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Implementing Life Course Strategies to Promote the Health and Wellbeing of Guatemalan Children and Adolescents

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Introduction

Countries need to redesign health care systems to better address the life course continuum during the first 2 decades of life consistent with the World Health Organization (WHO) working document titled "Investing in our future: a comprehensive agenda for the health and well-being of children and adolescents' [1] and the Sustainable Developmental Goals. There is an urgent need to promote a more comprehensive approach that includes nutrition and physical activity as well as social and emotional well- being in children and adolescents. It is necessary to support learning, academic success and resilience. This is even more critical when the COVID pandemic is superimposed on communities plagued by poverty and violence. The Pan American Health Organization (PAHO) strongly supports the "Call to Action" for unmet adolescent health needs [2], and adopted the Plan of Action for Women's, Children's and Adolescents' Health 2018-2030, which endorses an integrated life course approach [3]. Health ministries need to create high level organizational structures to implement and coordinate programs that focus on the first 2 decades of life. Ministries need to have a vision beyond reducing mortality of neonates and children under 5 as well as implementing child immunization programs. Governments need to break down silos between and within ministries and encourage multisector public and private collaborations to create, fund, and evaluate innovative programs benefiting families, children, and adolescents.

Our experience implementing programs consistent with the life course approach during the first 2 decades of life in a poor rural area of Guatemala identified 6 key strategies for success: 1 community engagement, 2 multidisciplinary teams with intensive training, aggressive task shifting, and effective ongoing communication channels across all integrated programs. 3 multidimensional adolescent programs, and 4 integrated mental health training and services, 5 integrated data registries/systems and 6 blended funding streams. By sharing our experiences we hope to stimulate other successful projects in urban and rural areas to publish their experiences in order to accelerate the dissemination of this life course approach for the first 2 decades of life.

Background

This project is located in the southwest region of Guatemala, at the intersection of 3 departments (San Marcos, Retalhuleu, and Quetzaltenango) in the coastal lowlands. The rural population of approximately 30,000 inhabitants, living in more than 20 small communities (called aldeas), struggle with poverty and lack access to health, education, and reliable clean water. In 2011, the Center for Global Health (CGH) in the Colorado School of Public Health partnered with an agricultural corporation, Agro-America, to establish the Center for Human Development (CHD) to improve the health, education, and welfare of residents in this rural agricultural region with an emphasis on the first 2 decades of life [3]. Agro-America, a private, family-owned, Guatemalan agribusiness operating banana and palm oil plantations and one of the largest employers in the SW Trifinio region, is committed to social investing to improve the human development index of the families and communities in the area. This article describes how the 6 strategies were operationalized and challenges that needed to be overcome in the process.

Community Engagement

Having the trust and respect of the community is essential for the successful implementation of a multisectoral life course approach. It is essential to have an effective partnership with the community, encouraging the active participation of family members in addressing population health issues and designing programs needed to enhance health, development, academic success, and resilience during the first 2 decades of life.

To begin the community engagement process, the CHD carried out a Community Health Assessment (CHA) to evaluate the health status and risk determinants of people living in the region [4]. In September and October 2011, the CGH conducted a random community sample of 287 families having a child less than 5 years old. Reproductive health problems were clearly identified: 56 (19.5%) of the participants reported 6 or more children. Slightly more than half of the women reported their first pregnancy before the age of 18 years, and 7.8% before the age of 15 years. Almost 6% of the mothers reported having a stillbirth, which was associated with the lack of adequate prenatal or perinatal care. Having a child die was a frequent occurrence; 40 participants (13.9%) reported having a child die during the first 5 years of life, with more than half of the deaths (55.6%) occurring in the first 2 months of life and 87.3% within the first year of life. Two related childhood developmental screening studies carried out in July 2012 found that children in the region had high rates of abnormal developmental scores in multiple domains, as defined by the Ages and Stages Questionnaire, 3rd edition (ASQ-3) and identified factors associated with a higher risk of delays [4,5].

After the results of the assessment, the CHD assessed how the community was organized, its level of function, and how best to develop a partnership with the community to set priorities and build mutual trust. In 2012, the Department of Anthropology at the University of Colorado Denver assembled a team-based qualitative inquiry, called a Rapid Anthropologic Assessment Procedure (RAP), using triangulation, iterative data collection, and qualitative analysis to rapidly understand the situation from the community perspective. The RAP produced a visual map of the community leadership and organizational structure and described the issues that made certain groups more vulnerable to social, economic, health, and environmental disturbances. The assessments provided the foundation for an ongoing community engagement process that included the formation of a community advisory board; the establishment of a local community based Institutional Review Board to review and approve research projects; and a local committee to help carry out a census. The CHD reached out to local Ministry of Health and Ministry of Education staff to participate in our engagement process and collaborate to enhance access and quality of services with minimal duplication and competition.

Multidisciplinary teams with intensive training, aggressive task shifting, and effective ongoing communication channels across all integrated programs. The CGH designed and established a community-based program for pregnant women and children up to 3 years of age in the region. The program, called Creciendo Sanos (Growing Up Healthy), has 2 main segments; Madres Sanas (Healthy Mothers) and Ninos Sanos (Healthy Children). Creciendo Sanos uses 7 trained community health nurses who have . completed either auxiliary nursing school (1 year after high school) or professional nursing school (3 years after high school). One nurse serves as a program supervisor, and the other 6 nurses work in groups of 2 in assigned communities.

The Madres Sanas program targets reproductive and maternal health care. These community nurses make, at a minimum, four prenatal home visits where they perform basic screening tests such as height and weight, blood pressure measurements, urine analyses and blood glucose levels. They provide all pregnant women with prenatal vitamins that include folic acid. Malnourished pregnant women are also given a protein supplement. The nurses help the women make a delivery plan, stressing the value of delivering at a hospital or private clinic rather than home delivery. When appropriate the nurses also coordinate with the involved traditional birth attendants. Additional plans are made for high risk mothers to ensure available, affordable transportation. For these women, there is communication with the hospital regarding the reasons for that mother being high risk. The nurses also make 3 home visits after the baby is born at 2-4 days, 2 weeks and 1 month. The nurses are trained to identify a range of maternal complications, assist mother with breast-feeding and assess babies for danger signs indicating serious infections or other problems. Mothers with complications and babies with danger signs are referred (and often transported) to the clinic for a physician assessment.

During 2019, the nurses enrolled 313 pregnant women in the prenatal home visiting program. The nurses made 676 home visits, with 2.1 average visits per woman. Women enrolled later in their pregnancy and had fewer visits. During this period, 236 of the 313 women delivered. There were 130 (55%) deliveries at the Coatepeque public hospital, 20 in a private clinic (9%), 13 (6%) in the social security hospital, 60 (25%) in the home, and 13(6%) in other sites or an unknown location. There were 108 (46%) cesarean section deliveries and 127 (54%) vaginal deliveries. Among the 313 pregnant women, 81 (26%) were adolescents (as defined by less than 19) and there were 45 deliveries among these adolescents. Among these adolescent deliveries, there were 29 deliveries at the Coatepeque public hospital, 3 in a private clinic, 0 in the social security hospital, 11 in the home, and 2 in other sites or an unknown location. There were 23 (51%) cesarean section deliveries and 22 (49%) vaginal deliveries. The proportion of adolescent pregnancies (as defined by less than 19) declined from 48% prior to the introduction of our programs in 2016 to 26% documented in 2019. Prior to the introduction of our prenatal program, 40% of deliveries occurred in homes, so we have seen a 38% reduction in home deliveries.

Mothers with prenatal and /or post- natal depression are referred to the mental health team program. The nursing team also carried out a cluster-randomized trial of home-based postpartum contraceptive delivery at the 1month post- partum visit that demonstrated the benefits of long acting implants on increased contraceptive usage and decreased repeat pregnancy within 12 months [6,7]. The nurses in maternal community nursing program are trained and supervised by Ob-Gyn physicians and a nurse midwife based in Colorado. There are weekly zoom call meetings with the leader of the nursing team and Colorado based team members. Ongoing in person and virtual training of the team staff is critical to having the team function well. A description of the online training experience provided to the prenatal care nurses during the COVID pandemic has been published [8].

The Ninos Sanos component of the Creciendo Sanos program was designed to include an integrated approach to early childhood health and development, using mother-child interactive group visits to enhance the health and development of children from birth to 3 years of age. Mothers learn through a hands-on approach emphasizing demonstration, practice, and repetition. Materials created for the mothers are based on a simple and low-literacy pictorial format. Prior to the COVID pandemic the program had monthly mother-child interactive care groups starting at 2 months of age and continuing until each child reaches 3 years. Having group visits is supported by research showing that group visits are an effective means of delivery for well-child care and have improved maternal-child interactions, child development, and health outcomes [9-16], including in families with a lower socioeconomic status. Additionally, group visits have shown positive benefits when compared with more costly home visitation programs [14-16]. Nurses are provided a detailed manual describing all aspects of the program. Ongoing research and program analysis are currently underway to investigate the community preferences for ongoing program engagement; best practices in the post-pandemic era; and needed updates to program interventions to maximize health outcomes.

The nutritional recovery program has a multidisciplinary team to address high rates of acute and chronic malnutrition at the site. The Guatemala based team has 2 nurses, a physician, a psychologist and a nutritionist. and the Colorado based team has a physician, a public health professional and a data analyst. Prior to the COVID-19 pandemic, local Guatemalan nutrition graduate students participated. The target population for this program includes children 6 months to 5 years and pregnant women who are diagnosed with acute and/or chronic malnutrition. The focus is on nutritional recovery using nutritional supplementation, nutritional counseling and education.

One of the challenges faced by these programs is the aggressive recruitment of these well- trained nurses by the Ministry of Health, the Social Security system, and private clinics because of their training and experience.

Multidimensional Adolescent Programs

There is a need for a special focus on adolescent health and wellbeing. Adolescents face many difficulties, which are exacerbated by frequent exposure to violence and drugs. When the CHD carried out structured interviews with Trifinio youth in 2015, the dominant theme was the feeling that no one really cares about their physical or mental health or about improving their lives. In response to these interviews, as well as a 2015 adolescent school survey [17] and a discussion with the CHD community advisory committee; the CHD developed an adolescent program with 3 components; a local school-based reproductive health education program called Big Decisions, an adolescent clinic, and a youth leadership/community service program.

The “Big Decisions” program was created by Healthy Futures of Texas for the San Antonio, Texas school system. The 10-lesson science-based curriculum is considered an abstinence-plus program as it suggests that adolescents delay having sex for their own long-term benefit, but also provides information about contraceptives and the proper use of condoms in order to prevent unwanted pregnancies, HIV and STDs. The program seeks to build self- esteem, confidence, and formulate life goals within the context of providing comprehensive sex education. The program educator met with school principals and teachers in the area to recruit appropriate local schools. Following the selection of 5 schools, she also met with parents to provide an overview of the curriculum, give basic information on how to talk to their children about sex, and fielded questions. The first cohort of young adolescents (n=319) received the 10-lesson curriculum in 2017 and completed the program in September of 2018. The girls participating in this first cohort preferred to have the boys in the same sessions so they would hear their concerns and understand their feelings directly. We enrolled 198 new students in 2018 who completed the adapted curriculum. In 2019, we obtained a grant from the Summit Foundation. This allowed us to expand the program to an additional 7 schools, serving 1380 students’ ages 11 to 19 years old, including students from 11th and 12th grade.

In late June and early July 2019, a team of US and Guatemalan students and Guatemalan staff members enrolled 1,414 participants from 15 middle and high schools in a comprehensive Student Health Survey. The survey included questions related to the student’s opinion of the Big Decisions sexual health curriculum that had been implemented in some of the schools surveyed. The responses documented that the course was well received and appreciated by both girls and boys and the program was significantly associated with a reduced percentage of surveyed youth who ever had sexual relations and also who failed to use a form of contraception during sex. Completion of the program was also significantly was associated with an increased use of a condom at the first sexual encounter.

The 2015 and 2019 adolescent surveys also documented the mental health needs of youth living inthe region [20]. Among the 1,414 students responding in the 2019 survey, mental health problems were common as 19% of participants stated that they had little interest in doing things almost every day during the last two weeks and 51% stated that they felt sad, without hope, or run down at least a few days in the last two weeks. Greatly concerning was the finding that 12.5% stated that they had made a plan to harm themselves or die during the last 6 months The survey identified risk factors (drinking, fighting, being attacked, being bullied) for poor mental health outcomes (being lonely most of the time and having considered suicide). These data inform the design and implementation of needed mental health services in the community.

The second component for adolescent health includes an adolescent clinic that provides clinical services including preventive care, acute and chronic care, mental health services, confidential STI and pregnancy testing, and contraceptives. The main focus for the clinic is counseling and contraception to teen girls and boys, as well as health services for pregnant teens and teen mothers. A key function of the clinic is offering Long-Acting Reversible Contraceptives (LARCs) for those in need of reliable and effective contraception. The 3rd component is called Youth Leaders. The vision for "The core values of the program are fourfold. First, become leaders by striving to create a better future for their community. Second, be responsible and committed to their personal and community development. Third, have respect for children, youth and adults in the community. Fourth, persevere by pursuing excellence day by day.

The program began in May of 2017, by providing scholarships to students who apply and go through a selection process. Initially 9 high school students were selected, and in April 2018, an additional 5 students were selected. The program pays the high school student school fees and their initial school supplies. Both the students and their parents must sign a contract that describes the program, required attendance to the activities and a commitment to serve the community. Since high school students only go to school in the afternoons, the participants meet twice a week in the mornings. The structured curriculum is based on the program "Youth Engaged in Leadership and Learning (YELL)" from the John W. Gardner Center for Youth and Their Communities 2nd Edition © 2007. The curriculum includes activities that promote gaining self-esteem, public speaking, leadership and advocacy. The program incorporates experiential learning based on community assets and challenges. Their responsibilities highlight ways that they can "Make a positive contribution to their community". For example, they help families obtain and correctly use water filters since all local water supplies are contaminated. They help mothers understand the importance of talking, reading, playing and praise for early childhood development by assisting community nurses during mother-child care groups. They distribute books to families with young children and demonstrate how to read to and play with young children to best promote their development and have them ready to learn when they enter school.

Integrated Mental Health Training and Services

We recognized that the capacity to integrate mental health services into the maternal, neonatal, pediatric, and adolescent and nutrition recovery programs was limited and required a special focus. Nurses reported a lack of general knowledge on maternal mental health and adolescent mental health and needed more training to assess and treat these conditions. To address these issues, the CHD is collaborating with colleagues at the University of Colorado, Boulder, who developed the Alma project. This project is based on an effective type of psychotherapy for depression called Behavioral Activation, which focuses on delivering a guideline for project leaders, or compañeras, who seek to help pregnant or postpartum women experiencing depression. . The program consists of 8 sessions lasting approximately 45 minutes each, with a detailed protocol. Additionally, the program's guide includes tasks to be completed by women following each session to actively seek relief and wellness. The project was divided into three phases:

Phase 1 Collect qualitative data regarding maternal mental health through semi-structures interviews conducted with the nurses and community leaders, Topics included signs and symptoms of maternal depression, common barriers women face when pregnant or with a newborn, the support system available for women in the communities, and thoughts on current questionnaires.

Phase 2 Adapt the program using data gathered through the interviews using the ADAPT-ITT framework (a framework commonly used in adapting HIV prevention programs with behavioral components).
Phase 3 Test the adapted modules with the local nurse coordinator and decide which questionnaires will be most appropriate to use with this particular population, then fully implement the project. The CHD onsite psychologist maintains constant communication between the Alma team and the maternal/neonatal nurses, provides direct supervision of the nurses who are working with women facing maternal depression and supervises data collection process. Learning how to implement appropriate mental health services with limited mental health professionals into our program will strengthen our overall project.

Integrated Data Registries/Systems

Assessing program outcomes and population health requires well integrated data registries and systems. The data management system of the CHD includes an integrated secure system to manage all data from the maternal, neonatal, child and adolescent community nursing programs.

Building and maintaining integrated, efficient, high-quality, and secure data systems takes a substantial, but worthwhile, investment. An onsite data manager is needed to ensure that data are correctly and completely entered in a timely manner, as well as meticulously checked for errors. A data analyst prepares weekly and monthly reports and utilizes a data dashboard depicting the most important information. Program staff reviews the dashboard and reports and communicate the data to all appropriate team members, who then use the data to inform decision making [18].

Since 2015, our community health and research programs using these databases have carried out a number of quality improvement projects, such as one describing high blood pressure during pregnancy [19], one documenting interpregnancy intervals [20], and one documenting the causes of an increasing frequency of caesarian section deliveries [21]. Our team also documented a high frequency of neonatal microcephaly before the introduction of Zika virus in the community that was unaffected by the later introduction of Zika [22].

Blended Funding Streams

The CHD has integrated several funding sources including Agro-America, the University of Colorado Anschutz Medical Campus, private foundations, philanthropy of individual donors, and indirect cost recovery from research grant subcontracts. Reimbursement for clinical services including medical and dental clinic visits, laboratory testing, and pharmacy also generate revenue. Revenue from laboratory and pharmacy services covers these cost centers while the revenue from the medical and dental services is insufficient to break even on their costs. Agro-America funds approximately half of the CHD non-research budget. In addition, the CHD takes advantage of Agro-America's existing infrastructure for human resources, purchasing, information technology, communications, and maintenance. The remaining budget is covered by the other funding sources. The University of Colorado Anschutz Medical Campus, which includes Children's Hospital Colorado, provide clinical support for the project through elective rotations of residents and fellows with faculty oversight.

Redesigning the health care system in nontraditional ways may require governmental agencies to collaborate more effectively with each other as well as with non-governmental organizations to jointly fund these more innovative delivery models.

Conclusion

This case study provides one rural Central American example of how the life course approach to maternal, neonatal, child and adolescent programs is being implemented effectively using the 6 key strategies. Published case studies of other successful projects in urban areas and in other countries are needed to accelerate the dissemination of this life course approach for the first 2 decades of life.

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