Overview: Trifinio Human Development Initiative

The Trifinio area is a region at the intersection of three states in the coastal lowlands of southwestern Guatemala. The states of San Marcos, Quetzaltenango, and Retalhuleu share a region cultivated with crops for export (primarily bananas and palm oil), which are owned by large agro-business enterprises. The rural population of approximately 25,000 inhabitants struggle with poverty and lack of access to health, education, and reliable clean water. The Center for Global Health (CGH) at the Colorado School of Public Health completed a community health and environmental needs assessment in October 2011 as an initial step in the long-term strategic planning process to improve the quality of life for residents in the Trifinio area. The needs assessment found that the population has low levels of income and education, poor water and sanitation infrastructure, high child morbidity and mortality, insufficient food security, and minimal access to medical care. The CGH is partnering with a local private sector agricultural corporation, Agro-America, to develop a Trifinio Human Development Initiative to improve the health, education, and welfare of residents in this rural agricultural region.

Early Childhood Health and Development Program

As part of the Trifinio Human Development Initiative, an integrated Early Childhood Health and Development Program is being specifically designed for the Trifinio population, based on evidence from the World Health Organization as well as similar programs in other developing regions. (Aboud et al, 2013; Baker-Henningham and Boo, 2010; Eshel et al, 2006; Grantham-McGregor et al, 1991; WHO, 1999). The importance of integrated interventions to improve early childhood development, health, and nutrition is widely recognized at an international level (Campbell et al, 2002; Engel et al, 2007; Fernald et al, 2009; Grantham-McGregor et al, 2007; Walker et al, 2007). The first three years of a child’s life are a critical period for brain growth and development and have significant consequences for the long-term future functioning of that individual. Such interventions have the potential to enhance a child’s physical growth, socio-emotional and cognitive development, as well as the overall economic productivity of a society.

The Early Childhood Health and Development Program in the Trifinio has been informed by two initial pilot studies conducted by CGH researchers. An initial early childhood developmental screening study in the Trifinio region in July 2012 found that children had high rates of ASQ-defined developmental delays and further suggested that high risk families who do not provide certain types of stimulation for their child would benefit from an intervention educating mothers about responsive parenting. (Domek et al, 2013) Intervention materials integrating ways to promote early childhood development, health, and nutrition were then developed and piloted during a July 2013 study. This study showed that mothers in the Trifinio were able to significantly increase their knowledge about health and development topics following a short interactive flipchart talk promoting responsive parenting. Mothers further increased their knowledge 1-2 weeks after the intervention, without any re-exposure to the intervention materials, presumably by informal reinforcement with other mothers in the community. See Appendix A for further details about these studies.

Given the need for an intervention to promote early childhood development and health and the success of early pilot materials in the Trifinio, the Early Childhood Health and Development Program was designed to include an integrated approach to early childhood health and
development – combining a series of neonatal home visits, mother-child care groups, and community education sessions to enhance the health and development of children from 0-3 years of age. The program starts with three neonatal home visits by the community health workers in the first month of life (birth, 2 weeks, and 1 month), based on WHO Essential Newborn Care guidelines, to assess neonates and provide appropriate referrals for sick newborns (Darmstadt et al, 2009; Gisore et al, 2012; Nsibande et al, 2013) and to screen for maternal depression (with referral for severely depressed mothers). Small group talks given by the community health workers then occur when the child is 6-9 months, 12-15 months, 24-27 months and 36-39 months of age to teach, promote, and reinforce caregiver knowledge of age-appropriate topics including anticipatory guidance (Nelson et al, 2003), good hygiene and hand washing, home management and recognition of common illnesses (including fever, cough, and diarrhea), timely immunizations, safety and injury prevention, and responsive parenting techniques (Eshel et al, 2007). These visits also include growth monitoring and promotion (with referral for severely malnourished children), developmental screening (with referral for severely delayed children), and iron deficiency anemia testing and treatment (at 12 months of age). In addition to the community health worker visits, bi-monthly mother-child interactive care groups start at 2 months of age and continue until the child reaches 3 years. These groups use participatory learning to promote stimulation techniques, provide peer support for the mothers, reinforce caregiver knowledge of health topics, and perform growth monitoring and promotion. (Milteer et al, 2012; Prost et al, 2013) See Appendix B for a more detailed bio-medical rationale for each of these visits.

**Outcomes and indicators**

*Short and midterm goals:*
- Increase identification of sick neonates and referral to the hospital
- Increase rates of exclusive breastfeeding before 6 months of age
- Increase responsive parenting behaviors (talking, praise, reading and play)
- Decrease incidence of diarrhea
- Increase use of oral rehydration solution for dehydration
- Increase hand washing with soap
- Increase screening and treatment for iron deficiency anemia

*Longterm goals:*
- Decrease neonatal mortality
- Decrease developmental delays
- Decrease hospitalizations for moderate to severe dehydration
- Decrease stunting and incidence of severe malnutrition
- Decrease incidence of iron deficiency anemia
- Decrease hospitalizations for pneumonia
References


Appendix A

Early Childhood Development Studies in the Trifinio
An initial research study on early childhood development was performed by researchers from the CGH in July 2012 (Domek et al, 2013). Developmental screening was conducted by Guatemalan community health workers using Spanish age-appropriate versions of the Ages and Stages Questionnaire (ASQ), a developmental screening tool that questions mothers of children to assess five domains (gross motor, fine motor, communication, personal-social, and problem solving). Surveys that examined demographic information and family behaviors were also completed for each participant. Early childhood education materials from the Colorado Bright Beginnings Program were adapted and used to create two 30-page flipchart talks to educate mothers on nutrition, health, and development topics relevant to 12–24-month-olds and 24–48-month-olds. Trained local community health workers performed the 30-minute talks one-on-one with the mothers. A post-survey was given two weeks after the intervention. Results of the study showed that 59% of children had a screening delay in at least one ASQ category and 37% of children had a delay in at least two categories, with fine motor (47% with a delay) and problem solving (32% with a delay) having the most delays. Specific maternal characteristics (illiteracy and no primary education) were significantly associated with having two or more ASQ delays (p < 0.05). Certain maternal-child interactive behaviors, including playing together with toys (p=0.04) and conversing when feeding (p=0.03), were significantly associated with fewer ASQ communication delays. Follow-up post-surveys were completed by 62 mothers, with over 90% saying that after the intervention they increased the amount of time they spent talking, playing, and using a picture book with their child. The pilot study concluded that children in the southwestern region of Guatemala were found to have high rates of ASQ-defined developmental delays. The findings do suggest that high risk families who do not provide certain types of stimulation for their child would benefit from an intervention integrating ways to promote early childhood development, health, and nutrition by educating mothers about responsive parenting.

A pretest/posttest quasi experimental study was conducted by researchers at the CGH in July 2013. Early childhood education materials from the Colorado Bright Beginnings Program and health and nutrition recommendations from the World Health Organization were adapted to create two 30-page interactive flipchart talks to educate mothers on health and development topics relevant to 0-6 month olds and 6-12 month olds. Short learning assessments were given to the mothers pre-intervention, immediately post-intervention, and 1-2 weeks post-intervention. For the 0-6 month flipchart (n=38, 25 questions), mean pre-intervention scores were 77%. Mean immediate post-intervention scores improved to 87% (p<.0001), and mean 1-2 week post-intervention scores improved further from the immediate post-intervention score to 90% (p=0.01). For the 6-12 month flipchart (n=39, 20 questions), mean pre-intervention scores were 78 % (p<.0001). Mean immediate post-intervention scores improved to 89% (p<.0001), and mean 1-2 week post-intervention scores further improved from the immediate post-intervention score to 92% (p=0.03). This study concluded that mothers in a poor region of southwestern Guatemala significantly increased their knowledge about health and development topics following a short interactive flipchart talk promoting responsive parenting. Mothers further increased their knowledge 1-2 weeks after the intervention, without any re-exposure to the intervention materials, presumably by informal reinforcement with other mothers in the community.
**Appendix B**

**Rationale for each community health worker visit:**

*Birth, 2 week, and 1 month visits:* This is a time with high rates of neonatal morbidity and mortality, often due to infection or hypernatremic dehydration resulting from inadequate breastfeeding, which warrants close monitoring by community outreach workers during the 1st month of life. The program focuses on individual visits during the first month because mothers typically do not leave the house during this period and community health workers need to assess individual babies and appropriately refer sick neonates.

*6-9 month visit:* This is a critical period for early infant growth and development. There are also increased risks for infection as maternal antibodies wane. This is a time for appropriate introduction of complementary foods as the period of exclusive breastfeeding ends and anticipating injury prevention as the child begins to become more mobile. A developmental assessment is possible and essential at this age.

*12-15 month visit:* This is a period of rapid growth and development. The primary immunization series should now be complete and verified by the tecnicas. Iron deficiency becomes common at this age and affects development and growth (39% of children were anemic in the July, 2012 Trifinio study). Children with iron deficiency anemia should be treated with appropriate supplementation.

*24-27 and 36-39 month visits:* This continues to be a period of rapid and important growth and development, when early intervention and appropriate physical, mental and social stimulation will impact the child’s developmental outcomes over time.

*Bi-monthly care groups from age 2 months to 36 months:* These groups provide peer support for the mothers and use participatory learning to promote development and reinforce caregiver knowledge of health topics, and perform growth monitoring and promotion.