Care Groups. Facilitating the work are the CBIO community registers used by *Educadoras* to ensure that all children are immunized; and close coordination with the SIAS Ambulatory Nurses. Impeding coverage is the difficult mountain geography, discouraging immunization-seeking at remote health facilities; and the already-mentioned lapses in SIAS funding by MSPAS, periodically cutting off the immunizations provided by the Ambulatory Nurses. We are responding by utilizing routine home visitation by FCs and *Educadoras* to detect children pending vaccinations and improving coordination with the SIAS Ambulatory Nurses when and where their services are available. We will also solicit approval from MSPAS to provide child immunizations at the Casa Maternas.

#### **Objective 5: Increase the participation of women in community meetings and in family health-related decision-making, and improve community support for maternal and child health.**

The CBIO+CG Methodology mobilizes communities to recognize and address their own health priorities. This includes the empowerment of women and the cultivation of community social capital to support maternal and child health. We help communities conduct Participatory Community Diagnoses of their health problems, draft Community Health Plans, and establish Community Health Committees. We create Care Groups to bring health education to the household level by training in each community a Community Facilitator who in turn trains women peer educators (*Comunicadoras*). We hold monthly community assemblies to share with the community their health data in their Maya language. By the end of PY3 in the Phase 1 communities, women actively participating in community meetings had increased from 10% at baseline to 48%; communities completing a community project in the previous 3 months had increased from 13% to 66% and communities with an obstetric emergency transportation plan had increased from 29% to 87%.

Training has focused on capacity-building of the Community Health Committees and Micro-Regional Committees, and the training of Community Facilitators and *Comunicadoras* in each community. Facilitating the work is the excellent mastery of the integrated CBIO and Care Group methodology of staff, especially the *Educadoras*; enlisting key community allies, especially *Comadronas*; and the Casa Maternas, which intensify community investment in maternal/child health. Impeding the work is community infighting and pervasive male chauvinism. We are responding by 1) adding male *Educadores* who can reach out to men; 2) involving entire families, including husbands, in home-based health counseling; and 3) creating Women’s Support Committees to complement the largely male Community Health Committees to give women avenues for leadership development. In PY4 we will also explore partnerships to provide micro-loans to women.

#### **Implementation Lessons Learned**

Two lessons stand out for PY3: 1) our integrated model relies on intensive teamwork with communities and other stakeholders; and 2) therefore, it is vulnerable when those partners fall short.

1) Teamwork: A lesson reinforced from PY2 is that our new model integrating the CBIO+CG methodology, the SIAS program of MSPAS, and our Casa Maternas requires intensive teamwork. During our assessment of PY3, staff were unanimous in citing this lesson learned - the necessity for teamwork (*trabajo en equipo*). This lesson was so compelling that the revised CBIO Manual now includes a section on teamwork [see Annex 5]. This means community leaders who implement constructive community policies, mobilize their communities to build and use Casa Maternas, and give women opportunities to participate in community affairs (such as the leaders of the village of Chenen, in San Sebastián Coatán, who have established a community emergency transportation

insurance plan and have aggressively advocated use of the Casa Maternas); the integration of the *Comadronas* into the Casa Materna team; the municipal governments’ contributions of land and ambulances; and the support of MSPAS through its funding of the critical SIAS program. This is exemplified by our work increasing health facility deliveries to reduce maternal mortality— *where all partnerships of the model were fully functional, in the 31 Phase 1 communities of San Sebastián Coatán, we achieved 60% coverage of health facility deliveries by the end of PY3 and reduced maternal mortality by 61%*. Strengthening this teamwork and these partnerships is the key recommendation and task of PY4. This means more education and capacity building of Health Committees and Micro-Regional Committees; improving our coordination with municipal and local and area MSPAS offices; and disseminating our CSHGP and Project TRACtion operational research, which have gathered publishable qualitative and quantitative evidence strongly supporting our model.

2) **Vulnerability**: But the corollary lesson learned is the vulnerability of this model to breakdowns in its partners. At the community level, intra-community discord, poor leadership, and male chauvinism have impeded the participation of women and the adaptation of new health behaviors. As a result, after three years we are still shy of our 80% goal of participation of WRA in Care Groups and Self-Help Groups. When MSPAS shut down the SIAS program for 3 months in some areas and permanently in others, for lack of funding, we lost the Ambulatory Nurses who provided essential health services, limiting our coverage of ANC, family planning, treatment for diarrhea and ARI, and immunizations. This contributed to less than expected coverage of ANC, little improvement in family planning coverage, and gaps in coverage of child immunizations.

We need to strengthen our community-level work to combat community discord and male chauvinism. This means integrating men more into the project through such strategies as couple and family health counseling during home visitations, and strengthening Women’s Support Committees. We also need to reduce our dependence on MSPAS, while at the same time making every attempt to strengthen this partnership. Our nutrition intervention, which requires little MSPAS support, will be strengthened. Our partnership with Medicines for Humanity will support our Casa Materna-based *boutiquines*, enabling Casa Materna staff to treat pneumonia and diarrhea and secure a steady supply of uterotonic drugs. Also, a complex system is more stable than a simple system – we need still more partnerships, and in PY4 will pursue new partnerships in sustainable food production, micro-loans for women, reproductive health, and women’s empowerment.

**Table 3: Summary of Key Analysis and Use of Findings**

<b>Key Finding</b>	<b>Integrating Casa Maternas and SIAS with the CBIO and CG methodologies has forged a new integrated model of enormous potential that combines demand generation and fulfillment for health services, improving accessibility, adequacy, affordability, availability, and acceptability of services – and key to this model is teamwork/partnership with our stakeholders and partners.</b>
<b>Expected/Actual Results</b>	Our EOP goal for health facility deliveries is 40%; our mid-term mini-KPC showed project coverage of 28% at the end of Phase 1, from a baseline of 16%. But where all parts of our model were functioning, in the Phase 1 communities of San Sebastián Coatán, by the end of PY 3 we achieved 60% coverage.
<b>Analysis</b>	CBIO and Care Groups generate demand for key MCH services, but cannot fulfill demand, The services are being provided mostly by the Ambulatory Nurses of the MSPAS-funded SIAS program and/or by Casa Materna staff, particularly maternal/newborn care. Without these partnerships and teamwork with communities and MSPAS, the CSHGP cannot meet its objectives.
<b>Stakeholders Engaged</b>	Community leadership (especially the Community Health Committees and Micro-regional Committees of the Casa Maternas.); the three municipal governments; the MSPAS district and area offices.
<b>Lessons Learned/ Recommendations</b>	The integration of SIAS and the Casa Maternas into the CSHGP project provides the critical <i>fulfillment of the demand</i> for ACCESSIBLE and culturally ACCEPTABLE services generated by the CSHGP. Where all partners are functioning well, we are achieving extraordinary results. The model should be strengthened and replicated.
<b>Use of Findings</b>	Publishable evidence for the model will be provided by our Project TRACtion Case Study, which we will

	disseminate during PY4 to stakeholders, partners, and potential partners to garner more support. We will also work to perfect the model, capacity building with key partners, especially the communities.
<b>Key Finding</b>	<b>Our integrated service model is vulnerable to deficiencies in our key partners, particularly community leadership and MSPAS</b>
<b>Expected/Actual Results</b>	Coverage of modern method of contraception barely changed from 36% at baseline to 37%. Coverage of 4 ANC was only 59% for the project at end of PY3, vs. 85% for the Casa Materna partner communities. Participation of WRA in Care Groups/Self Help Groups is stuck at 76%, still shy of the minimum 80% goal for the Care Group methodology.
<b>Analysis</b>	Poor community leadership and machismo discourage participation of women in Care Groups/Self-Help Groups and uptake of new health behaviors, such as health facility births. Loss of the SIAS program's Ambulatory Nurses for 3 months during PY3 (and permanently in some catchments) impeded coverage in key maternal/child health services.
<b>Stakeholders Engaged</b>	Community Health Committees; local, area, and national offices of MSPAS
<b>Lessons Learned/ Recommendations</b>	Our model is vulnerable to weaknesses of key partners, particularly weak community leadership and a dysfunctional MSPAS. We need to develop stronger community leadership, and involve men/husbands more in interventions. We need to reduce our dependency on MSPAS/SIAS and utilize the Casa Maternas as an alternative to provide key MCH services utilizing the <i>boutiquines</i> .
<b>Use of Findings</b>	We will build capacity with Community Health Committees, Micro-regional Committees, and Women's Support Committees and include men/husbands in home-based health counseling. We will strengthen our Nutrition intervention, which relies little on MSPAS and strengthen our partnership with Medicines for Humanity. We will actively develop new partnerships to create a more complex and therefore more stable integrated system.

Engagement and capacity building of stakeholders, as noted above in our discussions of lessons learned, is the key modus operandi of our methodology, particularly engagement of the communities we serve, not as “clients” or “beneficiaries” but as full partners in improving their health. Our stakeholder engagement and education drills down to the household level, with our training of Care Groups Volunteers and their training of thousands of mothers. We support and educate Community Health Committees in every community via monthly meetings and via community assemblies to share community and project results in their Maya language with understandable graphic formats. We educate them on the causes and prevention of health and improve their ability to execute their leadership responsibilities. This support now extends to the Women's Support Committees, to the Micro-Regional Committees of the Casa Maternas, and to the COICAM, which will advocate in support of the Casas. We have similarly educated the three municipal governments, garnering their support for the Casa Maternas. Dissemination of our work has generated national interest and organizations in other departments are seeking from us training and technical assistance in implementing CBIO+CG and Casa Maternas in their catchments: the MSPAS District Office of Comitancillo, in San Marcos; the Association of Comadronas of Ixcan, in Quiché; and OSAR of Cubulco, in Baja Verapaz. In PY4 we will further disseminate our methodology with other NGOs.

Integrating our work with MSPAS has been both a priority and a challenge. Though our success in executing the SIAS program under contract with MSPAS offers a route to sustainability through increased MSPAS support, the current disorganization of MSPAS has put that in question. We have held informative meetings with the Area Supervisor of Huehuetenango and the Vice Minister of Health, but they have since resigned and we must renew our efforts to educate the new MSPAS leadership on the potential of our methodology to help the Ministry achieve its goals, particularly increasing health facility births and decreasing child malnutrition. We are working steadily towards a vision of sustainability that combines contributions from MSPAS, the municipal governments, and the communities themselves. We also plan to leverage our current matching support from the Ronald McDonald House Charities to secure corporate support from McDonald's of Guatemala.

Our project clearly complements and supports the USAID Mission's priorities to improve maternal/newborn care and combat child malnutrition. We have regular communication with the Mission, specifically with Dra. Yma Alfaro and Dr. Baudilio Lopez, including presentations of our annual results. They have been extremely helpful, providing linkages with resources and with potential partners. Dra. Alfaro has visited our project site and provided us valuable feedback as well as validation of our work. In addition, we have attended regional meetings of NGOs in Huehuetenango hosted by the USAID Mission to share our project methods and results.

### **III. Operations Research Annual Progress Report – Executive Summary**

The objective of the Operational Research is to document how the anticipated synergy of the CBIO and Care Group (CBIO+CG) methodologies can achieve the goals of cost-effectively reducing maternal and child mortality in rural Guatemala. A detailed report of the Operation Research for PY3 is found in Annex 4. A brief summary follows:

Formative Research: In PY3 we cleaned and analyzed in depth the enormous amount of data we accumulated via our qualitative and quantitative research done in PY2. Key findings:

- Pneumonia, birth asphyxia, and diarrhea account for 85% of U5 deaths; hemorrhage of various causes accounts for 54% of maternal deaths;
- In interviews and FGDs the field staff cited multiple advantages of the methodology, especially community engagement and addressing real community health priorities. The disadvantages cited were primarily challenges of the context, not the methodology itself. The staff and investigator recommendations, as well as the PY3 lessons learned were incorporated into a revision of Curamericas Guatemala's CBIO Manual [see Annex 5].
- Interviews with *Comadronas* revealed that our strategy for integrating them into the health system, congruent with MSPAS goals and methods, is working extremely well.

Evaluative Research: In early PY 3 we conducted mini-KPC surveys to assess end-of-Phase 1 changes in key health and women's empowerment indicators in Phase 1 communities; and conducted Focus Group Discussions with mothers, husbands, mothers-in-law and community leaders to assess changes in women's and community empowerment.

- KPC data shows statistically significant increases were noted in deliveries with the 3 ENAs, women receiving TT during pregnancy, knowledge of dangers signs of pregnancy, women's participation in community meetings, and community execution of cooperative projects.
- The FGDs revealed increased empowerment of women and increased community solidarity, though still in a context of male dominance and control, and identified facilitators and impediments to women's empowerment and decision-making autonomy.

Problems/Challenges: The OR is ambitious and we are struggling to secure the resources needed for its execution. We have therefore relied on volunteer MPH graduate students doing capstone or thesis work, guided by the Principle Investigators.

Changes Made to Original OR Plans – Our original plan called for comparing health outcomes of Phase 1 communities with those of Phase 2 communities at the end of Phase 1, but lack of resources for the KPC Survey needed caused us to cancel this plan. Other comparisons will be made instead.

Plans for PY4: 1) We will disseminate our Phase 1 results, along with our TRACtion Case Study, to our partner communities, stakeholders, funders, and potential stakeholders and funders. 2) We will finalize our methodology for determining cost effectiveness of the CBIO+CG Methodology and, as Phase 2 concludes, conduct our cost/benefit analysis; 3) near the conclusion of Phase 2 we will conduct our final 600-sample KPC Survey to compare indicators for health outcomes and women's/community empowerment of the Phase 1 communities with those of Phase 2 to assess the impact of the methodology; and 4) we will write and disseminate final OR report documents capturing the results of the investigation with technical support from Project Evidence.

## IV. Annexes

### Annex 1: Project Year 4 Workplan

C/G=Curamericas/Guatemala; CSPS=Child Survival Program Specialist; PI- Operational Research Principal Investigators; CSPM=Child Survival Program Manager; IF=Institutional Facilitators; CF=Community Facilitators (Care Group Promoters); CBIO=Community-Based Impact-Oriented; Health Educators=HE; HES= Health Educator Supervisor; OR=Operations Research Committee; AC=Program Accountant; TBA=Traditional Birth Attendant (*Comadrona*); CHC=Community Health Committee; WSC= Women's Support Committee; CGVs=Care Group Volunteers; HBLSS=Home Based Life Saving Skills; MNC=Maternal/Neonatal Care; MSPAS=Ministry of Public Health and Social Welfare; AN=Ambulatory Nurse; MC- Municipal Coordinator; NS- Casa Materna Nurse Supervisor; SBA- Casa Materna Skilled Birth Attendants; MRC- Micro-Regional Committee; COICAM – Institutional Council for the Casa Maternas; Muni – Municipal Government, EE- External Evaluator

Activity	Q1	Q2	Q3	Q4	
<b>Operational Research</b>					
Cleaning and analysis of PY3 Vital Events Data; revisions/improvements to Vital Events Registers	●				CSPS; PIs; OR;IF
Complete Plan for Cost/Benefit Analysis; conduct Cost/Benefit Analysis		●		●	CSPS; PIs; OR;
Write definitive documents for summarizing Phase 1 findings	●	●			CSPS; PIs; OR
Bi-annual visits from the Research Technical Support Committee		●		●	CSPS, PI; CSPM, OR
Draft Plan for Phase 2 Data Collection and Analysis	●	●			CSPS, PI CSPM, OR
TRACtion Case Study Research, Analysis, Publication, Dissemination	●	●	●		CSPS, PI CSPM, OR
Technical Assistance from Project Evidence for OR Report		●	●		CSPS, PI
Phase 2 Data Collection (Final KPC, final FGDs and Interviews)			●	●	CSPS, PI CSPM, OR, HEs, IIFs
Analysis of Phase 2 Data and Writing of Phase 2/EOP OR Report				●	CSPS, PI CSPM, OR
Preparation of Papers for Publication based on OR results (both Phases)				●	CSPS, PI CSPM, OR
<b>Project Implementation- Casa Maternas</b>					
Continued Operation of 3 existing Casa Maternas (Calhuitz, Santo Domingo, Tuxtla)- safe deliveries, referrals of complications, ANC, PPC	●	●	●	●	MRCs, NS, SBAs, TBAs
Beginning operation of new Casa Materna in Pett	●	●	●	●	MRCs, NS, SBAs, TBAs
Ongoing education at Casa Maternas – Circles of Pregnant Women, Lactating Women, and Adolescents	●	●	●	●	NS, SBAs, TBAs
Ongoing training of staff for Casa Maternas(SBAs)- 3 ENAs, AMTSL, HBLSS, resuscitation	●	●	●	●	NS; SBAs
Ongoing training of SBAs and integration in Casa Materna team	●	●	●	●	NS; SBAs; TBAs
Securing of stakeholder commitments for Casas from MRCs, municipal governments, and MSPAS	●	●	●	●	CSPM, MC, MRC, Munis, MSPAS
Ongoing capacity building of MRCs; monthly meetings with MRCs	●	●	●	●	CSPM, MC, HEs, SBAs, NS
Meetings and advocacy work of COICAM	●	●	●	●	CSPM, MC, COICAM
Operation and monitoring of Casa Materna pharmacies ( <i>boutiquines</i> )-provision of treatment for ARI/diarrhea	●	●	●	●	CSPM, NS; SBAs; TBAs
Securing approval of MSPAS to provide child immunizations at Casas		●	●		CSPM, MSPAS

Ongoing dissemination of Casa Materna results and advocacy work with MSPAS and potential new Casa Materna implementation partners	●	●	●	●	CSPM, CSPS
Project Implementation – CBIO, Care Groups, SIAS					
Continued Community Mobilization for Phase 2 communities, formation of remaining CHCs; completion of roll-out of Phase II	●				MCs, IFs, HEs, CFs
Ongoing updating of Censuses, Maps, and Community Registers in all Phase 1 and Phase 2 communities	●	●	●	●	MCs, HEs, FCs, IFs
Capacity building of CHCs and Women's Support Committees in communities of both Phases.	●	●	●	●	CHCs, WSCs, HEs
On-going monthly meetings with CHCs ( <i>Sala Situacionales</i> ) and community assemblies ( <i>assembleas</i> ) to discuss community health	●	●	●	●	CHCs, WSCs, HEs, FCs
Registration of U5 children, WRA, and pregnant women (on-going); vital events capture of pregnancies, births, deaths; verbal autopsies	●	●	●	●	IFs, HEs, CFs, CGVs, TBAs
Recruitment and Training/Support of Community Facilitators and Care Group Volunteers	●	●	●	●	CHCs, HEs, CFs, CGVs
Ongoing updating of Care Group Training Modules in Training Guide ( <i>Guia</i> ) on MNC, Nutrition, ARI, Diarrhea, and Immunization and updating of <i>Guia</i>	●	●	●	●	HESs, HEs
Ongoing training cascade of HEs, FCs, and CGVs	●	●	●	●	HEs, CFs, CGVs
Ongoing monitoring and assessment of HEs by HES; of FCs by HEs; of CGVs by FCs and HEs; ongoing capacity building to improve skills	●	●	●	●	HEs, CFs, CGVs
Ongoing routine home visitation (RHV) by HEs and FCs of pregnant women, post-partum women, and women of under-2 children	●	●	●	●	HEs, CFs, CGVs
Ongoing monitoring of feeding practices (esp. EBF) by CGVs and FCs	●	●	●	●	HEs, CFs, CGVs
Ongoing growth monitoring of under-2 children	●	●	●	●	HEs, CFs, CGVs
Continuation of Positive Deviance intervention and conducting home nutrition workshops.	●	●	●	●	HEs, FCs
Ongoing couples and family health counseling by HEs to better integrate men/husbands	●	●	●	●	HEs, FCs
Phase 2 SIAS Services. Implementing and promoting on-going SIAS health activities in Phase 1 and Phase 2 communities	●	●	●	●	IFs, HEs, CFs, FCs, ANs
Finalization of SIAS services contract with MSPAS for PY4	●				CSPM, MSPAS
Monthly Meetings with Municipal Gov't and district MSPAS offices to share project data	●	●	●	●	CSPM, MCs, HEs,
Quarterly Coordination Meetings with MSPAS, MRCs, Munis, COICAM	●	●	●	●	CSPM, MCs
Ongoing Technical Assistance from Program Specialist	●	●	●	●	CSPS
Strategic Planning work; drafting of 5-year Strategic Plan for Curamericas Guatemala	●				CSPM; CSPS; outside consultants
Training in Community Mobilization and Conflict Resolution		●			CSPS
Sustainability Workshops Grant-Writing, Fund-Raising, & Partnership Development		●		●	CSPS
Recruitment and Contracting of Final Evaluator		●	●		CSPS, CSPM
Final KPC Survey (300 cluster sample surveys for both Phases)-preparing materials, training interviewers and tabulators, tabulation and analysis				●	CSPS, CSPM, IFs, HEs, MCs
Final Evaluation				●	EE
Quarterly outreach meetings (in person and virtual) with USAID, stakeholders, partners, and potential partners	●	●	●	●	CPS, CSPM, PI

Annual Stakeholders Meeting				● Curamericas, C/G; MSPAS, MRCs, Munis, CHCs
Writing the PY4 Annual Report				● CSPS, CSPM, OR
Dissemination of Final Evaluation and EOP Results				● CPS, CSPM, PI
Final Annual Audit				● CSPM, CSPS, AC, External Auditor



## Annex 2: Updated performance monitoring indicator table (Phase 1 Communities)

Outcome Indicator	Baseline Phase 1	Current Data Phase 1	Data Source	Proposal EOP Target
<b>Nutrition (30% LOE)</b>				
Exclusive breastfeeding (0-5 months): Percent of infants aged 0-5 months who were given breast milk only in the 24 hours preceding survey	75.0%	NA		85%
Vitamin A Supplementation for Child: Percentage of children age 6-23 months who received a dose of Vitamin A in the last 6 months: card verified or mother's recall *	79.1%	83.0%	Mini-KPC	85%
IYCF practice indicator ( 6-23 months): Percent of infants and young children aged 6-23 months fed according to a minimum of appropriate feeding practices*	53.0%	NA		70%
Underweight: Percentage of children age 0-23 months who are underweight (-SD for the median weight for age, according to WHO/NCHS reference population)*	16.4%	NA		12%
<b>Immunization (5% LOE)</b>				
Measles Immunization: Percentage of children aged 12-23 months who received Measles vaccination by the time of the survey (card verified).	79.3%	NA		85%
Vaccination Coverage: Percentage of children aged 12-23 months who received all required antigens and doses by the time of the survey- BCG, PENTA1-3, Polio1-3, and Measles (card verified).	73.6%	NA		80%
<b>Prevention and Treatment of Diarrhea (15%)</b>				
ORT Use During a Diarrheal Episode: Percentage of children age 0-23 months with diarrhea in the last two weeks who received oral rehydration solution and/or recommended home fluids	28.3%	NA		50%
Increased fluid intake during a diarrheal episode: Percent of children 0-23 months with diarrhea in the last two weeks who were offered more fluids during the illness	7.5%	NA		40%
Increased food intake during a diarrheal episode: Percent of children 0-23 months with diarrhea in the last two weeks who were offered the same amount or more food during the illness	0.0%	NA		40%
Zinc Treatment for Diarrhea: Percent of children 0-23 months with diarrhea in the last two weeks who were treated with zinc supplements	6.7%	NA		50%

<b>Outcome Indicator</b>	<b>Baseline Phase 1</b>	<b>Current Data Phase 1</b>	<b>Data Source</b>	<b>Proposal EOP Target</b>
Regular Point of Use Water Treatment: Percentage of households of children age 0-23 months that treat water effectively and regularly	66.6%	NA		75%
Safe Water Storage: Percent of households that store water safely	11.7%	NA		40%
Safe Feces Disposal: Percentage of households that disposed of the youngest child's feces safely the last time s/he passed stool	43.1%	62.2%	Mini-KPC	80%
Hand washing at Critical Times: Percent of mothers who usually wash their hands with soap before food preparation, before feeding children, after defecation, and after attending to a child who has defecated	1.3%	32.6%	Mini-KPC	50%
Appropriate Hand Washing Station: Percentage of mothers of children age 0-23 months who live in households with soap, water, and recipient at a designated place for hand washing *	2.3%	34.7%	Mini-KPC	50%
<b>Treatment of ARI/Pneumonia (15%)</b>				
Appropriate Care Seeking for Pneumonia: Percentage of children age 0-23 months with chest-related cough and fast and/or difficult breathing in the last two weeks who were taken to an appropriate health provider	26.0%	40.4%	Mini-KPC	50%
<b>Maternal/Newborn Care (35%)</b>				
Quality Antenatal Care: Percentage of mothers of children age 0-23 months who had four or more antenatal visits with a skilled provider (doctor, nurse, professional midwife)	13.4%	NA		50%
Tetanus Toxoid: Percentage of mothers with children age 0-23 months who received at least 2 tetanus toxoid vaccinations before the birth of their youngest child.	63.2%	67.0%	Mini-KPC	75%
Iron Tablets for Pregnant Women: Percentage of mothers of children age 0-23 months who took iron tablets or syrup for at least 90 days before the birth of their youngest child.	21.7%	73.0%	Mini-KPC	60%
Knowledge of Danger Signs during Pregnancy: Percentage of mothers of children 0-23 months who knew at least two danger signs during pregnancy.	22.1%	57.7%	Mini-KPC	50%
Skilled Birth Attendant: Percentage of children age 0-23 months whose births were attended by skilled personnel (doctor, nurse, professional midwife) in a health facility	15.4%	27.5%	Mini – KPC	35%
Essential Newborn Care: Percentage of children age 0-23 who received all three elements of essential newborn care: thermal protection immediately after birth, clean cord care, and immediate and exclusive breastfeeding.	6.0%	37.0%	Mini-KPC	25%

<b>Outcome Indicator</b>	<b>Baseline Phase 1</b>	<b>Current Data Phase 1</b>	<b>Data Source</b>	<b>Proposal EOP Target</b>
Active Management of Third Stage of Labor (AMTSL): Percentage of mothers of children age 0-23 months who received AMTSL during their most recent delivery: uterotonic drug; uterine massage; controlled cord traction.	9.4%	15%	Mini-KPC	25%
Knowledge of Maternal Danger Signs During Delivery: Percentage of mothers of children 0-23 months who know at least two danger signs during delivery.	13.4%	NA		50%
Post-Partum Visit for the Mother and Newborn: Percentage of mothers of children age 0-23 and children age 0-23 months who received a post-partum visit from an appropriate trained health worker within two days after the birth of the youngest child.	22.4%	NA		50%
Knowledge of Post-partum Danger Signs: Percentage of mothers of children age 0-23 months who knew at least two post-partum danger signs.	17.1%	NA		50%
Knowledge of Neonatal Danger Signs: Percentage of mothers of children age 0-23 who know at least two neonatal danger signs.	27.4%	NA		50%
Vitamin A Supplementation for Mother: Percentage of mothers of children 0-23 months who received Vitamin A supplementation with 2 months post-partum	22.1%	25.0%	Mini-KPC	50%
Knowledge of Risk Associated with Birth to Pregnancy Intervals Less than 24 Months: Percentage of mothers of children 0-23 months who know at least two risks of having a birth to pregnancy interval of less than 24 months	6.4%	NA		50%
Current Contraceptive Use Among Mothers of Young Children: Percentage of non-pregnant mothers of children age 0-23 months who are using a modern contraceptive method*	35.8%	37.4%	Mini-KPC	45%
<b>Women's Empowerment</b>				
Decision-Making re: ARI Treatment: Percentage of ARI episodes in 0-23 months old children in the past two weeks in which either the mother or the mother jointly with another person decided the care-seeking and/or treatment	72.7%	90.4%	Mini-KPC	85%

<b>Outcome Indicator</b>	<b>Baseline Phase 1</b>	<b>Current Data Phase 1</b>	<b>Data Source</b>	<b>Proposal EOP Target</b>
Decision-Making re: Location of Delivery and Birth Attendant: Percentage of households with children 0-23 months in which either the mother or the mother jointly with another person decided the location and birth attendant of her last delivery	68.2%	85.9%	Mini-KPC	80%
Control of Money for Purchasing Food for Children: Percentage of mothers of children 0-23 months who indicate that they do not need to ask for the money needed to buy the food necessary to meet the minimum acceptable feeding practices for infants and young children	12.6%	6.1%	Mini-KPC	30%
Decision-Making re: Contraception: Percentage of households with children 0-23 months in which either the mother or the mother jointly with her husband/partner (or another person) would practice contraception and, if so, the method to be used	56.5%	63.5%	Mini-KPC	70%
Women's Participation in Community Meetings: Percentage of mothers of 0-23 month old children who report that in the past 3 months they both attended and expressed their opinion at a community meeting.	10.0%	47.9%	Mini-KPC	30%
<b>Community Support of Maternal Child Health</b>				
Community OE Response Plan: Percentage of mothers of children 0-23 months old who report that their community has in place an emergency response plan that would provide transport for them and/or their newborn child to the nearest health facility in the event of a difficult delivery or danger signs in pregnancy or during the post-partum period	29.4%	NA		60%
Care Group Activity: Percentage of mothers of children 0-23 months old who report that in the past month they have either been a Care Group volunteer, participated in a Care Group meeting, or have been instructed by a Care Group member.	8.4%	95.7%	Mini-KPC	70%
<b>Community Social Capital</b>				
Community Solidarity: Percentage of mothers of 0-23 month old children who report that their community has worked together to solve a community problem or make a community improvement in the past 3 months.	13.0%	65.9%	Mini-KPC	40%

## Annex 3: Project Data Form

### Child Survival and Health Grants Program Project Summary

Oct-27-2014

#### Curamericas (Guatemala)

##### General Project Information

**Cooperative Agreement Number:** AID-OAA-A-11-00041

**CURAMERICAS Headquarters Technical Backstop:** Ira Stollak

**CURAMERICAS Headquarters Technical Backstop**

**Backup:**

**Field Program Manager:** Mario Valdez

**Midterm Evaluator:**

**Final Evaluator:**

**Headquarter Financial Contact:** Ira Stollak

**Project Dates:** 10/1/2011 - 9/30/2015 (FY2011)

**Project Type:** Innovation

**USAID Mission Contact:** Baudillo Lopez

**Project Web Site:** <http://www.curamericas.org/our-work/guatemala>

##### Field Program Manager

**Name:** Mario Valdez (Child Survival Program Manager)

**Address:** Pasac 1º. B-228 Cantel

Quetzaltenango Guatemala

**Phone:** +502.776.38.095

**Fax:**

**E-mail:** [mariovaldez@hotmail.com](mailto:mariovaldez@hotmail.com)

**Skype Name:**

##### Alternate Field Contact

**Name:**

**Address:**

**Phone:**

**Fax:**

**E-mail:**

**Skype Name:**

##### Grant Funding Information

**USAID Funding:** \$1,748,559 **PVO Match:** \$1,270,835

##### General Project Description

Curamericas Global, a 2011 Innovation category grantee, is implementing the *Community-Based Impact-Oriented Child Survival Project* in three underserved municipalities of the Department of Huehuetenango, Guatemala. The project goal is to improve health and nutrition, and ultimately reduce mortality, in under-five children through community mobilization, training and capacity building of local partners, establishment of emergency response networks, and implementation of high-impact interventions at the community, municipality and district levels. Interventions include: Maternal/Newborn Care (35%), Nutrition (30%), Pneumonia (15%), Diarrhea (15%), and Immunizations (5%). The project will reach approximately 40,692 beneficiaries consisting of 28,058 women of reproductive age and 12,634 under-five children.

##### Project Location

**Latitude:** 15.78 **Longitude:** -90.23

**Project Location Types:** Rural

**Levels of Intervention:** Health Center

Health Post Level

Home

Community

**Province(s):** Department of Huehuetenango

**District(s):** Municipalities of San Sebastián Coatán, Santa Eulalia, and San Miguel Acatán

**Sub-District(s):** --

##### Operations Research Information

**OR Project Title:** Community-Based Impact-Oriented (CBIO) Methodology and Care Groups

**Cost of OR Activities:** \$112,284

**Research Partner(s):** Johns Hopkins Bloomberg School of Public Health; Centro Universitario de Occidente "CUNOC"

**OR Project Description:** Curamericas will conduct operations research that examines combining Community-Based Impact-Oriented (CBIO) methodology and the Care Group model as

a means to ensure that culturally appropriate high-quality care reach those most in need. Research will assess the synergistic effects these methodologies have on health outcomes, health behavior, and social impact when implemented together. Formative research will also be conducted on redefining the role of traditional birth attendants in a manner that aligns with the Ministry of Public Health and Social Welfare's national strategy and their role in improving the quality of maternity care and reducing maternal mortality.

## Partners

**Curamericas Guatemala** (Collaborating Partner) \$0

**Mayan Families** (Collaborating Partner) \$0

**American College of Nurse Midwives** (Collaborating Partner) \$8,000

## Strategies

**Social and Behavioral Change Strategies:** Community Mobilization

Group interventions

Interpersonal Communication

**Health Services Access Strategies:** Emergency Transport Planning/Financing

Addressing social barriers (i.e. gender, socio-cultural, etc)

Implementation with a sub-population that the government has identified as poor and underserved

Implementation in a geographic area that the government has identified as poor and underserved

**Health Systems Strengthening:** Quality Assurance

Conducting capacity assessment of local partners

Supportive Supervision

Task Shifting

Developing/Helping to develop clinical protocols, procedures, case management guidelines

Developing/Helping to develop job aids

Monitoring health facility worker adherence with evidence-based guidelines

Providing feedback on health worker performance

Monitoring CHW adherence with evidence-based guidelines

Referral-counterreferral system development for CHWs

Community role in recruitment of CHWs

Development of clinical record forms

Review of clinical records (for quality assessment/feedback)

Coordinating existing HMIS with community level data

Pharmaceutical management and logistics

Community input on quality improvement

**Strategies for Enabling Environment:** Stakeholder engagement and policy dialogue (local/state or national)

Building capacity of communities/CBOs to advocate to leaders for health

**Tools/Methodologies:** BEHAVE Framework

Rapid Health Facility Assessment

Community-based Monitoring of Vital Events

LQAS

Participatory Rapid/Rural Appraisal

MAMAN Framework

## Capacity Building

**Local Partners:** Local Non-Government Organization (NGO)

National Ministry of Health (MOH)

Dist. Health System

Health Facility Staff

Health CBOs

Government sanctioned CHWs

Non-government sanctioned CHWs

TBAs

## Interventions & Components

**Control of Diarrheal Diseases (15%)**

- Water/Sanitation

- Hand Washing

- ORS/Home Fluids

- Feeding/Breastfeeding

- Care Seeking

- Case Management/Counseling

- POU Treatment of water

- Zinc

- Community Case Management with Zinc (Implementation)

- Community Case Management with ORS (Implementation)

CHW Training  
HF Training

**Immunizations (5%)**

- Polio
- Vitamin A
- Surveillance
- Cold Chain Strengthening
- Injection Safety
- Mobilization
- Measles Campaigns
- Community Registers

CHW Training  
HF Training

**Infant & Young Child Feeding**

- ENA
- Comp. Feed. from 6 mos.
- Cont. BF up to 24 mos.
- Growth Monitoring
- Maternal Nutrition
- Peer support
- Promote Excl. BF to 6 Months
- Intro. or promotion of LAM

CHW Training  
HF Training

**Maternal & Newborn Care (35%)**

- Emergency Obstetric Care
- Neonatal Tetanus
- Recognition of Danger signs
- Newborn Care
- Post partum Care
- Child Spacing
- Integation. with Iron & Folic Acid
- Normal Delivery Care
- Birth Plans
- Home Based LSS
- Control of post-partum bleeding
- Emergency Transport
- Neonatal Vitamin A
- Kangaroo Mother Care (skin to skin care)
- Misoprostol
- AMTSL
- Pre-eclampsia

CHW Training  
HF Training

**Pneumonia Case Management (15%)**

- Case Management Counseling
- Access to Providers Antibiotics
- Recognition of Pneumonia Danger Signs

CHW Training  
HF Training

## Operational Plan Indicators

<b>Number of People Trained in Maternal/Newborn Health</b>			
<b>Gender</b>	<b>Year</b>	<b>Target</b>	<b>Actual</b>
Female	2012	92	
Female	2012		3200
Male	2012		385
Male	2012	42	
Female	2013	4000	
Female	2013		4315
Male	2013		462
Male	2013	450	
Female	2014		9214
Male	2014		779
Female	2015	7000	
Male	2015	700	
<b>Number of People Trained in Child Health &amp; Nutrition</b>			
<b>Gender</b>	<b>Year</b>	<b>Target</b>	<b>Actual</b>
Female	2012	52	
Female	2012		3200
Male	2012		385
Male	2012	52	
Female	2013	4000	
Female	2013		4543
Male	2013		462
Male	2013	450	
Female	2014		6438
Male	2014		779
Female	2015	7000	
Male	2015	700	
<b>Number of People Trained in Malaria Treatment or Prevention</b>			
<b>Gender</b>	<b>Year</b>	<b>Target</b>	<b>Actual</b>
Female	2012		0
Female	2012	0	
Male	2012		0
Male	2012	0	
Female	2013		0
Female	2013	0	
Male	2013		0
Male	2013	0	
Female	2014		0
Male	2014		0
Female	2015	0	
Male	2015	0	



**Locations & Sub-Areas**

San Miguel Acatán 30,977  
San Sebastián Coatán 21,945  
Santa Eulalia 45,419  
Total Population: 98,341

**Target Beneficiaries**

	San Miguel Acatán	San Sebastián Coatán	Santa Eulalia	Total
Children 0-59 months	4,403	3,961	6,963	15,327
Women 15-49 years	9,113	7,445	15,772	32,330
Beneficiaries Total	13,516	11,406	22,735	47,657

**Rapid Catch Indicators: DIP Submission**

Rapid Catch Indicators: DIP Submission

Sample Type: 30 Cluster

**Antenatal Care**

**Description** -- Percentage of mothers of children age 0-23 months who had four or more antenatal visits when they were pregnant with the youngest child

**Numerator:** Enter the number of mothers with children age 0-23 months who had at least four antenatal visits while pregnant with their youngest child

**Denominator:** Enter the total number of mothers of children age 0-23 months in the survey

Sub Area Name	Numerator	Denominator	Percent(calculate)	Confidence Limits
San Miguel Acatán	12	140	8.6%	6.6
San Sebastián Coatlán	27	140	19.3%	9.2
Santa Eulalia	20	319	6.3%	3.8

**Maternal TT Vaccination**

**Description** -- Percentage of mothers with children age 0-23 months who received at least two Tetanus toxoid vaccinations before the birth of their youngest child

**Numerator:** Enter the number of mothers with children age 0-23 months who received at least two tetanus toxoid vaccinations before the birth of their youngest child

**Denominator:** Enter the total number of mothers of children age 0-23 months in the survey

Sub Area Name	Numerator	Denominator	Percent(calculate)	Confidence Limits
San Miguel Acatán	81	140	57.9%	11.6
San Sebastián Coatlán	115	140	82.1%	9.0
Santa Eulalia	182	319	57.1%	7.7

**Skilled Birth Attendant**

**Description** -- Percentage of children age 0-23 months whose births were attended by skilled personnel

**Numerator:** Enter the number of children age 0-23 months whose birth was attended by a doctor, nurse, midwife, auxiliary midwife, or other personnel with midwifery skills

**Denominator:** Enter the total number of children age 0-23 months in the survey

Sub Area Name	Numerator	Denominator	Percent(calculate)	Confidence Limits
San Miguel Acatán	11	140	7.9%	6.3
San Sebastián Coatlán	25	140	17.9%	9.0
Santa Eulalia	28	319	8.8%	4.4

**Current Contraceptive Use Among Mothers of Young Children**

**Description** -- Percentage of mothers of children age 0-23 months who are using a modern contraceptive method

**Numerator:** Enter the number of mothers with children age 0-23 months who are using a modern contraceptive method

**Denominator:** Enter the total number of mothers of children age 0-23 months in the survey

Sub Area Name	Numerator	Denominator	Percent(calculate)	Confidence Limits
San Miguel Acatán	68	140	48.6%	11.7
San Sebastián Coatlán	54	140	38.6%	11.4
Santa Eulalia	66	319	20.7%	6.3

**Post-Natal Visit to Check on Newborn Within the First 2 Days After Birth**

**Description** -- Percentage of children age 0-23 months who received a post-natal visit from an appropriately trained health worker within two days after birth

**Numerator:** Enter the number of children age 0-23 months who received a post-natal visit within two days after birth by an appropriate health worker

**Denominator:** Enter the total number of children age 0-23 months in the survey

Sub Area Name	Numerator	Denominator	Percent(calculate)	Confidence Limits
San Miguel Acatán	17	140	12.1%	7.7
San Sebastián Coatlán	22	140	15.7%	8.5
Santa Eulalia	76	319	23.8%	6.6

**Exclusive Breastfeeding**

**Description** -- Percentage of children age 0-5 months who were exclusively breastfed during the last 24 hours

**Numerator:** Enter the number of children age 0-5 months who drank breast milk in the previous 24 hours AND did not drink any other liquids in the previous 24 hours AND was not given any other foods or liquids in the previous 24 hours

**Denominator:** Enter the total number of children age 0-5 months in the survey

Sub Area Name	Numerator	Denominator	Percent(calculate)	Confidence Limits
San Miguel Acatán	27	35	77.1%	19.7
San Sebastián Coatlán	22	28	78.6%	21.5
Santa Eulalia	71	93	76.3%	12.2

**Infant and Young Child Feeding**

**Description** -- Percentage of infants and young children age 6-23 months fed according to a minimum of appropriate feeding practices

**Numerator:** Enter the number infants and young children age 6-23 months fed according to a minimum of appropriate feeding practices  
**Denominator:** Enter the total number of children age 6-23 months in the survey

Sub Area Name	Numerator	Denominator	Percent(calculate)	Confidence Limits
San Miguel Acatán	52	105	49.5%	13.5
San Sebastián Coatán	57	112	50.9%	13.1
Santa Eulalia	133	226	58.8%	9.1

#### Vitamin A Supplementation in the Last 6 Months

**Description** – Percentage of children age 6-23 months who received a dose of Vitamin A in the last 6 months: card verified or mother's recall

**Numerator:** Enter the number of children age 6-23 months who received a dose of Vitamin A in the last 6 months (mother's recall or card verified)

**Denominator:** Enter the total number of children age 6-23 months in the survey

Sub Area Name	Numerator	Denominator	Percent(calculate)	Confidence Limits
San Miguel Acatán	89	105	84.8%	9.7
San Sebastián Coatán	89	112	79.5%	10.6
Santa Eulalia	160	226	70.8%	8.4

#### Measles Vaccination

**Description** – Percentage of children age 12-23 months who received a measles vaccination

**Numerator:** Enter the number of children age 12-23 months who received a measles vaccination by the time of the interview as seen on the card or recalled by the mother

**Denominator:** Enter the total number of children age 12-23 months in the survey

Sub Area Name	Numerator	Denominator	Percent(calculate)	Confidence Limits
San Miguel Acatán	57	64	89.1%	10.8
San Sebastián Coatán	55	63	87.3%	11.6
Santa Eulalia	100	141	70.9%	10.6

#### Access to Immunization Services

**Description** – Percentage of children age 12-23 months who received DTP1 according to the vaccination card or mother's recall by the time of the survey

**Numerator:** Enter the number of children age 12-23 months who received a DTP1 at the time of the survey according to the vaccination card/child health booklet or mother's recall

**Denominator:** Enter the total number of children age 12-23 months in the survey

Sub Area Name	Numerator	Denominator	Percent(calculate)	Confidence Limits
San Miguel Acatán	63	64	98.4%	4.3
San Sebastián Coatán	56	63	88.9%	11.0
Santa Eulalia	112	141	79.4%	9.4

#### Health System Performance Regarding Immunization Services

**Description** – Percentage of children age 12-23 months who received DTP3 according to the vaccination card or mother's recall by the time of the survey

**Numerator:** Enter the number of children age 12-23 months who received DTP3 at the time of the survey according to the vaccination card/child health booklet or mother's recall

**Denominator:** Enter the total number of children age 12-23 months in the survey

Sub Area Name	Numerator	Denominator	Percent(calculate)	Confidence Limits
San Miguel Acatán	61	64	95.3%	7.3
San Sebastián Coatán	56	63	88.9%	11.0
Santa Eulalia	101	141	71.6%	10.5

#### Treatment of Fever in Malarious Zones

**Description** – Percentage of children age 0-23 months with a febrile episode during the last two weeks who were treated with an effective anti-malarial drug within 24 hours after the fever began

**Numerator:** Enter the number of children age 0-23 months with a febrile episode in the last two weeks AND whose mother/caretaker sought treatment for the child within 24 hours AND who were treated with an appropriate anti-malarial drug

**Denominator:** Enter the total number of children age 0-23 months with a febrile episode in the last two weeks

Sub Area Name	Numerator	Denominator	Percent(calculate)	Confidence Limits
San Miguel Acatán			%	
San Sebastián Coatán			%	
Santa Eulalia			%	

#### ORT Use

**Description** – Percentage of children age 0-23 months with diarrhea in the last two weeks who received oral rehydration solution (ORS) and/or recommended home fluids

**Numerator:** Enter the number of children age 0-23 months with diarrhea in the last two weeks AND who received oral rehydration solution (ORS) and/or recommended home fluids

**Denominator:** Enter the total number of children age 0-23 months who had diarrhea in the last two weeks

Sub Area Name	Numerator	Denominator	Percent(calculate)	Confidence Limits
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San Miguel Acatán	14	65	21.5%	14.1
San Sebastián Coatán	9	61	14.8%	12.6
Santa Eulalia	47	112	42.0%	12.9

#### Appropriate Care Seeking for Pneumonia

**Description** – Percentage of children age 0-23 months with chest-related cough and fast and/or difficult breathing in the last two weeks who were taken to an appropriate health provider

**Numerator:** Enter the number of children age 0-23 months with chest-related cough and fast and/or difficult breathing in the last two weeks who were taken to an appropriate health provider

**Denominator:** Enter the total number of children with chest-related cough and fast and /or difficult breathing in the last two weeks

Sub Area Name	Numerator	Denominator	Percent(calculate)	Confidence Limits
San Miguel Acatán	8	35	22.9%	19.7
San Sebastián Coatán	3	31	9.7%	14.7
Santa Eulalia	25	89	28.1%	13.2

#### Point of Use (POU)

**Description** – Percentage of households of children age 0-23 months that treat water effectively

**Numerator:** Enter the number of households of mothers of children 0-23 months that treat water effectively

**Denominator:** Enter the total number of households of children age 0-23 months in the survey

Sub Area Name	Numerator	Denominator	Percent(calculate)	Confidence Limits
San Miguel Acatán	88	140	62.9%	11.3
San Sebastián Coatán	32	140	22.9%	9.8
Santa Eulalia	254	319	79.6%	6.3

#### Appropriate Hand Washing Practices

**Description** – Percentage of mothers of children age 0-23 months who live in households with soap at the place for hand washing

**Numerator:** Enter the number of mothers with children age 0-23 months who live in households with soap at the place for hand washing

**Denominator:** Enter the total number of mothers of children age 0-23 months in the survey

Sub Area Name	Numerator	Denominator	Percent(calculate)	Confidence Limits
San Miguel Acatán	10	140	7.1%	6.0
San Sebastián Coatán	4	140	2.9%	3.9
Santa Eulalia	0	319	0.0%	0.0

#### Child Sleeps Under an Insecticide-Treated Bednet

**Description** – Percentage of children age 0-23 months who slept under an insecticide-treated bednet (in malaria risk areas, where bednet use is effective) the previous night

**Numerator:** Enter the number of children age 0-23 months who slept under an insecticide-treated bednet the previous night

**Denominator:** Enter the total number of children age 0-23 months in the survey

Sub Area Name	Numerator	Denominator	Percent(calculate)	Confidence Limits
San Miguel Acatán			%	
San Sebastián Coatán			%	
Santa Eulalia			%	

#### Underweight

**Description** – Percentage of children 0-23 months who are underweight (-2 SD for the median weight for age, according to the WHO/NCHS reference population)

**Numerator:** Enter the number of children 0-23 months with weight/age -2 SD for the median weight for age, according to the WHO/NCHS reference population

**Denominator:** Enter the total number of children age 0-23 months in the survey

Sub Area Name	Numerator	Denominator	Percent(calculate)	Confidence Limits
San Miguel Acatán	26	140	18.6%	9.1
San Sebastián Coatán	36	140	25.7%	10.2
Santa Eulalia	45	319	14.1%	5.4

**Numerator:** Enter the number infants and young children age 6-23 months fed according to a minimum of appropriate feeding practices  
**Denominator:** Enter the total number of children age 6-23 months in the survey

Sub Area Name	Numerator	Denominator	Percent(calculate)	Confidence Limits
San Miguel Acatán	52	105	49.5%	13.5
San Sebastián Coatán	57	112	50.9%	13.1
Santa Eulalia	133	226	58.8%	9.1

#### Vitamin A Supplementation in the Last 6 Months

**Description** – Percentage of children age 6-23 months who received a dose of Vitamin A in the last 6 months: card verified or mother's recall

**Numerator:** Enter the number of children age 6-23 months who received a dose of Vitamin A in the last 6 months (mother's recall or card verified)

**Denominator:** Enter the total number of children age 6-23 months in the survey

Sub Area Name	Numerator	Denominator	Percent(calculate)	Confidence Limits
San Miguel Acatán	89	105	84.8%	9.7
San Sebastián Coatán	89	112	79.5%	10.6
Santa Eulalia	160	226	70.8%	8.4

#### Measles Vaccination

**Description** – Percentage of children age 12-23 months who received a measles vaccination

**Numerator:** Enter the number of children age 12-23 months who received a measles vaccination by the time of the interview as seen on the card or recalled by the mother

**Denominator:** Enter the total number of children age 12-23 months in the survey

Sub Area Name	Numerator	Denominator	Percent(calculate)	Confidence Limits
San Miguel Acatán	57	64	89.1%	10.8
San Sebastián Coatán	55	63	87.3%	11.6
Santa Eulalia	100	141	70.9%	10.6

#### Access to Immunization Services

**Description** – Percentage of children age 12-23 months who received DTP1 according to the vaccination card or mother's recall by the time of the survey

**Numerator:** Enter the number of children age 12-23 months who received a DTP1 at the time of the survey according to the vaccination card/child health booklet or mother's recall

**Denominator:** Enter the total number of children age 12-23 months in the survey

Sub Area Name	Numerator	Denominator	Percent(calculate)	Confidence Limits
San Miguel Acatán	63	64	98.4%	4.3
San Sebastián Coatán	56	63	88.9%	11.0
Santa Eulalia	112	141	79.4%	9.4

#### Health System Performance Regarding Immunization Services

**Description** – Percentage of children age 12-23 months who received DTP3 according to the vaccination card or mother's recall by the time of the survey

**Numerator:** Enter the number of children age 12-23 months who received DTP3 at the time of the survey according to the vaccination card/child health booklet or mother's recall

**Denominator:** Enter the total number of children age 12-23 months in the survey

Sub Area Name	Numerator	Denominator	Percent(calculate)	Confidence Limits
San Miguel Acatán	61	64	95.3%	7.3
San Sebastián Coatán	56	63	88.9%	11.0
Santa Eulalia	101	141	71.6%	10.5

#### Treatment of Fever in Malarious Zones

**Description** – Percentage of children age 0-23 months with a febrile episode during the last two weeks who were treated with an effective anti-malarial drug within 24 hours after the fever began

**Numerator:** Enter the number of children age 0-23 months with a febrile episode in the last two weeks AND whose mother/caretaker sought treatment for the child within 24 hours AND who were treated with an appropriate anti-malarial drug

**Denominator:** Enter the total number of children age 0-23 months with a febrile episode in the last two weeks

Sub Area Name	Numerator	Denominator	Percent(calculate)	Confidence Limits
San Miguel Acatán			%	
San Sebastián Coatán			%	
Santa Eulalia			%	

#### ORT Use

**Description** – Percentage of children age 0-23 months with diarrhea in the last two weeks who received oral rehydration solution (ORS) and/or recommended home fluids

**Numerator:** Enter the number of children age 0-23 months with diarrhea in the last two weeks AND who received oral rehydration solution (ORS) and/or recommended home fluids

**Denominator:** Enter the total number of children age 0-23 months who had diarrhea in the last two weeks

Sub Area Name	Numerator	Denominator	Percent(calculate)	Confidence Limits
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Malaria Rapid CATCH indicators not recorded due to no malaria interventions as part of the project.

San Miguel Acatán	14	65	21.5%	14.1
San Sebastián Coatán	9	61	14.8%	12.6
Santa Eulalia	47	112	42.0%	12.9
<b>Appropriate Care Seeking for Pneumonia</b>				
<b>Description</b> – Percentage of children age 0-23 months with chest-related cough and fast and/or difficult breathing in the last two weeks who were taken to an appropriate health provider				
<b>Numerator:</b> Enter the number of children age 0-23 months with chest-related cough and fast and/or difficult breathing in the last two weeks who were taken to an appropriate health provider				
<b>Denominator:</b> Enter the total number of children with chest-related cough and fast and /or difficult breathing in the last two weeks				
Sub Area Name	Numerator	Denominator	Percent(calculate)	Confidence Limits
San Miguel Acatán	8	35	22.9%	19.7
San Sebastián Coatán	3	31	9.7%	14.7
Santa Eulalia	25	89	28.1%	13.2
<b>Point of Use (POU)</b>				
<b>Description</b> – Percentage of households of children age 0-23 months that treat water effectively				
<b>Numerator:</b> Enter the number of households of mothers of children 0-23 months that treat water effectively				
<b>Denominator:</b> Enter the total number of households of children age 0-23 months in the survey				
Sub Area Name	Numerator	Denominator	Percent(calculate)	Confidence Limits
San Miguel Acatán	88	140	62.9%	11.3
San Sebastián Coatán	32	140	22.9%	9.8
Santa Eulalia	254	319	79.6%	6.3
<b>Appropriate Hand Washing Practices</b>				
<b>Description</b> – Percentage of mothers of children age 0-23 months who live in households with soap at the place for hand washing				
<b>Numerator:</b> Enter the number of mothers with children age 0-23 months who live in households with soap at the place for hand washing				
<b>Denominator:</b> Enter the total number of mothers of children age 0-23 months in the survey				
Sub Area Name	Numerator	Denominator	Percent(calculate)	Confidence Limits
San Miguel Acatán	10	140	7.1%	6.0
San Sebastián Coatán	4	140	2.9%	3.9
Santa Eulalia	0	319	0.0%	0.0
<b>Child Sleeps Under an Insecticide-Treated Bednet</b>				
<b>Description</b> – Percentage of children age 0-23 months who slept under an insecticide-treated bednet (in malaria risk areas, where bednet use is effective) the previous night				
<b>Numerator:</b> Enter the number of children age 0-23 months who slept under an insecticide-treated bednet the previous night				
<b>Denominator:</b> Enter the total number of children age 0-23 months in the survey				
Sub Area Name	Numerator	Denominator	Percent(calculate)	Confidence Limits
San Miguel Acatán			%	
San Sebastián Coatán			%	
Santa Eulalia			%	
<b>Underweight</b>				
<b>Description</b> – Percentage of children 0-23 months who are underweight (-2 SD for the median weight for age, according to the WHO/NCHS reference population)				
<b>Numerator:</b> Enter the number of children 0-23 months with weight/age -2 SD for the median weight for age, according to the WHO/NCHS reference population				
<b>Denominator:</b> Enter the total number of children age 0-23 months in the survey				
Sub Area Name	Numerator	Denominator	Percent(calculate)	Confidence Limits
San Miguel Acatán	26	140	18.6%	9.1
San Sebastián Coatán	36	140	25.7%	10.2
Santa Eulalia	45	319	14.1%	5.4

## Annex 4: Operations Research Report for PY3

### 1. Overview – OR Goals and Design

The objective of our Operational Research is to document the anticipated synergy of the CBIO and Care Group (CBIO + CG) methodologies to achieve a powerful integrated program implementation platform that is able to respond to the urgent needs of reducing maternal and child morbidity and mortality in the marginalized indigenous communities of Guatemala. The research is yielding important evidence and insights into both the strengths and challenges of the integrated methodology and we are finding strong evidence that it is a holistic and sustainable strategy for improving the health of mothers and children in resource-constrained high-mortality settings that engages communities to become active partners in improving their health. The findings are: 1) helping Curamericas Global and Curamericas Guatemala refine culturally-appropriate best-practices than can overcome the barriers to accessing quality health services among the indigenous population of rural Guatemala and 2) helping the Guatemala national government develop feasible and sustainable ways to increase the availability, accessibility, affordability, adequacy, and acceptability of health services for the rural indigenous population of Guatemala and thus achieve the objectives of its flagship initiatives, Cero Hambre [Zero Hunger] and La Ventana de 1,000 Dias (The Window of 1000 Days).

The Child Survival Health Grants Project (CSHGP) was designed as a two phase quasi-experimental controlled operations research project. In Phase 1, which corresponds to PY1 and PY2 of the planned 4-year CSHGP, 92 communities were mobilized for program engagement in the three municipalities of San Sebastián Coatán, San Miguel Acatán, and Santa Eulalia. In Phase 2, which corresponds to PY 3 and PY4 of the CSHGP, engagement and services in the Phase 1 communities continue and 104 new communities in the three municipalities are being mobilized and served, reaching all of the communities in the three municipalities. Health impact is being measured by changes in health behavior, changes in coverage of key health indicators, and changes in maternal and child mortality. Social impact is being measured by changes in community engagement in improving maternal and child health and changes in the empowerment of women. Phase 1 communities receive the services of both the CSHGP program and the Guatemalan Ministry of Health (MSPAS) Extension of Coverage Program (Programa de Extensión de Cobertura- PEC) for the 4 years of the CSHGP project; Phase 2 communities received only the government's Extension of Coverage Program (PEC) in PY1 and PY2, and they are receiving the services of both PEC and CSHGP in PY3 and PY4.

The Operational Research has two research arms, Formative and Evaluative. The Formative Research explores and refines the integrated CBIO+CG methodology. This includes 1) identifying and correcting weaknesses in the integrated methodology; 2) defining the epidemiological priorities of the population; and 3) redefining the role of Comadronas (traditional birth attendants) in order to finally find a way to integrate them into the Guatemalan health system in a way that also improves the quality of maternal/newborn care and reduces maternal and neonatal mortality. The Formative Research is heavily concentrated in Phase 1 so that the lessons learned can be applied to the CSHGP in Phase 2 to maximize project's overall health and social impacts in the final two years of the project. The Evaluative Research arm will assess the health and social impacts achieved and the cost-effectiveness of the approach, utilizing the quasi-

experimental controlled research design by comparing the results obtained in Phase 1 communities with those achieved for Phase 2 communities at the conclusion of the project. We anticipate superior outcomes in the Phase 1 communities that are statistically significant, demonstrating the dose-response impact of the combined CBIO+CG methodology and its value added above and beyond the services provided by MSPAS.

In PY2 we managed to complete most but not all of the Phase 1 operational research activities. These preliminary results were reported in the PY2 Annual Report. During the first two quarters of PY3, we were able to 1) clean, refine, and further analyze the Phase 1 data obtained during PY2; 2) complete the remainder of the planned Phase 1 research activities; and 3) analyze the complete Phase 1 data set. Thus, the key accomplishment of PY3 was to produce our definitive Phase 1 results. The report that follows will summarize those findings. Where the Phase 1 data has been cleaned and refined, it will differ from the preliminary data reported in the PY2 Annual Report. In addition, in PY3 we began to implement program changes and improvements based on the findings of formative research, as presented below.

## **2. Formative Research Findings**

The Formative Research Objectives and Questions are:

Objective 1: Refine the CBIO+CG methodology, procedures and field manuals.

Question: How can the CBIO+CG methodology be improved so that it is readily usable and not overly cumbersome for field programs?

Objective 2: Define the project population, determine the community health priorities and the epidemiological priorities and document the activities carried out.

Questions: Who is living where within the project area? What are the community health priorities and the epidemiological priorities? What are the priority sub-groups? How can these priorities be combined to create program priorities for the project area?

Objective 3: Assess and document the challenges and advantages of implementing the CBIO+CG methodology and integrating it in the MSPAS framework for health care delivery.

Questions: What are the lessons learned in implementing the CBIO+CG methodology? How can the CBIO+CG methodology be best and most feasibly introduced into the MSPAS framework for health care delivery?

Objective 4: In partnership with the Comadronas, the community, and MSPAS, establish a new role for the Comadronas in maternity care and document the process of project activities in helping Comadronas perform their new role.

Question: How can the Comadronas transition into an effective new role in maternity care that improves the quality of care provided to mothers in the project area and that respects cultural traditions and expectations?

Objective 5: Establish and pre-test procedures and forms for the Comadrona census, the Comadrona surveys, and the Care Group Volunteer surveys, for training Comadronas in their new role, and for measuring community engagement in program activities and women's



participation in community activities and in decision-making related to their own health and the health of their children.

Questions: What are appropriate methods for carrying out a census of Comadronas and Care Group Volunteers? What are appropriate forms for interviewing Comadronas for their new role? What are appropriate methods for reorienting Comadronas for their new role? What are appropriate methods for measuring complex key project outcomes such as community engagement in program activities and women's participation in community activities and in decision-making related to their own health and the health of their children?

Table 1 (below) summarizes the PY3 OR activities and the Phase 1 findings of the Formative Research. A narrative summarizing the key findings follows.

*Table 1 - OR PY3 Activities and Phase 1 Findings - Formative Research*

<i>Objective 1</i>	<i>Assess and Refine the CBIO+CG Methodology in the CSHGP Context</i>
<i>Key Activities/Tasks</i>	<ul style="list-style-type: none"> <li>• A thorough audit of the CBIO vital events registry system</li> <li>• A thorough audit of the death registries and verbal autopsies used for determining maternal and child mortality and primary and secondary causes of mortality</li> </ul>
<i>Findings, Data, Discussion</i>	<p><i>-Audit of the vital events registry revealed omissions, errors, and duplication of data.</i></p> <p><i>-Audit of the vital events registry for maternal and U5 deaths revealed a large backlog of uncompleted verbal autopsies; but also verified that completed autopsies were of high quality and that utilizing the MSPAS verbal autopsy format was working well.</i></p> <p><i>-Analysis of vital events records in PY3 showed marked improvement in data quality and timeliness of reporting</i></p>
<i>Use/Dissemination of Results</i>	<ul style="list-style-type: none"> <li>• A system of enumeration of unique vital events was developed and implemented which has virtually eliminated duplication of records</li> <li>• Missing verbal autopsies were identified and teams of interviewers were deployed to capture the missing verbal autopsies.</li> <li>• The refinement/cleaning of the vital events data and capture of the verbal autopsies enabled accurate calculation of Phase 1 mortality data: maternal and child mortality rates; causes of mortality; and mapping of location of mortality.</li> <li>• Mortality data shared with communities at community assemblies and with MSPAS and utilized to guide project interventions and track project impact.</li> </ul>
<i>Objective 2</i>	<i>Document the Community's Health Priorities and the Epidemiological Priorities</i>
<i>Key Activities/Tasks</i>	<ul style="list-style-type: none"> <li>• Baseline KPC survey (January 2012) and Mini-KPC Survey (September 2013) to identify community health priorities</li> <li>• 88 communities complete a Diagnostics and Community Health Plans identifying community health priorities completed during Phase 1,</li> <li>• Registration, , cleaning, and analysis of maternal and U5 mortality data utilizing CBIO vital events registration system</li> </ul>
<i>Findings, Data, Discussion</i>	<ul style="list-style-type: none"> <li>• Pneumonia revealed to be by far the largest cause of U5 mortality (45%), followed by birth asphyxia (25%) and diarrheal disease (16%).</li> <li>• Post-partum hemorrhage was by far the largest cause of maternal mortality (54%), followed by septicemia/septic shock (23%) and eclampsia/pre-eclampsia (15%)</li> <li>• The "first delay" (failure to recognize obstetric emergency) was the largest of the "4 delays" (40%)</li> <li>• By the end of Phase 1, community perception of their health priorities had significantly aligned with the actual epidemiological priorities revealed by the vital events system, with the significant exceptions of the need for birth spacing/family planning, which the communities still do not perceive as a priority, and nutrition, which only 15% of the mothers saw as a priority.</li> </ul>

<i>Use/Dissemination of Results</i>	<ul style="list-style-type: none"> <li>• Vital events data confirmed the prioritization of the project interventions to combat pneumonia and diarrheal disease, especially during the first year of life, and birth asphyxia in neonates.</li> <li>• Vital events data confirmed the prioritization of the project interventions to reduce maternal mortality, especially due to post-partum hemorrhage.</li> <li>• Vital events data shared with communities at community assemblies and with MSPAS staff to help guide interventions and coordination</li> <li>• Results showed the need to increase community education in malnutrition, maternal/newborn care, and family planning.</li> </ul>
<i>Objective 3</i>	<i>Assess and document the challenges and advantages of the CBIO+CG methodology</i>
<i>Key Activities/Tasks</i>	<ul style="list-style-type: none"> <li>• Written questionnaires completed by 24 Curamericas Guatemala staff</li> <li>• 6 in-depth interviews with Curamericas Guatemala staff</li> <li>• 2 focus group discussions (FGDs) with Curamericas Guatemala and MSPAS staff</li> </ul>
<i>Findings, Data, Discussion</i>	<ul style="list-style-type: none"> <li>• Staff members exhibit an excellent comprehension of the CBIO+CG methodology and cite many advantages, including community engagement, home visitation, use of Care Groups, and ability of the methodology to identify and target actual local health priorities</li> <li>• Staff members do not see the CBIO+CG data collection demands as onerous and recognize the need for and use of the data</li> <li>• Disadvantages cited included 1) the need to cope male chauvinism and community discord and 2) the need for improved coordination with MSPAS and the Extension of Coverage program- but these are actually contextual issues not specific to the methodology</li> </ul>
<i>Use/Dissemination of Results</i>	<ul style="list-style-type: none"> <li>• Excellent staff understanding of methodology confirmed the effectiveness of the current staff training methodology emphasizing fieldwork and mentoring, and the project decided that it should continue</li> <li>• Many disadvantages cited are actually context-specific and not intrinsic to the methodology (e.g., coping with <i>machismo</i>)</li> <li>• Given the local context, staff need more skills and tools in identifying locally-specific challenges to CBIO+CG implementation - specifically, tools for community/gender work (e.g., combating machismo and community conflict resolution), which could be added to the CBIO+CG training manual</li> <li>• For Phase 2, 4 male Health Educators (<i>Educadores</i>) were added to the staff to facilitate the involvement of men to help combat <i>machismo</i></li> <li>• The CBIO+CG manual was updated to incorporate many of the recommendations of staff and the investigator</li> </ul>
<i>Objectives 4 and 5</i>	<i>Establish and document a new role for the Comadronas and the instruments for investigating this new role</i>
<i>Key Activities/Tasks</i>	<ul style="list-style-type: none"> <li>• Development of a census of <i>Comadronas</i> who are working in Phase 1 communities</li> <li>• Development of interview guides for 1) San Miguel Acatán and Santa Eulalia <i>Comadronas</i>, and 2) for San Sebastián <i>Comadronas</i></li> <li>• Development of protocol for guided observation of <i>Comadronas</i> working with <i>Casa Materna</i> (strategically located birthing center staffed with professional SBA) staff during a delivery</li> <li>• Census of <i>Comadronas</i> in the Phase 1 communities of the three municipalities</li> <li>• In-depth interviews with 36 <i>Comadronas</i> (20 from San Sebastián Coatán, 10 from San Miguel Acatán, and 6 from Santa Eulalia)</li> <li>• Observation of <i>Comadronas</i> working with <i>Casa Materna</i> staff during a delivery</li> </ul>
<i>Findings, Data Discussion</i>	<ul style="list-style-type: none"> <li>• All the <i>Comadronas</i> interviewed appreciate the training they have received from both Curamericas and MSPAS staff in the essential newborn actions (clean cord care, Immediate Breast Feeding IBF, and thermal care), elements of Active Management of the Third Stage of Labor (AMTSL) (uterine massage, controlled cord traction) and Home-Based Life Saving Skills (HBLSS). This training has facilitated the integration of <i>Comadronas</i> with the <i>Casa Materna</i> staff.</li> <li>• The <i>Comadronas</i> from Santa Eulalia and San Miguel Acatán, where there have been no operating <i>Casa Maternas</i>, acknowledge that the <i>Casas</i> are appropriate for referring complications and difficult pregnancies but that normal deliveries should be done by them in the woman's home.</li> <li>• The <i>Comadronas</i> from San Sebastián Coatán, most of whom have been coordinating with the two operating <i>Casas</i> in Coatán, understand and accept their new role in encouraging facility-based deliveries at the <i>Casas</i>, accompanying the woman in labor there, and assisting appropriately in the delivery. They feel that all deliveries should take place in a <i>Casa Materna</i>.</li> <li>• The interviews and the observations confirm that the <i>Casa Materna</i> staff have established excellent teamwork with the <i>Comadronas</i>; staff see <i>Comadronas</i> as an integral part of the <i>Casa</i> team and the <i>Comadronas</i> see</li> </ul>

	<p>themselves that way as well.</p> <ul style="list-style-type: none"> <li>• The San Sebastian Coatán Comadronas emphasized how previously they felt isolated, carrying the burden of responsibility of the delivery - but now they feel a sense of relief with the shared responsibility and teamwork with the Casa staff.</li> <li>• The acceptance by Comadronas of the Casa Materna as the preferred place for all deliveries and not just for management of complications appears to follow a dose-response pattern: the more the Comadronas are exposed to the Casas and their staff, the more they appreciate their value.</li> <li>• The integration of the Comadronas appears to be a key factor in the success of the Casa Maternas, whose methodology emphasizes respect for and integration with traditional Mayan cultural practices and encourages their use by local women.</li> </ul>
<i>Use/Dissemination of Results</i>	<ul style="list-style-type: none"> <li>• The findings thoroughly validate our strategy for training and integrating Comadronas into the health system via the Casa Maternas</li> <li>• The findings confirm that we may have finally found an answer to the ongoing polemic in Guatemala - what is, if any, the role of the Comadrona in the Guatemala health system?</li> <li>• In PY3 we followed the recommendations of the OR and continued our training of Comadronas, integrating them into the functioning of two new Casa Maternas</li> <li>• In PY3 we disseminated our results with MSPAS and other Guatemalan NGOs, which has generated intense interest from NGOs and local MSPAS district offices across Guatemala. At present, organizations in three other Guatemalan departments are planning to implement Casa Maternas integrating Comadronas based on our model.</li> </ul>

Objective 1: In PY2 we performed thorough audits of our CBIO vital events gathering and recording system, including the vital registries for each municipality maintained by the Institutional Facilitators in Excel files. In PY3, errors and discrepancies were rectified and systems for numeration and data cleaning were introduced to reduce errors, particularly errors arising from duplication of vital events. In PY3, further analysis of the vital events registries showed marked improvement in the quality of the data. The audit of the verbal autopsies showed that the autopsies completed were of high quality and that utilizing the MSPAS verbal autopsy form rather than our own was working well and eliminating an unnecessary duplication of work for the Institutional Facilitators (which would have resulted if we had used the WHO verbal autopsy form). However, we detected a large number of pending verbal autopsies which delayed definitive calculation of causes of death. Therefore, in PY3, interview teams were deployed to complete the missing verbal autopsies, which then enabled our calculation of Phase 1 findings for causes of mortality in Phase 1 communities [see Objective 2 below and Objective 1, Evaluative Research, below].

The audits revealed 1) the need for strengthened supervision and support for the Institutional Facilitators; 2) the need for improved software and technology for handling the ever-increasing volume of vital events data, such as more robust data processing software and use of m-Health and "cloud" computing; and 3) the need to better systematize how verbal autopsies define "primary" and "secondary" causes of death. In response, a new staff position was created and filled: an Institutional Facilitator Supervisor, based at the Calhuitz project center, to oversee and support the work of the Institutional Facilitators. We also developed a partnership with D-Tree International for developing an integrated m-Health/'cloud"-based data processing system and are now seeking implementation funding. Systematization of definition of cause of death, however, remains to be completed.

Objective 2: In PY3 we completed the analysis of the Phase 1 vital events data for Phase 1 communities utilizing the now-complete data from the improved vital events registry system [see Objective 1, above]. This enabled us to utilize a characteristic unique to CBIO+CG: calculate the

actual causes of maternal and child mortality and geographically locate those deaths in order to formulate a project response to those locally-defined priorities, which may or may not differ from national or regional priorities. The actual U5 MR was 57 at the end of Phase1.

*Table 2 - Causes of U5 Mortality in Phase 1 communities at end of Phase 1:*

<i>Cause of U5 death</i>	<i>Number</i>	<i>Percentage</i>
<i>Pneumonia</i>	32	45%
<i>Birth Asphyxia</i>	18	25%
<i>Diarrheal diseases/dehydration</i>	11	15%
<i>Prematurity</i>	5	7%
<i>Other</i>	5	7%
<i>Total</i>	71	100%

The data revealed the following epidemiological priorities for U5 children in the Phase 1 communities:

- Pneumonia is by far the number #1 epidemiological priority in U5 children accounting for 45% of all U5 deaths. Birth asphyxia is the number #2 cause of U5 death, with 25% of U5 deaths (and #1 cause of neonatal death - see Objective 1, Evaluative Research, below). Diarrheal disease is the number #3 epidemiological priority, accounting for 15% of U5 deaths.
- These top three causes account for 85% of U5 deaths. In addition, 38% of U5 deaths were neonatal and 42% were post-neonatal (1-11 months), with 80% of U5 mortality occurring the first year of life.

*Table 3 -Causes of Maternal Mortality in Phase 1 communities at end of Phase 1:*

<i>Cause of maternal death</i>	<i>Number</i>	<i>Percentage</i>
Post-Partum Hemorrhage (all causes)	7	54%
Infection	3	23%
Eclampsia/pre-eclampsia	2	15%
Diarrhea	1	8%
Total	13	100%

*Table 4 - The "Four Delays" attributable to maternal mortality  
(Note - some deaths had more than one attributable delay)*

<i>Cause of maternal death</i>	<i>Number</i>	<i>Percentage</i>
<i>First delay (failure to recognize danger signs)</i>	8	40%
<i>Second delay (failure to respond promptly to danger signs and seek help)</i>	5	25%
<i>Third delay (delay in transport to health facility)</i>	4	20%
<i>Fourth delay (delay receiving treatment once at health facility)</i>	3	15%

Maternal mortality ratio at the end of Phase 1 was 1005. The epidemiological priority for maternal mortality was post-partum hemorrhage, by far the #1 cause of maternal death, accounting for 54% of all deaths. Of the four delays, all were present, with the first delay (failure to recognize danger signs in pregnancy, delivery, or post-partum) the most common (40%).

The priority sub-groups thus identified were: 1) children under 1 year of age (80% of U5 mortality); 2) neonates (38% of U5 mortality); and 3) pregnant, delivering and post-partum women.

In PY2 we completed a baseline KPC Survey which included a question to elicit from the interviewed mothers what they perceived to be their community's health priorities; this was followed by a Mini-KPC with the same question in September 2012 and the analysis of that data in PY3. The following table compares the percentage of women who cited each community priority at baseline with the percentage who cited the same priority at the conclusion of Phase 1:

*Table 5 - Change in perceived community health priorities*

<i>Community Health Priority</i>	<i>Baseline</i>	<i>End of Phase 1</i>
<i>Pneumonia</i>	26%	67%
<i>Diarrhea</i>	36%	55%
<i>Lack of obstetric emergency transportation</i>	7%	34%
<i>General lack of medical services</i>	20%	19%
<i>Malnutrition</i>	5%	15%
<i>Lack of clean/safe deliveries</i>	6%	10%
<i>Disrespectful health personnel</i>	1%	9%
<i>Lack of prenatal and post-natal care</i>	6%	9%
<i>Obstetric emergencies</i>	2%	5%
<i>Measles</i>	2%	5%
<i>Lack of family planning</i>	2%	0%

The results reveal the success of the CBIO+CG methodology in educating communities so that their perceived priorities align with the actual priorities as determined by the vital events data: mention of pneumonia, the #1 killer of children, increased from 26% to 67%; or diarrhea, the #3 killer, increased from 36% to 55%. Community education on the causes and prevention of maternal mortality resulted in mention of lack of emergency transportation for complications in delivery increased from 7% to 34%. However, mention of obstetric emergencies, lack of pre-and-postnatal care, and lack of clean/safe births increased but remained low, and while mention of malnutrition tripled from 5% to 15%, its mention remains relatively low. Most concerning is the complete lack of mention of family planning as a community priority at the end of Phase 1 (0%). This revealed a need to increase community education efforts around malnutrition, maternal/newborn care, and family planning during Phase 2.

Objective #3 - In PY2 we performed the following activities to analyze the challenges, advantages, and disadvantages of the CBIO+CG methodology in order to apply lessons learned to the methodology during Phase 2:

- 1) Detailed written questionnaires completed by 24 members of the Curamericas Guatemala staff (3 Municipal Coordinators, 2 Institutional Facilitators, 1 M & E Technician, and 18 Health Educators (Educadoras));
- 2) 2 FGDs, one with 6 Educadoras of San Sebastián Coatán, and one with 4 MSPAS staff also working in San Sebastián Coatán (2 Educadoras, 1 Ambulatory Nurse, and 1 Data Entry Technician); and
- 3) In-depth interviews with 4 Curamericas Guatemala staff (the Municipal Coordinator of San Sebastián Coatán, the M & E Technician, the Institutional Facilitator of San Sebastián Coatán, and 1 Community Facilitators from a community in San Sebastián Coatán). Coding and analysis of the questionnaires and transcripts revealed the following key findings:

Staff members exhibit a comprehensive theoretical and practical knowledge of the CBIO+CG methodology, its goals, methods, and implementation steps.

Staff members cite the following advantages of the methodology:

- It is based on the generation of community trust and partnership and, for this reason, is effective and sustainable.
- This trust is generated at a household level as well as at a community level, which greatly facilitates changing health behaviors at the household level.
- The data collected, while voluminous, are valuable and actionable; they guide interventions and provide documentation of results.
- The Care Groups and Self-Help Groups are invaluable in allowing the penetration of health messages at the household level and in facilitating the collection of vital events and monitoring outputs and achievement of project indicators
- These data ensure that the project is responding to the actual epidemiological priorities and serves those most in need.

The staff, however, cite the following challenges and disadvantages:

- Doing the community census and then keeping it and the community registers up-to-date is very time-consuming
- Female participation is essential to the methodology. However, there are many local contextual barriers to this, including apathy, *machismo*, low levels of education, and the burden of household chores. Many emphasized the barrier of *machismo*.

- Generating community trust is often a challenge in this still post-civil war context where communities are still rebuilding lost social capital. Community discord is a common problem.
- It should be noted that several of these challenges are those of the project social context, and not the methodology itself.

Both the staff and the person who led the staff interviews (MPH student Jason Lambden of the Johns Hopkins School of Public Health) had specific recommendations. Staff recommended:

- More work to combat machismo
- Associated with this, do more to involve men in the project activities
- Learn methods to overcome apathy and community discord
- Allow the Educadoras more time in the communities to deal with these issues - perhaps more Educadoras (fewer communities served per Educadora) or resolving the challenge of transportation (Educadoras do not operate motorcycles and spend much time walking from community to community).
- Improve coordination and communication with local MSPAS staff of the PEC program to coordinate community visits and transportation.

The investigator's recommendations:

- Add to the CBIO+CG methodology an OR initiative at the beginning of a project to quickly identify the locally-specific barriers to implementation
- Add the following to staff training for the methodology: skills and knowledge in community mobilization, family and community dynamics, conflict resolution, coping with machismo, generation of trust, and recruitment of "champions"/allies.
- Integrate into the methodology ways to better involve men from the very beginning of the project.
- Add to the methodology and its manual methods and tools for supportive supervision of staff and staff professional development.
- Add the methodology and its manual Curamericas Guatemala's model of staff training, which has proven so effective. This model involves integration of classroom theory, fieldwork, and one on one mentoring by experience staff, guided by a training guide/curriculum.

Co-prime investigator Ira Stollak also recommended the facilitation of the census and registers with a new more powerful m-Health- and cloud-based integrated data system [see Objective #1, above].

In PY3 we began to respond to these findings. Four (4) male Health Educators (Educadores) were added to the staff to work with men (who in this cultural context will not always respond to women), in order to combat machismo and recruit and involve positive male role models. In addition, the Curamericas Guatemala CBIO+CG manual was updated to include many of the above recommendations. As mentioned above [Objective #1], a partnership was forged with D-Tree International to implement an m-Health/cloud-based database to facilitate the ongoing maintenance of community censuses and registers. Funding is now being sought for this initiative.

Objective 4: Guatemalan rural indigenous communities exhibit one of the highest rates of maternal mortality in Latin America, with MMRs in some areas at levels seen only in Afghanistan and sub-Saharan Africa, representing a public health emergency [see Objective #1,

Evaluative Research, below]. Two ongoing polemics in Guatemala have been 1) how to encourage health facility births among rural indigenous women in order to reduce MMR, and 2) what is the role - if any - of the Comadrona [traditional birth attendant] in the Guatemalan health system. In our Casa Maternas and the integration of Comadronas into Casa Materna operation, we have found an answer to these challenges, confirmed by our operational research.

Coverage of health facility births among indigenous women is very low- only 21% in Huehuetenango department, and only 15% at project baseline in the 3 municipalities of our project. The main reasons for this are: 1) geographic isolation from existing MSPAS health facilities over difficult mountain terrain; 2) lack of respect among providers at MSPAS health facilities for the Mayan culture, inability of the providers to speak Mayan, and lack of engagement of MSPAS with the indigenous communities; and 3) traditional preferences for home deliveries, which incorporate a constellation of traditional Maya practices. Casa Maternas respond these barriers - 1) they are strategically located, within 30 minutes by foot or vehicle from the woman's home; 2) they are community-built, -owned, and -operated; 3) they offer clean safe births attended by Auxiliary Nurses, along with prompt referral of complications to the nearest hospital in the city of Huehuetenango; and 4) they are culturally appropriate, offering services in the local Mayan language, allowing non-intrusive traditional practices, and, most important, integrating the Comadronas who, instead of performing unsupervised deliveries alone in the woman's home, encourage the woman to deliver in the Casa, accompany her there, and assist the Casa Materna staff in the delivery, still receiving her traditional fee. In a "harm reduction" strategy, both Curamericas and MSPAS staff have been training Comadronas in clean/safe birthing practices for several years, emphasizing clean cord care, immediate breastfeeding, and prompt thermal care, but Curamericas has built on this training to successfully integrate the Comadronas into Casa Materna operations. Recent operational research has shown that in Phase 1 communities in San Sebastián Coatán, the coverage of health facility births has now reached 50%: the strategy is working.

To document and better understand this success, during PY2 we conducted the following research activities, led by MPH graduate student Kaitlin Cassidy of the Tulane School of Public Health:

- Conducted a census of Comadronas in the Phase 1 communities of the 3 municipalities to understand better the demographics of these women
- Performed 36 in-depth interviews with Comadronas: 20 in San Sebastián Coatán, where there have been two operating Casa Maternas; and 10 in San Miguel Acatán and 6 in Santa Eulalia, where, at that time, there were not any operating Casas.
- A detailed observation of a delivery at the Casa Materna in Calhuitz to observe a Comadrona assisting Casa staff in a delivery

Table 6 below summarizes the findings of the census, which included 82 Comadronas (an estimated coverage of 80% of the Comadronas in the 92 Phase 1 communities):



*Table 6 - Summary results of Comadrona census*

	Number	% women	Mean age	Age range	% Married	% Illiterate	Mean years of formal education	% speak Spanish	% who are principally housewife
<i>Santa Eulalia</i>	36	94%	56	40-85	92%	83%	0.4	8%	83%
<i>San Miguel Acatan</i>	31	94%	61	35-90	84%	84%	0.4	0%	29%
<i>San Sebastian Coatán</i>	15	100%	52	33-68	87%	93%	0.1	0%	87%
<i>Total</i>	82	95%	57	33-85	88%	85%	0.3	4%	63%
	Mean yrs worked as Comadrona	Yrs as Comadrona - range	Mean age became a Comadrona	Age became Comadrona - range	Mean deliveries attended in past yr	Lifetime deliveries - range	Mean lifetime neonatal deaths reported	Lifetime Neonatal deaths reported-range	Mean lifetime maternal deaths reported
<i>Santa Eulalia</i>	25	4-55	33	14-50	16	10-400	0.2	0-3	0.28
<i>San Miguel Acatan</i>	27	1-60	35	17-58	13	6-700	1.1	0-5	0.13
<i>San Sebastian Coatán</i>	21	5-45	32	20-40	7	7-800	0.6	0-3	0.07
<i>Total</i>	25	1-60	33	14-58	13	6-800	0.7	0-5	0.18

The census reveals a number of characteristics common to most Comadronas as well as some characteristics with marked heterogeneity. The vast majority are female, married, and illiterate, with less than a year of formal education, speak only their Maya language, and, with the exception of San Miguel Acatan, are primarily housewives (ama de casa). In San Miguel only 29% are primarily housewives, with 65% occupied mostly as a Comadrona. The main heterogeneity concerns their age and years as a Comadrona, with the enormous variation in the latter resulting in great heterogeneity in experience- number of years as a Comadrona ranges from 1 to 60 years, with lifetime number of births attended ranges from 6 to an estimated 800. How they learned to be a Comadrona is also highly heterogeneous: most in Santa Eulalia (67%) and San Sebastián Coatán (54%) learned from family members, usually their mother. But in San Miguel Acatán, 78% were self-taught, learning empirically and/or through dreams. Very few learned from other non-family Comadronas. Also to be noted is the very small number of reported neonatal or maternal deaths - considering the number of deliveries reported and our data on the MMR, this appears to be a significant under-reporting of neonatal and maternal deaths.

The key take-away from the census is that the Comadronas represent a highly traditional segment of the female population- married, illiterate, mono-lingual non-Spanish-speaking housewives.

While the development of training materials for this non-literate audience has been a challenge, their very traditional presence in the Casa Materna teams appears to have greatly encouraged the use of the Casas.

The coding and analysis of the transcripts of the in-depth interviews revealed marked differences in the responses of the Comadronas from San Miguel and Santa Eulalia, on the one hand, and those of the Comadronas of San Sebastián Coatán on the other. The former (n=16), who were working without a readily available Casa Materna, stated that the Casas were appropriate for complications in delivery or pregnancy, but that normal deliveries should be attended by them in the woman's home per ancient Maya tradition. They appreciate the training they have received from both Curamericas and MSPAS staff and believe it has improved their skills and are open to receive more training, as well as maternal vitamins to give to pregnant women, as well as being open to receiving help handling difficult deliveries. Due to their recent training from Curamericas and MSPAS, they recognize now their past errors and are open to continued training. Due to these trainings, they express a high opinion of both Curamericas and MSPAS. Though they believe normal deliveries should take place at home, they have no problem bringing women to the Casa Materna or MSPAS clinic in the event of a difficult delivery.

While the Comadronas from San Sebastián also expressed the same satisfaction with the training they had received, their responses were otherwise very different. They believe that the Casa Materna is the appropriate place for all deliveries, not only for complications. In fact, they believe the Casa is a better option for a normal delivery than the hospital or MSPAS clinic, chiefly because it is closer to the woman's home and more affordable. They have full faith in the Casa Materna staff to manage and successfully refer complications and arrange emergency transportation to the hospital in Huehuetenango. Fifteen, or 75% of the Comadronas in San Sebastian, have already worked directly with the Casa Materna team and report excellent teamwork and coordination. They emphasized the teamwork - they now feel a delivery should be the work of a team, not an individual birth attendant. They report that usually their role, once they accompany the woman to Casa, is to perform post-delivery uterine massage (as they were taught by Casa Materna staff) to help reduce the risk of post-partum hemorrhage. They mention that they are allowed to perform their traditional prayers and other traditional practices.

A key finding is their emphasis on the benefits of teamwork with the Casa Materna staff. In the past they felt the burden of responsibility working alone and appreciate working as part of a team - if something goes wrong, there is shared responsibility. They report a sense of equality - the Casa staff accept them as equals. They report encouraging the pregnant women in their communities to deliver in the Casa, but emphasize that the location of the delivery is a family decision that they cannot always affect. Some report exasperation at families that still insist on home deliveries and in such cases, they feel they have to "wash their hands" of responsibility if something goes wrong during the home delivery - it becomes the family's responsibility. The San Sebastian Coatán Comadronas also report good communication and coordination with the Ambulatory Nurses of the PEC program, who provide antenatal and post-partum care at the health posts in the villages during their periodic visits.

**Overall, the findings indicate that the project's strategy to integrate Comadronas into the health system via their new role as part of the Casa Materna team is an enormous success.** Therefore it is important to understand the key factors contributing to this success:

- The longstanding training of Comadronas by Curamericas and MSPAS staff before there are operating Casa Maternas in or near the Comadronas' communities has served to prepare them both psychologically and skill-wise for eventual integration and should therefore continue. These trainings have allowed the Comadronas to accept, understand and practice the safe/clean delivery practices they will need as part of the Casa Materna team. They have learned the limits of their previous capacities and have become accustomed to working with health professionals from the formal health services system and to accept the necessity of health facilities.
- It appears that the attitude of the Comadronas towards the Casa Maternas has a clear dose-response basis - the more exposure they have to the Casas, the higher their opinion. The new role and the teamwork it requires has alleviated the Comadronas' former sense of isolation and sole responsibility, and this teamwork provides a clear motivation for their integration above and beyond their desire to see successful birth outcomes . This is facilitated by the respect accorded them by the Casa Materna staff, which is returned in kind.

The recommendations of the investigator:

- Continue the training of Comadronas by Curamericas and MSPAS staff, even in catchments where there are no imminent plans to implement a Casa Materna – this will promote better quality of birthing care in the home and will prepare them for eventual integration, as well as encourage them to refer women to the existing Casas.
- For Comadronas working where there is not functioning Casa, find ways to expose them to the Casas - this can be accomplished via visits (especially to observe deliveries), and via talks (charlas) with Casa Materna staff and/or trained integrated Comadronas.
- Integration of the Comadronas, while a huge contributing factor to the Casa Materna success, is not a cure-all -- the Comadronas clearly indicate that there is a limit to their ability to persuade families to decide on a delivery at a facility, even at a culturally-adapted Casa Materna. To accomplish this, the project will need to work directly with the families [see Question 2, Evaluative Research, below].

These recommendations have been followed in PY3, with great success. Two new Casa Maternas have been established, one in San Miguel Acatán and one in Santa Eulalia, involving the successful integration of 26 more trained Comadronas into the operation of those Casas. The Casas now have committees of Comadronas who help coordinate Comadronas training. The word of the success of the Casa Maternas has spread during PY3 via our dissemination efforts and via local networking, and NGOs in Quiché and Baja Verapaz departments and a district MSPAS office in San Marcos department now desire our support in implementing a Casa Materna in their catchment areas. The Quiché NGO is the Association of Comadronas of Ixcan, a formally incorporated NGO led by Comadronas which, like Curamericas Guatemala, is executing the PEC program under contract with MSPAS. They, as Comadronas, see the Casa Materna as the answer to the polemic of what is to be their role as Comadrona in the formal Guatemala health system.

### **3. Evaluative Research Findings**

The Evaluative Research Objectives and Questions are:

Objective #1: Understand and quantify the health impact of the CBIO+CG methodology, the effectiveness of CBIO+CG in improving the health of mothers and children in the project area, and the cost-effectiveness of the methodology.

*Questions:*

- Does the CBIO+CG methodology produce significant improvements in the population coverage of interventions that are designed to address the epidemiological priorities for mothers and children compared to a control/comparison area and compared to the Department of Huehuetenango?
- Does the CBIO+CG methodology produce significant improvements in the nutritional status of children compared to a control/comparison area and compared to the Department of Huehuetenango?
- Does the CBIO+CG methodology produce significant improvements in maternal and U5 mortality in the project area compared to the Dept. of Huehuetenango?
- How does the cost-effectiveness of the CBIO+CG methodology as implemented by Curamericas Global in the project area compare to that of other Guatemala maternal and child health programs using different methodologies?

Objective #2: Understand and quantify the social impact of CBIO+CG and the effectiveness of the methodology in promoting women's empowerment and community social capital.

*Questions:*

- Does the CBIO+CG methodology produce significant increases in community involvement related to problem solving compared to a control/comparison area?
- Does the CBIO+CG methodology produce significant increases in women's participation in community health activities compared to a control/comparison area?
- Does the CBIO+CG methodology produce significant increases in women's health-related decision-making autonomy compared to a control/comparison area?

Table 7 (below) summarizes the PY3 OR activities and the Phase 1 findings of the Evaluative Research. A narrative summarizing the key findings follows.

*Table 7 - OR PY3 Activities and Phase 1 Findings - Evaluative Research*

<i>Objective 1</i>	<i>Quantify the health impact of CBIO+CG in the project area and the cost-effectiveness of the methodology</i>
<i>Key Activities/Tasks</i>	<ul style="list-style-type: none"> <li>• Baseline and Mini-KPC Surveys in key project interventions</li> <li>• Completion and analysis of missing verbal autopsies</li> <li>• Cleaning, completion, and analysis of Phase 1 vital events data to determine mortality rates/ratios and causes of mortality</li> </ul>
<i>Findings, Data, Discussion</i>	<ul style="list-style-type: none"> <li>-Statistically significant increases in coverage of iron/folic acid (22% to 73%); recognition of danger signs in pregnancy (22% to 58%) and births with the 3 essential newborn actions (6% to 59%)</li> <li>-Large increases in coverage of health facility deliveries (15% to 28%) and prompt care-seeking for symptoms of pneumonia in children (26% to 40%).</li> <li>-Little increase in use of modern contraceptive methods (36% to 37%)</li> <li>-Maternal mortality ratio at end of Phase 1 was 1,005, representing a public health emergency; main cause is hemorrhage (54%)</li> <li>-U5 mortality rate was 57, with pneumonia (45%), birth asphyxia (25%) and diarrheal disease (15%) representing 85% of U5 mortality</li> <li>-Neonatal mortality rate was 22 with birth asphyxia major cause (64%); post-neonatal mortality rate was 24, with pneumonia main cause (64%); and 12-59 mortality rate was 12, with pneumonia (47%) main cause.</li> <li>-80% of U5 mortality occurred in the first year of life</li> </ul>

<i>Use/Dissemination of Results</i>	<ul style="list-style-type: none"> <li>Data was shared with the communities and with partners/stakeholders (municipal governments, MSPAS) to plan coordinated response</li> <li>Data show clear need to intensify interventions against pneumonia and to consider CCM for pneumonia</li> <li>Data showed how problems with oxytocin supply chain impeded provision of AMTSL - alternative supply of oxytocin procured</li> <li>Data revealed a maternal public health emergency and supported our integrated response in PY3 - expanding Care Groups to create demand for maternal/newborn services and opening two new Casa Maternas to fulfill the demand for these services</li> </ul>
<i>Objective 2</i>	<i>Understand and quantify the social impact of CBIO+CG and its effectiveness in promoting women's empowerment and community social capital</i>
<i>Key Activities/Tasks</i>	<ul style="list-style-type: none"> <li>-Mini KPC surveys covering key women's and community empowerment indicators</li> <li>- Focus Group Discussions with women, Comunicadoras, community health committees, and mothers-in-law re: women's participation and decision making</li> </ul>
<i>Findings, Data, Discussion</i>	<ul style="list-style-type: none"> <li>The percentage of women who reported that their community implemented a new project in the previous 3 months increased dramatically from 13% to 66%</li> <li>Women's participation in community meetings increased dramatically from 10% to 48%</li> <li>96% of women reported contact with a Care Group or Self-Help Group in the previous month</li> <li>FGDs confirmed the improvement in women's empowerment but indicated great variability from community to community and family to family</li> <li>Factors facilitating women's empowerment include ability to leave the home with or without husband's approval; having her own source of income; absence of the husband in the household, away from home working in a distant location (US, Mexico, other department of Guatemala); and the positive influence of community leaders, Curamericas, and the Catholic Church</li> <li>The cultural context remains one of male dominance; factors impeding women's empowerment include intra-familial violence; control by the husband; lack of her own source of income; low self-esteem and fear; and community leaders who discourage women's participation.</li> </ul>
<i>Use/Dissemination of Results</i>	<ul style="list-style-type: none"> <li>The project will need to improve staff skills in working with men to combat machismo/male dominance, as well as secure project partners to facilitate this (e.g., Catholic Church, programs for women's micro-loans, etc.)</li> <li>Male staff will be needed to work with men; 4 male Educadores have been added to the staff</li> </ul>

Objective #1: In PY2 and the first quarter of PY3 we realized mini- KPC Surveys covering key project intervention health indicators (December 2012, March 2013, June 2013, September 2013, and December 2014) to compare with the findings of the baseline KPC Survey completed in January 2012. [Note - a Mini KPC is a KPC survey focusing on only 2 or 3 indicators using SRS (simple random sampling) with a sample size of 100. Our CBIO community registers allow us to do SRS rather than the usual stratified cluster sampling, permitting a much smaller sample size to achieve the same precision].

During the first quarter of PY3 we completed the following activities:

- Cleaning and analysis of the Phase 1 vital events data (births; maternal and U5 deaths) utilizing the improved vital events registries, and calculation of maternal mortality ratio and neonatal, post-neonatal, infant, and U5 mortality rates.
- Completion of the missing verbal autopsies for maternal and U5 deaths during Phase 1 and analysis of the causes of maternal, neonatal, post-neonatal, infant, and U5 mortality.

Table 8, below, captures the results of the KPC interviews, baseline vs. end of Phase 1, for the Phase 1 communities:

*Table 8 - Coverage of selected indicators, Baseline KPC vs. Mini-KPCs, Phase 1 communities, end of Phase 1*

INDICATOR	Baseline Pct.	Margin of Error	End of Phase 1 Pct.	Margin of Error	Change	Statistically significant?
Percentage of mothers of children 0-23 months who took iron/folic acid supplements during their pregnancy with their youngest child	21.7%	5.7%	73.0%	6.2%	+51.3%	YES
Percentage of children 6-23 months old who received Vitamin A supplementation during the 6 months previous to the interview	79.1%	6.7%	83.0%	5.2%	+3.9%	NO
Percentage of mothers of children 0-23 months who know at least 2 danger signs of pregnancy	22.1%	5.8%	57.7%	12.0%	+35.7%	YES
Percentage of children 0-23 months whose delivery was performed in a health facility by a health professional (doctor, nurse, professional midwife)	15.4%	5.0%	27.5%	11.2%	+12.1%	NO
Percentage of mothers of children 0-23 months who received at least 2 tetanus toxoid injections before the birth of their youngest child	63.2%	6.7%	67.0%	11.3%	+3.8%	NO
Percentage of mothers of children 0-23 months who received 3 elements of AMTSL during the birth of their youngest child (use of uterotonic drug; controlled cord traction; uterine massage).	9.4%	4.0%	15.0%	8.6%	+5.6%	NO
Percentage of mothers of children 0-23 months who are not pregnant and who are using a modern contraceptive method	35.8%	6.7%	37.4%	12.2%	+1.6%	NO
Percentage of children 0-23 months who received the 3 essential newborn actions at their delivery: clean umbilical cord care; immediate breastfeeding; and immediate thermal care	6.0%	3.3%	37.0%	6.7%	+31.0%	YES
Percentage of children 0-23 months with cough and rapid breathing during the 2 weeks previous to the interview who were seen by a health professional within 2 days	26.0%	12.0%	40.4%	11.8%	+14.4%	NO

There were increases in the coverage of all of the surveyed indicators, including statistically a significant increase in the percentage of mothers who know at least 2 danger signs in pregnancy (from 22% to 58%, which is vital considering that the "first delay" (failure to recognize danger signs) is the most common delay attributable to maternal death in the project area (see Formative Research, Objective #2, above). There was a dramatic and statistically significant increase in the percentage of births characterized by the 3 essential newborn actions (ENA) (from 6% to 37%). Given that 62% of deliveries were attended by Comadronas, this indicates that the Comadronas are indeed applying the training they are receiving in ENA. There was a dramatic and statistically significant increase in the coverage of pregnant women receiving iron/folic acid supplementation (from 22% to 73%), a vital accomplishment in an area characterized by a high prevalence of malnutrition and anemia.

The increase in deliveries characterized by at least 3 elements of Active Management of the Third Stage of Labor (AMTSL) (from 9% to 15%) and health facility deliveries attended by a health professional (which nearly doubled from 15% to 28%) are important accomplishments given the extremely high maternal and neonatal mortality in the indigenous population. Further analysis of the KPC data shows that the limiting factor in the coverage of AMTSL was the use of a uterotonic drug, which are used only during health facility births and which were used in only

15% of deliveries. However, the coverage of controlled cord traction was 83% and uterine massage was 75% - given that only 28% of the deliveries were in health facilities, this indicates that the Comadronas are practicing these techniques as taught to them by Curamericas and MSPAS staff. Also, the data indicated that a uterotonic drug was used in only 56% of the health facility deliveries (more on this below).

The percentage of children with symptoms of ARI/pneumonia who received treatment from a health professional within 48 hours increased dramatically from 26% to 40% [though due to the small sub-sample size - restricted to children with the ARI/pneumonia symptoms - the change was not significant]. Given that our vital events data shows that pneumonia is the #1 killer of U5 children, this is an important accomplishment.

However, there was very little change in the use of modern contraceptive methods (from 36% to 37%). The increase in vitamin A supplementation for 6-23 month-old children and tetanus vaccinations for pregnancy increased modestly from already-high levels of coverage.

That health facility births almost doubled can be attributed to our Casa Materna intervention and the Care Group-based demand-creation for this maternal/newborn health service. The extremely high coverage of the 3 ENAs, controlled cord traction, and uterine massage testify to the effectiveness of the integration and training of the Comadronas. *The key limiting factor in the application of AMTSL is the use of a uterotonic drug (oxytocin or misoprostol), and this has been in part due to the erratic supply of oxytocin from MSPAS for the Casa Maternas and MSPAS clinics.* If this supply chain can be secured, coverage of AMTSL should, in theory, equal coverage of health facility deliveries if all such deliveries follow MSPAS protocols. Therefore in PY3 we began to seek alternative supplies of oxytocin, and have received a grant from the US-based NGO Medicines for Humanity for a supply of oxytocin for our Casa Maternas. Another option we began to explore in PY3 is the possibility of implementing a community case management intervention with proven success in Africa and South Asia - provision of misoprostol to pregnant women by trained traditional midwives and/or community health workers. Given the low coverage of uterotonic drugs and the finding from our vital events data that 54% of maternal deaths are due to hemorrhage, piloting this intervention seems a logical step - but this will require formal approval from MSPAS, a lengthy process that we may begin in PY4. The findings also indicate the need for more formative qualitative research, such as a Barrier Analysis, to determine the impediments to use of modern contraceptive methods.

The following tables show the results of the analysis of vital events data and the verbal autopsies performed in PY3 for the data as of the end of Phase 1:

*Table 9 - Maternal Mortality Ratio, Phase 1 communities, end of Phase 1*

<i>Timeframe</i>	<i>No. of Births</i>	<i>No. Maternal Deaths</i>	<i>Maternal Mortality Ratio</i>
OCT. 2012 - SEP. 2013	1294	13	1005

**Table 10 - Causes of Maternal Mortality in Phase 1 communities at end of Phase 1:**

<i>Cause of maternal death</i>	<i>Number</i>	<i>Percentage</i>
Post-partum hemorrhage (all causes)	7	54%
Infection	3	23%
Eclampsia/pre-eclampsia	2	15%
Diarrhea	1	8%
Total	13	100%

**Table 11- Neonatal Mortality, Phase 1 Communities, end of Phase 1**

<i>Timeframe</i>	<i>No. of Births</i>	<i>No. Neonatal Deaths</i>	<i>Neonatal Mortality Rate</i>
OCT. 2012 A SEP. 2013	1294	28	22

**Table 12 - Causes of Neonatal Mortality, Phase 1 communities, end of Phase 1**

<i>Causes of Neonatal Mortality</i>	<i>No.</i>	<i>Pctg.</i>
Birth asphyxia/aspiration of meconium	18	64%
Pneumonia/ARI	5	18%
Causes attributable to prematurity	5	18%
Total	28	100%

**Table 13 - Post neonatal mortality (1-11 months), Phase 1 communities, end of Phase 1**

<i>Timeframe</i>	<i>No. Births</i>	<i>No. Post-neonatal deaths (1-11 months)</i>	<i>Post-neonatal mortality rate</i>
OCT. 2012 A SEP. 2013	1294	31	24

**Table 14 - Causes of post neonatal mortality (1-11 months), Phase 1 communities, end of Phase 1**

<i>Cause of Post-neonatal Mortality</i>	<i>No.</i>	<i>Pctg</i>
Pneumonia/ARI	20	64%
Diarrheal disease/dehydration	8	26%
Other	3	10%
Total	31	100%



*Table 15 - 12-59 month mortality rate, Phase 1 communities, end of Phase 1*

<i>Timeframe</i>	<i>No. Births</i>	<i>No.12-59 month deaths</i>	<i>12-59 month mortality rate</i>
OCT. 2012 A SEP. 2013	1294	15	12

*Table 16 - Causes of 12-59 month mortality, Phase 1 communities, end of Phase 1*

<i>Cause of 12-59 month Mortality</i>	<i>No.</i>	<i>Pctg</i>
Pneumonia	7	47%
Diarrhea	3	20%
Accidents	2	13%
Other (none more than 1 death)	3	20%
Total	15	100%

*Table 17 - U5 mortality rate, Phase 1 communities, end of Phase 1*

<i>Timeframe</i>	<i>No. Births</i>	<i>No.U5 deaths</i>	<i>U5 mortality rate</i>
OCT. 2012 A SEP. 2013	1294	74	57

*Table 18 - Causes of U5 Mortality in Phase 1 communities at end of Phase 1:*

<i>Cause of U5 death</i>	<i>Number</i>	<i>Percentage</i>
Pneumonia	32	45%
Birth Asphyxia	18	25%
Diarrheal diseases/dehydration	11	15%
Prematurity	5	7%
Other	5	7%
Total	71	100%

*Table 19- Distribution of U5 mortality, Phase 1 communities, end of Phase 1*

<i>Neonatal</i>	<i>Post neonatal</i>	<i>Infant</i>	<i>12-59 months</i>
38%	42%	80%	20%

The data clearly shows that the three main killers of U5 children are pneumonia/ARI, birth asphyxia, and diarrheal disease, which account for 85% of U5 deaths. This makes the project interventions targeting those illnesses, such as ANC, health facility births, PPC, prompt care-

seeking for pneumonia/ARI, POU water treatment and storage, hand-washing, and ORT of highest priority. This is a clear example of the CBIO+CG methodology in action: identifying and responding to the local epidemiological priorities. Birth asphyxia is by far the main cause of neonatal mortality (64%) at the end of Phase 1, confirming our Casa Materna strategy and the training of Casa Materna staff in resuscitation and of Comadronas in Home-Based Life-Saving Skills (HBLSS). With four (4) Casa Maternas now operational, we anticipate a decline in neonatal deaths by the end of Phase 2, including a decline in the proportion of neonatal deaths due to birth asphyxia.

The data clearly show pneumonia as the #1 killer of U5 children, responsible for a full 67% of all deaths among children 0-59 months of age and 64% of deaths in post-neonates (1-11 months). This means we must intensify our interventions to combat pneumonia, which must include 1) combating the malnutrition underlying much of this mortality (exclusive breastfeeding, correct complementary feeding); strengthening community surveillance by the Community Facilitators and Comunicadoras (Care Group Volunteers); and strengthening the coverage and effectiveness of the education on care-seeking for pneumonia in the Care Groups and Self-Help Groups. The result of this strengthening in PY3 has already been presented above – the percentage of children with symptoms of pneumonia given prompt treatment increased to 40%. But more must be done. Given the magnitude of the problem, we should consider working MSPAS to obtain approval to pilot a Community Case Management (CCM) intervention for pneumonia, which has proven effective in marginalized rural communities in Sub-Saharan Africa and South Asia.

Diarrhea causes 20% of deaths among children 1-11 months of age and 20% of deaths among children 12-59 months of age. It also aggravates the malnutrition that underlies much of the local U5 morbidity and mortality. We must therefore strengthen the interventions for prevention and treatment of diarrheal disease: POU water treatment and storage, hand-washing, proper disposal of feces, and ORT. Our PY3 mini-KPCs show that coverage of these indicators has increased to 33 % for hand washing at the 4 critical moments, 35 % of homes with a hand washing station, and 62% of households disposing of feces correctly.

The Phase 1 data also reveal that an atypically high percentage of U5 deaths occur in the first year life - a full 80% (compared to 67% for the rural indigenous population of Guatemala, per MSPAS data from their most recent DHS Survey). The difference lies primarily in the critical post-neonatal period (1-11 months of age), with 42% of U5 mortality (compared to 34% for the national indigenous population). This means that we must not only prioritize the under-1 population, but also within this population, pneumonia and diarrhea in the critical post-neonatal period. The data also show the effectiveness of the project in reducing mortality in the 12-59 month age group.

The cleaned and completed Phase 1 data for maternal mortality reveal a maternal mortality ratio of 1,005, much higher than our preliminary data indicated - a level comparable to Afghanistan and areas of sub-Saharan Africa, and representing a public health emergency. In comparison and in marked contrast, the MMR for all of Guatemala is only 140; for the Guatemala indigenous population it is 162; and for the Dept. of Huehuetenango, only 213. This data confirms the need for our integrated CBIO+CG and Casa Materna methodologies - CBIO+CG to stimulate demand for key maternal/newborn interventions, and the Casa Maternas to provide those services, particularly health facility births with a skilled attendant and timely emergency obstetric care. It

also means we must further strengthen community response, including community emergency transport plans, improving maternal nutrition during pregnancy, and reducing the number of unwanted pregnancies as well as increasing the birth interval by increasing the use of modern methods of contraception. Related interventions that we are not yet emphasizing are called for. These include: 1) working with adolescents and families to lower the age of first pregnancy; and 2) reducing the work-load of pregnant women during the third trimester.

Objective #2: To understand the project's impact on women's empowerment and decision-making autonomy and on community social capital, both quantitative and qualitative methods were used in PY2 and during the first two quarters of PY3:

- Mini KPC surveys (September 2013 and February 2013) with 100 Phase 1 women selected via SRS
- 17 Focus Group Discussions (January 2014) with purposefully selected persons from representative Phase 1 communities- 9 with reproductive age women (including 1 with Comunicadoras); 3 with married men; 3 with Community Health Committees; and 2 with mothers-in-law (*suegras*).

Table 11, below, summarizes the findings of the mini - KPC surveys in comparison to the baseline KPC findings:

*Table 20- Results of Mini-KPC surveys on women's empowerment and community social capital - Phase 1 communities - end of Phase 1*

<i>Indicator</i>	<i>Pct. Baseline</i>	<i>Pct. End of Phase 1</i>	<i>Change</i>	<i>Significant?</i>
Percentage of mothers of children 0-23 months who stated that during the 3 months prior to the interview the community achieved a community project working together	13.0%	65.9%	+52.9%	Yes
Percentage of mothers of children 0-23 months who during the previous month participated in a community meeting and expressed her opinion	10.0%	47.9%	+37.8%	Yes
Percentage of mothers of children 0-23 months who reported that in the previous month they had contact with a Care Group or Self-Help Group and/or participated as a Care Group Volunteer ( <i>Comunicadora</i> )	8.4%	95.7%	+87.4%	Yes
Percentage of mothers of children 0-23 months who participated in the decision regarding the place of delivery of her youngest child	68.2%	85.9%	+17.6%	Yes
Percentage of mothers of children 0-23 months who participated in the decision regarding the use of a method of family planning	56.5%	63.6%	+7.1%	No
Percentage of mothers of children 0-23 months with symptoms of ARI/pneumonia in the previous month who participated in the decision to seek treatment for the child	72.7%	90.4%	+17.7%	No
Percentage of mothers of children 0-23 months of age who stated that they have control of the money needed to buy food or medical care for their child(ren)	12.6%	6.1%	-6.5%	No

The KPC data shows a dramatic and statistically significant increase from 13% to 66% in the percentage of mothers who reported that during the prior three months that their community had achieved a community project working together, revealing the impact CBIO+CG can have in

strengthening community social capital. The data showed that 35% of the projects realized were directly for the benefit of mothers and children (e.g., construction of a Casa Materna, improvements in the local school, etc.).

The data also revealed a dramatic and statistically significant increase (from 10% to 48%) in the percentage of women who reported that in the previous month they had attended a community meeting and expressed their opinion, a huge achievement in this highly male-centric culture where women's participation and mobility are often severely limited [see qualitative results, below]. This is strong evidence for the capacity of CBIO+CG to empower women. The data also reveal a profound penetration of the Care Group methodology into the communities, with 96% of the women reporting contact with a Care Group or Self-Help Group (or participation as a Care Group Volunteer), an increase from 8% at baseline.

There were increases in women's participation in all three key decisions regarding their and their children's health, and though the increases were more modest, in the case of the decision regarding the place of delivery of their youngest child, the change was statistically significant (from 68% to 86%). As a caveat, it should be noted that per the other KPC data presented above, in most cases this decision was to give birth at home rather than in a health facility. There was no evidence, however, that women's control over the money needed to ensure their children's health and nutrition had increased. This has to do with family economic dynamics that the project has not yet changed (see below).

The results of the coding and analysis of the transcripts of the focus group discussions supported the KPC findings but also revealed the many complex factors underlie the status of women in the project social context of traditional Maya culture. The evidence of the FGDs was very mixed - while it showed an acknowledgement of many participants that the status of women had improved, it also showed a continued context of male dominance and machismo. The participants from some communities noted a great improvement in women's status, which included more participation in community meetings, greater self-esteem among women, greater consciousness among women of their human rights, and a greater sense that they are owners ('dueñas') of their own bodies. However, participants from other communities noted no improvement at all in women's status; and other focus groups were very mixed. The empowerment of women appears to vary markedly from community to community and from family to family. This implies that a "one size fits all" strategy may not be feasible and that we must work community by community and family by family.

The following factors were mentioned in the FGDs that are facilitating women's empowerment:

- Support from the woman's husband, implying his trust in her, particularly her capacity to manage money
- Mobility: the ability to leave the home with or without her husband's permission
- The ability to manage her household chores to create free time to participate in community affairs
- "Good communication" with her husband - implying the ability to negotiate his approval for mobility and participation
- The absence of intra-familial violence
- Having her own business/source of her own money
- The absence of her husband (working away from home in the US, Mexico, or elsewhere in Guatemala)

- Community leadership that informs women of community meetings and gives them space to participate
- The influence of Curamericas Guatemala (especially via Care Groups/Self-Help Groups)
- The influence of the Catholic Church (especially through its talks (*charlas*) on women's human rights)
- The influence of key community leaders, such as the Community Facilitators, Comunicadoras, women leaders, and progressive men

*Factors that impeded women's empowerment mentioned in the FGDs included:*

- Low self-esteem among women and generalized fear of participating in community affairs
- Fear of speaking in front of male audiences
- Being controlled by her husband and his lack of trust in her (that she will comport herself well)
- Lack of mobility; movement controlled by the husband
- The burden of her domestic duties, leaving little or no time to participate in community affairs
- "Poor communication" with her husband; inability to communicate her needs or obtain his approval
- Presence of intra-familial violence
- Economic dependence on her husband - no source of her own money
- Low levels of education and inability to speak Spanish
- Lack of community leadership support for women's participation - women are not informed or invited to meetings or given space to participate.

These findings, while they support the quantitative results from the KPC surveys indicating increased women's empowerment, also show that the way forward will be complex. The findings also confirm the input from the staff already noted above (Objective #2, Formative Research) regarding the challenges of implementing the CBIO+CG methodology, at least in this context: the staff need better skills and tools in community mobilization, conflict resolution, and dealing with male dominance and machismo. As already noted, there seems to be high variability from community to community and from family to family, implying that we will need to work even more with community leaders - who appear to have great positive as well as negative influence - as well as with individual families, particularly with the husbands who appear to be the "gatekeepers" to women's mobility and participation. This will require male staff and males from partner organizations to work with men; as already mentioned above, we have added four (4) male Educadores to the project staff to begin this process. A promising strategy could be identifying male "positive deviants", men who exemplify enlightened attitudes towards women's empowerment and autonomy, and involving them in project activities.

Women's empowerment seems strongly correlated with women's control of their own money, typically through a small business. This implies a need to seek project partners such as NGOs involved in micro-loan programs for women.

Overall, the findings indicate that while the CBIO+CG methodology is improving women's empowerment and autonomy, the methodology alone (and the staff trained in it) are not sufficient and key allies and partners will be necessary to realize such a profound social transformation.

Research Products [all in-house]: “Using the Community-Based, Impact-Oriented Methodology to Determine Program Priorities” by Jason Lambden; “Comadrona Census Summary”, “The Changing Role of *Comadronas* in the Highlands of Guatemala,” and “Direct Observation of Comadrona Delivery” by Kaitlin Cassidy.

Problems/Challenges: The OR is ambitious and we are struggling to secure the resources needed for its execution. Relying excessively on the CSHGP field staff imposes undue stress. We have therefore relied on volunteer MPH graduate students doing capstone or thesis work, guided by the Principle Investigators.

Changes Made to Original OR Plans –A \$60,000 grant from URC-Project TRACtion is enabling us to add a Case Study of the impact of the Casa Maternas in achieving equity in MNC services. Our original plan called for comparing health outcomes of Phase 1 communities with those of Phase 2 communities at the end of Phase 1, but lack of resources for the KPC Survey needed caused us to cancel this plan.

Plans for PY4: 1) We will disseminate our Phase 1 results, along with our TRACtion Case Study to our partner communities, stakeholders, funders, and potential stakeholders and funders. 2) We will finalize our methodology for determining cost effectiveness of the CBIO+CG Methodology and as Phase 2 concludes conduct our cost/benefit analysis; 3) at the conclusion of Phase 2 we will conduct our final 600-sample KPC Survey to compare indicators for health outcomes and women’s/community empowerment of the Phase 1 communities with those of Phase 2 to assess the impact of the methodology; and 4) we will write and disseminate final OR report documents capturing the results of the investigation.

## **Annex 5: Revised Curamericas Guatemala CBIO Field Manual for Stakeholders and Staff**

In response to the formative research findings and recommendations of the Curamericas Guatemala staff and investigators, and also in response to the lessons learned by the staff in PY3, Curamericas Guatemala created a new version of its Spanish-language CBIO Manual, which guides the training of staff and partner communities and thus guides the implementation of the methodology. The guide is entitled “Documento Popular de la Metodología de Base Comunitaria Orientada al Impacto”, which can be translated “People’s Document for the Community-Based Impact-Oriented Methodology”.

As the title implies, this document is meant for use not just by staff but especially by the partner communities and stakeholders. It responds to OR findings, which showed that teamwork and partnership with the communities were essential to the success of the methodology and lack of this commitment to partnership and participatory involvement jeopardized its success. To this end it is in an well-illustrated easy-to-read format. It includes a new section specifically on teamwork (“trabajo en equipo”) to drive home the lesson of the importance of teamwork and solidarity. It is currently being reproduced and will soon be distributed to all Community Health Committees and Community Facilitators.

The Guide is too long to include in this report, so is being submitted as a separate pdf document.

