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FOOD AND NUTRITION TECHNICAL ASSISTANCE

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Strengthening and Evaluating the Preventing Malnutrition in Children under 2 Approach in Guatemala: Report of the Enrollment Survey

August 2013

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THE SCIENCE OF IMPROVING LIVES

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Abbreviations and Acronyms

BCC	behavior change communication
BMI	body mass index
CAPI	computer-assisted personal interview
CC	*centro de convergencia* (convergence center)
CIA	Central Intelligence Agency
CSB	corn-soy blend
DHS	Demographic and Health Surveys
EBS	*equipo básico de salud* (basic health team)
EDI	Economic Development Initiatives
ENSMI	*Encuesta Nacional de Salud Materno Infantil* (National Maternal and Infant Health Survey)
FANTA	Food and Nutrition Technical Assistance Project
g	gram(s)
HAZ	height-for-age z-score
HDDS	Household Dietary Diversity Score
HDI	Human Development Index
HH	household
HHS	Household Hunger Scale
IFPRI	International Food Policy Research Institute
IYCF	infant and young child feeding
kcal	kilocalorie(s)
kg	kilogram(s)
LAZ	length-for-age z-score
LNS	lipid-based nutrient supplement(s)
µg	microgram(s)
mg	milligram(s)
mm	millimeter(s)
MN	micronutrient
MNP	micronutrient powder(s)
MOH	Ministry of Health
MUAC	mid-upper arm circumference
NGO	nongovernmental organization
ORS	oral rehydration salts
PEC	*Programa de Extensión de Cobertura* (Extension of Coverage Program)
PM2A	Preventing Malnutrition in Children under 2 Approach
PROCOMIDA	*Programa Comunitario Materno Infantil de Diversificación Alimentaria* (Maternal and Infant Community Food Diversification Program)
PSS	prestadoras de servicios de salud (health services providers)
Q	quetzal
SBS	*servicios básicos de salud* (basic health services)
SIAS	*Sistema Integral de Atención en Salud* (Integrated System for Health Care)
SRQ-20	Self-Reporting Questionnaire
SD	standard deviation
U.S.	United States
UNDP	United Nations Development Programme
USAID	U.S. Agency for International Development

WAZ	weight-for-age z-score
WHO	World Health Organization
WHZ	weight-for-height z-score
WLZ	weight-for-length z-score

1. Introduction

This report presents the findings from the enrollment survey conducted as part of the impact evaluation of the *Programa Comunitario Materno Infantil de Diversificación Alimentaria* (PROCOMIDA) (Maternal and Infant Community Food Diversification Program), a U.S. Agency for International Development (USAID) development food aid program funded with Food for Peace Act Title II resources. PROCOMIDA uses the Preventing Malnutrition in Children under 2 Approach (PM2A), which aims to lower the prevalence of child malnutrition by targeting all pregnant women, mothers of children 0–23 months, and children under 2 in food-insecure areas with a package of health and nutrition interventions. PROCOMIDA is implemented by Mercy Corps in Alta Verapaz, Guatemala.

Guatemala is the most populous country in Central America, with more than 14 million inhabitants. It is located between the Pacific Ocean and the Caribbean Sea and shares borders with four countries: Mexico, El Salvador, Honduras, and Belize. The population of Guatemala includes many different ethnic groups, including Mestizo (Ladino) and people of European descent, which make up the majority of the country's population (59.4%), as well as a number of indigenous ethnic groups of primarily Mayan descent, including K'iche (9.1%), Kaqchikel (8.4%), Mam (7.9%), and Q'eqchi' (6.3%). Inequality is a significant problem, especially in relation to income and landownership (Central Intelligence Agency [CIA] 2013).

The United Nations Development Programme (UNDP) ranks Guatemala 131 out of 187 countries with a Human Development Index (HDI) of 0.574, which is below the regional average of 0.731for Latin America and the Caribbean. An estimated 13.1% of the population lives below the poverty line of $1.25 per day (UNDP 2010). The literacy rate is 69.1%, which is higher among men (75.4%) than women (63.3%) (CIA 2013).

Guatemala has the third highest rate of chronic malnutrition in children in the world. The prevalence of stunting (height-for-age z-score [HAZ] < −2) in children between 3 and 59 months of age in Guatemala is 49.8%, with 21.2% being severely stunted (HAZ < −3). The prevalence of stunting has dropped a mere 5.4 percentage points from 1995 to 2008 (*Encuesta Nacional de Salud Materno Infantil* [ENSMI] [National Maternal and Infant Health Survey] 2009). The prevalence of stunting is highest in rural areas (58.6%), among the indigenous population (65.9%), and among children of mothers who have not attended school (69.3%). As in all of Latin America, wasting (weight-for-height z-score [WHZ] < −2) is uncommon, with a prevalence below 2% (ENSMI 2009).

The remainder of this report is structured as follows.

- Section 2 presents details on the PROCOMIDA intervention, the evaluation design, and the study methods.
- Section 3 presents the health center and community- and household (HH)-level results.
- Sections 4 and 5 follow with a description of the HH characteristics and the results for pregnant women.
- Section 6 presents the findings on children.
- Section 7 discusses the differences between study arms.
- Section 8 concludes with a summary of the results.

2. Methods

2.1 The PROCOMIDA Intervention

PROCOMIDA is being implemented in the department of Alta Verapaz, which has some of the country's highest rates of stunting (59.4% of children 3–59 months of age as compared to 49.8% nationally) (ENSMI 2009). Mercy Corps started implementation in 4 of the 16 Alta Verapaz municipalities (Cahabón, Cobán, Lanquín, and San Pedro Carchá) in 2010. The municipalities of Senahu and Frey Bartolome de las Casas were added in 2011 and 2012, respectively.[1] The majority ethnic group in the PROCOMIDA areas is Q'eqchi'.

The primary objectives of PROCOMIDA are to improve the health and nutritional status of pregnant and lactating women and children under 2 years of age and to strengthen the quality and delivery of health care services. To accomplish this, PROCOMIDA has three interrelated components:

- The distribution of food rations, including family and individual rations
- The required participation in behavior change communication (BCC) sessions that focus on improving key health- and nutrition-related behaviors
- Strengthening of preventive health services for pregnant and lactating women and children under 5 and required attendance by beneficiaries and their children under 2 years of age at these services

Family rations are provided to increase HH food security and to prevent the sharing of the individual ration. Individual rations directly target pregnant women, women within the first 6 months post-partum and/or children 6–23 months of age and aim at increasing their energy, protein, and micronutrient intake. The reasons for providing the individual ration are based on the inadequate diet of pregnant and lactating women and children 6–23 months of age, the high prevalence of micronutrient deficiencies,[2] and high levels of child stunting (Marini, 2003). The composition of the family and individual rations are described in the next section.

The objective of the BCC sessions is to improve women's health- and nutrition-related knowledge and practices. Formative research conducted in the PROCOMIDA communities revealed limited knowledge and practices and a clear willingness to learn about and adopt better infant and young child feeding (IYCF) and health practices among mothers (Olney et al. 2012).

The third PROCOMIDA component—strengthening of preventive health services and increasing health care utilization—corresponds to the need to improve the training of the health staff and, more specifically, community facilitators, midwives, and community health workers. In addition, the low availability of services and supplies and the lack of knowledge of the benefits and appropriate use of micronutrient (MN) supplements (Olney et al. 2012) are major constraints to the proper utilization of preventive health services and products (e.g., supplements).

PROCOMIDA's food distributions and BCC sessions are organized at the *centros de convergencia* (CCs) (convergence centers). CCs are part of the *Programa de Extensión de Cobertura* (PEC) (Extension of

[1] The research activities are limited to the four municipalities where program implementation started.

[2] In Guatemala, an estimated 38% of children under 5 and 22% of pregnant women suffer from anemia and 16% of preschool-aged children are deficient in vitamin A. World Bank. 2010. "Nutrition at a Glance: Guatemala." Accessed on April 26, 2013. http://siteresources.worldbank.org/INTLACREGTOPNUT/Resources/Guatemala4-20-10.pdf.

Coverage Program), which is funded by the *Sistema Integral de Atención en Salud* (SIAS) (Integrated System for Health Care); SIAS is managed by the Guatemalan Ministry of Health (MOH). The PEC system aims to expand health coverage to rural populations and to provide *servicios básicos de salud* (SBS) (basic health services) to pregnant and lactating women and children under 5 years of age. *Prestadoras de servicios de salud* (PSS) (health service providers) are responsible for the day-to-day management of the CCs, the training of health staff, and service delivery according to SBS guidelines, while the MOH is in charge of supplying PSS with the necessary resources, e.g., money, equipment, and supplies. The CCs are staffed by medical staff (doctor and/or nurse) paid by the PSS and community-level volunteers.

Women can enroll in PROCOMIDA at any stage during pregnancy or lactation if the lactating woman has a child under 6 months of age or can enroll her child between the ages of 6 and 18 months. Children graduate from the program when they are 23 months of age. More than one beneficiary per nuclear family can be enrolled in the program, and individual rations are provided to each eligible beneficiary. However, only one family ration is provided to the nuclear family regardless of the number of beneficiaries. A total of 50,000 HHs will be enrolled.[3]

2.2 PROCOMIDA's Impact Evaluation

PROCOMIDA incorporates a research program being undertaken by the International Food Policy Research Institute (IFPRI) in collaboration with Mercy Corps, with funding from USAID through the Food and Nutrition Technical Assistance Project (FANTA). The overall objectives of the research are to assess the impact and cost-effectiveness of PROCOMIDA on child nutritional status and to assess the differential and absolute impact of varying the food ration composition and size in a PM2A program such as PROCOMIDA. To assess the program's impact, a longitudinal study is being conducted in the target population. The first round of the longitudinal study enrolled women who were 3–7 months pregnant. The results of the enrollment survey are presented in this report. Follow-up interviews are conducted when the mother's child turns 1 month, 4 months, 6 months, 9 months, 12 months, 18 months, and 24 months of age.

Enrollment in the study was independent from the women's enrollment in the PROCOMIDA program. Enrollment in the evaluation study and the program were kept separate because the study aims at evaluating the population-level impact of the program (i.e., intent-to-treat effect of the intervention packages) rather than the impact on the beneficiaries only (i.e., treatment-on-the-treated).

As a consequence of this design, a traditional baseline survey providing information on the situation of communities and families before the program implementation started was not possible. The enrollment report nevertheless provides a good description of the baseline situation. Only around one third of the households and pregnant women were enrolled in PROCOMIDA at the time of the enrollment survey and they had been in the program for only a limited amount of time. The potential impact of program at enrollment into the study cohort was thus limited. As discussed in section 2.3.7., we tested for statistically significant differences between the study arms (defined below) and point out differences that appear to be a consequence of participation in the program.

[3] Originally, PROCOMIDA had been approved to work in 221 CCs and enroll 31,500 households (PROCOMIDA Proposal 2009). In 2012, PROCOMIDA received approval for a sixth-year extension and an increase in enrollment to a total of 50,000 households (personal communication with PROCOMIDA chief of party 2012).

For the purposes of the IFPRI-led research on PROCOMIDA and more specifically to answer questions related to the optimal size of the family food ration and the composition of the individual food ration, the study compares HHs in CCs that have been randomly assigned to one of six study groups:

- Group A: Full family ration (rice, pinto beans, and oil), individual ration (corn-soy blend [CSB]), BCC, and required health visits
- Group B: Reduced family ration (rice, pinto beans, and oil), individual ration (CSB), BCC, and required health visits
- Group C: No family ration, individual ration (CSB), BCC, and required health visits
- Group D: Full family ration (rice, pinto beans, and oil), lipid-based nutrient supplement (LNS) as the individual ration, BCC, and required health visits
- Group E: Full family ration (rice, pinto beans, and oil), micronutrient powder (MNP) supplement as the individual ration, BCC, and required health visits
- Group F: Control group: does not receive PROCOMIDA (i.e., does not receive family or individual rations or BCC messages) and is not required to attend health visits; however, families in the control group do have access to standard MOH health services

Table 2.1. The Six Study Groups of the PROCOMIDA Evaluation

	Study group					
Program component	**A**	**B**	**C**	**D**	**E**	**F**
Food ration						–
Family ration (rice, beans, oil)	Yes	Reduced	–	Yes	Yes	–
Individual ration	Yes	Yes	Yes	Yes	Yes	–
CSB	Yes	Yes	Yes	–	–	–
LNS	–	–	–	Yes	–	–
MNP	–	–	–	–	Yes	–
BCC	Yes	Yes	Yes	Yes	Yes	–
Required health visits	Yes	Yes	Yes	Yes	Yes	–[a]

[a] HHs in the control group have access to the standard MOH health services.

The full family ration of rice, pinto beans, and vegetable oil provides a total of 269 kcal per HH member per day and is given to all beneficiary families in study groups A, D, and E. Group B's reduced family ration provides approximately 152 kcal per day per family member. Group C does not receive a family ration.

Table 2.2. PROCOMIDA Monthly Family Ration Sizes[a]

Foods	Full family food ration (Groups A, D, and E)		Reduced family food ration (Group B)	
	Weight (kg)	Energy (kcal)	Weight (kg)	Energy (kcal)
Rice	6.00	21,600	3.00	10,800
Pinto beans	4.00	13,600	3.00	10,200
Vegetable oil	1.85	16,354	0.925	8,177
Total	**11.85**	**51,554**	**6.925**	**29,177**
Total kcal/capita/day[b]		269[c]		152[c]

[a] These rations were distributed starting in July 2011; from June 2010 to June 2011 a larger family ration size was distributed (see Table A.2).
[b] Total kcal/capita/day is calculated using an average HH size of 6.3 members (the average HH size in the enrollment survey; see Table 4.1) and 30.42 days/month.
[c] Note that the individual ration is not meant to be shared, so we do not include it in the computation of the total energy/capita/day. If the CSB was shared, it would provide an additional 78 kcal/capita/day, and the total full family food ration would therefore provide 347 kcal/capita/day and the reduced family food ration would provide 231 kcal/capita/day.

The individual ration is intended to be consumed strictly by the targeted individual; in study groups A, B and C it consists of CSB. The ration provides 494 kcal per day. In two of the study groups (D and E), micronutrient supplements are provided instead of CSB: LNS in group D and MNP in group E. The nutrient composition of the LNS and MNP supplements and the number of sachets provided can be found in Table A.1.

Table 2.3. PROCOMIDA monthly Individual Ration Sizes [a]

Target group	Individual ration							
	CSB (Groups A, B, and C)		LNS[b] (Group D)			MNP[b] (Group E)		
	kg/month	kcal/day	sachets/ month	g/day	kcal/day	sachets/ month	g/day	kcal/day
Pregnant/ women within the first 6 months postpartum	4.0	494	30	20	118	60	4	–
Children aged 6–23 months	4.0	494	60	20	118	60	4	–

[a] Note that all groups receive PROCOMIDA BCC and health services except the control group, which will have access to standard MOH health services.
[b] The nutrient composition of the LNS and MNP supplements and the number of sachets provided can be found in Table A.1.

2.3 Study Methods

2.3.1 Sample Size

The sample size calculations for the longitudinal cohort study are based on the use of double difference impact estimation. The parameters used for the sample size calculation were a type 1 error of 0.05, power of 0.90, and an intracluster correlation of 0.007. Further details on the sample size calculations (including the minimal detectable difference in HAZ for all study group comparisons) can be found in Leroy et al. 2009.The estimated required sample size was 600 women in each study group or a total of 3,600 women.[4]

2.3.2 Study Arms

A cluster randomized controlled evaluation design is used for the impact evaluation. For this study, a cluster was defined as a group of communities served by one CC. One CC serves, on average, 900–1,000 people living in two to three communities. A total of 120 CCs were selected out of the pool of 221 PROCOMIDA-eligible CCs in the municipalities of Cahabón, Cobán, Lanquín, and San Pedro Carchá in Alta Verapaz. The CCs were randomly assigned to one of the six study groups (20 CCs per group). The complete list of selected CCs and the study arm to which each one was assigned is shown in Table A.3. Further details on the selection can be found in Appendix B.

2.3.3 Enrollment of the Study Cohort

All women who were 3–7 months pregnant who resided in communities served by the 120 selected CCs were invited to enroll in the study. A master list of eligible women was compiled using information obtained from the nongovernmental organizations (NGOs) that manage the CCs' health services and from a list of PROCOMIDA's beneficiaries, before the start of field operations in August 2011 (see Section 2.3.5 for more information). Each month the list of eligible pregnant women was updated.

If there was more than one eligible pregnant woman in the HH, one woman was randomly selected by ranking the women's first names alphabetically. If another woman became pregnant in the same HH at a later date, she was not eligible to enroll in the study cohort but could receive the same program benefits as study participants who resided in her cluster.

2.3.4 Data Collection

Data were collected at the CC, community, and HH level, using pretested questionnaires. The list of modules included in each of the questionnaires is presented in Tables 2.4–2.7, along with a brief description of each module.

CC Questionnaire

The CC questionnaire gathered information on the CCs' schedule, personnel, services provided, and availability of equipment and supplies.

[4] Due to the expected loss to follow-up, the number of pregnant women to be enrolled needed to be higher. Using information on loss-to-follow between the first rounds of data collection, we estimated the required number of pregnant women to be approximately 4,600.

Table 2.4. List of Modules Included in Health Services Assessment Questionnaire

Module	Topic	Description	Respondent
1	Schedule	Hours of operation for preventative services for children, pregnant women, and women postpartum	CC personnel
2	Personnel	Number of health care personnel and the number of hours worked at the CC per month	CC personnel
3	Services for children	Provision of growth monitoring services, services for sick children, and treatment for severely malnourished children	CC personnel
4	Services for women	Prenatal care, delivery assistance, and postnatal care	CC personnel
5	Vaccinations	Vaccination and vitamin A supplementation	CC personnel
6	Equipment	Availability of medical equipment required for the provision of preventive and curative care for children and pregnant women	CC personnel
7	Medications	Supply of medication	CC personnel
8	Infrastructure	Construction materials used for floor, walls, and roof; availability of water, electricity, toilets/latrine, and stove, etc.	CC personnel

Community Questionnaire

The community questionnaire collected information on the local schools and health services, food crops, fruit trees, the presence of associations or cooperatives, forms of transportation, infrastructure, recent immigration/emigration patterns, weather conditions, development projects, and positive and negative events that affected the community residents in recent years. Data were collected in each of the 274 communities served by the 120 CCs.

Table 2.5. List of Modules Included in Community Questionnaire

Module	Topic	Description	Respondent
1	Schools	Information on schools attended by children living in the community, including location, type, fees, and perceived quality	Group of community members
2	Health services	Health services used by families living in the community, including location and travel time, vaccination campaigns, and epidemics; health personnel living in the community are also identified	Group of community members
3	Food crops	Main crops in the community and timing of harvest	Group of community members
4	Fruit trees and permanent crops	Main fruit trees and permanent crops in the community and timing of harvest	Group of community members
5	Community organizations	Existing community organizations, their objectives, and membership	Group of community members
6	Transportation	The availability and cost of public transportation to a number of locations and ease of access to the community	Group of community members

Module	Topic	Description	Respondent
7	Infrastructure	The availability of electricity, water, and telephone	Group of community members
8	History	Community, migration, climate, etc.	Group of community members
9	Development programs	Development programs implemented over the past 5 years	Group of community members
10	Events	Events that affected the community (positively or negatively) over the past 5 years	Group of community members

Household Questionnaire

The HH questionnaire was used to gather information on HH demographics and socioeconomic indicators, food security, participation in social assistance programs, shocks, and the characteristics of the pregnant woman and their children under 2 years of age. The HH questionnaire was based on instruments from a variety of sources. All modules were adapted to the specific needs of this study. Table 2.6 presents the modules included in the questionnaire, the questionnaire or instrument the module was based on, and a short description of each module.

Table 2.6. List of Modules Included in the Enrollment Household Questionnaire

Module	Topic	Source	Description	Respondent
1	HH roster and education	IFPRI	Information on the composition of the HH, including designation of the head of HH, a list of all HH members, their age and sex, and their relationship to the head of HH; highest educational level attained and activity/employment in the past month	Head of HH, spouse, HH member over 18 years of age, or pregnant woman
2	Housing	IFPRI	Construction materials used for floor, walls, and roof; availability of water and electricity; fuel/energy used for cooking, lighting, etc.	HH member over 18 years of age or pregnant woman
3	Assets	IFPRI	Durable HH goods (in working condition), including tools for agricultural production and animals	HH member over 18 years of age or pregnant woman
4	Non-food expenditure	IFPRI	HH expenses over the past week, month, and year in specific non-food items	HH, spouse, HH member over 18 years of age, or pregnant woman
5	Food consumption and expenditure	IFPRI	Expenses and consumption of food by the HH in the past week	Individual in charge of food preparation or HH member over 18 years of age or pregnant woman
6	Participation in social programs	IFPRI	All social programs HH members participate in and the benefits received from these programs	HH, spouse, HH member over 18 years of age, or pregnant woman

Module	Topic	Source	Description	Respondent
7	Shocks	IFPRI	All shocks (economical, agricultural, and familial) faced by the HH in the past 12 months	HH, spouse, HH member over 18 years of age, or pregnant woman
8	Food Security	FANTA Household Hunger Scale (HHS) (Deitchler et al. 2010)	The prevalence of HH hunger using the FANTA HHS	Individual in charge of food preparation or HH member over 18 years of age
9	Pregnant woman's knowledge	Demographic and Health Surveys (DHS) (www.measuredhs.org), IFPRI	Knowledge on child health, health care seeking, feeding, and danger signs	Pregnant woman
10	Pregnant woman's status	DHS, IFPRI	Women's autonomy and decision-making power	Pregnant woman
11	Pregnant woman's occupation and activity	IFPRI	Women's literacy, occupation, and activities	Pregnant woman
12	Pregnant woman's prenatal care	DHS	Prenatal care received	Pregnant woman
13	Pregnant woman's health	IFPRI, WHO(Self-Reporting Questionnaire (SRQ)-20)	The pregnant woman's health and stress	Pregnant woman
19	Pregnant woman's participation in PROCOMIDA	IFPRI	Participation of the pregnant woman in PROCOMIDA	Pregnant woman
21	Hygiene spot-check	IFPRI	Cleanliness of the pregnant woman and of the interior and exterior of the house using a spot-check observation method	Enumerator (direct observation)

Anthropometry Questionnaire

The anthropometry questionnaire was used to record height (or length) and weight of the pregnant women and their children under 24 months of age.

Table 2.7. List of Modules Included in Anthropometry Questionnaire

Module	Topic	Description	Respondent
18	Child & pregnant women anthropometry	Child weight and length were measured; length was measured twice and a third length measurement was taken if the difference between the first two measurements exceeded 6 mm Pregnant woman's height and weight were measured; pregnant woman height was measured twice and a third measurement was taken if the difference between the first two measurements exceeded 10 mm	–

2.3.5 Enrollment Survey Fieldwork

Survey firm. Vox Latina, a Guatemala City-based survey firm, was contracted in 2011 to conduct the longitudinal survey. A special field office to manage the Vox Latina field operations was opened in Cobán in August 2011. The Vox Latina office ensured that enumerators and supervisors were equipped with the necessary supplies and the updated list of eligible pregnant women. They also reported enrollment numbers to IFPRI weekly and uploaded electronic questionnaires into Dropbox[5] daily. The Vox Latina team in Cobán was also in charge of managing equipment, monitoring fieldwork, preparing trainings, and communicating all field issues with IFPRI. In addition, staff wrote a weekly report that updated IFPRI on Vox Latina field and office activities.

Computer-assisted personal interviewing with Surveybe. Data were collected using portable computers. Economic Development Initiatives (EDI), a London-based firm, was contracted in January 2011 to program the enrollment questionnaire into Surveybe, their computer-assisted personal interview (CAPI) software. Surveybe is an advanced CAPI software package allowing for real-time (i.e., in the field, while the questionnaire is being completed) automatic skips and range and other checks of captured information. The enumerator can correct the issues identified by Surveybe as the interview is being conducted.

Training.

- **Training of supervisors.** The selected supervisors participated in a 1-week training before enumerator training began. The training covered basic computer skills, introduction to Surveybe, and an overview of the enrollment questionnaire. They were also trained to manage a large team of enumerators, conduct basic computer tasks (e.g., management of computer folders and use of USB flash drives), upload files into Dropbox, archive completed electronic questionnaires on both the supervisor's and enumerators' computers, and correctly report progress and problems to the Vox Latina-Cobán office. The supervisors also attended all trainings for enumerators.
- **Training of enumerators.** A variety of methods were used to train the enumerators in the use of the paper questionnaire over the course of 3 weeks. These included lectures, role-play, discussions

[5] Dropbox is an online file-sharing service. The program installs a Dropbox folder on each user's computer. This folder can be shared with other users and syncs automatically between computers as new files are added.

of all potential answers to a question, and discussions related to the coding of different types of responses. The enumerators were continuously evaluated during the training. Each week, a short written test was used to evaluate their understanding of the paper questionnaire.

- **The use of Q'eqchi'.** In the absence of a standard Q'eqchi' spelling and since many Q'eqchi' speakers have difficulty reading written Q'eqchi', the Spanish questionnaire was not translated. Rather, fieldworkers were trained to apply the questionnaire in Q'eqchi'. To standardize the translation, interviewers first decided on a suitable translation in small groups and then the entire team discussed it until a final translation was approved. The translation was then evaluated by two staff members of the Mayan Academy of Languages who had extensive knowledge of the Alta Verapaz region. After they gave their final approval, the translation was read one more time to the group. Each enumerator was instructed to write down the translation in the paper version of the questionnaire.
- **Training of enumerators in Surveybe.** Once enumerators were familiar with the paper questionnaire and knew how to conduct the survey in Q'eqchi', they were trained in the use of the Surveybe questionnaire over the course of 1 week. A variety of activities were used in the Surveybe training, including lectures, individual and group computer exercises, and answering each question in the Surveybe questionnaire. Enumerators were also trained to understand how to troubleshoot problems with the computer (e.g., frozen screen) and what safety practices to use in the field (e.g., always use a surge protector when charging the computer's battery).
- **Training and standardization in anthropometry.** The team of fieldworkers was carefully trained in conducting the anthropometric measurements for 1 week. Their training included lectures and equipment demonstrations and was followed by practical exercises in the measurement of height and weight of infants, children, and women. The fieldworkers were then standardized (Cogill 2003) in the measurement of height and weight. First, the height and weight of five children 0–24 months of age and their mothers were measured by all fieldworkers and the trainer; each fieldworker measured each individual twice. A spreadsheet was created to compute the precision and accuracy of all trainees. A second round of standardization was organized for those needing more practice. Based on the results of the standardization, a final selection of anthropometrists was made.
- **Pilot test and feedback.** After completing the training, each enumerator conducted three pilot interviews. Each completed electronic questionnaire was reviewed by the IFPRI coordinator, the Vox Latina field manager, and a randomly selected enumerator pair. Observations, comments, and problems were discussed among the entire group for 2 days.

Identifying and enrolling pregnant women. The cohort was enrolled between August 2011 and December 2012. To identify and enroll pregnant women in a timely fashion, a surveillance system was set up. This system is described below.

- **Master list of pregnant women and control sheets.** At the beginning of the enrollment process (and every month thereafter), a list of eligible pregnant women (women who were between 3 and 7 months pregnant) was compiled by IFPRI using information obtained from the PSS that manage the CCs' health services and from a list of newly enrolled beneficiaries in PROCOMIDA (see Figure 2.1, Steps 1 and 2). Every month, newly identified pregnant women were added to the list, thus generating an updated master list of eligible pregnant women each month (see Figure 2.1, Step 3a). For each woman, a control sheet was generated that included basic information on the woman and the last date the interview could be conducted, based on her expected due date (see example in Appendix A, Table A.4, and Figure 2.1, Step 3b). The control sheets were used to track enrollment progress in the field, ensure that women were enrolled in a timely manner, and cross-check the number of electronic questionnaires received by Vox Latina.

- **Enrolling women in the study.** The control sheets for each eligible woman were given to the supervisors of each field team (see Figure 2.1, Step 3b), and they were instructed to first interview women who were further along in their pregnancy (see Figure 2.2, Step 1). After conducting the enrollment interview, the enumerators recorded the interview date, the Surveybe enrollment questionnaire identification number, and any pertinent information about the interview on the control sheet (see Figure 2.2, Steps 2 and 3).
- **Identifying newly pregnant women in the field.** Field teams met with community health volunteers to identify women eligible for enrollment who were not included in the master list. If a pregnant woman was detected in the field, the field team was instructed to fill out a control sheet for the newly identified woman and to conduct the enrollment interview, if possible (see Figure 2.2, Steps 2 and 3).
- **Enrollment monitoring.** At the end of each week, the field team turned in the control sheets of enrollment interviews conducted and newly identified pregnant women to IFPRI staff (see Figure 2.2, Step 4). The IFPRI-Cobán office then entered the information into an Access database to track enrollment progress by CC and study arm and to monitor reasons for not conducting the interview (e.g., not eligible for enrollment, could not be located, or did not accept interview). Each week, the master list was updated and a report sent to Vox Latina that detailed the remaining number of identified eligible pregnant women (see Figure 2.2, Step 5).

Figure 2.1. Monthly Update of Master List of Pregnant Women

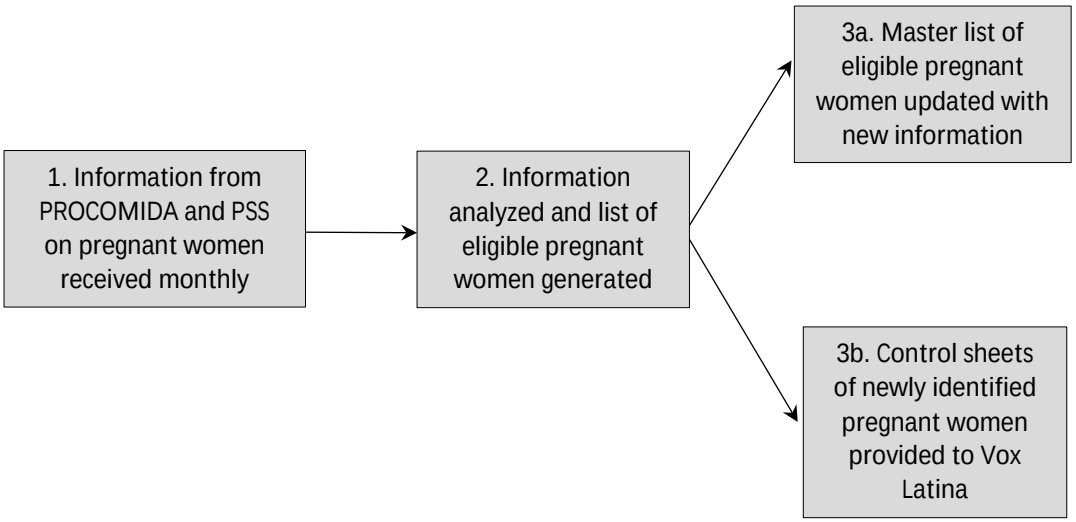
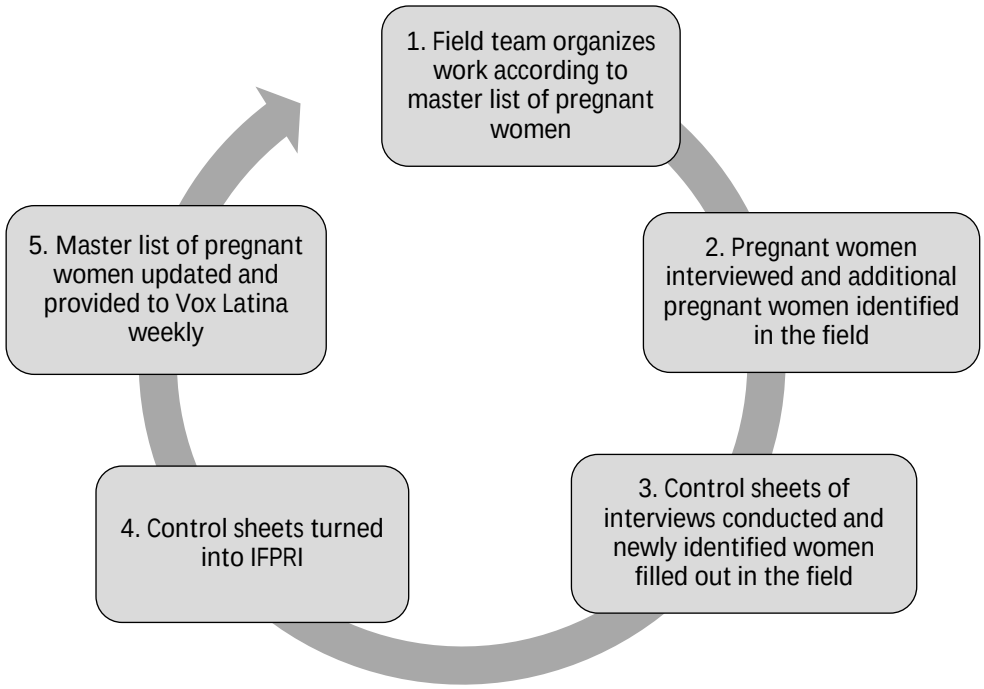


Figure 2.2. Weekly Update of Master List of Pregnant Women

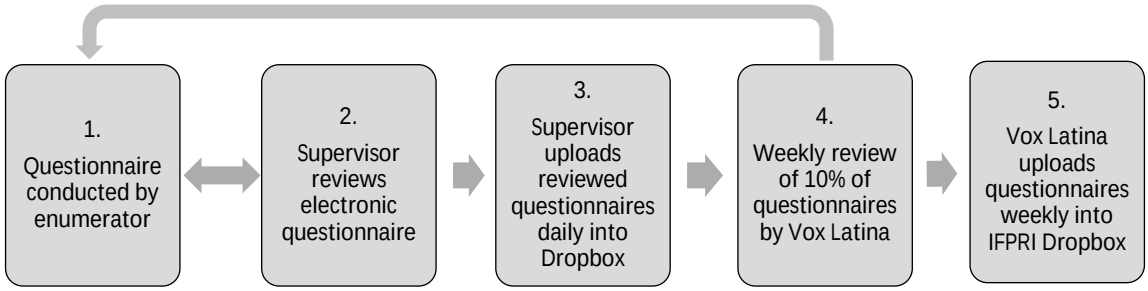


Field operations.

- **Information sessions.** Information sessions were organized at each CC before fieldwork was started to inform the community about the purpose of the survey and to request their cooperation. Additional information sessions were held when community leaders changed or when questions arose.
- **Field teams.** Six teams (composed of 1 supervisor and 4–6 enumerators) administered the enrollment questionnaire. The enumerators worked in pairs and both conducted the enrollment questionnaire and collected and recorded the anthropometric data. Field teams were assigned to specific CCs and were monitored closely and continuously by the survey firm and IFPRI staff. Continuous monitoring ensured that a high level of data quality was maintained and that challenges encountered during fieldwork were addressed in an efficient and timely manner.
- **Administration of the enrollment and anthropometry questionnaires.** Enumerators were instructed to briefly explain the use of the computer to the interviewees before conducting the interview. Enumerators always carried an extra-charged computer battery and hard copies of the questionnaires to be used in case the computer was lost or broken. Before leaving a HH where a questionnaire had been administered, enumerators reviewed each electronic questionnaire to make sure that no answers were overlooked (see Figure 2.3, Step 1).
- **Reviewing the questionnaire in the field.** The supervisor for each team was responsible for daily quality checks of the completed questionnaires. This included reviewing the responses to difficult questions and checking for internal consistency (see Figure 2.3, Step 2). If problems were encountered, enumerators returned to the HH and corrected the mistakes. Each night, the supervisor uploaded the reviewed questionnaires to his or her Dropbox folder (accessible to Vox Latina) and then archived the questionnaires on his or her own and the enumerator's computer (see Figure 2.3, Step 3).

- **Review of the questionnaire in Cobán.** Each week, the field coordinator randomly selected 10 percent of the questionnaires for quality control (see Figure 2.3, Step 4). Quality control checks included reviewing responses to difficult questions and checking for internal consistency. If problems were encountered, the field coordinator communicated with the supervisor and, if necessary, the enumerators returned to the HH and corrected the mistakes. Once the batch of electronic questionnaires collected that week passed the quality test, the field coordinator uploaded the questionnaires into the Dropbox folder shared between Vox Latina and IFPRI (see Figure 2.3, Step 5).

Figure 2.3. Process to Review and Upload Electronic Questionnaires



2.3.6 Enrollment Survey Data Management

Once the questionnaires were received by the IFPRI-Cobán office, they were exported to Stata (StataCorp) and four data management tasks were conducted.

- First, a unique HH ID was generated to identify the HH for follow-up interviews.
- Second, data checks were conducted by running a number of Stata do-files specifically written to identify missing information and internal consistency errors. After running these do-files, IFPRI communicated any detected problems with Vox Latina.
- Third, a cross-check was conducted between the number of questionnaires in Stata with that recorded in the Access database. If there were differences, IFPRI first tried to locate the electronic questionnaire in the Dropbox folder. If the electronic questionnaire was not found, IFPRI communicated the problem to Vox Latina, who located the file on the enumerator's or the supervisor's computer.
- Finally, a list of all pregnant women enrolled per CC was generated and provided to Vox Latina. For each enrolled woman, the list showed the number of months pregnant, the expected birth date, and the name of the pregnant woman's husband or partner. The list was used to prevent enrolling a woman twice and to avoid enrolling two pregnant women in the same HH.

2.3.6 CC and Community Survey Fieldwork

Survey Firm. Vox Latina was also contracted to complete the CC and community surveys. A specialized team not involved in the HH survey was in charge.

The use of Surveybe. Interviews were conducted with paper questionnaires; data entry was done using Surveybe.

Training.

- **Training of enumerators and supervisors.** A variety of methods were used during the 4-day training: lectures, role-play, discussions of all potential answers to a question, and discussions related to the coding of different types of responses.
- **The use of Q'eqchi'.** Interviews were conducted in both Spanish and Q'eqchi'. The majority of CC staff knew Spanish, while most of the community leaders preferred conducting the survey in Q'eqchi'. The questionnaire was kept in Spanish and enumerators translated questions into Q'eqchi', when necessary.
- **Pilot test and feedback.** After training was completed, each enumerator conducted two CC and two community interviews. Each completed questionnaire was reviewed by the IFPRI coordinator, the Vox Latina field manager, and a randomly selected enumerator pair. Observations, comments, and problems were discussed among the entire group for 1 day.

Field operations.

- **Field teams.** Two teams (composed of 1 supervisor and 4 enumerators) administered the CC and community questionnaires.
- **Administration of the CC questionnaire.** The CC questionnaire was administered to at least one health professional per CC facility.
- **Administration of the community questionnaire.** The community questionnaire was conducted using a group interview methodology for each community. The group interview was conducted by inviting community leaders, such as health and education professionals, religious leaders, and others. The questionnaire was filled out by at least two enumerators who ensured that a consensus was reached on all the issues discussed.
- **Reviewing the questionnaires in the field.** The supervisor for each team was responsible for daily quality checks of the completed questionnaires. If necessary, the enumerators returned to the community or CC and corrected the mistakes.
- **Review of the questionnaires in Cobán.** Each week, the field coordinator randomly selected 10 percent of the questionnaires for quality control. If problems were encountered, the field coordinator communicated with the supervisor and, if necessary, the enumerators returned to the community or CC and corrected the mistakes.

2.3.7 Data Cleaning and Analysis

Data Cleaning

Standard data cleaning checks were performed using Stata.

Variable Creation

From the data collected, new variables were created in order to summarize the data in a more concise manner. Many of these variables were based on norms and standards provided by international organizations and the Government of Guatemala. The variables created for this report are summarized below.

CC characteristics. We evaluated the information obtained from the CC questionnaires against the MOH norms.

- **CC *equipo básico de salud* (EBS) (basic health team).** SBS at the CCs are provided by the EBS. The EBS is made up of institutional ambulatory medical staff and community-level staff. The institutional ambulatory medical staff visits the CC once per month and consists of either a doctor

or nurse, and an institutional facilitator. The community-level staff is based in the communities served by the CC. The local staff is selected by the community and consists of a community facilitator, a CC-approved midwife, and community health workers (each serving about 20 families). CCs might also have health educators and a health commission,[6] but these are optional. The institutional EBS should visit the CC at least once a month, while community EBS members work as needed in the community.

- **Consultations and available health services.** Consultations and available health services were evaluated against the MOH norms for consultations for children and woman of reproductive age.
- **Medical and vaccination supplies.** Medical and vaccination supplies were evaluated using the approved list of medicines, vaccines, supplements, and other supplies that must be either available at the CC or brought on a monthly basis by the institutional EBS.
- **Infrastructure.** Each CC should have a waiting room, a room for consultations, a bathroom, and a room that can be used to store medical supplies or other materials.

Household characteristics. The following HH[7] variables were created.

- **Dependency ratio.** The dependency ratio is the ratio of persons who are economically dependent and those who provide for them, within the HH. Calculated by dividing the number of people in the HH aged under 15 or over 60 years of age (deemed not economically active) by the number between 15 and 60 years of age (deemed potentially economically active).
- **Cleanliness of interior and exterior of dwelling.** These variables were constructed from spot-check observations conducted at the time of the interviews. Fieldworkers[8] noted the presence of garbage, feces, dust, or dirty clothes around dwellings. The variables describe the proportion of premises scoring "clean" on all counts.[9]
- **Assets.** HH asset ownership was summarized in six different counts: the total number of HH goods; the total number of agricultural tools and equipment; the total number of small animals; the total number of medium-sized animals; the total number of large animals; and the total number of cars, motorbikes, or bikes.
- **Household Hunger Scale (HHS).** Constructed according to FANTA guidelines (Deitchler et al. 2010), with scores assigned to a set of three questions about meals and hunger (no food to eat of any kind in your HH; go to sleep at night hungry; go a whole day and night without eating), based on the frequency of occurrence ("never" = 0; "rarely" or "sometimes" = 1; "often" = 2) over the past 4 weeks. A total score of 0 to 1 was classified as "little or no hunger," 2 to 3 as "moderate hunger," and 4 to 6 as "severe hunger."

[6] Health commissions are in charge of arranging transportation to the hospital for people with medical emergencies. The health commission also works with PROCOMIDA to store the family and individual rations between the day of delivery to the CC and the day of distribution to the beneficiaries. On distribution days, health commission members help PROCOMDIA with the distribution of the rations and the collection the voluntary contribution. To receive the monthly food rations, beneficiaries must first attend a PROCOMIDA BCC session and provide a voluntary monetary contribution. The voluntary contribution amount provided by each beneficiary was determined jointly by health commission members and beneficiaries and may vary by treatment arm since each CC determined an amount that would be a fair exchange for the rations received

[7] A household was defined as all individuals who live in the same house and share meals.

[8] Fieldworkers were extensively trained on this instrument, but no formal standardization was conducted.

[9] The outside of the house was evaluated with respect to the need for cleaning, the presence of human feces and/or animal feces, and the presence of garbage. The inside of the house was evaluated with respect to need to be swept, the presence of animal feces, the water being covered, and the presence of dirty clothes. The outside of the house was classified as "clean" if the fieldworkers recorded "no" for all items. The same approach was followed for the inside of the house.

- **Household dietary diversity.** Constructed using the 12 food groups of the FANTA Household Dietary Diversity Score (HDDS)[10] (Swindale and Bilinsky 2006). Foods consumed over the past 7 days (from the HH consumption module) were classified according to the 12 predefined food groups, providing a simple score out of 12. Once dietary diversity was calculated, the types of food groups consumed were compared between HHs that consumed fewer than 10 groups (the sample median) and those who consumed 10 or more. It must be noted that the dietary diversity calculated here is not the same as the HDDS. The long reference period (7 days instead of the 24 hours for the HDDS) increases the probability of a food group having been consumed.

Characteristics of the pregnant women. The following variables were created.

- **Pregnancy trimester.** The trimester was calculated using the first day of the women's last menstrual period and defined as follows:
  - First trimester: Up to 12 weeks
  - Second Trimester From 12.1 to 28 weeks
  - Third Trimester: Over 28 weeks
- **Literacy.** Literacy was evaluated by asking pregnant women to read a sentence both in Spanish and in Q'eqchi' to assess her literacy in each language. While women may not have been educated to read Q'eqchi' they are exposed to written Q'eqchi' in their communities. In addition, many of the PROCOMIDA materials are also in Q'eqchi'. Therefore, being literate in Q'eqchi' can provide a basis to understand if they can read Q'eqchi'.
- **Nutrition and health knowledge.** Pregnant women were asked a series of questions to assess their knowledge about a wide range of nutrition- and health-related topics, such as IYCF practices, hygiene, how to care for a sick child or a child recovering from illness, and danger signs. Separate variables were created to describe the proportion of pregnant women responding correctly to each of the knowledge questions.
- **Mental health.** Mental health was assessed by use of the Self-Reporting Questionnaire (SRQ-20) (World Health Organization [WHO] 1994), a 20-item questionnaire used to detect common mental disorders in primary health care settings. Cutoff points for categorizing severe mental distress vary according to context and the underlying mental health burden. No research has been conducted to determine a Guatemala-specific cutoff, so the researchers used a cutoff of 8 of the 20 questions answered positively to identify cases of distress as suggested by a previous validation in other developing countries (Harpham et al. 2005).
- **Cleanliness.** Fieldworkers[11] noted the cleanliness of hands, face, hair, and clothes of the pregnant woman. The variable describes the proportion of pregnant women scoring "clean" on all counts.[12]

Prenatal care practices. In Guatemala, a minimum of four prenatal visits is recommended for pregnant women, during which professional medical staff should take a woman's height, weight, proteinuria, blood pressure, temperature, and pulse; provide tetanus immunization; and inform women on danger signs during pregnancy. MOH norms recommend that women take two 300 mg iron tablets and one 5 mg folic acid tablet each week, which are provided free of charge at the CC.

[10] The 12 HDDS food groups are: cereals and grains; roots and tubers; legumes, nuts, and pulses; milk and dairy products; eggs; meat and poultry; fish and seafood; fruits; vegetables; oils and fats; sugar, honey, sweets, and snacks; and miscellaneous.

[11] Fieldworkers were extensively trained on this instrument, but no formal standardization was conducted.

[12] For pregnant women, fieldworkers were asked to assess the cleanliness of hands, hair, clothes, and face. Possible answers were "clean," "dirty," and "dusty." Pregnant women were classified as "clean" if the fieldworker recorded "clean" for all items.

Anthropometric measures. The pregnant women's and children's anthropometric data were used to construct the following indicators.

- **Pregnant woman's adjusted weight.** Weight was adjusted for the weight of the women's clothes[13] by subtracting the estimated weight of the clothes from the measured body weight. The weight of the clothes was estimated by asking the women to provide the enumerator with a skirt and top comparable in weight to the one that was currently being worn. These items were then weighed and their weight recorded.
- **Child's length-for-age z-score (LAZ), weight-for-length z-score (WLZ), and weight-for-age z-score (WAZ).** LAZ, WLZ, and WAZ were calculated using the 2006 WHO growth standard (WHO 2006). Stunting was defined as LAZ < −2, wasting as WLZ < −2, and underweight as WAZ < −2.[14]

Data Analysis

In the results section (Section 3), the variables or indicators of interest are presented as percentages or means and standard deviations[15] as appropriate. In all results tables, the variables and indicators are presented for the entire sample and by study group. For child nutritional status, the results are also presented by gender and age category. The final sample size for each variable and indicator is reported in the results tables.

To determine if the study arms were comparable, we used the following linear model for continuous and dichotomous variables:

$$y_i = a_0 + b_1 S_{i1} + b_2 S_{i2} + b_3 S_{i3} + b_4 S_{i4} + b_5 S_{i5} + \varepsilon_i$$

where y_i is the variable or indicator of interest for observation *i*. We included five dummy variables ($S_{i.}$) for the study arms. The standard errors of the parameters were adjusted for the (potential) lack of independence between observations in the same CC by using a clustered sandwich estimator. A joint F-test was used to determine whether there were statistically significant differences in continuous variables between the study arms.

For categorical variables, the Pearson chi-squared statistic was adjusted for the lack of independence between clusters with the second-order correction of Rao and Scott (1984) and converted into an F statistic.

Results were considered significantly different between study groups if $p < 0.05$. Variables that have significant differences between the study arms are noted in the tables.[16] For categorical variables, the asterisk is placed in the row of the last category.

It must be noted that even in absence of true differences between study arms, it is to be expected that at $\alpha = 0.05$, 5% of the tests will result as significant; only a larger percentage of differences found would indicate that the study arms were not comparable. The statistically significant differences are discussed in Section 7.

[13] Indigenous skirts in Alta Verapaz are made of up to 11 meters of heavy cloth.

[14] Child anthropometric measures collected during the enrollment survey are used to evaluate the comparability of the study groups.

[15] Non-normally distributed variables are presented as medians.

[16] A note explaining the differences is added to the tables with at least one statistically significant difference between groups. If no differences were detected, the note is omitted.

3 Results: CC and Community Characteristics

3.1 CC Characteristics

3.1.1 Medical Equipment and CC Infrastructure

The majority of the CCs (82.5%) were housed in their own building. Even though each CC should have a functioning bathroom, only 70.0% were found to have one. About half were traditional latrines. Only around 27.0% of the centers had electricity and around 22.0% were actually connected to the electrical grid. The majority of the CCs had cement floors, brick or wooden walls, and corrugated roofing sheets. The most commonly used water source was rainwater (53.3%), followed by surface water (15.8%) and tap water (16.7%). In accordance with MOH requirements, the large majority of CCs had a waiting room and private room for consultations. Around one-fifth did not comply with the requirement to have a storage space for medicines and other supplies and, even though required, only around half had a sink.

Table 3.1. CC Infrastructure

	Full sample[a]	Study arm[a]					
		A	B	C	D	E	F
N[b]	**120**	**20**	**20**	**20**	**20**	**20**	**20**
Own building	82.5	75.0	85.0	80.0	90.0	75.0	90.0
% that have a bathroom (functioning)	70.0	80.0	55.0	70.0	75.0	90.0	50.0
Traditional latrine	52.5	58.8	53.3	29.4	40.0	73.7	56.3
Improved latrine	47.5	41.2	46.7	70.6	60.0	26.3	43.8
Electricity							
% with electricity	26.7	20.0	30.0	15.0	30.0	35.0	30.0
% connected to power grid	21.7	20.0	25.0	10.0	25.0	25.0	25.0
Cement floor	90.8[c]	80.0	85.0	90.0	100.0	100.0	90.0
Type of walls							
Brick/cement/other blocks	69.2	60.0	50.0	80.0	85.0	70.0	70.0
Wood	25.8	25.0	45.0	20.0	5.0	30.0	30.0
Other	5.0	15.0	5.0	0.0	10.0	0.0	0.0
Corrugated sheet ceiling	99.2	100.0	100.0	100.0	95.0	100.0	100.0
Water source							
Tap water	16.7	25.0	15.0	20.0	30.0	5.0	5.0
Open well	3.3	0.0	0.0	5.0	0.0	10.0	5.0
Surface water	15.8	20.0	25.0	15.0	10.0	0.0	25.0
Rainwater	53.3	55.0	50.0	50.0	45.0	70.0	50.0
Other	10.8	0.0	10.0	10.0	15.0	15.0	15.0
Waiting room (% with)	95.0	95.0	95.0	100.0	90.0	100.0	90.0
Sink	47.1	52.6	60.0	50.0	55.0	20.0	45.0
Private room for consultations (% with)	97.5	95.0	95.0	100.0	95.0	100.0	100.0
Storage for medicines and other supplies (% with)	77.3	60.0	80.0	85.0	89.5	75.0	75.0

[a] Values are %.
[b] Sample size ranged from N = 106 to 120 in the full sample; N = 16 to 20 in the A arm; N = 19 to 20 in the B arm; N = 18 to 20 in the C arm; N = 18 to 20 in the D arm; N = 19 to 20 in the E arm; and N = 16 to 20 in the F arm.
[c] Study arms differ, $p < 0.05$.

The majority of CCs had essential furniture like a hospital bed, a chair, a table, and a bench for patients. Nearly all CCs were equipped with a Salter hanging scale, an adult scale, and a length/height board for children. Only around one-third, however, had a scale for newborns, a height board for adults, or a mid-upper arm circumference (MUAC) tape.

A blood pressure monitor for adults and a stethoscope were generally available. One-fifth of the CCs did not have a thermometer and around half did not have a blood pressure monitor for children. The majority of CCs had the following essential vaccination equipment: an ice pack, vaccine carrier, syringes, and a bio-hazard box. Very few of the CCs had disposable specula or Pap smear kits (26.7% and 22.5%, respectively). Pregnancy and delivery kits were available in only 49.2% and 53.3% of CCs. The availability of other essential equipment and supplies was generally poor. Sterile gloves were available in only 14.2% of CCs, and IV equipment, necessary for the rapid treatment of dehydration shock, in only around one-third of CCs.

Table 3.2. CC Medical Equipment and Supplies

	Full sample[a]	Study arm[a]					
		A	B	C	D	E	F
N	**120**	**20**	**20**	**20**	**20**	**20**	**20**
Furniture, % of CCs with…							
Hospital bed	96.7	95.0	100.0	100.0	100.0	90.0	95.0
Chair	92.5	95.0	95.0	90.0	95.0	95.0	85.0
Table	92.5	95.0	100.0	85.0	95.0	90.0	90.0
Bench	95.8	95.0	95.0	100.0	95.0	90.0	100.0
Anthropometric equipment, % of CCs with…							
Scale for newborns	30.0	25.0	45.0	35.0	25.0	30.0	20.0
Salter hanging scale	89.2[c]	90.0	100.0	80.0	95.0	95.0	75.0
Adult scale	95.8	95.0	100.0	100.0	100.0	100.0	80.0
Height board for adults	35.0	35.0	25.0	40.0	30.0	40.0	40.0
Length/height board for children	95.8	100.0	100.0	95.0	95.0	90.0	95.0
MUAC tape	33.3	30.0	30.0	35.0	30.0	40.0	35.0
General equipment, % with…[b]							
Thermometer	79.2[c]	70.0	100.0	80.0	80.0	75.0	70.0
Blood pressure monitor (for children)	47.5	35.0	65.0	50.0	30.0	60.0	45.0
Blood pressure monitor (for adults)	97.5	100.0	95.0	95.0	100.0	95.0	100.0
Stethoscope	96.7	100.0	95.0	95.0	100.0	95.0	95.0
Laryngoscope	31.7	15.0	40.0	35.0	30.0	35.0	35.0
Vaccination equipment available, % with…[b]							
Ice pack	91.7[c]	90.0	85.0	100.0	85.0	90.0	100.0
Vaccine carrier	92.5	95.0	85.0	100.0	90.0	90.0	95.0
Syringes	92.5	90.0	90.0	95.0	95.0	85.0	100.0
Bio-hazard box	94.2	95.0	95.0	100.0	85.0	95.0	95.0

	Full sample[a]	Study arm[a]					
		A	B	C	D	E	F
Gynecological equipment, % with...[b]							
Disposable specula	26.7[c]	15.0	45.0	45.0	0.0	25.0	30.0
Pap smear test kit	22.5[c]	5.0	40.0	35.0	0.0	25.0	30.0
Pregnancy kit	49.2	40.0	65.0	50.0	35.0	45.0	60.0
Delivery kit	53.3[c]	45.0	65.0	55.0	70.0	60.0	25.0
Ayre's spatula	32.5	25.0	40.0	35.0	35.0	35.0	25.0
Other equipment and supplies, % with...[b]							
Non-sterile gloves	70.8	75.0	75.0	60.0	75.0	70.0	70.0
Sterile gloves	14.2[c]	10.0	30.0	20.0	5.0	20.0	0.0
Surgical knife	33.3	25.0	40.0	35.0	50.0	25.0	25.0
Scalpel	26.7	25.0	35.0	25.0	35.0	20.0	20.0
Cotton swabs	93.3	80.0	95.0	100.0	100.0	95.0	90.0
Gauze	69.2	65.0	70.0	70.0	70.0	70.0	70.0
Tongue depressor	86.7	85.0	75.0	95.0	85.0	95.0	85.0
Roll of gauze	31.7	20.0	30.0	50.0	25.0	35.0	30.0
Elastic roll	23.3	15.0	15.0	35.0	20.0	35.0	20.0
Medical tape	30.8	40.0	35.0	50.0	15.0	30.0	15.0
IV	34.2	35.0	30.0	35.0	25.0	35.0	45.0
Catheter for IV	31.7	30.0	25.0	30.0	25.0	35.0	45.0
Child vaccination cards	83.3	70.0	80.0	85.0	90.0	90.0	85.0

[a] Values are %.
[b] Equipment could be at the CC or brought by any member of the EBS staff during consultations.
[c] Study arms differ, $p < 0.05$.

3.1.2 Medicine and Vaccines

The availability of supplements and essential medicines that CCs are required to have in stock according to MOH norms was low. Except for acetaminophen and ORS, none of the supplements or medicines were available in more than 80% of the CCs, and some were virtually unavailable.

Table 3.3. Availability of Iron, Folic Acid, and Essential Medicines for Women and Children at CCs

	Full sample[a]	Study arm[a]					
		A	B	C	D	E	F
N	**120**	**20**	**20**	**20**	**20**	**20**	**20**
Essential medicine and micronutrient supplements for women, % of CCs with...							
Iron	70.8	80.0	45.0	80.0	75.0	80.0	65.0
Folic acid	62.5	75.0	45.0	70.0	75.0	60.0	50.0
Amoxicillin	42.5	45.0	30.0	40.0	35.0	70.0	35.0
Albumin and magnesium hydroxide	32.5	35.0	55.0	25.0	30.0	30.0	20.0
Procaine penicillin	37.5	35.0	40.0	35.0	25.0	50.0	40.0
Chloramphenicol ophthalmic	66.7	55.0	70.0	80.0	65.0	70.0	60.0

	Full sample[a]	Study arm[a]					
		A	B	C	D	E	F
Essential medicine and micronutrient supplements for children: % of CCs with…							
Iron	67.5	65.0	55.0	65.0	60.0	90.0	70.0
Folic acid	62.5	75.0	45.0	70.0	75.0	60.0	50.0
Macrovital/chispitas	30.0	30.0	30.0	20.0	35.0	45.0	20.0
Amoxicillin	59.2	50.0	65.0	50.0	55.0	70.0	65.0
Acetaminophen	84.2[b]	70.0	85.0	90.0	100.0	85.0	75.0
Erythromycin	71.7	80.0	80.0	75.0	65.0	70.0	60.0
Salbutamol	53.3	50.0	75.0	60.0	35.0	60.0	40.0
Oral rehydration salts (ORS)	80.8	75.0	90.0	85.0	80.0	90.0	65.0
Trimetoprim-Sulfametoxazole	61.7	65.0	70.0	55.0	55.0	75.0	50.0
Metronidazole	65.8[b]	75.0	80.0	55.0	60.0	85.0	40.0
Albendazole	76.7	80.0	85.0	80.0	80.0	85.0	50.0
Essential medicine and micronutrient supplements for general population: % of CCs with…							
Epinephrine	0.8	5.0	0.0	0.0	0.0	0.0	0.0
Polyvalent anti-venom	8.3	10.0	15.0	5.0	5.0	10.0	5.0
Penicillin benzatínica	43.3	50.0	50.0	30.0	35.0	45.0	50.0

[a] Values are %.
[b] Study arms differ, $p < 0.05$.

Vaccinations and vitamin A megadoses were almost never kept at the CCs, but brought to the centers by the institutional ambulatory EBS staff, per MOH norms. Shortages were common: During the 6 months preceding the survey, CCs experienced around two shortages in the last 6 months. Since vaccines and vitamin A megadoses are brought to the CCs by the institutional EBS during their monthly visits, CCs did not have access to these vaccines one-third of the time (i.e., two shortages for a total of six visits during the last 6 months). As the correct timing and spacing is important to maximize vaccines' protective effects, the interruptions in their availability at the CC have potentially large negative consequences on the health of women and children.

Table 3.4. Vaccination Availability at CCs

	Full sample[a]	Study arm[a]					
		A	B	C	D	E	F
N	**120**	**20**	**20**	**20**	**20**	**20**	**20**
Hepatitis B							
At CC	0.8	0.0	0.0	0.0	5.0	0.0	0.0
Brought by institutional EBS	53.3	45.0	50.0	55.0	50.0	65.0	55.0
Number of shortages in last 6 months	2.2 ± 1.4	2.0 ± 0.0	2.8 ± 1.3	2.0 ± 0.9	2.5 ± 2.1	2.2 ± 2.0	1.5 ± 1.0
BCG							
At CC	0.8	0.0	0.0	0.0	5.0	0.0	0.0
Brought by institutional EBS	96.7	95.0	100.0	90.0	95.0	100.0	100.0
Number of shortages in last 6 months	2.2 ± 1.1	2.2 ± 1.5	2.0 ± 0.8	1.9 ± 1.1	2.6 ± 1.0	1.8 ± 1.3	2.5 ± 1.3

	Full sample[a]	Study arm[a]					
		A	B	C	D	E	F
Polio							
At CC	0.8	0.0	0.0	0.0	5.0	0.0	0.0
Brought by institutional EBS	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Number of shortages in last 6 months	1.6 ± 0.8[c]	1.8 ± 0.9	1.7 ± 0.8	1.8 ± 0.4	1.1 ± 0.4	2.0 ± 1.4	1.3 ± 0.5
Pentavalenta							
At CC	0.8	0.0	0.0	0.0	5.0	0.0	0.0
Brought by institutional EBS	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Number of shortages in last 6 months	1.6 ± 0.8	1.7 ± 0.8	1.9 ± 1.0	2.0 ± 0.8	1.6 ± 0.9	1.3 ± 0.5	1.3 ± 0.5
Rotavirus							
At CC	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Brought by institutional EBS	93.3	85.0	90.0	95.0	90.0	100.0	100.0
Number of shortages in last 6 months	1.8 ± 0.8	1.8 ± 0.8	2.2 ± 1.2	2.3 ± 0.6	1.8 ± 1.0	1.2 ± 0.4	1.7 ± 0.6
Measles, mumps, and rubella							
At CC	0.8	0.0	0.0	0.0	5.0	0.0	0.0
Brought by institutional EBS	96.7	95.0	95.0	100.0	95.0	95.0	100.0
Number of shortages in last 6 months	1.6 ± 0.8	1.8 ± 1.1	1.8 ± 0.8	1.0 ± 0.0	1.5 ± 0.6	–[b]	1.3 ± 0.5
Polio booster							
At CC	0.8	0.0	0.0	0.0	5.0	0.0	0.0
Brought by institutional EBS	97.5	95.0	95.0	100.0	95.0	100.0	100.0
Number of shortages in last 6 months	1.6 ± 0.8[c]	1.5 ± 1.0	1.8 ± 0.8	2.0 ± 0.0	1.8 ± 1.0	1.0 ± 0.0	1.3 ± 0.5
DPT booster							
At CC	0.8	0.0	0.0	0.0	5.0	0.0	0.0
Brought by institutional EBS	99.2	95.0	100.0	100.0	100.0	100.0	100.0
Number of shortages in last 6 months	1.7 ± 0.8[c]	1.3 ± 0.6	1.9 ± 1.0	2.3 ± 0.6	1.8 ± 0.8	1.0	1.0 ± 0.0
Tetanus (for pregnant woman)							
At CC	0.8	0.0	0.0	0.0	5.0	0.0	0.0
Brought by institutional EBS	97.5	100.0	95.0	95.0	100.0	95.0	100.0
Number of shortages in last 6 months	1.9 ± 0.8	2.0	2.3 ± 1.0	1.8 ± 1.0	1.8 ± 0.4	1.4 ± 0.9	2.3 ± 1.0
Vitamin A (100,000 units)							
At CC	1.7	0.0	5.0	0.0	5.0	0.0	0.0
Brought by institutional EBS	96.7	95.0	90.0	100.0	100.0	100.0	95.0
Number of shortages in last 6 months	2.3 ± 1.4	2.4 ± 2.0	2.4 ± 1.4	1.8 ± 0.8	2.5 ± 0.7	2.5 ± 0.7	2.3 ± 1.9
Vitamin A (200,000 units)							
At CC	1.7	0.0	5.0	0.0	0.0	0.0	5.0
Brought by institutional EBS	95.0	95.0	90.0	95.0	95.0	95.0	100.0
Number of shortages in last 6 months	2.4 ± 1.2	2.0 ± 0.0	2.7 ± 1.5	1.5 ± 0.7	2.0 ± 1.0	2.5 ± 1.0	3.0 ± 2.8

[a] Values are mean ± SD or %.
[b] In the 19 CCs that did receive the MMR vaccination, no shortages were reported.
[c] Study arms differ, $p < 0.05$.

3.1.3 CC Personnel

CCs served on average 1,144 people (living in 2–3 communities), of which an estimated 167 (15%) were children under the age of 5 and 355 (31%) were women of reproductive age.

Following MOH norms, the institutional staff at nearly all surveyed CCs was composed of a nurse and an institutional facilitator. The community CC staff almost always consisted of a midwife and a community facilitator. About one-fourth of the CCs did not have community health workers. When considering both the institutional and community-level staff, we found that around 75% of the CCs had the required staff to make up a complete EBS. Only one-fourth of the CCs had their own health educators. PROCOMIDA health educators were present in a large majority of CCs (88.0%) in study arms A through E,[17] whereas those in control communities (arm F) did not have any by design.

Table 3.5. CC Population Served and Personnel

	Full sample[a]	Study arm[a]					
		A	B	C	D	E	F
N	**120**	**20**	**20**	**20**	**20**	**20**	**20**
Communities served	2.3 ± 1.4	2.2 ± 1.3	2.4 ± 1.3	2.3 ± 1.5	2.3 ± 1.3	2.3 ± 1.6	2.2 ± 1.3
Population size served	1144 ± 600	1256 ± 539	1050 ± 484	1260 ± 900	1251 ± 587	1035 ± 496	1021 ± 500
Children between 0–5 years of age	167 ± 104	173 ± 77	200 ± 116	134 ± 72	188 ± 163	141 ± 76	164 ± 84
Women of reproductive age	355 ± 290	395 ± 242	313 ± 202	433 ± 508	332 ± 206	309 ± 201	347 ± 277
Institutional ambulatory EBS personnel, % with at least one…							
Doctor	2.5	5.0	0.0	0.0	10.0	0.0	0.0
Nurse	99.2	100.0	100.0	100.0	95.0	100.0	100.0
Institutional facilitator	99.2	100.0	95.0	100.0	100.0	100.0	100.0
Community EBS personnel, % with at least one…							
CC approved midwife	99.2	100.0	95.0	100.0	100.0	100.0	100.0
Community facilitator	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Community health worker	77.5	75.0	70.0	75.0	80.0	85.0	80.0
CCs with a complete EBS, %	75.8	75.0	60.0	75.0	80.0	85.0	80.0
CC with complete EBS (no health worker)[b]	98.33	100.0	90.0	100.0	100.0	100.0	100.0
Optional staff, % with at least one…							
Health educator	25.0	20.0	20.0	40.0	15.0	30.0	25.0
Health educator (PROCOMIDA)	73.3[c]	85.0	90.0	95.0	85.0	85.0	0.0

[a] Values are mean ± SD or %.
[b] A number of NGOs providing health services at the CCs reportedly decided that they do not need to have a health worker. When not taking into account the health worker requirement, the proportion of CCs with a complete EBS is 98.3%.
[c] Study arms differ, $p < 0.05$.

[17] 17 CCs in the PROCOMIDA arms had two health educators: one CC health educator and one PROCOMIDA health educator.

3.1.4 Consultations and Health Services Provided by the Institutional and Community EBS Staff

The institutional EBS staff appeared to comply with the norm of being present at the CC 1 day per month. On that day, they provided prenatal checkups and consultations for children under 5 years and conducted home visits to pregnant women, women who have just given birth, and children under 5.

The results suggest a clear division of labor between the institutional and the community EBS staff. Most of the institutional EBS consultations were for sick children and pregnant women (26 and 16 during the last 3 months, respectively). Postnatal checkups and monitoring of child weight and height by the institutional EBS staff were considerably less common (fewer than 10 in the last 3 months). The opposite pattern was found for the community EBS staff.

Table 3.6. Institutional EBS Health Consultations and Home Visits

	Full sample[a]	Study arm[a]					
		A	B	C	D	E	F
N[b]	**120**	**20**	**20**	**20**	**20**	**20**	**20**
Days per month CC is attended by institutional EBS	1.2 ± 0.4	1.1 ± 0.3	1.1 ± 0.4	1.3 ± 0.4	1.3 ± 0.6	1.3 ± 0.4	1.1 ± 0.3
Days per month of…							
Prenatal consultations	1.1 ± 0.3	1.1 ± 0.2	1.0 ± 0.0	1.1 ± 0.4	1.1 ± 0.5	1.1 ± 0.4	1.1 ± 0.2
Consultations for children under 5 years	1.1 ± 0.3[c]	1.1 ± 0.3	1.0 ± 0.0	1.2 ± 0.4	1.2 ± 0.4	1.1 ± 0.4	1.1 ± 0.3
Home visits to pregnant women, women postpartum, or children under 5 years	1.3 ± 1.4	1.6 ± 2.4	1.0 ± 0.7	1.4 ± 1.1	1.5 ± 1.6	1.1 ± 0.8	1.1 ± 1.3
Consultations[d] in the past 3 months for….							
Monitoring of child weight	2.0 ± 9.8	0.0 ± 0.0	3.8 ± 16.8	3.4 ± 11.2	2.5 ± 10.1	0.2 ± 0.9	2.3 ± 9.2
Monitoring of child height	3.4 ± 13.4	0.0 ± 0.0	1.6 ± 6.9	2.6 ± 8.2	9.8 ± 24.9	3.5 ± 14.5	2.6 ± 10.3
Sick children	26.3 ± 33.7	24.6 ± 19.7	35.2 ± 31.7	24.3 ± 28.2	34.5 ± 64.0	16.8 ± 12.3	21.4 ± 13.7
Pregnant women	15.6 ± 11.6	16.7 ± 9.1	18.4 ± 21.0	13.1 ± 6.2	16.5 ± 11.7	13.4 ± 7.1	15.5 ± 8.4
Women postpartum	5.0 ± 5.5	4.9 ± 4.8	8.6 ± 9.8	3.0 ± 2.4	4.3 ± 3.0	4.8 ± 4.5	4.3 ± 4.1

[a] Values are mean ± SD.
[b] Sample size ranged from N = 115 to 120 in the full sample; N = 17 to 20 in the A arm; N = 19 to 20 in the B arm; N = 19 to 20 in the D arm; and N = 18 to 20 in the F arm.
[c] Study arms differ, $p < 0.05$.
[d] Numbers were obtained from CC records; if these weren't available, the interviewed staff member was asked to provide an estimate.

The community EBS staff conducted home visits to pregnant women, women postpartum, or children under the age of 5 years around 4 days per month. Prenatal consultations and consultations for children under 5 years were available less than 1 day per month. The consultations provided by the community EBS appear to complement the consultations provided by the institutional EBS: consultations for growth monitoring (particularly weight) were very common, whereas consultations for pregnant women, postpartum women, and sick children were rather uncommon.

Table 3.7. Community EBS Health Consultations and Home Visits

	Full sample[a]	Study arm[a]					
		A	B	C	D	E	F
N	**120**	**20**	**20**	**20**	**20**	**20**	**20**
Days per month of…							
Prenatal consultations	0.4 ± 0.8	0.3 ± 0.7	0.4 ± 0.9	0.6 ± 1.0	0.6 ± 1.1	0.3 ± 0.4	0.3 ± 0.7
Consultations for children under 5 years	0.9 ± 1.9	0.6 ± 1.0	1.1 ± 2.7	0.9 ± 1.3	0.7 ± 1.0	0.9 ± 2.2	1.6 ± 2.5
Home visits to pregnant women, women postpartum, or children under 5 years	4.1 ± 3.8	4.3 ± 3.6	4.3 ± 4.1	4.5 ± 3.7	3.3 ± 3.2	5.3 ± 5.6	2.8 ± 1.3
Consultations[c] in the past 3 months for….							
Monitoring of child weight	95.8 ± 72.9	90.3 ± 56.6	103.0 ± 76.8	91.8 ± 77.0	108.5 ± 106.6	84.3 ± 47.7	96.7 ± 65.0
Monitoring of child height[b]	33.0 ± 49.5	42.4 ± 53.5	27.4 ± 40.0	41.0 ± 68.2	15.6 ± 30.5	38.6 ± 47.0	33.4 ± 50.2
Sick children	9.9 ± 18.3	11.8 ± 34.5	8.5 ± 7.0	14.1 ± 21.4	8.4 ± 10.4	7.5 ± 10.7	9.3 ± 11.5
Pregnant women	2.0 ± 5.1	3.1 ± 7.8	2.6 ± 5.3	2.1 ± 4.9	2.0 ± 5.9	1.4 ± 3.4	0.9 ± 1.7
Women postpartum	1.1 ± 3.3	1.1 ± 2.9	2.0 ± 4.1	1.9 ± 5.5	0.7 ± 2.9	0.5 ± 1.0	0.7 ± 1.5

[a] Values are mean ± SD.
[b] Child height might have been measured at the same time as child weight, so the height and weight consultations should not be summed to get the total number of consultations.
[c] Numbers were obtained from CC records; if these weren't available, the interviewed staff member was asked to provide an estimate.

When asked about each of the MOH required actions during consultations for sick children,[18] nearly all CCs reported reviewing the child's vaccination schedule and whether the child had received micronutrient supplementation as per MOH norms. Surprisingly, taking the sick child's temperature was not mentioned at one-fifth of the CCs. The sick child's weight and height were taken at around 77% and 61% of the CCs, respectively, even though it is a MOH requirement. Oral rehydration salts (ORS) were universally provided to children with diarrhea; zinc was available at only around 70% of the centers, even though it is part of the MOH standard for treatment of diarrhea in infants and children. Between 80% and 90% of the CCs said that they could refer sick children to either a health center or a hospital.

According to the MOH, severely malnourished children should be stabilized and referred to a hospital immediately. However, only 60% of the CCs referred severely malnourished children to a hospital. Other centers mentioned referrals to a health center (44%) or a specialized center (15%). As would be expected based on the MOH norm to refer severely malnourished children elsewhere, specially formulated foods such as Plumpy'nut®, other fortified foods, or supplements were available in fewer than 10% of the surveyed centers.

[18] For each required action (taking the child's temperature, weight, height, immunization status, etc.), we asked whether it was part of the prenatal consultation at the CC.

Table 3.8. Available Health Services Provided to Children under 5 Years of Age

	Full sample[a]	Study arm[a]					
		A	B	C	D	E	F
N	**120**	**20**	**20**	**20**	**20**	**20**	**20**
Services provided to sick children, %							
Temperature taken	82.5	85.0	90.0	80.0	85.0	75.0	80.0
Weight taken	76.7	80.0	80.0	75.0	75.0	90.0	60.0
Height taken	60.8	60.0	60.0	60.0	70.0	70.0	45.0
Evaluation of vaccination schedule	98.3	100.0	95.0	100.0	95.0	100.0	100.0
Evaluation of micronutrient supplementation	99.2	100.0	95.0	100.0	100.0	100.0	100.0
Services provided to children with diarrhea, %							
ORS	96.7	100.0	95.0	100.0	90.0	100.0	95.0
Zinc packets	69.2	60.0	65.0	65.0	75.0	65.0	85.0
Can sick children be referred to…, %							
Health center	87.5	95.0	85.0	90.0	80.0	85.0	90.0
Hospital	83.3	70.0	85.0	90.0	75.0	90.0	90.0
Services provided to severely malnourished children, %							
Given fortified foods	6.7	0.0	5.0	5.0	25.0	0.0	5.0
Given Plumpy'nut®	6.7	10.0	5.0	0.0	15.0	5.0	5.0
Given micronutrients	8.3	5.0	15.0	10.0	10.0	5.0	5.0
Referred to specialized center	15.0	15.0	5.0	25.0	20.0	10.0	15.0
Referred to hospital	60.0	40.0	70.0	70.0	45.0	65.0	70.0
Referred to *centro de salud* (health center)	44.2[b]	45.0	60.0	20.0	35.0	60.0	45.0

[a] Values are %.
[b] Study arms differ, $p < 0.05$.

When asked about each of the MOH required actions during prenatal consultations,[19] all or nearly all CCs reported taking the women's weight, fundal height, and pulse, and checking the fetal heartbeat and movement. Three-quarters of CCs mentioned taking the women's temperature and only one out of four took the woman's height, even though calculating the women's body mass index (BMI) (which requires women's weight and height) is part of the MOH norms.

According to the MOH norms, pregnant women should receive an anemia test at the first prenatal visit and urine and blood glucose tests at each of the four prenatal visits. When asked about the availability of

[19] For each required action (taking the pregnant woman's weight, height, fundal height, etc.), we asked whether it was part of the prenatal consultation at the CC.

each of these tests,[20] pregnancy urine tests were found to be available in only 40.8% of CCs; testing for anemia or blood glucose levels was possible in only 2 of the 120 surveyed CCs. Following MOH norms, CCs reported providing tetanus immunization and iron and folic acid supplements to pregnant women. Prenatal multi-vitamin supplements (not a MOH requirement) were provided in only one-fourth of the CCs.

Table 3.9. Services Provided to Pregnant Women

	Full sample[a]	Study arm[a]					
		A	B	C	D	E	F
N	**120**	**20**	**20**	**20**	**20**	**20**	**20**
Prenatal services offered:							
Weight taken	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Height taken	25.8	35.0	35.0	20.0	20.0	10.0	35.0
Fundal height taken	96.7	100.0	95.0	100.0	95.0	95.0	95.0
Pulse taken	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Blood pressure taken	98.3	100.0	95.0	100.0	100.0	95.0	100.0
Temperature taken	74.2	85.0	75.0	80.0	85.0	55.0	65.0
Fetal heartbeat checked	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Fetal movement checked	99.2	100.0	100.0	100.0	100.0	100.0	95.0
Anemia test	1.7	0.0	5.0	5.0	0.0	0.0	0.0
Blood glucose test	1.7	0.0	5.0	0.0	0.0	0.0	5.0
Urine tests	40.8[b]	65.0	45.0	25.0	20.0	55.0	35.0
Tetanus vaccination administered to pregnant women	94.2	95.0	100.0	95.0	90.0	90.0	95.0
Supplements provided to pregnant women:							
Iron	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Folic acid	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Prenatal multi-vitamin supplement	25.0	20.0	25.0	30.0	20.0	25.0	30.0

[a] Values are %.
[b] Study arms differ, $p < 0.05$.

In total, CC staff assisted with on average five home births in the 3 months preceding the survey and between three and four pregnant women in labor were referred to another health facility during the same time period.[21] The large majority of CCs (95.0%) reported conducting home visits to women within 2 weeks of birth as per MOH norms. A somewhat lower percentage (86.7%) complied with the norm to have the institutional EBS staff visit the women within 40 days of birth. Even though it is not part of the MOH recommendations, half of the CCs provided vitamin A to women postpartum. Most of the CCs

[20] A separate yes-no question was used for each test.

[21] Unfortunately, we do not have information on the total number of births.

reportedly complied with the requirement to provide women with iron (90.8%) and folic acid (91.7%) supplements in the 6 months after having given birth.

Table 3.10. Services Provided to Women Giving Birth and Women Postpartum

	Full sample[a]	Study arm[a]					
		A	B	C	D	E	F
N[b]	**120**	**20**	**20**	**20**	**20**	**20**	**20**
Number of births in the last 3 months:							
Number referred to health facility	3.4 ± 2.6	3.5 ± 3.2	3.9 ± 3.0	3.4 ± 2.4	3.5 ± 2.4	2.9 ± 2.2	3.4 ± 2.3
Number of assisted home births	4.6 ± 4.1	4.6 ± 4.6	4.8 ± 4.6	4.5 ± 4.2	3.9 ± 3.0	4.7 ± 3.4	5.3 ± 4.8
Services offered to women postpartum:							
Home visits by community EBS within 15 days of birth	95.0	95.0	95.0	100.0	95.0	100.0	85.0
Home visits by institutional EBS within 40 days of birth	86.7	80.0	95.0	85.0	95.0	90.0	75.0
Supplements provided to women postpartum:							
Vitamin A	48.3	40.0	45.0	65.0	35.0	55.0	50.0
Iron	90.8[c]	90.0	100.0	85.0	95.0	85.0	90.0
Folic acid	91.7[c]	90.0	100.0	85.0	100.0	85.0	90.0
Multivitamins	12.5	5.0	10.0	25.0	10.0	10.0	15.0

[a] Values are mean ± SD or %.
[b] Sample size ranged from N = 119 to 120 in the full sample; and N = 19 to 20 in the B arm.
[c] Study arms differ, $p < 0.05$.

3.1.5 CC Health Commission Activities

Almost all CCs had a health commission, consisting of around six members who worked an average of 22 hours per month. The most common activity of the commission was transporting sick children and pregnant women to the health center or hospital (77.5%). Approximately half of the health commissions reportedly helped women prepare for their delivery. This typically includes helping plan for transportation to health facilities, child care for younger children, and saving for the newborn. A high proportion of CCs (86.7%) had a local fund (either with the CC or the health commission) to help with health emergencies. The majority of CCs had transportation available to take people with a health emergency to another health facility (88.3%).

Table 3.11. Health Commission Characteristics and Activities and Availability of Transportation at the CC

	Full sample[a]	Study arm[a]					
		A	B	C	D	E	F
N[b]	**120**	**20**	**20**	**20**	**20**	**20**	**20**
Health commission	99.2	100.0	100.0	95.0	100.0	100.0	100.0
Number of members	6.1 ± 2.0	5.8 ± 0.9	6.7 ± 2.2	5.8 ± 2.3	6.1 ± 1.0	6.6 ± 3.5	5.6 ± 0.9
Number of hours worked per month per member	21.7 ± 17.9	23.5 ± 19.1	20.5 ± 18.8	22.4 ± 17.8	23.1 ± 14.7	26.8 ± 22.8	13.7 ± 11.3
Main functions of health commission							
Transport sick children and pregnant women	77.5	85.0	75.0	70.0	80.0	85.0	70.0
Monetary help for CC	44.2[c]	30.0	45.0	45.0	70.0	55.0	20.0
Help women prepare for child birth	51.7	60.0	55.0	40.0	40.0	60.0	55.0
CC or health commission has local fund for health emergencies	86.7[c]	95.0	80.0	80.0	100.0	85.0	80.0
Transportation available for a health emergency at CC	88.3	80.0	95.0	90.0	90.0	95.0	80.0

[a] Values are mean ± SD or %.
[b] Sample size ranged from N = 106 to 120 in the full sample; N = 16 to 20 in the A arm; N = 19 to 20 in the B arm; N = 18 to 20 in the C arm; N = 18 to 20 in the D arm; N = 19 to 20 in the E arm; and N = 16 to 20 in the F arm.
[c] Study arms differ, $p < 0.05$.

3.2 Community Characteristics

3.2.1 Utilities, Infrastructure, and Access to Services

Average community population size was around 600 people. Only half of the communities had access to electricity and fewer than 3% of communities had a telephone landline. The majority of the communities (85%) had mobile network coverage, though only around 60% could charge their mobile phones in the community. The primary source of drinking water varied depended on the season: Most of the communities relied on unimproved sources such as rivers or lakes during the dry season; the most common source during the rainy season was rainwater.

Table 3.12. Utilities and Infrastructure within Communities

	Full sample[a]	Study arm[a]					
		A	B	C	D	E	F
N	**274**	**45**	**46**	**47**	**46**	**46**	**44**
Population	595 ± 611	613 ± 580	578 ± 491	635 ± 742	636 ± 640	520 ± 488	588 ± 703
Electricity	50.4	48.9	47.8	51.1	54.3	58.7	40.9
Distance to nearest landline telephone:							
0 km (available in community)	2.6	0.0	4.3	0.0	4.3	2.2	4.5
1–5 km	6.2	6.7	6.5	0.0	10.9	6.5	6.8
6–10 km	13.9	11.1	10.9	25.5	13.0	6.5	15.9
11–30 km	38.0	46.7	52.2	34.0	26.1	32.6	36.4
31–50 km	18.2	8.9	17.4	21.3	17.4	21.7	22.7
> 50 km	21.2	26.7	8.7	19.1	28.3	30.4	13.6
Distance to nearest mobile network:							
0 km (available in community)	85.0	88.9	93.5	85.1	76.1	76.1	90.9
1–5 km	8.4	8.9	6.5	10.6	8.7	8.7	6.8
6–10 km	4.4	2.2	0.0	4.3	13.0	4.3	2.3
11–30 km	2.2	0.0	0.0	0.0	2.2	10.9	0.0
31–50 km	0.0	0.0	0.0	0.0	0.0	0.0	0.0
> 50 km	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Possible to charge mobile phone in community, % yes	57.7	48.9	54.3	57.4	58.7	73.9	52.3
Primary source of drinking water during dry season:							
Tap water	8.4	11.1	10.9	8.5	15.2	2.2	2.3
Uncovered well water	0.7	0.0	0.0	2.1	0.0	0.0	2.3
Covered well water	1.5	0.0	2.2	0.0	2.2	4.3	0.0
Unimproved source/river/ lake	77.7	77.8	76.1	76.6	73.9	80.4	81.8
Rainwater	7.3	4.4	6.5	8.5	4.3	8.7	11.4
Other	4.4	6.7	4.3	4.3	4.3	4.3	2.3
Primary source of drinking water during rainy season:							
Tap water	9.9	15.6	10.9	12.8	15.2	2.2	2.3
Uncovered well water	0.7	0.0	0.0	0.0	2.2	0.0	2.3
Covered well water	0.7	0.0	0.0	0.0	2.2	2.2	0.0
Unimproved source/river/ lake	25.5	33.3	30.4	23.4	21.7	23.9	20.5
Rainwater	62.4	48.9	56.5	63.8	58.7	71.7	75.0
Other	0.7	2.2	2.2	0.0	0.0	0.0	0.0

[a] Values are mean ± SD or %.

Very few of the communities had access to a daily or weekly market in their community (2.2% and 5.1%, respectively). Around half of the communities had to travel more than 10 km to the nearest daily or weekly market. Almost all communities had a church. A bus stop was available in 70% of the communities. Nearly 80% of the communities had to travel more than 10 km to the closest administrative center.

Table 3.13. Access to Closest Market, Church, Bus Stop, and Administrative Center

	Full sample[a]	Study arm[a]					
		A	B	C	D	E	F
N[b]	**274**	**45**	**46**	**47**	**46**	**46**	**44**
Distance to closest…							
Daily market:							
0 km (available in community)	2.2	4.4	2.2	0.0	4.3	2.2	0.0
1–5 km	17.2	8.9	19.6	13.0	17.4	15.2	29.5
6–10 km	18.7	15.6	17.4	23.9	23.9	13.0	18.2
11–30 km	35.9	42.2	47.8	30.4	28.3	37.0	29.5
> 30 km	26.0	28.9	13.0	32.6	26.1	32.6	22.7
Weekly market:							
0 km (available in community)	5.1	2.2	4.3	6.4	4.3	4.3	9.1
1–5 km	24.5	13.3	13.0	29.8	34.8	30.4	25.0
6–10 km	22.6	20.0	26.1	19.1	28.3	23.9	18.2
11–30 km	37.2	51.1	41.3	40.4	26.1	28.3	36.4
> 30 km	10.6	13.3	15.2	4.3	6.5	13.0	11.4
Church:							
0 km (available in community)	95.3	95.6	100.0	89.4	91.3	95.7	100.0
1–5 km	4.4	4.4	0.0	8.5	8.7	4.3	0.0
6–10 km	0.4	0.0	0.0	2.1	0.0	0.0	0.0
11–30 km	0.0	0.0	0.0	0.0	0.0	0.0	0.0
> 30 km	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Bus stop:							
0 km (available in community)	70.1	68.9	76.1	76.6	67.4	63.0	68.2
1–5 km	25.5	26.7	21.7	14.9	26.1	32.6	31.8
6–10 km	3.6	4.4	0.0	8.5	4.3	4.3	0.0
11–30 km	0.7	0.0	2.2	0.0	2.2	0.0	0.0
> 30 km	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Administrative center:							
0 km (available in community)	0.7	0.0	2.2	2.2	0.0	0.0	0.0
1–5 km	7.3	4.4	4.3	2.2	10.9	13.0	9.1
6–10 km	13.9	13.3	15.2	17.4	17.4	4.3	15.9
11–30 km	44.3	48.9	56.5	43.5	30.4	41.3	45.5
> 30 km	33.7	33.3	21.7	34.8	41.3	41.3	29.5

[a] Values are %.
[b] Sample size ranged from N = 273 to 274 in the full sample and N = 46 to 47 in the C arm.

People travelled to nearby communities mostly by foot (92.3%), transport truck (46.0%), or bus (35.4%). To travel to nearby cities, transport trucks (81.8%), buses (74.1%), and motorcycles (39.8%) were the most commonly used modes of transportation. Most communities (79.6%) had a road leading to, or within 1 km of, the center of the community, but the large majority (93.8%) of them were not paved. The poor condition of the roads is reflected in the limited number of months that they could be used: Four-wheel drive vehicles were reported to have year-round access, but regular cars could not use the road for an average of 5 months in the 12 months preceding the survey. In around half of the communities, people had to travel more than 10 km to reach the closest asphalt road.

Table 3.14. Local Forms of Transportation

	Full sample[a]	Study arm[a]					
		A	B	C	D	E	F
N[b]	**274**	**45**	**46**	**47**	**46**	**46**	**44**
Primary form of transportation…[b]							
To nearby communities:							
Walking	92.3	91.1	93.5	97.9	82.6	95.7	93.2
Transport trucks (*venaderos)*	46.0	55.6	43.5	51.1	37.0	39.1	50.0
Bus	35.4	40.0	37.0	40.4	30.4	30.4	34.1
Motorcycle	27.7	24.4	32.6	21.3	21.7	23.9	43.2
Bicycle	25.2	31.1	21.7	19.1	21.7	28.3	29.5
Private car	15.0	15.6	15.2	10.6	10.9	15.2	22.7
Taxi	1.5	0.0	0.0	2.1	4.3	0.0	2.3
To nearest large city:							
Walking	15.7	15.6	17.4	10.6	21.7	8.7	20.5
Transport trucks (venaderos)	81.8	88.9	84.8	72.3	76.1	87.0	81.8
Bus	74.1	60.0	73.9	76.6	76.1	76.1	81.8
Motorcycle	39.8	31.1	52.2	34.0	37.0	30.4	54.5
Bicycle	10.6	11.1	15.2	10.6	8.7	6.5	11.4
Private car	21.9	20.0	23.9	19.1	21.7	17.4	29.5
Taxi	3.3	0.0	4.3	4.3	8.7	0.0	2.3
Distance from community center to closest road:							
0 km (available in community)	79.6	73.3	87.0	83.0	84.8	71.7	77.3
1–5 km	19.3	24.4	13.0	17.0	13.0	26.1	22.7
> 5 km	1.1	2.2	0.0	0.0	2.2	2.2	0.0
Construction material of closest road: dirt	93.8	95.6	93.5	95.7	89.1	97.8	90.9

	Full sample[a]	Study arm[a]					
		A	B	C	D	E	F
N[b]	**274**	**45**	**46**	**47**	**46**	**46**	**44**
During the last 12 months, number of months the road could be used by:							
Private car	7.3 ± 5.8	7.5 ± 5.9	9.2 ± 5.0	6.7 ± 5.9	6.4 ± 6.0	5.9 ± 5.8	8.2 ± 5.5
Car (4X4)	11.8 ± 1.5	11.7 ± 1.8	11.9 ± 0.4	11.5 ± 2.4	11.9 ± 0.6	11.6 ± 1.9	12.0 ± 0.0
Transport trucks (*venaderos*)	11.1 ± 3.1	11.5 ± 2.5	11.4 ± 2.4	10.9 ± 3.4	11.1 ± 3.0	10.8 ± 3.4	10.9 ± 3.5
Bus	9.0 ± 5.1	8.1 ± 5.6	10.2 ± 4.2	9.5 ± 4.8	7.9 ± 5.5	8.6 ± 5.3	9.6 ± 4.7
Heavy truck	9.6 ± 4.7	10.1 ± 4.4	9.8 ± 4.6	8.7 ± 5.4	9.6 ± 4.8	10.1 ± 4.4	9.4 ± 4.9
Distance from community center to closest asphalt road:							
0 km (available in community)	3.6	2.2	6.5	2.1	8.7	0.0	2.3
1–5 km	18.2	8.9	23.9	29.8	15.2	2.2	29.5
6–10 km	22.6	20.0	8.7	27.7	13.0	30.4	36.4
11–30 km	35.8	53.3	23.9	21.3	50.0	52.2	13.6
31–50 km	8.0	0.0	4.3	17.0	8.7	10.9	6.8
> 50 km	11.7[c]	15.6	32.6	2.1	4.3	4.3	11.4

[a] Values are mean ± SD or %.
[b] Respondents could provide more than one answer.
[c] Study arms differ, $p < 0.05$.

3.2.2 Access to Schools and Health Services

Kindergartens (defined as preschool education) were available in only around half of the communities. The average annual cost of sending a child to kindergarten was Q836 (US $105). Most communities (91.6%) had a primary school; the average annual cost of attending primary school was Q1,149 (US $144). Few communities mentioned that children attended early childhood or primary education outside of their community. Consequently, the number of observations was too small to calculate meaningful average distances to the closest school. Most communities (77.0%) did not have a *básico* school (the first 3 years of secondary education), with the nearest school an average of 14.5 km away. The average annual cost was around Q6,000 (US $600). It was rare to find *diversificado* schools (years 4–5 or 4–6 of secondary education) in the study communities. The average distance to the closest *diversificado* was about 30 km and it cost on average Q8,656 (US $1,082) to attend one.

Table 3.15. School Characteristics

	Full sample[a]	Study arm[a]					
		A	B	C	D	E	F
N[b]	**274**	**45**	**46**	**47**	**46**	**46**	**44**
Kindergarten							
Number in the community:							
0	53.6	53.3	67.4	38.3	54.3	47.8	61.4
1	43.1	46.7	26.1	55.3	43.5	50.0	36.4
> 1	3.3	0.0	6.5	6.4	2.2	2.2	2.3
Annual cost (Q)	835.7 ± 823.5	709.5 ± 472.4	918.3 ± 941.0	897.1 ± 855.7	1063.3 ± 1324.9	579.2 ± 212.6	841.2 ± 512.7
Primary schools							
Number in the community:							
0	8.4	6.7	8.7	10.6	10.9	6.5	6.8
1	89.8	91.1	91.3	87.2	84.8	93.5	90.9
> 1	1.8	2.2	0.0	2.1	4.3	0.0	2.3
Annual cost (Q)	1149.0 ± 952.3	1104.5 ± 820.7	1179.1 ± 1216.5	1239.6 ± 1223.9	1093.1 ± 812.1	968.2 ± 481.8	1319.0 ± 973.6
Básico schools							
Number in the community:							
0	77.0	80.0	84.8	72.3	76.1	76.1	72.7
1	19.0	17.8	13.0	25.5	17.4	19.6	20.5
> 1	4.0	2.2	2.2	2.1	6.5	4.3	6.8
Distance if not in community (km)	14.5 ± 30.7	7.9 ± 15.2	21.8 ± 52.8	14.6 ± 23.5	6.2 ± 10.4	15.4 ± 25.7	19.4 ± 27.4
Annual cost (Q)	5966.2 ± 32662.7	3224.3 ± 1890.5	4546.2 ± 2891.3	16534.0 ± 80783.7	3350.4 ± 2122.7	3337.2 ± 2118.7	5038.2 ± 5438.3
Diversificado[c]							
Number in the community:							
0	99.3	100.0	100.0	100.0	97.8	97.8	100.0
1	0.4	0.0	0.0	0.0	0.0	2.2	0.0
> 1	0.4	0.0	0.0	0.0	2.2	0.0	0.0
Distance if not in community (km)	30.4 ± 24.1	34.0 ± 28.6	26.4 ± 21.8	35.6 ± 25.2	25.0 ± 22.6	37.0 ± 28.9	30.5 ± 21.1
Annual cost (Q)	8656.3 ± 4154.5	7343.8 ± 2467.9	10313.5 ± 5346.9	8055.6 ± 4554.7	9766.3 ± 4164.4	7444.4 ± 3201.4	8158.7 ± 3661.8

[a] Values are mean ± SD or %.
[b] Sample size ranged from N = 107 to 274 in the full sample; N = 14 to 45 in the A arm; N = 15 to 46 in the B arm; N = 15 to 47 in the C arm; N = 23 to 46 in the D arm; N = 13 to 46 in the E arm; and N = 17 to 44 in the F arm.
[c] Secondary school is divided in two parts: 3 years of *básico* (comparable to the junior high school in the United States) and 2 or 3 years of *diversificado*.

Most communities had a CC within the community (52.7%) or located within a distance of no more than 5 km (41.6%). Health centers (the second tier in the Guatemalan public health system) were more distant, with a large majority of the communities (73.7%) having to travel more than 11 km to reach the nearest center. Residents of almost all communities (95.6%) had to travel more than 11 km to the nearest hospital.

Community residents mostly walked to the CC. Transport trucks and mini buses were the most common modes of transportation when visiting a health center or a hospital. It took residents on average just under an hour to reach the nearest CC located outside the community; travelling to the nearest health center and public hospital took an average of 1 hour and 24 minutes and just under 2 hours, respectively.

Table 3.16. Access to Health Services by the Community Residents

	Full sample[a]	Study arm[a]					
		A	B	C	D	E	F
N[2]	**274**	**44**	**46**	**47**	**46**	**46**	**44**
Distance to nearest CC:							
0 km (in the community)	52.7	51.2	53.5	60.9	48.8	47.8	53.5
1–5 km	41.6	46.3	39.5	37.0	44.2	45.7	37.2
6–10 km	4.2	2.4	4.7	0.0	4.7	6.5	7.0
11–30 km	1.1	0.0	2.3	0.0	2.3	0.0	2.3
> 30 km	0.4	0.0	0.0	2.2	0.0	0.0	0.0
Distance to nearest health center:							
0 km (in the community)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1–5 km	7.6	0.0	2.5	0.0	15.6	20.0	13.0
6–10 km	18.7	20.7	10.0	25.9	21.9	10.0	26.1
11–30 km	49.7	62.1	62.5	37.0	40.6	55.0	34.8
31–50 km	16.4	6.9	17.5	29.6	18.8	5.0	17.4
> 50 km	7.6	10.3	7.5	7.4	3.1	10.0	8.7
Distance to nearest hospital:							
0 km (in the community)	0.5	0.0	0.0	0.0	2.7	0.0	0.0
1–5 km	0.5	0.0	0.0	0.0	2.7	0.0	0.0
6–10 km	3.4	0.0	0.0	5.4	10.8	0.0	2.8
11–30 km	30.4	30.0	25.9	32.4	21.6	27.5	44.4
31–50 km	27.1	20.0	25.9	32.4	21.6	27.5	33.3
> 50 km	38.2	50.0	48.1	29.7	40.5	45.0	19.4
Main methods of transportation used to visit CC outside the community:							
Bus/minibus	2.4	4.8	4.5	5.6	0.0	0.0	0.0
Transport trucks	0.8	0.0	0.0	0.0	0.0	0.0	5.3
Taxi	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Private car	0.8	0.0	0.0	0.0	0.0	4.2	0.0
Walk	96.0	95.2	95.5	94.4	100.0	95.8	94.7

	Full sample[a]	Study arm[a]					
		A	B	C	D	E	F
N[2]	**274**	**44**	**46**	**47**	**46**	**46**	**44**
Main methods of transportation used to visit health centers outside the community:							
Bus/minibus	31.8	30.4	26.1	36.4	17.9	26.7	61.1
Transport trucks	45.7	47.8	65.2	45.5	42.9	33.3	33.3
Taxi	3.9	4.3	4.3	0.0	3.6	13.3	0.0
Private car	10.1	13.0	0.0	13.6	17.9	6.7	5.6
Walk	8.5	4.3	4.3	4.5	17.9	20.0	0.0
Main methods of transportation used to visit hospitals outside the community:							
Bus/minibus	31.4	28.6	40.0	22.6	36.7	23.5	40.6
Transport trucks	53.7	57.1	45.0	58.1	40.0	64.7	53.1
Taxi	2.9	3.6	10.0	0.0	6.7	0.0	0.0
Private car	10.9	10.7	5.0	16.1	13.3	11.8	6.3
Walk	1.1	0.0	0.0	3.2	3.3	0.0	0.0
Time to travel to the nearest … outside the community (minutes):							
CC	52.5 ± 33.4	53.1 ± 35.6	46.1 ± 24.8	54.7 ± 32.7	54.8 ± 49.3	53.3 ± 24.3	53.8 ± 31.2
Health center	83.6 ± 47.4	74.2 ± 31.5	85.5 ± 47.6	85.6 ± 50.7	87.4 ± 50.7	95.5 ± 55.9	74.4 ± 48.3
Public hospital	114.5 ± 68.9	110.1 ± 53.3	159.4 ± 112.4	107.8 ± 59.4	97.1 ± 47.3	123.7 ± 57.9	94.9 ± 54.6

[a] Values are mean ± SD or %.
[b] Sample size ranged from N = 125 to 274 in the full sample; N = 21 to 45 in the A arm; N = 20 to 46 in the B arm; N = 17 to 47 in the C arm; N = 21 to 46 in the D arm; N = 15 to 46 in the E arm; and N = 18 to 44 in the F arm.

3.2.3 Agriculture

Corn and beans were cultivated in nearly all communities. Malanga (a tuber also known as cocoyam), yucca, and chilies were cultivated in 65%–80% of the communities and sweet potatoes in a third of the communities. Ayote (a type of squash), cilantro, cabbage, and tomatoes were less common.

Table 3.17. The 10 Most Common Crops Cultivated within the Community

	Full sample[a]	Study arm[a]					
		A	B	C	D	E	F
N	**274**	**45**	**46**	**47**	**46**	**46**	**44**
% of communities growing:							
Corn	99.6	100.0	100.0	100.0	100.0	97.8	100.0
Beans	97.4	97.8	97.8	95.7	100.0	100.0	93.2
Malanga[b]	80.7	82.2	87.0	70.2	78.3	89.1	77.3
Chilies	68.6	71.1	71.7	63.8	76.1	65.2	63.6
Yucca	65.3	71.1	63.0	59.6	60.9	71.7	65.9
Sweet potato	31.8	33.3	30.4	29.8	28.3	34.8	34.1
Ayote[c]	21.5[d]	20.0	10.9	27.7	37.0	17.4	15.9
Cilantro	17.5	11.1	19.6	19.1	15.2	28.3	11.4
Tomato	14.2	13.3	13.0	17.0	13.0	15.2	13.6
Cabbage	13.5	8.9	13.0	21.3	23.9	8.7	4.5

[a] Values are %.
[b] Tuber also known as cocoyam (*Xanthosoma*).
[c] Type of squash (*Cucurbita moschata)*.
[d] Study arms differ, $p < 0.05$.

A majority of the communities (more than 75%) grew bananas, cardamom, coffee, and oranges. Mandarins and avocados were grown in 53.3% and 42.0% of the communities, respectively. Sugar cane, allspice, coyol (palm tree [*Acrocomia aculeate*] with yellowish-green fruits of which the nut-like seed is consumed), mamey sapote (tree [*Pouteria sapota*] with large edible fruits), cacao, and achiote (shrub or small tree [*Bixa orellana*] of which the fruits are used as a food colorant) were less common.

Table 3.18. The Most Common Fruit, Tree, or Permanent Crops Cultivated within the Community

	Full sample[a]	Study arm[a]					
		A	B	C	D	E	F
N	**274**	**45**	**46**	**47**	**46**	**46**	**44**
% of communities growing:							
Banana	85.4	88.9	73.9	85.1	91.3	87.0	86.4
Cardamom	81.4	84.4	87.0	80.9	69.6	84.8	81.8
Coffee	80.3	75.6	73.9	78.7	84.8	80.4	88.6
Orange	76.6	71.1	73.9	89.4	71.7	82.6	70.5
Mandarin	53.3	62.2	43.5	42.6	45.7	69.6	56.8
Avocado	42.0	33.3	39.1	55.3	45.7	39.1	38.6
Sugar cane	31.8	22.2	21.7	29.8	41.3	39.1	36.4
Coyol	27.4	17.8	23.9	38.3	23.9	26.1	34.1
Allspice	25.9	26.7	15.2	21.3	28.3	39.1	25.0
Mamey sapote	21.5	24.4	15.2	27.7	17.4	17.4	27.3
Cacao	19.0	22.2	28.3	19.1	6.5	17.4	20.5
Achiote	17.2	20.0	26.1	10.6	8.7	17.4	20.5

[a] Values are %.

3.2.4 Social Groups, Development Programs, and Recent Events

Communities had on average six associations, cooperatives, or other types of community groups. A large majority of these groups (89.8%) had women members. The groups focused on activities related to health (90.9%),[22] education (89.4%), local government (73.4%), culture (54.7%), and resolution of conflicts (46.7%); other less common activities were community security, religion, agriculture, disaster preparedness or recovery, care and maintenance of the cemetery, land measurements or allocation, water, and roads.

[22] Reported health-related activities included providing assistance to pregnant women, patients, and the EBS on the day of health consultations at the CC; maintaining and cleaning the CC; managing the health fund; transporting emergency cases to the hospital; and visiting community members at the hospital.

Table 3.19. Presence of Associations, Cooperatives, or Other Groups in the Community

	Full sample[a]	Study arm[a]					
		A	B	C	D	E	F
N	**274**	**45**	**46**	**47**	**46**	**46**	**44**
Number of groups	5.9 ± 2.2	5.4 ± 2.0	5.9 ± 2.1	6.0 ± 2.1	6.3 ± 2.6	6.2 ± 2.4	5.9 ± 2.2
% of groups with women	89.8	86.7	93.5	89.4	93.5	87.0	88.6
% of groups with activities related to:							
Health	90.9[b]	88.9	100.0	85.1	84.8	89.1	97.7
Education	89.4	91.1	91.3	87.2	84.8	89.1	93.2
Local government	73.4	60.0	78.3	76.6	76.1	76.1	72.7
Culture	54.7	46.7	56.5	55.3	56.5	56.5	56.8
Resolution of conflicts	46.7	44.4	41.3	55.3	58.7	50.0	29.5
Community security	39.1	42.2	41.3	40.4	32.6	37.0	40.9
Religion	35.4	40.0	30.4	38.3	41.3	23.9	38.6
Agriculture	27.4	22.2	32.6	25.5	21.7	37.0	25.0
Disaster preparedness or recovery	23.0	20.0	19.6	23.4	17.4	41.3	15.9
Care and maintenance of cemetery	20.8	15.6	15.2	23.4	21.7	23.9	25.0
Land measurements or allocation	19.0	11.1	26.1	17.0	15.2	23.9	20.5
Water	17.5	17.8	8.7	21.3	23.9	19.6	13.6
Roads	15.7	11.1	10.9	19.1	15.2	23.9	13.6
Other	40.5	44.4	37.0	42.6	50.0	37.0	31.8

[a] Values are mean ± SD or %.
[b] Study arms differ, $p < 0.05$.

Within the last 5 years, the communities reported having had an average of between two and three development projects. Surprisingly, PROCOMIDA was not mentioned in 16% of the communities in arms A through E. *Mi Familia Progresa*[23]was available in half of the communities. Other projects mentioned by more than 10% of the communities related to school construction and infrastructure, water infrastructure, agriculture activities and improvements in health.

The most commonly reported impacts on the community were related to improvements in health and nutrition (86.5%). Around half of the communities felt that the development projects had improved infrastructure and increased community knowledge.

[23] *Mi Familia Progresa* is a conditional cash transfer program implemented by the Guatemalan government. Payments are made to women every 3 months. The Otto Perez (president since 2012) administration changed the name of the *Mi Familia Progreso* program to *Bono Seguro*. We counted *Mi Familiar Progreso* and *Bono Seguro* as one and the same.

Table 3.20. Development Project Activities over the Past 5 Years within the Community

	Full sample[a]	Study arm[a]					
		A	B	C	D	E	F
N	**274**	**45**	**46**	**47**	**46**	**46**	**44**
Average number of projects	2.5 ± 1.3	2.6 ± 1.4	2.6 ± 1.4	2.4 ± 1.1	2.9 ± 1.4	2.7 ± 1.3	2.1 ± 1.3
% of communities with the following development projects:							
PROCOMIDA	70.8[b]	84.4	84.8	72.3	91.3	89.1	0.0
Mi Familia Progresa	48.9	44.4	47.8	48.9	54.3	41.3	56.8
School construction and infrastructure	30.7	42.2	26.1	36.2	23.9	28.3	27.3
Water infrastructure	20.8	20.0	17.4	17.0	21.7	23.9	25.0
Agriculture activities	18.6	13.3	17.4	12.8	28.3	15.2	25.0
Health improvements	12.4	11.1	8.7	12.8	17.4	15.2	9.1
Road construction and maintenance	9.1	8.9	8.7	8.5	8.7	6.5	13.6
Improvements in housing	8.0	4.4	10.9	6.4	8.7	6.5	11.4
Providing solar panels to HHs	4.7	4.4	2.2	4.3	4.3	8.7	4.5
Construction of latrines	4.4[b]	0.0	8.7	4.3	6.5	6.5	0.0
% of communities that said development project had a positive impact on:							
Income generation	24.8	37.8	28.3	17.0	23.9	19.6	22.7
Town and housing conditions (infrastructure)	48.2	46.7	41.3	51.1	43.5	50.0	56.8
Community knowledge	45.6	48.9	52.2	42.6	50.0	45.7	34.1
Improved health and nutrition	86.5[b]	88.9	91.3	85.1	97.8	95.7	59.1
Agricultural harvests	10.2	4.4	10.9	6.4	13.0	6.5	20.5
Schooling and schooling supplies	33.6	26.7	26.1	34.0	39.1	37.0	38.6

[a] Values are mean ± SD or %.
[b] Study arms differ, $p < 0.05$.

Around 43% of communities reported an increase in the number of new residents in the community in the last 5 years; a similar percentage thought that there was neither an increase nor a decrease in the arrivals and departures of residents. Almost 60% of communities perceived higher than usual rainfall and about 85% higher than normal temperatures over the past 12 months. Overall, about 60% of the communities felt that their living conditions had improved over the last 5 years; only around 6% felt that it had worsened.

Table 3.21. Recent Events in the Community

	Full sample[a]	Study arm[a]					
		A	B	C	D	E	F
N	**274**	**45**	**46**	**47**	**46**	**46**	**44**
In the last 5 years, the general movement of residents; % with…							
More arrivals	42.7	42.2	43.5	38.3	39.1	39.1	54.5
More departures	9.1	8.9	6.5	10.6	6.5	6.5	15.9
About the same for both	7.3	6.7	13.0	4.3	8.7	4.3	6.8
No arrivals, no departures	40.9	42.2	37.0	46.8	45.7	50.0	22.7
Perception of rainfall over the last 12 months; % who had…							
More rain than usual	29.6	37.8	28.3	42.6	17.4	28.3	22.7
A little more rain than usual	29.6	28.9	21.7	29.8	28.3	28.3	40.9
Almost the same as usual	23.7	15.6	26.1	14.9	32.6	26.1	27.3
A little less rain than usual	16.8	17.8	23.9	10.6	21.7	17.4	9.1
A lot less rain than usual	0.4	0.0	0.0	2.1	0.0	0.0	0.0
Perception of temperature over the last 12 months; % who said…							
A lot higher than usual	43.8	44.4	37.0	57.4	41.3	43.5	38.6
A little higher than usual	40.9	31.1	37.0	38.3	47.8	45.7	45.5
About the same as usual	13.9	20.0	23.9	2.1	10.9	10.9	15.9
A little lower than usual	1.5	4.4	2.2	2.1	0.0	0.0	0.0
A lot lower than usual	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Perception of living conditions over the last 5 years; % who said…							
Improved	60.6	64.4	58.7	48.9	63.0	58.7	70.5
Got worse	6.2	2.2	6.5	8.5	13.0	2.2	4.5
Neither	33.2	33.3	34.8	42.6	23.9	39.1	25.0

[a] Values are %.

3.3 Summary of CC and Community Characteristics

CCs were generally found to comply with the MOH requirements for staffing and provision of services to pregnant women, women postpartum, and young children. The quality of many of the services provided appears inadequate, as many of the CCs do not follow the norms set forth by the MOH. A major problem is that many of the CCs lacked essential equipment, supplies, medicines, and vaccines. Apart from the presence of PROCOMIDA health educators in the PROCOMIDA study arms, there was no indication of a systematic difference between study arms.

The study communities were found to be isolated and to have limited access to basic services, including electricity, telephone landlines, health care, and secondary education. Only a minority of communities reported having access to tap water. Most communities reported their living conditions had improved over the last 5 years. One significant difference between study arms might be the result of the PROCOMIDA: More HHs in the communities in the PROCOMIDA arms than in the control arm reported that the development projects in their community had a positive impact on health and nutrition.

4 Results: Household Characteristics

This section presents results on HH demographics; housing; access to utilities, water, and sanitation; hygiene; assets; HH hunger and dietary diversity; food and non-food expenditure and consumption; participation in development programs; and economic shocks.

4.1 Household Demography and Housing

Mean HH size was 6.3, with about half of the members younger than 18 years of age. The average dependency ratio was just below one (0.9). The vast majority of HH heads were male (94.0%); they were on average 39.6 years of age. Almost all HH heads (99.6%) self-identified as being indigenous and fewer than half reported speaking Spanish (44.9%). A large majority of HH heads had no or low levels of education: 45.9% did not attend school and 31.7% did not complete primary school. HH heads primarily worked in agriculture, either farming their own land or their family lands (56.9%) or as hired agricultural laborer (22.6%).

Table 4.1. Demographic Characteristics of the Household and Characteristics of the Household Head

	Full sample[a]	Study arm[a]					
		A	B	C	D	E	F
N[b]	**4548**	**748**	**755**	**757**	**740**	**795**	**753**
Household							
HH size	6.3 ± 3.0	6.4 ± 3.0	6.2 ± 3.0	6.3 ± 3.0	6.5 ± 3.0	6.1 ± 3.0	6.2 ± 2.9
Number of minors (< 18 years)	3.0 ± 2.1	3.1 ± 2.1	3.1 ± 2.1	3.0 ± 2.1	3.1 ± 2.1	2.9 ± 2.1	3.0 ± 2.1
Number of adults (³ 18 years)	3.2 ± 1.8	3.3 ± 1.8	3.2 ± 1.8	3.3 ± 1.9	3.4 ± 1.8	3.1 ± 1.7	3.1 ± 1.7
Number of children (0–59 months)	0.9 ± 0.8	0.9 ± 0.8	0.9 ± 0.8	0.9 ± 0.8	0.9 ± 0.8	0.9 ± 0.8	0.9 ± 0.8
Number of children (0–24 months)	0.3 ± 0.5	0.3 ± 0.5	0.3 ± 0.5	0.3 ± 0.5	0.2 ± 0.5	0.3 ± 0.5	0.3 ± 0.5
Percent adults (members ³ 18 years/HH size) x 100)	54.4 ± 19.7	54.2 ± 19.8	53.8 ± 19.8	54.9 ± 19.8	54.1 ± 19.3	55.4 ± 19.9	53.8 ± 19.4
Dependency ratio	0.9 ± 0.7	0.9 ± 0.7	0.9 ± 0.7	0.9 ± 0.7	0.9 ± 0.7	0.9 ± 0.7	0.9 ± 0.7
Household head							
Age of HH head (years)	39.6 ± 13.9	39.9 ± 14.3	39.1 ± 13.3	40.7 ± 14.6	40.1 ± 13.6	38.7 ± 13.2	39.3 ± 14.0
Sex of HH head (% male)	94.0	94.1	95.2	95.2	92.8	91.9	94.4
Indigenous (%)	99.6	99.6	99.5	99.2	99.6	99.7	99.7
Speaks Spanish (%)	44.9	42.5	41.5	46.1	51.8	45.0	42.9
Education							
None	45.9	51.3	47.5	43.9	38.9	48.6	45.3
Preschool	0.3	0.3	0.3	0.5	0.3	0.1	0.1
Primary incomplete	31.7	28.8	34.2	31.7	35.7	27.7	32.0
Primary complete	13.6	11.4	11.5	15.9	13.5	14.9	14.3
(Some) junior high	5.6	4.7	4.4	4.9	7.6	6.3	5.9
(Some) senior high	2.5	3.0	1.9	2.7	3.4	2.2	2.3
University	0.3[d]	0.5	0.3	0.4	0.5	0.1	0.0

	Full sample[a]	Study arm[a]					
		A	B	C	D	E	F
N[b]	**4548**	**748**	**755**	**757**	**740**	**795**	**753**
Occupation							
Unemployed	6.1	6.0	4.8	5.7	7.3	7.0	5.6
Farms own or family land	56.9	55.9	60.3	57.1	53.0	61.0	53.5
Farms someone else's land	5.1	6.3	5.7	5.3	3.4	4.3	5.4
Agriculture laborer	22.6	23.9	19.3	22.1	22.2	19.6	28.7
Retail[c]	0.5	0.4	0.5	0.7	0.8	0.5	0.3
Market/trade	1.4	0.9	1.7	2.0	1.8	0.9	1.3
Office/institution	0.3	0.4	0.1	0.1	0.8	0.1	0.4
Manual labor	1.8	1.2	2.3	1.3	3.5	1.0	1.7
Construction	1.4	2.0	0.9	1.9	1.5	1.1	0.8
Security	0.1	0.0	0.1	0.1	0.0	0.1	0.0
Others	0.9	0.5	1.5	0.7	1.6	0.8	0.5

[a] Values are mean ± SD or %.
[b] Sample size ranged from N = 4516 to 4548 in the full sample; N = 743 to 748 in the A arm; N = 754 to 755 in the B arm; N = 750 to 757 in the C arm; N = 733 to 740 in the D arm; N = 790 to 795 in the E arm; and N = 746 to 753 in the F arm.
[c] Retail is a more formal form of trade, involving keeping a premise or shop that is owned or rented. Market/trade is informal or petty trade, such as a market stall or street vending;
[d] Study arms differ, $p < 0.05$.

The vast majority of HHs (97.3%) reported owning their homes; only a small fraction (1.4%) of HHs shared the dwelling with another HH. Houses were generally small and constructed with low-quality materials: The majority had dirt floors (82.4%), wooden walls (69.7%), and a roof of corrugated sheets (98.1%).

Table 4.2. Housing Characteristics

	Full sample[a]	Study arm[a]					
		A	B	C	D	E	F
N	**4548**	**748**	**755**	**757**	**740**	**795**	**753**
Housing							
Own home	97.4	97.9	96.7	98.2	96.2	98.2	97.3
Share home with other family	1.4	1.2	1.3	2.0	1.4	1.4	1.2
Number of rooms	2.1 ± 0.9	2.1 ± 0.9	2.2 ± 0.9	2.2 ± 1.0	2.2 ± 0.9	2.1 ± 0.9	2.1 ± 0.9
Housing quality							
Have dirt floor	82.5[b]	89.4	82.1	78.2	79.1	80.9	85.4
Type of wall							
Wood	69.7	68.9	68.3	63.3	67.7	75.0	74.8
Brick/cement/other blocks	15.8	11.5	15.5	20.2	19.7	16.0	12.1
Palm/bamboo	9.9	14.8	14.3	12.2	6.9	2.8	8.6
Other	4.6	4.8	1.9	4.4	5.7	6.3	4.5

	Full sample[a]	Study arm[a]					
		A	B	C	D	E	F
N	**4548**	**748**	**755**	**757**	**740**	**795**	**753**
Type of roof							
Corrugated aluminum	98.1	97.9	98.1	96.7	99.5	97.5	99.1
Thatch/straw	1.6	2.1	1.7	2.9	0.5	1.9	0.7
Concrete/tile	0.1	0.0	0.0	0.3	0.0	0.3	0.0
Others	0.2	0.0	0.1	0.1	0.0	0.4	0.3

[a] Values are mean ± SD or %.
[b] Study arms differ, $p < 0.05$.

HHs in the sample had limited access to a safe and secure source of drinking water. The most common sources of drinking water were rainwater (59.0%) and surface water, e.g., a spring or a river (22.0%). Only 16.6% of HHs had access to tap water. For those that did not have access to drinking water in the home, it took on average 23.6 minutes to get drinking water. Nearly all HHs used firewood as their cooking fuel (99.2%). Fewer than one-quarter of HHs lived in homes with electricity (24.6%); the main sources of light were candles (41.5%) and lamps using kerosene or oil (29.1%).

Table 4.3. Household Drinking Water and Energy Sources

	Full sample[a]	Study arm[a]					
		A	B	C	D	E	F
N[b]	**4548**	**748**	**755**	**757**	**740**	**795**	**753**
Drinking water source							
Faucet in home or yard	16.6	19.1	22.5	22.2	23.8	3.6	8.9
Open well	1.9	2.1	0.8	2.5	2.3	2.8	0.9
Covered well	0.3	0.8	0.1	0.3	0.0	0.3	0.3
Surface water	22.0	28.5	21.1	22.2	20.5	18.5	21.5
Rainwater	59.0	48.9	55.5	52.8	52.8	74.6	68.3
Time to get drinking water (minutes) if not available at home	23.6 ± 26.7	20.3 ± 23.0	20.8 ± 23.5	29.8 ± 30.6	23.5 ± 29.6	23.5 ± 26.7	24.1 ± 25.8
Electricity; % yes	24.6	22.1	26.0	28.4	29.6	26.7	15.1
Energy source for cooking							
Firewood	99.2	98.7	98.8	99.6	99.2	99.7	99.2
Other	0.8	1.3	1.2	0.4	0.8	0.3	0.8
Energy source for light							
Electricity	23.9	21.0	26.0	26.6	28.8	26.3	14.9
Kerosene/oil	29.1	33.3	29.4	30.1	27.3	23.6	31.2
Candles	41.5	38.9	37.7	38.2	41.1	43.4	49.4
Firewood	5.5	6.8	6.9	5.2	2.8	6.7	4.5

[a] Values are mean ± SD or %.
[b] Sample size ranged from N = 1197 to 4548 in the full sample; N = 259 to 748 in the A arm; N = 184 to 755 in the B arm; N = 209 to 757 in the C arm; N = 189 to 740 in the D arm; N = 179 to 795 in the E arm; and N = 177 to 753 in the F arm.

4.2 Household Hygiene and Sanitation

The large majority of HHs reported treating their water before consuming it (95.8%). The two main purification methods used were boiling (89.9%) and chlorination (34.0%). Most HHs stored drinking water in a covered container (74.4%). The majority of HHs had access to a toilet or latrine (95.1%), and only around 7.0% shared the latrine with another HH. The most common methods for disposing of garbage were burning (69.0%) and dumping (50.4%).

Table 4.4. Hygiene and Sanitation

	Full sample[a]	Study arm[a]					
		A	B	C	D	E	F
N[b]	**4548**	**748**	**755**	**757**	**740**	**795**	**753**
Drinking water treated	95.8	95.5	96.7	95.9	95.9	95.1	95.5
Drinking water treatment method[c]							
Boiling	89.8	90.9	92.2	90.3	89.6	88.0	88.0
Chlorinated	34.0	30.5	29.7	35.9	42.4	33.9	31.9
Other acceptable method	2.2	3.3	0.9	2.6	2.7	2.1	1.7
Drinking water storage							
Uncovered containers	24.9	23.4	22.1	23.0	27.8	25.3	27.5
Covered containers	74.4	76.2	77.4	75.6	70.9	74.6	71.8
No storage	0.7	0.4	0.5	1.5	1.2	0.1	0.7
Toilet or latrine	95.1	93.4	95.6	95.2	96.1	95.5	94.8
Toilet or latrine shared	6.9	8.4	6.6	5.5	7.3	7.6	5.7
Garbage disposal[c]							
Discarded	50.4[d]	51.9	50.2	45.2	56.6	48.1	50.5
Burned	69.0	70.3	73.0	68.3	68.2	68.4	65.7
Buried	20.7	20.6	20.3	23.8	15.1	23.4	20.6
Fertilizer/composted	22.0	21.3	18.4	21.7	24.3	25.8	20.3
Other	0.8	0.7	0.7	1.5	1.1	0.4	0.4

[a] Values are %.
[b] Sample size ranged from N = 4326 to 4548 in the full sample; N = 699 to 748 in the A arm; N = 722 to 755 in the B arm; N = 721 to 757 in the C arm; N = 711 to 740 in the D arm; N = 759 to 795 in the E arm; and N = 714 to 753 in the F arm.
[c] HHs reported all methods of water treatment or garbage disposal used; hence, totals sum to more than 100%.
[d] Study arms differ, $p < 0.05$.

Soap was available in nearly all sampled HHs (95.8%). Even though most HHs (97.9%) stated using soap the day of the interview or the day preceding the interview, its use appears to be inadequate. When asked when they had washed their hands with soap in the last 24 hours, only around 10% of the pregnant women mentioned having washed her hands after defecating, 15% before preparing food, and 29% before eating their own food.

Table 4.5. Use of Soap

	Full sample[a]	Study arm[a]					
		A	B	C	D	E	F
N	**4548**	**748**	**755**	**757**	**740**	**795**	**753**
% who:							
Have soap in HH	95.8	97.1	96.4	96.6	96.2	94.3	94.3
Used soap today or yesterday	97.9	98.4	98.1	97.9	98.6	98.2	96.3
When used soap today or yesterday; % who:							
Washed own hands after defecation	9.4[b]	9.2	6.8	10.7	10.5	11.6	7.4
Washed own hands before preparing food	14.7[b]	15.4	16.7	10.0	15.8	17.2	13.0
Washed own hands before eating	28.8	27.9	27.9	27.6	29.3	33.6	26.3

[a] Values are %.
[b] Study arms differ, $p < 0.05$.

More than 90% of pregnant women were evaluated as being "clean" in a spot-check of their hands, hair, clothes, and face. Approximately 70% the HH exterior surroundings were deemed clean. This percentage was considerably lower for the interiors (47.2%).

Table 4.6. Spot-Check Observations

	Full sample[a]	Study arm[a]					
		A	B	C	D	E	F
N[b]	**4547**	**748**	**755**	**757**	**740**	**795**	**753**
% of pregnant women all clean	90.9	89.4	91.9	91.5	90.4	92.2	89.5
% of exteriors all clean	69.7	69.8	68.5	71.6	69.6	70.2	68.6
% of interiors all clean	47.2	50.2	50.3	48.8	45.5	44.8	43.2

[a] Values are %.
[b] Sample size ranged from N = 3723 to 4547 in the full sample; N = 615 to 748 in the A arm; N = 644 to 755 in the B arm; N = 611 to 757 in the C arm; N = 596 to 740 in the D arm; N = 665 to 795 in the E arm; and N = 592 to 753 in the F arm.

4.3 Household Assets

Very few HHs owned real estate other than their home (5.2%), but the large majority owned agricultural land (93.9%). HHs on average owned 62.4 HH goods, between 8 and 9 pieces of agricultural equipment, and between 8 and 9 small animals. HHs had very few larger or more expensive assets, such as power-generating equipment, large animals, bicycles, motorcycles or cars.

Table 4.7. Asset Ownership

	Full sample[a]	Study arms[a]					
		A	B	C	D	E	F
N[b]	4548	748	755	757	740	795	753
% of HHs that own							
Other house/apartment	5.2	5.5	5.2	5.2	5.1	6.2	3.7
Plot of land	93.9	94.5	92.6	93.5	93.8	96.5	92.2
Number of … owned							
HH goods	62.4 ± 35.2[c]	62.4 ± 34.5	61.0 ± 30.4	62.3 ± 34.9	68.7 ± 40.6	64.0 ± 37.0	56.0 ± 31.4
Power-generating equipment (generator, solar panel)	0.1 ± 0.3	0.1 ± 0.3	0.1 ± 0.3	0.1 ± 0.3	0.1 ± 0.3	0.1 ± 0.3	0.1 ± 0.3
Agricultural equipment	8.9 ± 5.4	9.0 ± 5.5	8.9 ± 5.2	8.7 ± 5.4	9.5 ± 5.6	8.9 ± 5.3	8.4 ± 5.5
Small animals (poultry, rabbits, guinea pigs)	8.8 ± 14.1	9.2 ± 9.8	7.9 ± 9.0	9.0 ± 26.9	9.6 ± 9.9	8.8 ± 11.1	8.3 ± 8.7
Medium-sized animals (goat, sheep, lamb)	0.0 ± 0.4	0.0 ± 0.3	0.0 ± 0.6	0.0 ± 0.2	0.0 ± 0.4	0.0 ± 0.2	0.0 ± 0.4
Large animals (cows, pigs)	0.6 ± 1.8	0.7 ± 1.6	0.5 ± 0.9	0.6 ± 2.7	0.5 ± 1.3	0.8 ± 2.6	0.4 ± 0.9
Bicycles	0.2 ± 0.5[c]	0.2 ± 0.5	0.2 ± 0.5	0.2 ± 0.4	0.2 ± 0.5	0.2 ± 0.5	0.1 ± 0.3
Cars or motorbikes	0.0 ± 0.2	0.0 ± 0.2	0.0 ± 0.2	0.0 ± 0.2	0.1 ± 0.3	0.0 ± 0.3	0.0 ± 0.2

[a] Values are mean ± SD or %.
[b] Sample size ranged from N = 4542 to 4548 in the full sample; N = 746 to 748 in the A arm; N = 754 to 755 in the B arm; N = 755 to 757 in the C arm; N = 738 to 740 in the D arm; N = 794 to 795 in the E arm; and N = 752 to 753 in the F arm.
[c] Study arms differ, $p < 0.05$.

4.4 Household Hunger and Dietary Diversity

Few HHs experienced severe hunger (1.5%), but about one-fifth of the HHs experienced moderate hunger (19.4%) in the past 4 weeks.

Table 4.8. Household Hunger

	Full sample[a]	Study arms[a]					
		A	B	C	D	E	F
N	**4548**	**748**	**755**	**757**	**740**	**795**	**753**
Household hunger scale							
Little or no hunger	79.1	77.3	75.9	78.3	82.4	81.3	79.3
Moderate hunger	19.4	21.4	21.7	19.8	16.4	18.2	19.1
Severe hunger	1.5	1.3	2.4	1.8	1.2	0.5	1.6

[a] Values are %.

Average HH dietary diversity was 9.4 out of 12 possible food groups, and three-quarters of all HHs consumed at least 10 food groups (the sample median) in the preceding week.[24] Food groups that were consumed by nearly all HHs (over 97%) were cereals and grains, fruits, and oils and fats (Figure 4.1). Around 90% of HHs reported having consumed vegetables or meat and poultry and around 84% reported having consumed eggs in the previous week. Surprisingly, about 20% of HHs did not report having consumed legumes, when beans are a key staple food in Guatemala. Dairy products and fish and seafood were the least commonly consumed food groups.

HHs that consumed foods from fewer than 10 food groups were considerably less likely than those with higher dietary diversity to have consumed micronutrient-rich foods, such as vegetables, meat and fish, eggs, legumes and pulses, dairy, and fish and seafood (Figure 4.2).

The total number of food groups consumed and the percent of HHs with a total diversity less than or equal to 10 appeared to be associated with the size of the HH food ration (Figure 4.3). The lowest dietary diversity was found in study arms C (no family ration) and F (control). The differences between the C and F groups, however, were not statistically significant ($p < 0.05$).

Table 4.9. Household Dietary Diversity

	Full sample[a]	Study arms[a]					
		A	B	C	D	E	F
N	**4548**	**748**	**755**	**757**	**740**	**795**	**753**
Household dietary diversity							
Dietary diversity	9.4 ± 1.6[b]	9.4 ± 1.6	9.4 ± 1.5	9.1 ± 1.7	9.7 ± 1.4	9.7 ± 1.4	9.2 ± 1.7
% with dietary diversity ≤ 10	75.7[b]	74.9	78.1	80.7	71.1	70.3	79.2

[a] Values are mean ± SD or %.
[b] Study arms differ, $p < 0.05$.

[24] Note that dietary diversity was calculated using data from the food consumption module, which used a 7-day recall period. Using this long reference period, one would expect the number of food groups consumed to be larger than when using the conventional 24-hour reference period.

Figure 4.1. Consumption of Food Groups by Households during the Past 7 Days (full sample)

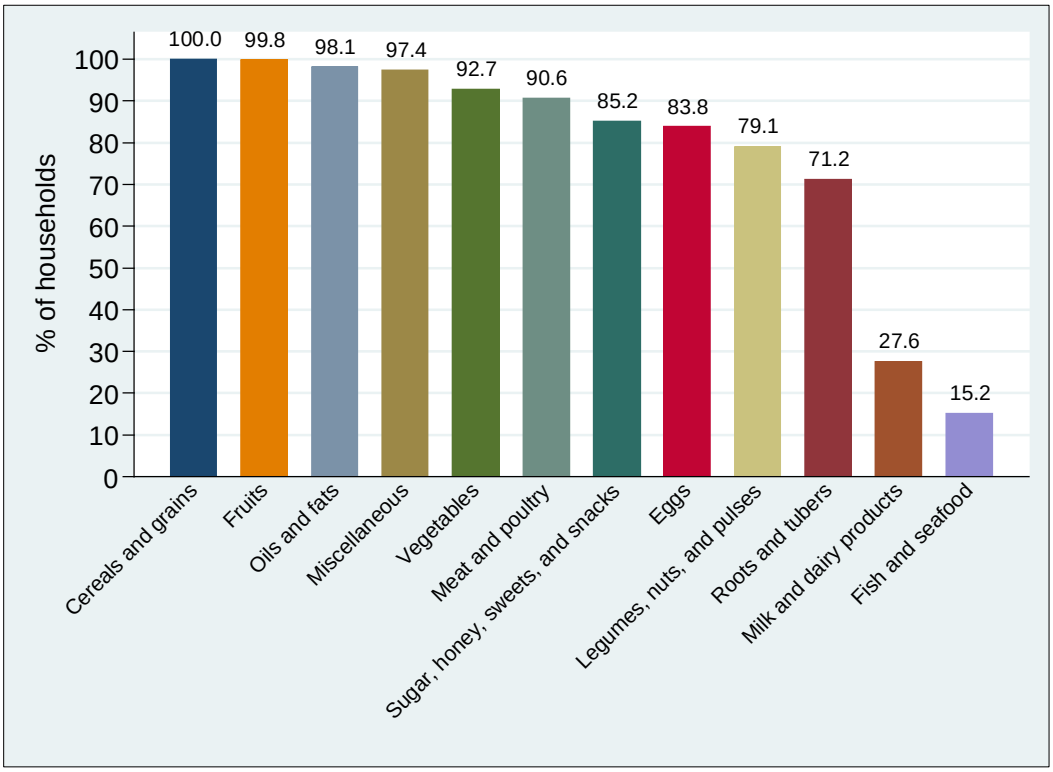


Figure 4.2. Consumption of Food Groups by Household Dietary Diversity during the Past 7 Days (full sample)

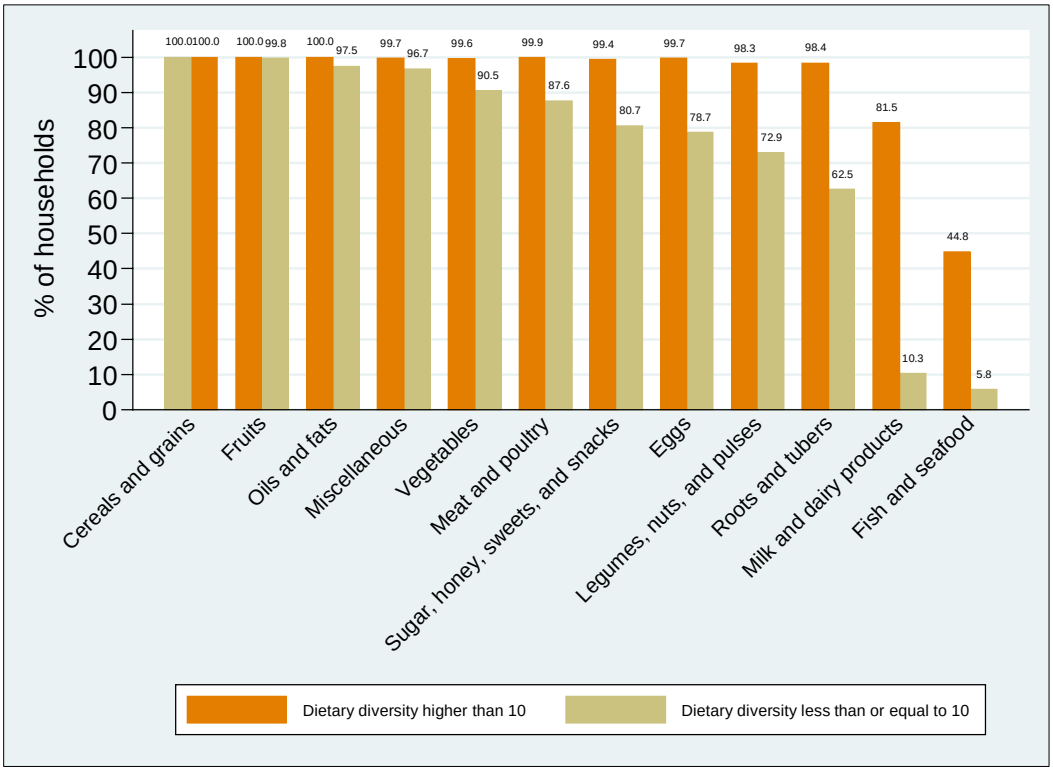
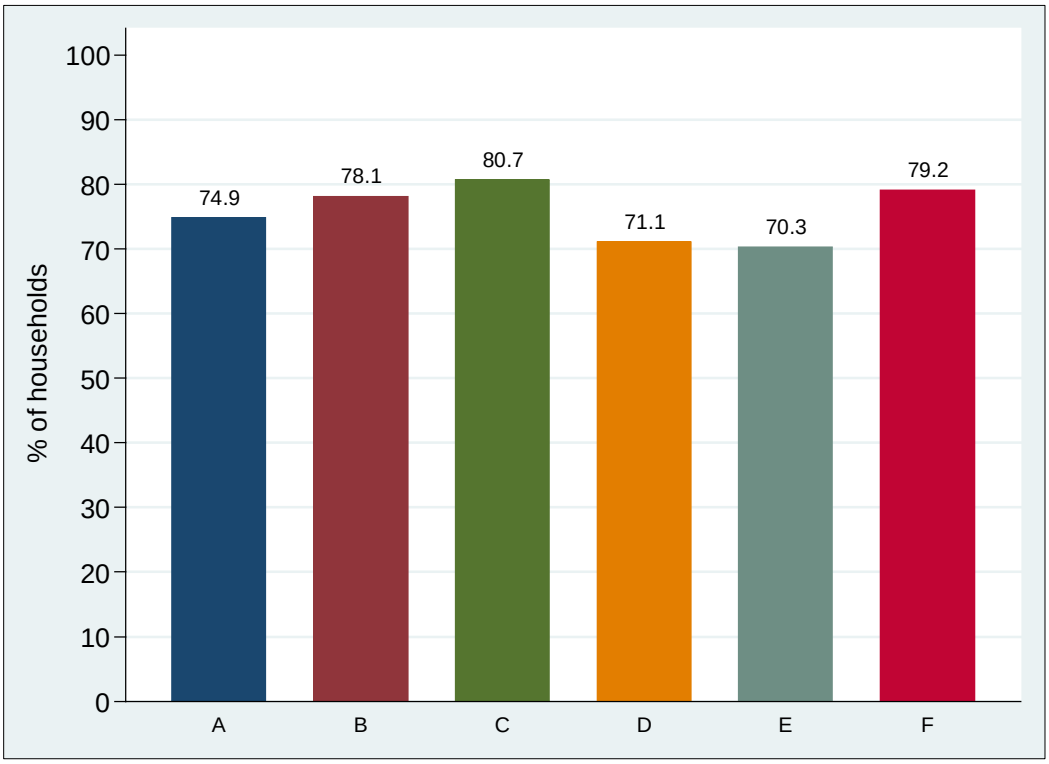


Figure 4.3. Proportion of Households That Consumed Fewer than 10 Food Groups during the Past 7 Days by Study Arm



4.5 Household Participation in Health, Nutrition, and Social Programs

Just under two-thirds of HHs reported participating in at least one social, health, or nutrition program. On average, HHs participated in between one and two programs. The most common programs were *Mi Familia Progresa* (41.1%), PROCOMIDA (37.5% in study arms A through E), and *Plan Internacional* (12.0%). The most common benefits received by beneficiary HHs were cash or vouchers (64.6%), food (51.0%), training (20.0%), and education (16.8%). Even though the BCC activities constitute a key component of PROCOMIDA, very few HHs mentioned "health and nutrition education" as a benefit received from the programs they participate in. The estimated average value of the in-kind benefits received in the last three months was Q205.1; HHs reported receiving an average of Q76.2 (equivalent to $9.52) in cash benefits. The estimated value of the in-kind benefits received differed significantly by study arm ($p < 0.05$) and appears to be associated with the size of the PROCOMIDA family ration received.

Table 4.10. Participation in Health, Nutrition, and Social Programs

	Full sample[a]	Study arms[a]					
		A	B	C	D	E	F
N[b]	**4548**	**748**	**755**	**757**	**740**	**795**	**753**
% of HHs participating in program	62.5[d]	68.0	65.8	61.2	70.4	62.4	47.1
Number of programs in which HH participates	1.4 ± 0.6[d]	1.4 ± 0.6	1.4 ± 0.6	1.4 ± 0.6	1.4 ± 0.6	1.4 ± 0.6	1.2 ± 0.4
% of HH participating in:							
Mi Familia Progresa	41.1	40.1	41.6	40.3	44.6	37.9	42.6
PROCOMIDA	31.4[d]	42.6	36.8	31.6	42.8	34.2	0.4
Plan Internacional	12.0	9.6	11.0	13.6	11.6	14.1	12.1
Other	0.9	1.1	0.7	0.8	0.9	0.8	1.3
% of HH receiving … from program[c]							
Health/medical treatment	0.7	0.0	1.0	0.2	1.5	1.4	0.0
Food	51.0[d]	64.0	56.3	51.8	60.5	55.6	3.4
Cash, vouchers	64.6[d]	58.2	61.8	64.6	62.4	59.1	88.7
Health and nutrition education	7.9[d]	9.0	7.0	8.2	7.7	10.5	3.9
Agricultural inputs (seeds)	0.5	0.4	0.2	0.9	0.4	0.6	0.3
Education	16.8	14.3	13.9	17.5	17.3	17.9	20.8
Training	20.0[d]	21.2	22.1	17.3	22.6	23.0	11.0
Production equipment	0.4	0.2	0.0	0.4	0.4	1.2	0.3
Other	0.7	0.2	0.4	1.1	0.8	0.8	0.8
Value of benefits received in last 3 months[c]							
In-kind (Q)	205.1 ± 567.6[d]	291.0 ± 431.0	175.9 ± 360.3	131.6 ± 774.0	246.9 ± 387.7	286.5 ± 851.4	43.4 ± 250.5
Cash (Q)	76.2 ± 214.6[d]	52.9 ± 171.5	63.6 ± 207.3	98.0 ± 241.0	89.7 ± 232.8	63.6 ± 181.9	96.6 ± 250.7

[a] Values are mean ± SD or %.
[b] Sample size ranged from N = 2841 to 4548 in the full sample; N = 509 to 748 in the A arm; N = 497 to 755 in the B arm; N = 463 to 757 in the C arm; N = 521 to 740 in the D arm; N = 496 to 795 in the E arm; and N = 355 to 753 in the F arm.
[c] Responses are for those participating in social, health, or nutrition programs.
[d] Study arms differ, $p < 0.05$.

4.6 Household Economic Shocks

Around 80% of HHs reported experiencing a negative economic shock in the past 5 years. On average, HHs had experienced 1.3 shocks**.** The most common shocks mentioned were loss of animals (54.9%); disease of or injury to a HH member (30.4%); loss of crops due to drought (27.0%); and changes in input prices and prices of products normally sold by the HH and/or difficulty selling products (21.9%). Other shocks mentioned by between 10% and 15% of the HHs included crop loss due to pests (15.7%) or floods (10.7%) and loss of employment (11.1%). For each shock, HHs were asked to evaluate the magnitude of its effect. More than 80% of HHs reported that at least one of the shocks they experienced had a large negative effect.

Table 4.11. Prevalence and Impacts of Shocks over the Past 5 Years

	Full sample[a]	Study arms[a]					
		A	B	C	D	E	F
N[b]	**4548**	**748**	**755**	**757**	**740**	**795**	**753**
% of HHs experiencing any shock	80.9	81.8	81.3	79.7	82.8	81.8	78.0
Number of shocks experienced	1.3 ± 1.4	1.2 ± 1.3	1.1 ± 1.2	1.2 ± 1.4	1.3 ± 1.3	1.4 ± 1.5	1.3 ± 1.4
Types of shocks experienced							
Disease of/injury to HH member	30.4	30.9	27.2	30.1	32.4	32.7	29.0
Death of a family member	11.7	11.4	11.9	11.5	12.2	12.3	11.0
Loss of crop due to flood	10.7	9.5	9.1	11.2	8.2	12.8	13.3
Loss of crop due to drought	27.0	28.5	26.6	25.2	26.9	25.3	29.3
Loss of crop due to pests	15.7	15.6	13.6	16.5	16.1	16.5	16.1
Loss of crop due to other reasons	11.2	9.5	8.9	10.2	12.7	14.5	11.6
Loss of animals	54.9	55.7	52.8	53.5	55.0	59.2	53.0
Loss of land	2.0	1.6	1.7	2.2	2.0	2.3	2.1
Changes in input/product prices/difficulty selling	21.9	21.3	18.4	22.5	22.0	25.0	21.9
Bankruptcy	3.1	1.7	4.2	3.6	3.9	2.8	2.5
Loss of employment	11.1	9.5	9.5	10.8	12.6	11.2	12.9
Loss of home or business due to a disaster	3.0[c]	3.2	1.3	3.4	3.0	3.4	3.6
Theft of destruction of materials, goods, vehicles, or money	5.7	4.8	4.9	5.7	5.8	7.7	4.9
Damage to house or HH goods	2.2	1.5	1.6	2.9	2.0	3.3	2.0
Assault/physical abuse	5.6	4.7	4.2	5.7	7.3	6.3	5.2
Conflict, legal issues	4.2	3.6	2.9	3.7	5.0	5.5	4.6
Other	1.7	1.7	2.3	1.5	1.2	1.8	1.9
Largest reported effect of all of the experienced shocks							
No effect	3.9	2.9	2.9	4.0	4.6	4.9	3.7
Small negative effect	14.4	15.2	17.3	12.3	14.2	15.5	11.9
Large negative effect	81.7	81.9	79.8	83.7	81.2	79.5	84.3

[a] Values are mean ± SD or %.
[b] Sample size ranged from N = 3679 to 4548 in the full sample; N = 612 to 748 in the A arm; N = 614 to 755 in the B arm; N = 603 to 757 in the C arm; N = 613 to 740 in the D arm; N = 650 to 795 in the E arm; and N = 587 to 753 in the F arm.
[c] Study arms differ, $p < 0.05$.

4.7 Summary of Household Findings

HH heads were primarily indigenous, worked as farmers, and had low levels of education. Housing conditions were poor, but the majority of HHs had a latrine. Most HHs treated their drinking water and stored it in a covered container. While soap was available in many HHS, its use appeared to be inadequate.

Few HHs experienced severe hunger, but about one-fifth of the HHs experienced moderate hunger in the past 4 weeks.

Approximately two-thirds of the HHs reported participating in a social, nutrition, or health program. *Mi Familia Progresa* and PROCOMIDA were the most common programs. A large proportion of HHs reported having experienced a shock in the past 5 years, mostly related to crop losses, loss of animals, business-related problems, loss of employment, and disease or death of or injury to a HH member. Shocks were perceived by the respondents as having had large negative effects on the HH.

Apart from the variables directly related to PROCOMIDA, none of the other significant differences seemed to indicate any systematic differences between study groups.

5 Results: Characteristics of Pregnant Women

The following section details the characteristics and activities of pregnant women and their status within the HH, their health and nutrition knowledge, their prenatal health care practices, their mental health, and their anthropometric status.

5.1 Pregnant Women Characteristics and Status

On average, pregnant women in the sample were about 25 years old and a large majority of them had a spouse or partner (96.0%). Very few pregnant women self-identified as the HH head; 62.3% reported being the HH head's spouse or partner, 22.2% the HH head's daughter-in-law, and 12.8% the HH head's daughter.

Compared to the HH head (Table 4.1), the level of education of pregnant women was somewhat higher,[25] but still low: About one-third had received no formal education and 42.0% did not finish primary school. Nearly all pregnant women considered themselves indigenous and spoke Q'eqchi'; fewer than one-quarter reported speaking Spanish (as compared to about half of the HH heads). Only about half of the women were literate. Close to 90% of the pregnant women reported not having worked for pay in the past year. When asked about employment in the past month, the proportion of unemployed women was very similar. Those who did work reported that it was on an infrequent basis and were remunerated for their work. Not surprisingly, pregnant women perceived their contribution to HH expenses to be absent or very small.

Table 5.1. Pregnant Women Characteristics and Activities

	Full sample[a]	Study arms[a]					
		A	B	C	D	E	F
N[b]	**4548**	**748**	**755**	**757**	**740**	**795**	**753**
Age (years)	24.8 ± 6.6	24.8 ± 6.7	24.6 ± 6.5	24.5 ± 6.5	24.9 ± 6.4	24.9 ± 6.7	25.1 ± 6.7
Has a spouse or partner	96.0	96.1	97.2	95.2	94.5	97.0	96.0
Relationship to HH head							
HH head	1.0	1.1	0.9	0.7	0.9	1.4	1.1
Spouse	62.3	62.7	62.6	59.0	59.5	65.4	64.1
Child	12.8	13.2	13.2	14.3	12.8	11.4	12.0
Daughter-in-law	22.2	21.8	20.9	24.8	24.1	20.1	21.4
Other	1.7	1.2	2.3	1.2	2.7	1.6	1.5
Education							
None	33.4	36.6	36.2	32.6	27.6	35.1	32.3
Preschool	0.8	0.8	0.7	0.5	0.8	0.9	1.1
Primary incomplete	42.0	41.4	38.7	43.2	45.7	39.8	43.5
Primary complete	16.6	14.0	18.0	16.8	17.3	17.5	15.7
(Some) junior high	6.1	6.6	5.8	5.2	6.8	5.8	6.6
(Some) senior high	1.0	0.4	0.5	1.7	1.8	0.8	0.8
University	0.1	0.1	0.0	0.0	0.1	0.1	0.0
Ethnicity and language							
Considers herself indigenous	99.3	99.5	99.1	99.3	98.6	99.9	99.5
Speaks Q'eqchi'	97.8	99.3	97.9	94.1	98.4	99.2	98.1

[25] Pregnant women were on average 15 years younger than the HH head. Their higher level of education is thus most likely due to a positive secular trend in levels of education.

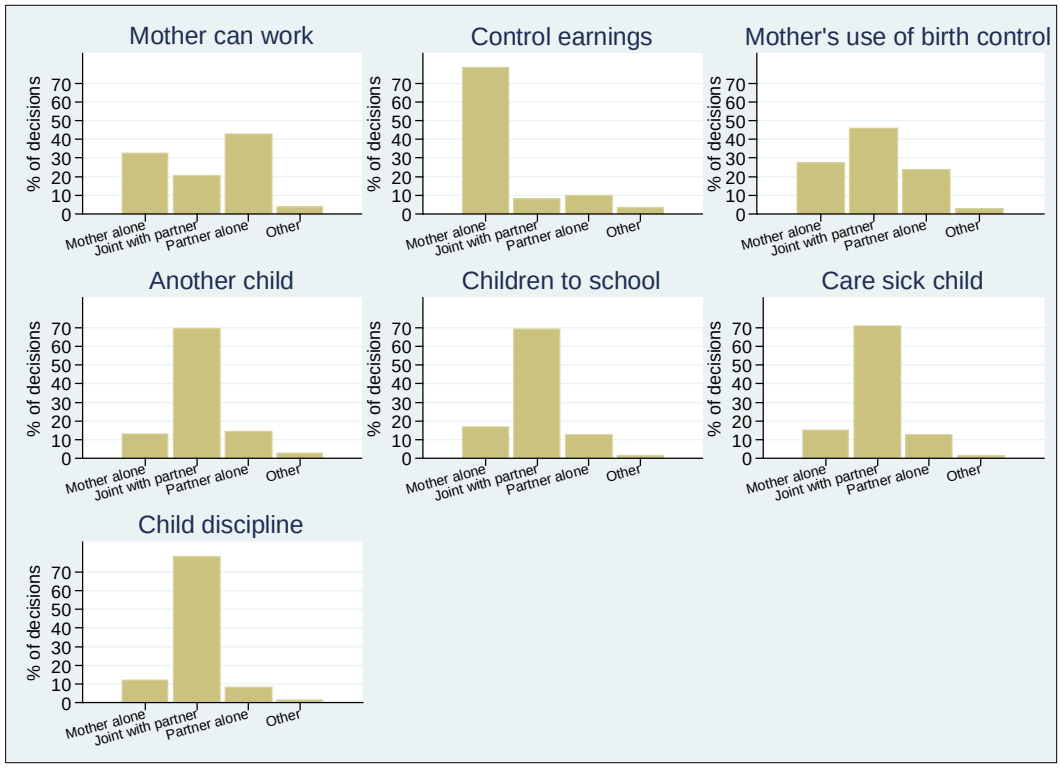
	Full sample[a]	Study arms[a]					
		A	B	C	D	E	F
N[b]	**4548**	**748**	**755**	**757**	**740**	**795**	**753**
Speaks Spanish	24.4	22.3	24.3	25.2	32.6	21.8	20.3
Literacy							
in Spanish							
Literate	55.0	50.4	52.7	55.2	60.4	54.6	56.6
Partially literate	8.2	9.8	7.7	6.6	8.8	8.9	7.6
Illiterate	36.8	39.8	39.6	38.2	30.8	36.5	35.9
in Q'eqchi'							
Literate	49.8	47.3	46.1	49.4	55.1	49.1	51.7
Partially literate	9.9	10.3	10.1	9.1	10.5	10.2	8.9
Illiterate	40.4	42.4	43.8	41.5	34.3	40.8	39.4
in either Spanish or Q'eqchi'							
Literate	56.9	53.2	53.9	57.2	62.6	55.8	58.6
Worked during the past 12 months							
None	88.4	90.4	89.3	89.0	84.7	89.3	87.8
Year long	2.6	2.3	2.8	2.2	4.3	1.4	2.7
Seasonal	3.0	3.1	2.4	3.6	3.5	2.8	2.8
Sometimes	6.0	4.3	5.6	5.2	7.4	6.5	6.8
Main occupation past month							
Unemployed	88.5	90.4	89.4	89.0	84.9	89.3	87.8
Farms own or family land	0.6	0.8	0.3	0.7	0.3	1.0	0.5
Farms someone else's land	0.4	0.7	0.9	0.1	0.1	0.3	0.4
Agricultural labor	2.5	2.3	1.9	2.6	3.4	2.3	2.5
Retail	1.3	0.5	1.3	1.7	1.5	0.9	1.9
Market/trade	3.2	2.9	4.2	2.9	3.4	3.0	2.5
Manual labor	1.5	0.8	0.5	1.6	2.8	1.1	2.1
Teacher	0.1	0.1	0.0	0.1	0.1	0.3	0.1
Housekeeper	1.6	1.2	1.1	0.9	3.1	1.8	1.9
Other	0.3	0.3	0.4	0.3	0.4	0.1	0.3
Earnings							
Only cash	94.7	90.3	96.3	94.0	96.5	92.9	96.7
Only in-kind	1.5	4.2	0.0	1.2	0.9	2.4	1.1
Only both cash and in-kind	2.1	4.2	1.3	2.4	0.9	2.4	2.2
Nothing	1.7	1.4	2.5	2.4	1.8	2.4	0.0
Pregnant women's perceived contribution to HH expenses							
Nothing	82.9	85.7	84.1	85.1	77.7	84.0	80.6
Almost nothing	3.0	2.8	2.3	1.7	3.9	3.3	4.1
A little	7.6	6.3	7.4	7.5	10.1	6.8	7.4
All/almost all	6.5	5.2	6.2	5.7	8.2	5.9	7.8

[a] Values are mean ± SD or %.

[b] Sample size ranged from N = 525 to 4548 in the full sample; N = 72 to 748 in the A arm; N = 80 to 755 in the B arm; N = 83 to 757 in the C arm; N = 113 to 740 in the D arm; N = 85 to 795 in the E arm; and N = 92 to 753 in the F arm.

Decision-making power within the HH differed considerably across the different decision-making domains (Figure 5.1). Women mostly controlled their own earnings. Issues with respect to children were mostly jointly decided. Women reported that the decision to work and to use birth control was roughly equally split between the three most common decision-making scenarios: decision by the woman alone, decision by her partner alone, or a joint decision.

Figure 5.1. Pregnant Women's Decision-Making Power



Pregnant women were unlikely to own high-value assets (such as land, a house, jewelry, and livestock) that they could sell. Land or houses were owned by 1% or less and jewelry and livestock by between 5% and 10% of the women. A somewhat larger proportion of women (16.3%) mentioned that they had money they could spend autonomously.

Table 5.2. Ownership and Control of Assets

	Full sample[a]	Study arms[a]					
		A	B	C	D	E	F
N[b]	**4548**	**748**	**755**	**757**	**740**	**795**	**753**
Pregnant women assets; % who own and can sell:							
Land/farm/fields	1.1	0.9	0.4	0.9	1.9	1.1	1.2
Primary residence	0.2	0.0	0.0	0.1	0.0	0.8	0.3
Secondary residence	0.1	0.3	0.0	0.0	0.1	0.0	0.0
Jewelry/stones	8.6	9.1	8.2	7.0	10.3	7.9	9.4
Livestock	5.5	6.1	6.1	4.9	5.7	5.0	5.0
Has own money to spend autonomously; % yes	16.3	13.0	15.0	16.6	18.8	16.5	17.8

[a] Values are %.
[b] Sample size ranged from N = 4547 to 4548 in the full sample; N = 747 to 748 in the A arm; N = 755 to 755 in the B arm; N = 757 to 757 in the C arm; N = 740 to 740 in the D arm; N = 795 to 795 in the E arm; and N = 753 to 753 in the F arm.

5.2 Pregnant Women Feeding, Care, and Health Knowledge

Only about half of the pregnant women mentioned vaginal bleeding as a danger sign of pregnancy and 40.0% mentioned severe headaches or blurred vision. Other danger signs requiring immediate medical attention were mentioned by 20% or fewer of the pregnant women. Knowledge of dangers signs in childhood illness was equally low. Even though almost all women mentioned fever, bloody stools were mentioned by only one-fifth of the women and all other dangers signs by 10% or less.

Most pregnant women (85.1%) knew that ORS are used to treat diarrhea and/or prevent dehydration. Contrary to the recommendation to breastfeed more than usual during child illness and convalescence, 29.8% of pregnant women believed that a sick child should be breastfed less; around 12% thought that children recovering from illness should be breastfed less.

Table 5.3. Health Care Knowledge

	Full sample[a]	Study arms[a]					
		A	B	C	D	E	F
N[b]	**4548**	**748**	**755**	**757**	**740**	**795**	**753**
Danger signs of pregnancy; % who said:							
Vaginal bleeding	54.8[c]	56.1	60.0	56.5	54.6	53.0	48.5
Abdominal pain	20.8	23.0	21.2	22.2	19.2	19.5	19.9
Vaginal discharge	9.0	7.1	10.2	9.2	10.7	9.2	7.6
Persistent back pain	1.1	0.9	1.1	1.2	1.6	1.3	0.7
Swollen hands/face	12.9	13.6	12.7	10.6	15.4	14.6	10.5
Severe headache/vision trouble	40.3	41.0	46.2	39.6	38.1	38.0	38.6
Regular contractions before 37 weeks	17.6	16.6	19.6	17.6	17.0	15.7	19.4
No fetal movement	4.1	3.3	4.5	3.7	4.1	5.3	3.9
Danger signs of childhood illness; % who said:							
Cannot drink/breastfeed	2.3	1.6	2.4	2.2	2.2	3.1	2.4
Symptoms intensify	10.2[c]	8.8	7.0	9.9	9.2	14.8	11.3
Fever	91.8[c]	92.0	94.7	93.5	91.9	87.9	90.7
Rapid breathing	3.1[c]	3.7	1.7	2.9	3.4	4.0	2.9
Difficulty breathing	10.5	9.4	7.5	8.9	11.6	13.0	12.5
Bloody stools	21.7	19.1	19.2	22.6	27.0	22.5	19.8
Difficulty swallowing	7.4	5.2	5.6	9.5	8.9	7.9	7.0
ORS, % who know they are used to treat diarrhea/dehydration	85.1	87.3	88.1	84.4	84.2	85.2	81.4
Breastfeeding during illness; % who believes one should:							
Breastfeed less	29.8	29.6	33.1	27.9	26.3	28.0	34.2
Breastfeed the same	37.1	38.1	33.9	35.1	40.4	39.1	35.6
Breastfeed more	29.5	29.6	29.4	32.5	28.8	30.1	27.0
Breastfeeding not mentioned	3.6	2.8	3.6	4.5	4.5	2.8	3.2
Breastfeeding during convalescence; % who believes one should:							
Breastfeed less	12.4	13.2	11.3	12.2	10.7	14.6	12.1
Breastfeed the same	36.3	36.5	34.1	36.1	39.8	34.7	36.8
Breastfeed more	48.2	47.2	51.2	48.5	45.5	48.3	48.2
Breastfeeding not mentioned	3.2	3.1	3.4	3.2	4.1	2.4	2.9

[a] Values are %.
[b] Sample size ranged from N = 4525 to 4548 in the full sample; N = 741 to 748 in the A arm; N = 752 to 755 in the B arm; N = 754 to 757 in the C arm; N = 737 to 740 in the D arm; N = 792 to 795 in the E arm; and N = 749 to 753 in the F arm.
[c] Study arms differ, $p < 0.05$.

Pregnant women in the sample were generally well informed about the importance of colostrum and exclusive breastfeeding: About 80% of pregnant women knew that they should breastfed a baby immediately or during the first hour after birth and that the baby should be fed colostrum. Nearly all of these women correctly mentioned reasons related to nutrition and health for giving colostrum. Among the women who believed colostrum should not be fed to the child, many (51.3%) thought that it was bad for the child's health.

Even though moderate maternal malnutrition[26] has little or no effect on the quantity of milk production, virtually all pregnant women thought that a malnourished mother cannot produce enough good milk.

When asked about the reasons for exclusive breastfeeding, 84.0% of pregnant women correctly mentioned reasons related to the child's health and nutrition while fewer than 8% mentioned lactational amenorrhea. The age mentioned to stop breastfeeding a child was 22.1 months on average- which is close to the WHO recommendation to breastfeed for 24 months and beyond. Nearly all women correctly mentioned on demand feeding when asked about the appropriate frequency of breastfeeding a child.

Although it is not necessary, 9 of 10 pregnant women thought that they would need to stop breastfeeding should they become pregnant again. Knowledge about what to feed a child younger than 6 months of age when the mother cannot be with her child was limited as well. Ideally, children should continue to be given breast milk exclusively even when they are not with their mothers. Only around 5%, however, mentioned breast milk, while around 18% mentioned powdered milk (i.e., not baby formula) and nearly 40% mentioned cereal.

Table 5.4. Breastfeeding Knowledge among Pregnant Women

	Full sample[a]	Study arms[a]					
		A	B	C	D	E	F
N[b]	**4548**	**748**	**755**	**757**	**740**	**795**	**753**
% who knew that:							
Baby should be breastfed immediately or during first hour after birth	79.1	80.3	80.9	81.1	76.9	80.5	74.6
Baby should be fed colostrum	83.0	84.5	81.9	82.8	83.5	85.0	80.1
Of those who responded yes, % who mentioned nutrition and health-related reasons	95.2[c]	97.0	97.1	93.9	94.3	96.6	92.0
Of those who responded no, % who mentioned:							
Bad for health	51.3	54.3	62.8	53.8	47.5	45.4	44.0
Does not help the baby	13.3	13.8	13.9	9.2	18.9	11.8	12.7
Other reason	11.5	11.2	8.8	10.8	12.3	14.3	12.0
Does not know	12.7	12.9	9.5	13.8	12.3	16.0	12.0
Malnourished mother can produce enough good milk	1.6	1.6	1.1	0.8	1.9	2.0	2.3

[26] Note that severely malnourished women—an uncommon condition in Guatemala—need therapeutic care and skilled support to successfully breastfeed.

	Full sample[a]	Study arms[a]					
		A	B	C	D	E	F
N[b]	**4548**	**748**	**755**	**757**	**740**	**795**	**753**
Reasons why exclusive breastfeeding is important, % who:							
Mentioned child health and nutrition	84.0	84.5	84.6	80.4	87.0	85.4	81.8
Mentioned lactational amenorrhea	7.7	7.9	7.4	7.9	8.2	8.3	6.4
Mentioned cost	2.7[c]	2.4	3.4	2.8	4.2	1.8	2.0
Does not know	3.1[c]	3.3	3.4	3.6	1.4	2.5	4.4
Appropriate age to stop breastfeeding (months)	22.1 ± 7.7	22.5 ± 7.0	22.2 ± 7.4	21.7 ± 7.6	21.8 ± 8.1	22.0 ± 8.0	22.3 ± 8.2
How often should a mother breastfed her child, % who said:							
Only on demand	95.6	95.9	96.4	96.7	95.4	94.3	94.7
Only decided by mother	1.8	1.9	1.7	0.8	2.2	1.9	2.4
Only both on demand and decided by mother	1.5	0.8	0.8	1.5	2.2	2.6	1.1
Does not know	1.1	1.5	1.1	1.1	0.3	1.1	1.9
Should a mother of child under 6 months stop breastfeeding if she becomes pregnant again, % who said:							
Yes	90.3	91.0	92.3	89.2	88.4	90.6	90.2
No	8.3	7.8	7.0	9.2	10.1	7.5	8.1
Does not know	1.4	1.2	0.7	1.6	1.5	1.9	1.7
Types of food that can be given to a child under 6 months of age if the mother cannot always be with the child, % who said:							
Breast milk	4.7	3.9	3.6	6.3	4.2	5.4	4.5
Powdered milk	17.6	16.4	16.8	16.2	19.2	19.0	17.8
Baby formula	59.2[c]	60.7	63.2	60.8	62.0	56.7	51.8
Cow's/goat's milk	4.1[c]	2.5	2.9	3.3	5.5	5.0	5.3
Cereal	38.5	38.8	36.6	35.3	39.1	39.0	42.4
Fruits, vegetables, potatoes	2.4	2.0	2.4	2.0	3.4	3.3	1.3
(Sugar) water, coffee, broth	3.0	4.3	2.9	2.1	2.2	3.9	2.4
Other	1.3	1.1	1.5	1.5	1.5	0.9	1.5
Doesn't know	7.3	7.8	7.4	6.9	5.8	8.9	7.0

[a] Values are mean ± SD or %.
[b] Sample size ranged from N = 4525 to 4548 in the full sample; N = 744 to 748 in the A arm; N = 751 to 755 in the B arm; N = 752 to 757 in the C arm; N = 740 to 740 in the D arm; N = 792 to 795 in the E arm; and N = 746 to 753 in the F arm.
[c] Study arms differ, $p < 0.05$.

Pregnant women's knowledge about the causes of malnutrition among infants and young children appeared adequate: The large majority mentioned reasons related to feeding and illness. However, only about half the women knew that solid foods and liquids other than breast milk should be introduced at the age of 6 months; about one-third of women thought that they should be introduced later. When asked about the best age to introduce specific foods (all of which can be introduced at 6 months according to the current WHO recommendation), around 70% correctly responded that cereals can be fed to children at around 6 months of age; the percentage of correct answers for leafy greens was about 60%. Fewer than half of the women knew that a number of other micronutrient-dense foods (such as papaya and mango, meat, fish, and organs) should be introduced at 6 months of age.

Only a fraction of women knew that vitamin A deficiency causes vision problems; the large majority, however, correctly mentioned poor immunity as a consequence of vitamin A deficiency. Around 70% of women knew about the plant-based sources of (pro)vitamin A, but few mentioned animal-source foods.

Key consequences of iron deficiency (such as limited cognitive development, fatigue, and weakness) were mentioned by fewer than 25% of (future) mothers. A large number of women incorrectly believed that iron deficiency was associated with poor immune status (around 85% of women); around 30% thought it limited child growth (around 30%). Similar to what was found for the dietary sources of vitamin A, the majority of women mentioned plant-based sources of iron; only around 30% mentioned meat and very few mentioned fortified products or micronutrient supplements.

Table 5.5. Pregnant Women's Knowledge Regarding Complementary Feeding Practices

	Full sample[a]	Study arms[a]					
		A	B	C	D	E	F
N[b]	**4548**	**748**	**755**	**757**	**740**	**795**	**753**
Reasons for child malnutrition; % who said[c]:							
Insufficient amount of food	73.3	73.3	77.1	73.6	76.4	70.9	68.8
Irregular meals	22.2	20.2	24.0	20.5	23.2	21.8	23.4
Illness	63.8	67.6	61.9	65.9	61.8	65.5	59.8
Early weaning	1.4	1.5	0.8	1.6	1.5	1.3	1.6
Lack of affection during feeds	8.6	7.8	9.1	9.6	9.7	7.8	7.7
Other	1.7	1.7	1.9	1.8	2.2	1.8	0.9
Does not know	2.2	1.9	1.7	1.8	1.6	2.3	4.1
Age of introduction of any liquids other than breast milk; % who said:							
Before 6 months	18.3	18.7	20.5	16.1	17.4	14.0	23.5
At 6 months	53.2	54.4	53.6	54.4	51.9	54.0	50.6
After 6 months	27.8	26.1	25.4	28.5	30.1	31.4	25.0
Does not know	0.7[d]	0.8	0.4	0.9	0.5	0.6	0.9
Age of introduction of any foods other than breast milk; % who said:							
Before 6 months	7.2	6.4	8.3	6.3	7.8	4.9	9.6
At 6 months	56.3	59.1	55.8	56.4	54.7	58.4	53.5
After 6 months	36.2	34.4	35.8	36.6	37.4	36.6	36.3
Does not know	0.3[d]	0.1	0.1	0.7	0.0	0.1	0.7
% who knew … can be introduced at 6 months of age							
Cereals	72.4	74.0	74.0	73.9	70.6	72.3	69.7
Leafy greens	58.6	61.5	58.4	58.8	53.9	60.4	58.7
Papaya or mango	43.3	44.3	42.6	43.1	40.5	45.8	43.6
Meat	27.4	26.4	25.2	28.5	24.9	30.2	28.8
Liver, kidney, or heart	39.2	39.1	37.8	38.2	37.0	43.5	39.5
Fish	24.9	26.9	22.3	25.8	21.0	27.0	26.4
Consequences of vitamin A deficiency among children; % who said[c]:							
Vision problems	1.7	1.6	1.5	0.9	2.8	1.5	2.0
Poor immunity	93.0	93.9	94.3	92.7	91.4	94.5	91.0
Other	15.5	15.2	13.0	15.1	17.4	17.7	14.3
Does not know	2.7	2.1	2.1	2.9	3.1	2.0	3.9

	Full sample[a]	Study arms[a]					
		A	B	C	D	E	F
N[b]	**4548**	**748**	**755**	**757**	**740**	**795**	**753**
Foods perceived as vitamin A rich; % who said[c]:							
Fruits/vegetables (yellow/orange color)	71.7[d]	70.7	75.2	69.2	75.1	72.5	67.5
Green leafy vegetables	71.3	71.3	73.9	69.5	67.0	73.2	72.6
Eggs	17.0	15.8	14.8	17.2	20.5	16.6	17.1
Liver	1.4[d]	0.8	0.5	1.6	2.0	2.1	1.5
Breast milk	1.7	2.8	0.9	1.2	1.9	1.8	1.5
Cow's milk	3.7	3.7	2.3	4.6	5.5	3.0	3.3
Consequences of iron deficiency among children; % who said[c]:							
Reduced ability to learn and do well in school	2.3	1.7	2.3	2.6	2.8	2.5	1.7
Limited development	24.5	22.7	22.4	25.1	28.5	24.3	24.0
Slow growth	29.1	29.5	27.7	29.3	30.7	29.6	27.8
Poor immunity	86.4	87.4	88.1	86.7	83.5	87.5	85.3
Fatigue	16.9	15.6	18.4	15.9	18.5	17.7	15.1
Weakness	23.5	21.8	22.8	23.2	25.0	26.2	21.6
Foods perceived as iron rich; % who said[c]:							
Meat	28.4	26.5	30.3	27.6	27.6	31.7	26.6
Fortified foods for babies	4.5	4.9	3.2	5.0	4.3	4.4	5.0
LNS	0.1	0.0	0.1	0.0	0.3	0.1	0.0
MNP	0.1	0.0	0.0	0.0	0.0	0.4	0.0
Macrovital/chispitas	0.5	0.7	0.4	0.8	0.4	0.3	0.5
CSB	2.0[d]	3.3	2.4	1.5	1.2	2.9	0.7
Green leafy vegetables	83.4	83.2	86.6	85.2	81.8	81.1	82.5
Beans	18.5	18.0	21.2	18.1	18.2	18.4	17.3

[a] Values are mean ± SD or %.
[b] Sample size ranged from N = 4393 to 4549 in the full sample; N = 737 to 748 in the A arm; N = 735 to 755 in the B arm; N = 720 to 757 in the C arm; N = 723 to 740 in the D arm; N = 760 to 795 in the E arm; and N = 717 to 753 in the F arm.
[c] HHs could report more than one response; hence, totals sum to more than 100%.
[d] Study arms differ, $p < 0.05$.

The importance of washing hands in relation to specific events was not well understood. While many pregnant women correctly stated that it was important to wash one's hands before eating (92.2%) or before handling or preparing food (73.9%), the need to wash one's hands before feeding a child or after using the toilet was mentioned by only around 20% and 60% of the respondents, respectively. Fewer than 10% of the women mentioned that hands should be washed after cleaning a child who had defecated. These results are consistent with the low prevalence of using soap reported in Table 4.5.

Nearly 80% of the pregnant women mentioned that proper hygiene practices are required to prevent children from getting worms. It must be noted, however, that one-fifth erroneously believed that certain food-related habits, such as eating more garlic or less sugar, would protect a child from getting worms.

The women in our sample were generally well aware of appropriate methods for treating drinking water; boiling (89.8%) and chlorination (64.4%) were the most commonly mentioned methods.

Table 5.6. Hygiene Knowledge

	Full sample[a]	Study arms[a]					
		A	B	C	D	E	F
N[b]	**4548**	**748**	**755**	**757**	**740**	**795**	**753**
Appropriate time for hand washing; % who said[c]:							
Before eating	92.2	92.1	92.2	90.8	92.7	92.7	93.0
After using the toilet	59.1	59.4	59.6	60.6	61.5	61.1	52.3
Before feeding a child	21.9	21.0	21.2	20.7	23.4	22.9	22.0
After cleaning a child who defecated	8.7[d]	9.1	9.9	7.4	12.8	8.2	4.6
Before handling or preparing food	73.9[d]	74.3	74.2	71.9	79.5	73.6	70.1
Appropriate hand washing products; % who said[c]:							
Soap (any)	98.7	98.4	98.5	98.9	99.2	98.5	98.5
Chlorine	13.7	13.4	12.8	10.6	15.9	14.6	14.7
Ash	6.1	7.4	5.4	7.5	5.9	5.7	4.9
Appropriate worm-protection methods for children; % who said:							
Proper hygiene (food, personal hygiene, etc.)	78.2	80.9	80.5	74.8	80.1	75.8	77.0
Food-related habits (eat more garlic, less sugar, etc.)	21.3	22.9	19.2	20.3	21.9	23.0	20.3
Appropriate purification methods for drinking water; % who said[c]:							
Boiling	89.8	92.5	91.4	89.8	88.9	88.2	88.3
Chlorination	64.4	61.1	58.9	64.7	70.0	66.5	65.3
Solar water disinfection	3.1	4.8	2.5	2.8	2.8	2.8	3.2
Iodine	0.2	0.0	0.3	0.3	0.1	0.1	0.1
Filter water	16.6	15.6	15.5	14.5	15.1	20.5	17.9
Better to give liquids to a child over 6 months old in a bottle or a cup; % who said:							
Bottle	32.9	40.4	38.6	34.6	35.3	30.4	18.2
Cup	66.8	59.5	61.4	64.7	64.5	69.3	81.4
Does not know	0.3[d]	0.1	0.0	0.7	0.1	0.3	0.4

[a] Values are mean ± SD or %.
[b] Sample size ranged from N = 4545 to 4548 in the full sample; N = 753 to 755 in the B arm; and N = 739 to 740 in the D arm.
[c] HHs could report more than one response; hence, totals sum to more than 100%.
[d] Study arms differ, $p < 0.05$.

5.3 Prenatal Health Care Practices of Pregnant Women

Women were on average 22.5 weeks pregnant at the time of enrollment in the study cohort and a majority reported having received prenatal care (86.0%). Prenatal care was mostly received from medical doctors or nurses (both around 45.0%) and trained midwives (27.6%). The average number of prenatal care visits with health care professionals was 2.4 at the time of enrollment. Even though approximately 80% of the women complied with the recommended number of visits for their gestational age, women's first prenatal

care visit was on average at 3.2 months, which is a little later than what is recommended by Guatemala's MOH (i.e., before 12 weeks of pregnancy). Prenatal care was mostly sought from public providers.

Although the use of prenatal services is common among this population, the quality of the care received could be improved. At prenatal visits, most women reportedly had their weight (87.5%) and blood pressure (80.5%) taken, and about 70% of the women reported having their fundal height measured. However, only around one-third had their height taken, fewer than 25% had received the tetanus vaccine or had a urine test, and an even smaller minority (10.2%) had blood drawn for a blood test.

Virtually all women were told where to seek help in case of pregnancy complications, but only about 60% were reportedly told how to identify pregnancy danger signs.

Around 60% of women reported having taken either iron and folic acid supplements or prenatal supplements; they had taken these supplements for on average 1.1 months, or about half of the time since their first prenatal visit. LNS and MNP were used in the D and E arms by 18.7% and 9.7% of the pregnant women, respectively. The duration of supplement use was also around 1 month. Even when conditioned on being a PROCOMIDA beneficiary (i.e., limiting the analyses to PROCOMIDA beneficiaries; see Section 5.6), the proportion of pregnant women using these supplements was found to be relatively low (51.9 % for LNS and 34.1% for MNP- data not shown). LNS and MNP increased the proportion of pregnant women taking supplements by about 5 and 3 percentage points in the LNS and MNP arms, respectively.

Alarmingly, more than 5% of the pregnant women interviewed reportedly experienced night blindness. This level exceeds the 5% mark established by WHO as representing a public health problem. Our finding is consistent with the 2009 WHO report finding vitamin A deficiency to be a public health problem in Guatemala among pregnant women (WHO 2009).

Table 5.7. Use of Prenatal Care Services among Pregnant Women

	Full sample[a]	Study arms[a]					
		A	B	C	D	E	F
N[b]	**4548**	**748**	**755**	**757**	**740**	**795**	**753**
Number of months pregnant according to self-reported last period date	22.5 ± 5.7[d]	22.9 ± 5.5	22.3 ± 5.6	22.6 ± 5.9	23.1 ± 5.8	22.4 ± 5.7	21.9 ± 5.9
Received any prenatal care; % yes	86.0[d]	82.8	89.8	86.9	88.0	84.0	84.7
Had prenatal care; % who consulted[c]:							
Doctor	45.8	44.0	40.8	43.3	53.0	48.4	45.6
Nurse	44.6[d]	42.8	53.9	48.1	40.9	39.1	42.7
Medical assistant/nurse assistant	1.5[d]	1.1	1.5	2.0	2.7	0.6	1.5
Trained midwife	27.6	24.1	25.2	27.5	29.4	29.8	29.7
Untrained traditional midwife	1.7	1.6	1.3	2.1	2.0	1.1	2.3
Total number of visits	2.4 ± 2.3	2.2 ± 2.2	2.2 ± 1.8	2.5 ± 2.4	2.7 ± 2.5	2.4 ± 2.4	2.4 ± 2.3
Prenatal care visits with trained professional							
% who complied with recommended number for gestational age	79.2	74.8	82.7	80.2	80.3	78.2	78.6
Month of pregnancy at first visit	3.2 ± 1.5	3.4 ± 1.4	3.2 ± 1.5	3.2 ± 1.4	3.2 ± 1.5	3.2 ± 1.4	3.1 ± 1.4

	Full sample[a]	Study arms[a]					
		A	B	C	D	E	F
N[b]	**4548**	**748**	**755**	**757**	**740**	**795**	**753**
Final prenatal care visit; % who went to:							
Public provider	92.2	92.7	91.7	93.5	90.8	92.2	92.0
Private provider	3.1	2.4	2.1	2.1	5.8	3.3	3.0
Private house/home	3.6	4.4	3.7	3.2	2.5	4.3	3.8
Prenatal services provided; % who:							
Received tetanus vaccination	20.9[d]	20.1	27.4	23.5	21.6	17.2	15.7
Had weight taken	87.5	88.3	87.2	92.1	83.8	88.9	84.6
Had height taken	31.5	32.9	29.0	33.5	32.2	29.6	31.7
Measured fundal height	71.2	74.1	72.1	69.7	73.3	69.7	68.6
Had blood pressure taken	80.5	81.4	81.9	81.2	78.6	79.4	80.6
Gave a urine sample	23.7	19.9	22.5	26.7	26.3	22.3	24.3
Gave a blood sample	10.2[d]	11.9	9.5	12.4	10.5	6.7	10.7
Pregnancy complications; % who were told:							
How to detect signs	59.5	58.0	65.9	61.6	58.8	59.4	52.8
Where to seek help if complications arose	94.9	93.7	95.4	95.3	95.6	95.1	94.2
Supplementation							
Iron							
% who took …	63.4	63.7	60.8	66.4	62.7	63.8	62.7
Duration (months)	1.1 ± 1.2	1.1 ± 1.3	1.1 ± 1.2	1.2 ± 1.3	1.2 ± 1.3	1.1 ± 1.2	1.1 ± 1.2
Folic acid							
% who took …	59.0	59.2	58.4	61.7	62.0	57.6	54.9
Duration (months)	1.1 ± 1.2	1.1 ± 1.2	1.1 ± 1.2	1.2 ± 1.2	1.2 ± 1.3	1.1 ± 1.2	1.1 ± 1.2
MNP							
% who took …	2.0[d]	0.3	0.0	0.4	1.4	9.7	0.1
Duration (months)	0.9 ± 1.1[d]	0.5 ± 0.7	***n/a***	0.5 ± 0.7	1.4 ± 2.1	0.9 ± 1.0	0.0
LNS							
% who took …	3.2[d]	0.5	0.0	0.1	18.7	0.4	0.1
Duration (months)	1.0 ± 1.1[d]	0.8 ± 0.5	***n/a***	5.0	0.9 ± 1.0	3.3 ± 0.6	2.0
Prenatal vitamins							
% who took …	10.3	10.1	10.1	9.2	11.9	11.6	8.6
Duration (months)	1.1 ± 1.2	1.0 ± 1.2	1.3 ± 1.3	1.3 ± 1.1	1.2 ± 1.3	1.0 ± 1.0	1.2 ± 1.5
Took either iron and folic acid or prenatal vitamins	58.8	58.0	56.4	60.9	62.3	59.7	55.6
Took either iron and folic acid, prenatal vitamins, or LNS or MNP	60.2	58.0	56.4	61.0	67.5	62.4	55.7
Experienced night blindness	5.5	5.1	4.4	4.4	6.9	5.2	7.0

[a] Values are mean ± SD or %.
[b] Sample size ranged from N = 91 to 4548 in the full sample; N = 2 to 748 in the A arm; N = 0 to 755 in the B arm; N = 1 to 757 in the C arm; N = 10 to 740 in the D arm; N = 3 to 795 in the E arm; and N = 1 to 753 in the F arm.
[c] HHs could report more than one response; hence, totals sum to more than 100%.
[d] Study arms differ, $p < 0.05$.

Around 70% of the pregnant women reported planning to give birth at home, and a large majority of these women expected a trained midwife to attend the birth.

Table 5.8. Planned Birth

	Full sample[a]	Study arms[a]					
		A	B	C	D	E	F
N	**4546**	**747**	**755**	**757**	**740**	**794**	**753**
Birth location							
Public provider	28.1	27.0	25.4	33.4	36.1	20.0	27.0
Private provider	0.5	0.3	0.0	0.8	0.7	0.9	0.3
House/home	70.0	71.8	74.6	63.8	62.7	77.0	69.9
Personnel attending birth							
Doctor	26.2	25.3	23.8	31.6	34.1	18.3	24.8
Nurse	0.4	0.4	0.4	0.4	0.4	0.4	0.3
Trained midwife	67.9	65.9	71.9	61.4	61.2	75.7	70.8
Traditional midwife	0.5	0.8	0.4	0.3	0.1	0.5	0.7
Community health worker/ promoter	1.1	1.5	0.3	2.5	0.4	1.3	0.7
Family member	2.2	4.6	2.5	1.6	2.2	1.5	1.2
Other	0.5	0.4	0.1	0.8	0.4	1.0	0.1

[a] Values are %.

5.4 Mental Health

Self-reported stress was relatively common among pregnant women included in the survey. Approximately half of the respondents scored above 7 on the SRQ-20 assessment, which indicates that these women were likely experiencing severe mental distress.[27]

Table 5.9. Mental Health

	Full sample[a]	Study arms[a]					
		A	B	C	D	E	F
N	**4548**	**748**	**755**	**757**	**740**	**795**	**753**
SRQ-20 scale (Range: 0 to 20)	8.5 ± 5.9[b]	8.2 ± 5.9	8.1 ± 5.7	8.3 ± 5.8	8.2 ± 5.8	9.2 ± 5.9	9.0 ± 6.0
% scoring 8 or higher on SRQ-20, indicating severe mental distress	52.3[b]	49.3	48.2	51.7	50.4	56.7	57.3

[a] Values are mean ± SD or %.
[b] Study arms differ, $p < 0.05$.

[27] Poor mental health of caregivers might adversely affect their caregiving practices and hence their child's nutrition, health, and development.

5.5 Anthropometry

On average, pregnant women weighed 54.5 kg and were 146.8 cm tall. One of three women was less than 145 cm tall, which is a marker for obstetrical risk. Surprisingly, average body weight of women in the third trimester was only about 2.6 kg higher than that of women in the second trimester, even though the difference in gestational age between both groups was on average 10 weeks. The U.S. Institute of Medicine recommends a second and third trimester weight gain of 454 g per week for women with a normal pre-pregnancy BMI (i.e., BMI between 18.5 and 24.9), 272 g per week for overweight women (BMI between 25.0 and 29.9) and 227 g per week for obese women (BMI > 30) (Rasmussen and Yaktine 2009). Using the prevalence of overweight and obesity observed in the PROCOMIDA baseline survey (Richter 2011, we would expect an average weight gain of 371 g/week, considerably higher than the estimated 260 g per week observed here.

Table 5.10. Anthropometric Status

	Full sample[a]	Study arms[a]					
		A	B	C	D	E	F
N[b]	**4547**	**748**	**755**	**757**	**739**	**795**	**753**
Adjusted weight (kg)[c]							
All women	54.5 ± 7.3	54.6 ± 7.0	54.7 ± 7.1	54.8 ± 7.4	54.8 ± 7.9	53.9 ± 6.9	54.0 ± 7.6
Second trimester	53.9 ± 7.2	54.2 ± 7.1	54.2 ± 7.0	54.3 ± 7.3	54.3 ± 7.9	53.3 ± 6.8	53.4 ± 7.5
Third trimester	56.5 ± 7.2	56.1 ± 6.3	56.5 ± 7.2	56.9 ± 7.5	56.5 ± 7.7	56.4 ± 7.0	56.6 ± 7.4
Height (cm)	146.8 ± 4.8	146.9 ± 4.7	147.0 ± 4.6	147.0 ± 4.7	146.7 ± 4.8	146.9 ± 4.7	146.5 ± 5.5
% < 145 cm	33.9	35.3	30.5	34.2	35.1	33.1	35.6

[a] Values are mean ± SD or %.
[b] Sample size ranged from N = 935 to 4547 in the full sample; N = 159 to 748 in the A arm; N = 152 to 755 in the B arm; N = 167 to 757 in the C arm; N = 165 to 739 in the D arm; N = 158 to 795 in the E arm; and N = 134 to 753 in the F arm.
[c] Weight was adjusted to take into account the weight of the women's clothes.

5.6 Participation in PROCOMIDA

Between 28.0% and 36.1% of pregnant women reported participating in the PROCOMIDA program, with the highest participation rates found in arms A and D. Note that Table 4.16 reports on any HH member's participation in PROCOMIDA. The lower percentage here could be due to the fact that women did not correctly identify themselves as beneficiaries (even if they were actual program beneficiaries) or erroneously believed they could not be a beneficiary if another HH member (possibly their own child under 2 years of age) was already in the program.

A key finding is that the percentage of pregnant women enrolled in the program at the time of the interview was low. Even though the proportion of pregnant women enrolled in PROCOMIDA increased with gestational age, it was still only about 39% in women in the intervention arms in the third trimester of pregnancy. The low enrollment rate during pregnancy might limit the potential impact of the program on maternal and child outcomes. Finally, enrollment appears to be higher in arms A and D. Whether this difference will continue in the study cohort over time and whether it is programmatically relevant will be studied in the subsequent surveys.

The main reasons given for non-participation were that women did not want to comply with required program duties (19.9%) or that they lacked the necessary information (13.8%). Around 5% of the non-

participating pregnant women mentioned that the voluntary contribution was too high or that they did not want to participate in the BCC sessions.

Food distributions and BCC sessions appear to be organized monthly as planned: The average reported time since receiving the last rations and participating in the last BCC session among PROCOMIDA beneficiaries was well below 1 month. As would be expected, the specific foods and micronutrients beneficiaries received corresponded with the treatment assignment of the HH's CC. Since the micronutrient supplements (MNP and LNS) were not available when PROCOMIDA implementation started, beneficiary HHs in arms D and E received CSB as the individual ration for the first months. This explains the relatively high percentage of HHs that reported having received CSB.[28] Finally, the proportion of PROCOMIDA beneficiary women consuming LNS and MNP (see Section 5.3) was close to the proportion who reported having received them.

Table 5.11. PROCOMIDA Program Participation

	Full sample[a]	Study arms[a]					
		A	B	C	D	E	F
N[b]	**4548**	**748**	**755**	**757**	**740**	**795**	**753**
Participation in PROCOMIDA							
All women	26.6[c]	35.4	31.5	28.0	36.1	28.1	0.4
Second trimester	24.8[c]	32.7	30.6	26.4	33.9	25.8	0.3
Third trimester	33.3[c]	44.0	34.9	34.1	43.6	36.7	0.7
Reasons for not participating							
Voluntary contribution too high	5.4[c]	5.6	7.7	4.0	5.9	10.8	0.1
Do not need the food rations	3.3[c]	5.2	4.6	3.5	4.2	4.0	0.0
Do not want to go to BCC sessions	6.3[c]	5.8	9.5	6.4	8.3	9.4	0.7
Do not want to fulfill other duties	19.9[c]	25.9	26.1	23.3	26.3	24.8	1.5
PROCOMIDA not in community	22.7[c]	3.3	2.7	5.7	4.0	3.3	88.0
Lack of information, not familiar with program	13.8[c]	13.0	12.4	21.1	15.7	14.5	8.3
Graduated or dropped out	4.1[c]	4.8	6.6	4.2	7.2	4.0	0.1
Other	19.1[c]	22.9	21.5	22.7	20.0	25.9	1.5
Reason unknown	2.4[c]	3.9	4.4	2.6	3.0	1.6	0.3
Months since last … received[d]							
Food ration	0.3 ± 0.7[c]	0.2 ± 0.5	0.2 ± 0.8	0.3 ± 0.8	0.2 ± 0.5	0.4 ± 0.7	
BCC	0.3 ± 0.8	0.3 ± 0.7	0.2 ± 0.8	0.4 ± 0.9	0.3 ± 0.6	0.5 ± 1.1	
Has received (%)[d]:							
Beans	82.3[c]	97.4	97.9	9.0	98.1	98.7	
Rice	82.5[c]	98.1	99.2	8.0	97.8	98.7	

[28] The E arm received CSB for a longer time than the D arm. This explains the higher proportion reporting having received CSB from PROCOMIDA.

	Full sample[a]	Study arms[a]					
		A	B	C	D	E	F
N[b]	**4548**	**748**	**755**	**757**	**740**	**795**	**753**
Oil	53.8[c]	70.2	44.5	7.5	64.0	75.8	
CSB	64.1[c]	97.0	96.6	96.2	7.5	27.4	
MNP mother	8.0[c]	0.4	0.0	0.5	4.1	37.7	
MNP child	6.6	0.0	0.0	0.5	2.2	32.3	
LNS mother	12.9[c]	0.8	0.0	0.5	55.8	1.3	
LNS child	5.8[c]	0.0	0.0	0.0	25.8	0.4	

[a] Values are mean ± SD or %.
[b] Sample size ranged from N = 935 to 4548 in the full sample; N = 159 to 748 in the A arm; N = 152 to 755 in the B arm; N = 167 to 757 in the C arm; N = 165 to 740 in the D arm; N = 158 to 795 in the E arm; and N = 0 to 753 in the F arm.
[c] Study arms differ, $p < 0.05$
[d] Analyses limited to PROCOMIDA beneficiaries

5.7 Summary of Pregnant Women Characteristics

Pregnant women had low levels of education, and only about half were literate. Their decision-making power differed across decision-making domains: Issues with respect to children were mostly jointly decided with their partner, the decision to work and for the pregnant woman to use birth control was roughly equally split among the three most common decision-making scenarios (the pregnant woman alone, her partner alone, or a joint decision), and women mostly controlled their own earnings. Only a minority owned assets that they could sell or had money that they could spend autonomously.

Pregnant women had limited child health and nutrition knowledge; in line with this limited knowledge, we found inadequate hand washing practices. The use of at least some prenatal services was common among this population, and about 80% of women complied with the recommended number of visits for their gestational age. Prenatal visits mostly consisted of evaluating the pregnant woman's weight, blood pressure, and fundal height; tetanus vaccinations and blood and urine tests were uncommon. About 60% of pregnant women took either iron or folic acid or prenatal supplements and they had taken these for about half the time since their first prenatal visit. Alarmingly, more than 5% of the pregnant women experienced night blindness. Based on the SRQ-20 assessment, approximately 50% of the pregnant women were found to be experiencing mental distress.

One-third of the women measured less than 145 cm tall, which is a marker for obstetrical risk. The estimated weight gain during the second and third trimester of pregnancy appeared to be considerably lower than the weight gain recommended by the U.S. Institute of Medicine.

The percentage of pregnant women who were PROCOMIDA beneficiaries was low. Even though the proportion enrolled increased with gestational age, it was still only about 39% in women in the third trimester of pregnancy.

The statistically significant differences did not reveal any systematic differences between study groups. As would be expected, variables directly associated with PROCOMIDA were significantly different between groups.

6 Results: Child Nutritional Status

Around one-fifth of the pregnant women had a child between 12 and 24 months of age whose height and weight were measured in the survey. The average age of the children was 19.4 months, and approximately half were boys.

At 66.0%, the prevalence of stunting among these children was very high, regardless of age group: The prevalence of stunting was very high among the youngest children (58.1% among children 12–14 months old), but it was even higher among older children and reached 70.0% among those 22–24 months old (Figure 6.1). LAZ followed a similar pattern, reaching a low of approximately −2.5 among children 22–24 months (Figure 6.2).

Mean WLZ was close to 0 for all age groups; consequently, the prevalence of wasting was very low. Weight-for-age reflects body mass relative to chronological age and is influenced by both the length of the child and his or her weight, The prevalence of being underweight thus fell between the prevalence of stunting and wasting. As is commonly found, girls 12–23 months old had considerably higher LAZ than boys 12–23 months old.

Table 6.1. Anthropometric Measurements of All Children (12–23 Months) of Pregnant Women

	Full sample[a]	Study arms[a]					
		A	B	C	D	E	F
N[b]	**765**	**139**	**124**	**129**	**111**	**136**	**126**
Age (months)	19.3 ± 3.1	19.2 ± 3.0	19.0 ± 3.1	19.6 ± 3.3	19.6 ± 3.1	19.4 ± 3.0	19.2 ± 3.0
Gender (% male)	48.6	46.0	43.5	50.4	52.3	47.8	52.4
LAZ	−2.4 ± 1.0	−2.3 ± 1.0	−2.3 ± 0.9	−2.4 ± 0.9	−2.6 ± 1.0	−2.2 ± 0.9	−2.4 ± 1.0
% stunted (LAZ < −2)	66.3[c]	62.6	63.7	66.7	79.3	61.0	66.7
WLZ	0.1 ± 0.9	−0.1 ± 0.9	0.1 ± 0.9	0.1 ± 1.0	0.3 ± 0.8	0.1 ± 0.9	0.1 ± 0.9
% wasted (WLZ < −2)	1.3[c]	1.4	0.8	0.8	0.0	2.9	1.6
WAZ	−1.1 ± 0.9	−1.2 ± 0.8	−1.1 ± 0.9	−1.1 ± 1.0	−1.1 ± 0.8	−1.0 ± 0.9	−1.1 ± 1.0
% underweight (WAZ < −2)	14.9	15.8	17.7	15.6	10.8	12.5	16.7

[a] Values are mean ± SD or %.
[b] Sample size ranged from N = 764 to 765 in the full sample; N = 128 to 129 in the C arm.
[c] Study arms differ, p < 0.05.

Table 6.2. Anthropometric Measurements of Male Children (12–23 Months) of Pregnant Women

	Full sample[a]	Study arms[a]					
		A	B	C	D	E	F
N	**372**	**64**	**54**	**65**	**58**	**65**	**66**
Age (months)	19.6 ± 3.0	19.4 ± 3.0	19.4 ± 3.2	19.6 ± 3.2	20.0 ± 2.9	19.4 ± 3.0	19.5 ± 2.8
LAZ	−2.5 ± 1.0[b]	−2.4 ± 1.0	−2.3 ± 0.9	−2.4 ± 1.0	−2.8 ± 0.9	−2.3 ± 0.9	−2.5 ± 0.9
% stunted (LAZ < −2)	68.8[b]	65.6	61.1	66.2	86.2	61.5	72.7
WLZ	0.1 ± 0.9	0.0 ± 0.8	0.2 ± 0.9	0.0 ± 0.8	0.2 ± 0.8	−0.1 ± 0.9	0.0 ± 0.9
% wasted (WLZ < −2)	1.1	0.0	0.0	1.6	0.0	3.1	1.5
WAZ	−1.2 ± 0.9	−1.2 ± 0.8	−0.9 ± 0.9	−1.2 ± 1.0	−1.2 ± 0.8	−1.2 ± 0.9	−1.2 ± 0.8
% underweight (WAZ < −2)	15.1	14.1	11.1	17.2	13.8	20.0	13.6

[a] Values are mean ± SD or %.
[b] Study arms differ, p < 0.05.

Table 6.3. Anthropometric Measurements of Female Children (12–23 Months) of Pregnant Women

	Full sample[a]	Study arms[a]					
		A	B	C	D	E	F
N	**393**	**75**	**70**	**64**	**53**	**71**	**60**
Age (months)	19.1 ± 3.2	19.1 ± 3.0	18.8 ± 3.1	19.5 ± 3.4	19.2 ± 3.3	19.4 ± 3.1	19.0 ± 3.2
LAZ	−2.3 ± 1.0	−2.2 ± 1.0	−2.4 ± 0.9	−2.4 ± 0.9	−2.3 ± 1.0	−2.1 ± 0.9	−2.3 ± 1.1
% stunted (LAZ < −2)	63.9	60.0	65.7	67.2	71.7	60.6	60.0
WLZ	0.1 ± 0.9[b]	−0.2 ± 0.9	0.0 ± 0.8	0.2 ± 1.1	0.3 ± 0.8	0.2 ± 0.9	0.1 ± 1.0
% wasted (WLZ < −2)	1.5	2.7	1.4	0.0	0.0	2.8	1.7
WAZ	−1.1 ± 0.9	−1.2 ± 0.9	−1.2 ± 0.9	−1.1 ± 1.0	−0.9 ± 0.8	−0.9 ± 0.8	−1.0 ± 1.1
% underweight (WAZ < −2)	14.8[b]	17.3	22.9	14.1	7.5	5.6	20.0

[a] Values are mean ± SD or %.
[b] Study arms differ, p < 0.05.

Figure 6.1. Prevalence of Stunting, Underweight, and Wasting, by Age

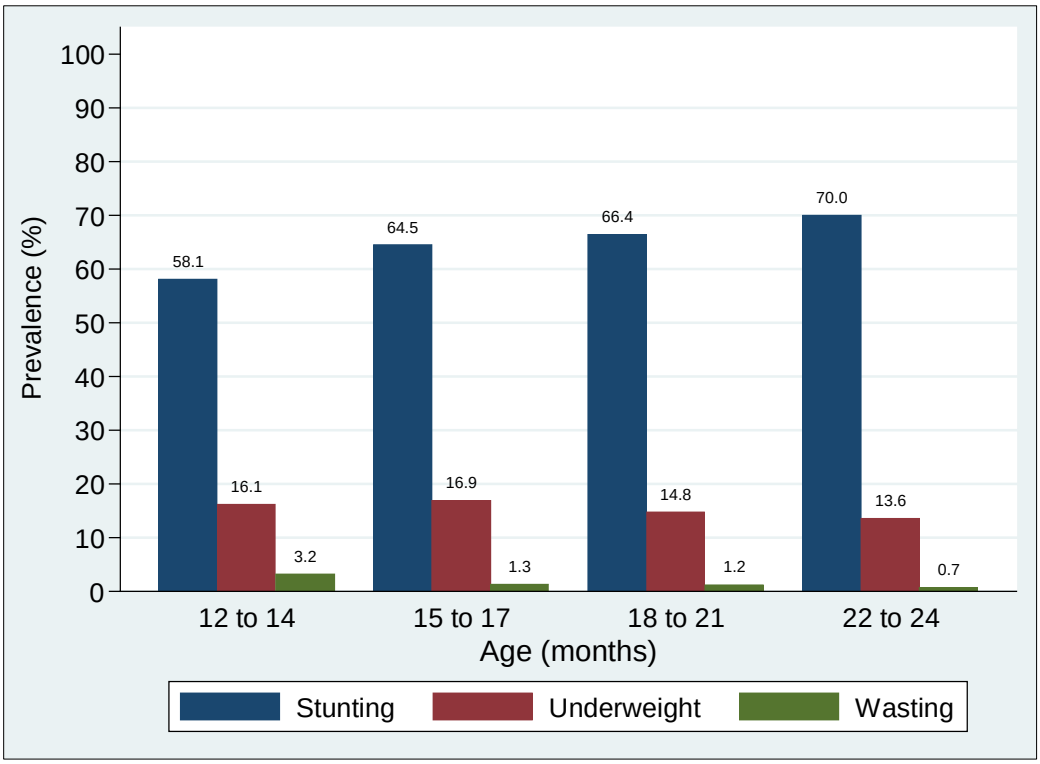
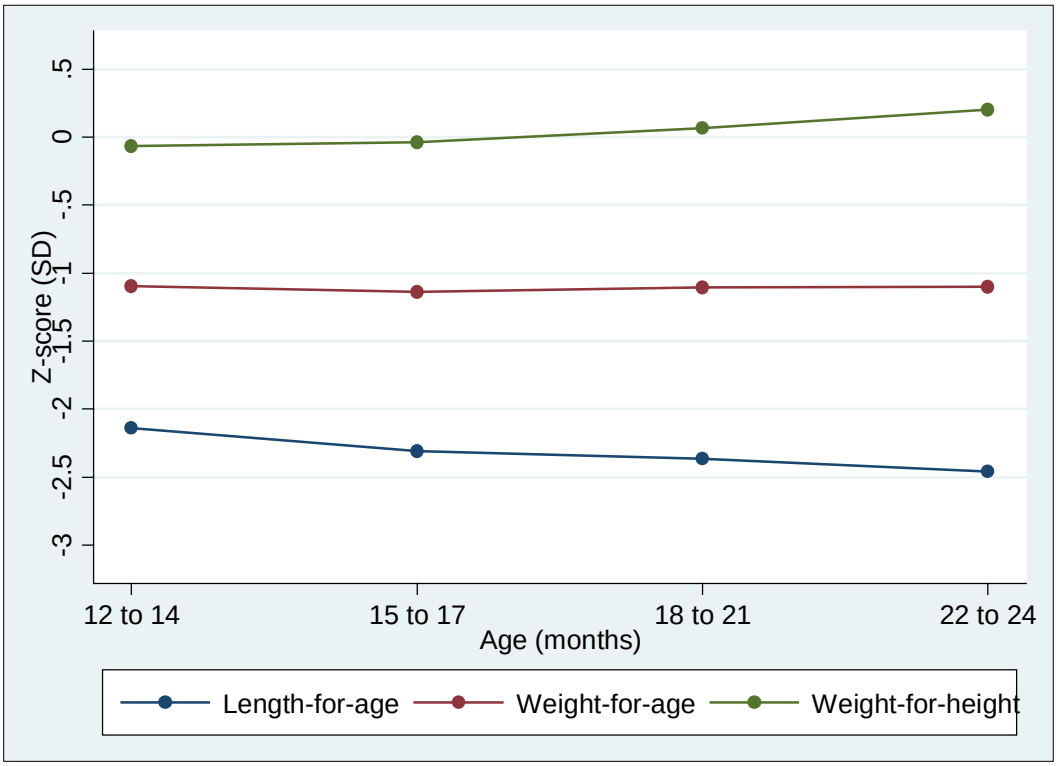


Figure 6.2. Mean Z-Scores for Length-for-Age, Weight-for-Age, and Weight-for-Height



7 Differences between Study Arms

The only meaningful statistical differences between study arms were directly related to the PROCOMIDA program. None of the statistically significant differences found between the study groups appears to indicate that the study groups are different.

8 Summary of Key Findings

8.1 Community Characteristics

The study communities were found to be isolated and to have limited access to basic services. Only around half were connected to the electricity network and very few had a telephone landline. Most had access to mobile phone service, but the lack of access to electricity made charging mobile phones a challenge. Given the poor condition of the roads, regular cars could not access the communities for 5 months each year. Only a minority of communities reported having access to tap water. Most communities reported that their living conditions had improved over the last 5 years.

Nearly all communities grew corn and beans; malanga, yucca, and chilies were grown in more than half of the communities. Common fruits, trees, and permanent crops were bananas, cardamom, coffee, and oranges. The community associations, cooperatives, or other types of groups focused on activities related to health, education, local government, and culture. Communities reported having received assistance from on average 2.5 development programs in the last 5 years.

Access to primary schools was generally good, while access to secondary schools was limited. Around half of the communities had a local CC and most other communities had a CC within a distance of no more than 5 km. Health centers (the second tier in the Guatemalan public health system) were more distant, with three-quarters of the communities having to travel more than 11 km to reach the nearest center. Residents of almost all communities had to travel more than 11 km to the nearest hospital.

8.2 CC Characteristics

The CCs were generally found to comply with the MOH requirements for staffing and provision of services to pregnant women, women postpartum, and young children. The quality of many of the services provided appears inadequate, as many of the CCs do not follow the norms set forth by the MOH. An important problem is that many of the CCs lacked essential equipment, supplies, medicines, and vaccines.

8.3 Household Characteristics and Food Security

Only around half of the HH heads had formal education; fewer than half spoke Spanish. They predominantly worked in agriculture.

Living conditions were found to be poor: houses were generally small and constructed with low-quality materials; only one-fourth of HHs had access to electricity. The most common sources of drinking water were rainwater and surface water. One-fifth of the HHs were classified as experiencing moderate or severe hunger. Around 80% of all HHs reported having experienced an economic shock in the past 12 months. The most common shocks related to losing animals, crop losses, and disease of or injury to a HH member. Shocks were perceived by the respondents as having had large negative effects on the HH.

Most HHs used a toilet or latrine. Even though many households had soap and reported having used it the day preceding the survey, the use of soap was inadequate: Only 10% of pregnant women reported washing their hands with soap after defecating.

Just under two-thirds of HHs participated in at least one social, health, or nutrition program. An estimated 37.5% of HHs in study arms A through E reported that they participated in PROCOMIDA.

8.4 Characteristics and Status of the Pregnant Women

Compared to the HH head, the level of education of pregnant women was somewhat higher, but still low. Fewer than one-quarter reported speaking Spanish (as compared to about half of the HH heads) and only about half of the women were literate.

Pregnant women's decision-making power differed across decision-making domains. Women mostly controlled their own earnings. Issues with respect to children were mostly jointly decided. The decision to work and for the women to use birth control was roughly equally split among the three most common decision-making scenarios: decision by the woman alone, decision by her partner alone, and a joint decision.

Women were unlikely to own high-value assets (such as land, a house, jewelry, and livestock) they could sell.

8.5 Maternal Knowledge

Women's knowledge with respect to maternal and child feeding, care, and health was limited. Only about half of the pregnant women mentioned vaginal bleeding as a danger sign of pregnancy and 40.0% mentioned severe headaches or blurred vision. Other danger signs requiring immediate medical attention were mentioned by 20% or fewer of the pregnant women. Knowledge of dangers signs in childhood illness was equally low. Even though almost all women mentioned fever, bloody stools were mentioned by only one-fifth of the women and all other dangers signs (such as difficulty breathing) by 10% or fewer. The majority of pregnant women knew about ORS, but almost 30% believed that a sick child should be breastfed less.

Around 80% of the pregnant women knew that a baby should be breastfed immediately or very soon after birth and that a baby should be fed colostrum. When asked about the benefits of exclusive breastfeeding, the majority of pregnant women mentioned nutrition and health benefits for the child, but very few mentioned lactational amenorrhea. The large majority of pregnant women erroneously thought that they would need to stop breastfeeding should they become pregnant again within 6 months of giving birth.

Only around half of the women knew the appropriate age for the introduction of solid foods and liquids other than breast milk. Fewer than half of the women knew that micronutrient-dense foods (such as papaya and mango, meat, fish, and organs) should be introduced at 6 months of age. Very few pregnant women knew that animal-source foods are good sources of iron and vitamin A.

The importance of washing hands in relation to specific events was not well understood. The limited handwashing knowledge is consistent with the limited use of soap reported above.

8.6 Prenatal Care Utilization

The majority of pregnant women reported having received prenatal care and around 80% complied with the recommended number of visits.

The quality of services, however, appeared to be low. The majority of women reported having their weight, blood pressure, and fundal height taken but height measurements, tetanus immunizations, and urine and blood tests were uncommon. These findings are consistent with what was found in the CC survey.

Around 60% of pregnant women took iron and folic acid supplements and had done so for about half of the time since their first prenatal visit. Alarmingly, more than 5% of the pregnant women interviewed reportedly experienced night blindness.

8.7 Maternal Health and Anthropometry

Approximately half of the pregnant women scored above the cutoff of 7 on the stress scale, indicating possible severe mental distress. A third of the women were "short," i.e., less than 145 cm tall and the estimated gestational weight gain was considerably lower than expected.

8.8 Child Nutritional Status

Child stunting was found to be excessively high, with 66.0% of the children 12–24 months old being stunted. The prevalence of stunting was very high among the youngest children in the sample (58.1% among children 12–14 months old) and reached 70% among those 22–24 months old. As has been seen in many low-income countries, the prevalence of stunting was considerably higher in boys than in girls, which is thought to be due to boys being biologically weaker and thus more susceptible to infections and other insults that negatively affect growth (Wamani et al. 2007). The prevalence of wasting was very low.

8.9 Differences between Study Groups

The study groups appear to be well balanced. The only meaningful systematic statistical differences between study arms were directly related to the PROCOMIDA program.

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Appendix A. PROCOMIDA Ration Sizes

The original family ration sizes are shown in Table A.1. These family rations sizes were distributed between June 2010 and June 2011. PROCOMIDA noticed that the ration sizes were too large given the beneficiary family size; the majority of families could not consume all the commodities in 1 month and there was concern that beneficiaries would start to sell the commodities. In July 2011, the ration sizes were decreased. Therefore, at the start of the enrollment survey (August 2011), pregnant women were already receiving the reduced ration sizes, but they could have been exposed to the original family ration size in previous months. The individual ration size was not altered.

Table A.1. Nutrient Composition of LNS and MNP Supplements

		LNS		MNP	
	Unit	**Child**	**Mother**	**Child**	**Mother**
Daily dose	g	20 g (two 10 g sachets)	20 g (1 sachet)	4 g (two 2 g sachets)	4 g (two 2 g sachets)
Energy	kcal	118	118	–	–
Proteins	g	2.6	2.6	–	–
Fat	g	9.6	10	–	–
Linoleic acid	g	4.46	4.6	–	–
α-Linolenic acid	g	0.58	0.6	–	–
Calcium	mg	280	280	280	280
Copper	mg	0.34	4	0.34	4
Folic Acid	µg	150	400	150	400
Iodine	µg	90	250	90	250
Iron	mg	9	20	9	20
Magnesium	mg	40	65	40	65
Manganese	mg	1.2	2.6	1.2	2.6
Niacin	mg	6	36	6	36
Pantothenic acid (B5)	mg	2	7	2	7
Phosphorus	mg	190	190	190	190
Potassium	mg	200	200	200	200
Riboflavin (B2)	mg	0.5	2.8	0.5	2.8
Selenium	µg	20	130	20	130
Thiamine (B1)	mg	0.5	2.8	0.5	2.8
Vitamin A	µg	400	800	400	800
Vitamin B12	µg	0.9	5.2	0.9	5.2
Vitamin B6	mg	0.5	3.8	0.5	3.8
Vitamin C	mg	30	100	30	100
Vitamin D	mg	5	10	5	10
Vitamin E	mg	6	20	6	20
Vitamin K	mg	30	45	30	45
Zinc	mg	8	30	8	30

Table A.2. Monthly Ration Size for the PROCOMIDA Beneficiary Population

Foods	Full family food ration (Groups A, C, D, and E)		Reduced family food ration (Group B)	
	Weight (kg)	Energy (kcal)	Weight (kg)	Energy (kcal)
Rice	12.0	43,800	7.0	25,550
Pinto beans	6.0	20,400	3.0	10,200
Vegetable oil	3.7	28,884	1.8	14,364
Total	**21.7**	**93,084**	**11.8**	**50,114**
Total kcal/capita/day[b]		445[c]		239[c]

[a] For the first year of distribution, these family food ration sizes were used. In Year 2, they were reduced by roughly half (see Table 2.2).
[b] Total kcal/capita/day is derived using an average HH size of 6.88 members and 30.42 days/month.
[c] Note that the individual ration is not meant to be shared, so we do not include it in the computation of the total energy/capita/day. If it was shared, it would provide an additional 71 kcal/capita/day, and the total full family food ration would therefore provide 516 kcal/capita/day and the reduced family food ration would provide 310 kcal/capita/day/.

Table A.3. List of Study CCs, the Municipality They Are Located in, and the Study Group They Were Assigned to

	CC	Municipality	Study group
1	Camcal	Cobán	A
2	Saquiha	Cahabon	A
3	Cerro Verde	Cobán	A
4	Corozal	Cobán	A
5	San Isidro	Cobán	A
6	San Pedro Canau	Cobán	A
7	Saacte	Cobán	A
8	San Vicente Chicatal	San Pedro Carchá	A
9	Santa Maria Julha	San Pedro Carchá	A
10	Sebob	San Pedro Carchá	A
11	Sejalal	San Pedro Carchá	A
12	Senimlaha	San Pedro Carchá	A
13	Jobchacob	Lanquin	A
14	Mawixul	Lanquin	A
15	Rubelraxtul	San Pedro Carchá	A
16	Chicanuz	Lanquin	A
17	Candelaria Yalicar	San Pedro Carchá	A
18	Chiyo	San Pedro Carchá	A
19	Taquinco la Esperanza	Cahabon	A
20	Santa Maria Rubeltzul	San Pedro Carchá	A

	CC	Municipality	Study group
1	Agricola Samanzana	Cobán	B
2	Belen	Cahabon	B
3	San Lucas Tzulben	Cahabon	B
4	Sebas I	Cahabon	B
5	Sesaquiquib Chimox	Cahabon	B
6	Chelac	San Pedro Carchá	B
7	Chiacal	San Pedro Carchá	B
8	Chicuxab	Cobán	B
9	Chijotom	San Pedro Carchá	B
10	Chirrequiche	San Pedro Carchá	B
11	Chitzunun	San Pedro Carchá	B
12	Sacoyou	Cobán	B
13	Seconty	Cobán	B
14	Quiha Esperanza	San Pedro Carchá	B
15	Sejac	San Pedro Carchá	B
16	Sesaquiquib	San Pedro Carchá	B
17	Sepajch I	Lanquin	B
18	Finca Guadalupe	Cobán	B
19	Sehache	San Pedro Carchá	B
20	Chiacte	Cahabon	B
1	Caquiton	San Pedro Carchá	C
2	Chiacam	San Pedro Carchá	C
3	Chijalal	San Pedro Carchá	C
4	Chiquixji	San Pedro Carchá	C
5	Chirreacte	San Pedro Carchá	C
6	Chirrequim	San Pedro Carchá	C
7	Monte Olivo	Cobán	C
8	Saraxoch	Cobán	C
9	Sesajab	Cobán	C
10	Ucula	Cobán	C
11	Nueva Concepcion Chitap	San Pedro Carchá	C
12	Rubel Cruz	San Pedro Carchá	C
13	San Lucas Secochoy	San Pedro Carchá	C
14	Seacte	San Pedro Carchá	C
15	Xalitzul	San Pedro Carchá	C
16	Xicacau	San Pedro Carchá	C
17	Chitzubil	Lanquin	C
18	Las Flores Chitoc	Cobán	C
19	Tzalamtun	Cahabon	C
20	Chajixim	San Pedro Carchá	C

	CC	Municipality	Study group
1	Pinares	Cahabon	D
2	Chiguarrom	San Pedro Carchá	D
3	Chilatz	Cobán	D
4	Chinaichab	Cobán	D
5	Chipac	San Pedro Carchá	D
6	Chiquisis	San Pedro Carchá	D
7	Chirrepec	Cobán	D
8	Chitap Oficial	San Pedro Carchá	D
9	Ostua	Cobán	D
10	El Rosario	San Pedro Carchá	D
11	Seilob	Cobán	D
12	Tontem	Cobán	D
13	Raxnam	San Pedro Carchá	D
14	Sacchaj	San Pedro Carchá	D
15	San Antonio I	San Pedro Carchá	D
16	San Vicente	San Pedro Carchá	D
17	Seconon	San Pedro Carchá	D
18	Sequixquib	San Pedro Carchá	D
19	Tuzam	Lanquin	D
20	Chizon	San Pedro Carchá	D
1	Chibax	San Pedro Carchá	E
2	Chinasayub	Cobán	E
3	Chitoc	San Pedro Carchá	E
4	Coperativa Samac	Cobán	E
5	Sactela	Cobán	E
6	Santa Valeria	Cobán	E
7	Sacristal	San Pedro Carchá	E
8	Salaute	San Pedro Carchá	E
9	San Antonio IV	San Pedro Carchá	E
10	Secuabon	San Pedro Carchá	E
11	Semox Setinta	San Pedro Carchá	E
12	Seraxquen	San Pedro Carchá	E
13	Setaña	San Pedro Carchá	E
14	Sexucti	San Pedro Carchá	E
15	Tierra Blanca	San Pedro Carchá	E
16	Tontem	San Pedro Carchá	E
17	Setaña	San Pedro Carchá	E
18	Rocja Satzac	Cobán	E
19	Nimlasayub	Cobán	E
20	Cipresales	San Pedro Carchá	E

	CC	Municipality	Study group
1	Campamac	Cobán	F
2	Sacta	Cahabon	F
3	Tamax	Cahabon	F
4	Chimote	San Pedro Carchá	F
5	Chiguoyo	San Pedro Carchá	F
6	Xucaneb	Cobán	F
7	Yaxbatz	Cobán	F
8	Yiquiche Canau	Cobán	F
9	Pequixul	San Pedro Carchá	F
10	Quixal	San Pedro Carchá	F
11	Sacsi Chitaña	San Pedro Carchá	F
12	Secampamac	San Pedro Carchá	F
13	Sepocillo	San Pedro Carchá	F
14	Sesimaj	San Pedro Carchá	F
15	Tzapur	San Pedro Carchá	F
16	Ulpan I	San Pedro Carchá	F
17	Nuevo Aquil	Cobán	F
18	Sactate	Cobán	F
19	Monte Blanco	Cobán	F
20	Chicanib	San Pedro Carchá	F

Table A.4. Pregnant Woman Control Sheet

LOCATION

MUNICIPALITY	CONVERGENCE CENTER	COMMUNITY

CONDUCT THE INTERVIEW NO LATER THAN:

|___|___| |___|___| |2|0|___|___|

DAY MONTH YEAR

PREGNANT WOMEN

|___|___| NUMBER OF HOUSEHOLD'S SECTOR	|___|___| HOUSEHOLD'S NUMBER IN THE SECTOR
NAME OF PREGNANT WOMAN	|___|___| AGE
NAME OF SPOUSE/PARTNER OF PREGNANT WOMEN	CIVIL STATUS

PREGNANCY

|___|___| |___|___| |2|0|___|___| DAY MONTH YEAR EXPECTED LABOR DATE	|___|___| NUMBER OF MONTH PREGNANT

ENROLLMENT INTERVIEW

<table>
<tr><td>¿Interview Accepted?
Yes……..……..1
No…….2</td><td colspan="2">|___|___| |___|___| |2|0|1|___|
DAY MONTH YEAR
INTERVIEW DATE</td></tr>
<tr><td>R-|__|__|-|__|__|-201|__|-
|__|__|-|__|__|-
|__|__|__|__|-|__|__|__|__|-
|__|__|__|-|__|__|__|
INTERVIEW CODE</td><td>CS|___|___|___|___|
CODE OF COMPUTER USED</td><td>|___|___| |___|___|
DAY MONTH
|2|0|1|___|
YEAR
DAY INTERVIEW REVIEWED BY SUPERVISOR
(SIGN WITH INITIALS)</td></tr>
<tr><td colspan="3">COMMENTS</td></tr>
</table>

Appendix B. Selection of Study CCs

The 120 CCs for the longitudinal survey were selected from the overall pool of 216 CCs where Mercy Corps initially decided to implement the PROCOMIDA program. Mercy Corps presented IFPRI with information on a small number of CC characteristics, such as the number of communities served, the NGO serving the CC, the municipality where the CC was located, and the total population size and number of families in each community. CCs with missing information (n = 7) or extremely large CCs, i.e., those serving more than six communities or with a population of more than 2,500 people (n = 8), were excluded. With the relatively small pool of CCs to draw the sample from, the number of characteristics that could be used to stratify the sample was limited. It is important to note, however, that the high proportion of CCs selected into the sample (approximately 60%) automatically guarantees a reasonable degree of sample representativity.

It was decided to first stratify on the number of communities served by the CC, which had been identified in the formative research as a potentially important determinant of the outcomes of interest. CCs were assigned to three different strata based on the number of communities served by the CC:

- One community (n = 82)
- Two communities (n = 57)
- Three or more communities (n = 62)

The number of CCs to be drawn from each stratum (which had to be multiples of six, given the six study arms) was proportional to the stratum's population size: 48 CCs from the first stratum (stratum representing 38.5% of the total population), 30 CCs from the second stratum (26.5% of the total population), and 42 from the third stratum (35.0% of the total population).

Because of the small number of CCs in each stratum, a "classic" probability proportional to size selection could not be implemented. It was thus approximated by dividing each stratum in substrata based on population size (11 substrata for stratum 1 and 8 substrata in strata 2 and 3), and randomly selecting CCs from all of the larger substrata and from every other substratum and the lower end of the population distribution. The six selected CCs in each substratum were then randomly assigned to one of the six research arms.