

SMI-Nicaragua

Household Census and Survey Data Quality Report

Second Follow-up Measurement

November 2018

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This report of the Salud Mesoamérica Initiative (SMI) Nicaragua household survey was produced in agreement with the Inter-American Development Bank (IDB). All analyses and writing were conducted by the Institute for Health Metrics and Evaluation (IHME) at the University of Washington.

About IHME

IHME monitors global health conditions and health systems and evaluates interventions, initiatives, and reforms. Our vision is that better health information will lead to better-informed decision-making and higher achievement in health. To that end, we strive to build the objective evidence about what does and does not improve health conditions and health system performance. IHME provides high-quality and timely information on health, enabling policymakers, researchers, donors, practitioners, local decision-makers, and others to better allocate limited resources to achieve optimal results.

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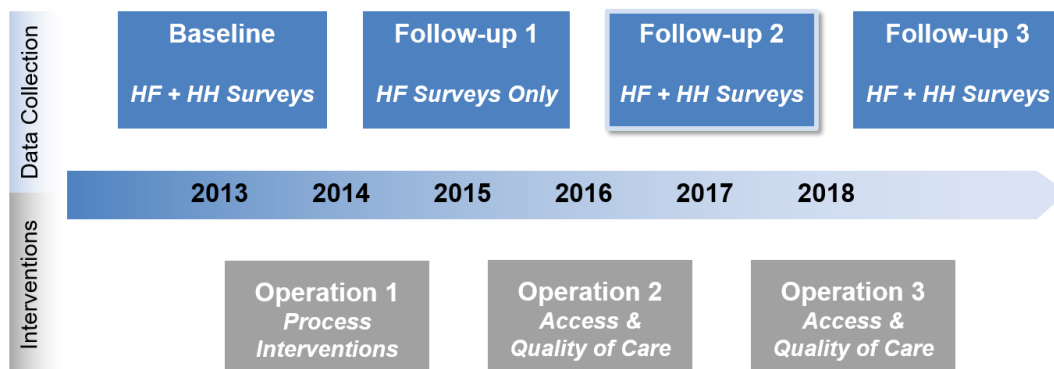
1 CHAPTER 1: INTRODUCTION

The Salud Mesoamérica Initiative (SMI) is a regional public-private partnership that brings together Mesoamerican governments, private foundations, and bilateral and multilateral donors with the purpose of reducing health inequalities affecting the poorest 20% of the population in the region. Funding focuses on supply- and demand-side interventions, including evidence-based interventions, the expansion of proven and cost-effective health care packages, and the delivery of incentives for effective health services. One of its defining features is the application of a results-based aid (RBA) model that relies on performance measurement and enhanced transparency and accountability. The initiative focuses its resources on integrating key interventions aimed at reducing health inequalities that stem from the lack of access to quality reproductive, maternal, neonatal, and child health services (including immunization and nutrition services) for the poorest quintile of the population.

1.1 Objectives

The objectives of the SMI evaluation are to assess whether countries are reaching the indicator targets set by the Initiative and to evaluate the results of specific interventions. In Nicaragua, baseline data were collected at households and health facilities in intervention and comparison areas (2013). The first follow-up data collection took place at health facilities in intervention areas only (2014), and this second follow-up measurement was performed at households and health facilities in intervention and comparison areas (2017). The use of health facility and household data collection methods permits the measurement of supply- and demand-side information on the Initiative. The pairing of the two types of surveys is a defining feature, designed to capture key indicators in a robust and multidimensional way. The timeline of data collection, evaluation, and interventions is shown in Figure 1.1.

Figure 1.1: SMI-Nicaragua timeline



The objectives of the SMI-Nicaragua second follow-up household survey are to capture household characteristics, reported maternal and child health data for women 15-49 years of age and for children 0-59 months of age, and anthropometric measurements including height, weight, and hemoglobin concentration for children. Community data collection permits the measurement of changes in health

status, access to health care, and satisfaction with health care, as well as an array of data points which give context to these factors.

Chapter 1 provides a general overview of the design and implementation of the SMI-Nicaragua second follow-up household census and SMI-Nicaragua second follow-up household survey and discusses the design and coverage of the study in both intervention and comparison areas. The subsequent chapters present results of the SMI-Nicaragua second follow-up household survey from intervention areas only. Appendix D presents results from comparison areas only and Appendix E presents results pooled from intervention and comparison areas.

1.2 SMI household census and survey

The SMI household census is used to capture the age and sex distribution of all of the usual members of all households in selected segments. Basic information including relationship to the head of the household and marital status is also collected. Children aged 0-59 months who have one or more parent residing in the same household are linked to their mother and/or father by way of unique household member identification codes.

Data from the SMI household census are used to identify and select eligible households for the detailed interviews and the physical measurements module (Figure 1.2). The household survey is typically conducted within one month of the household census. The SMI household survey includes three components: the Household Characteristics Questionnaire, the Maternal and Child Health Questionnaire, and the Physical Measurements Module.

The household questionnaire collects information on the source of water, type of toilet facilities, exposure to secondhand smoke, ownership of various assets including durable goods, agricultural land, and livestock, and household expenses and sources of health care financing.

The Maternal and Child Health Questionnaire covers eligible women's background characteristics (including education, occupation, and exposure to media), access to health care, current health status, recent history of illness and associated medical expenses, fertility preferences, knowledge and use of family planning methods (including barriers to use), exposure to health system interventions, and satisfaction with community health workers. Women who have been pregnant in the last five years answer questions about birth history; antenatal, delivery, and postpartum care; birth spacing; breastfeeding; and infant feeding practices.

Caretakers of children aged 0-5 years are asked detailed questions for each child under age 5 on topics such as child's current health status, recent history of illness including diarrhea, fever, and acute upper respiratory infection and associated medical expenses, child's exposure to health system interventions, immunization, and supplementation history.

The Physical Measurements Module captures weight, height/length, and hemoglobin concentrations of children aged 0-59 months. Portable scales and height rods were used for the anthropometric measurements and hemoglobin concentrations were assessed in the field using a portable HemoCue™ machine. Medically trained personnel (i.e., anthropometrists or professional nurses) performed all assessments.

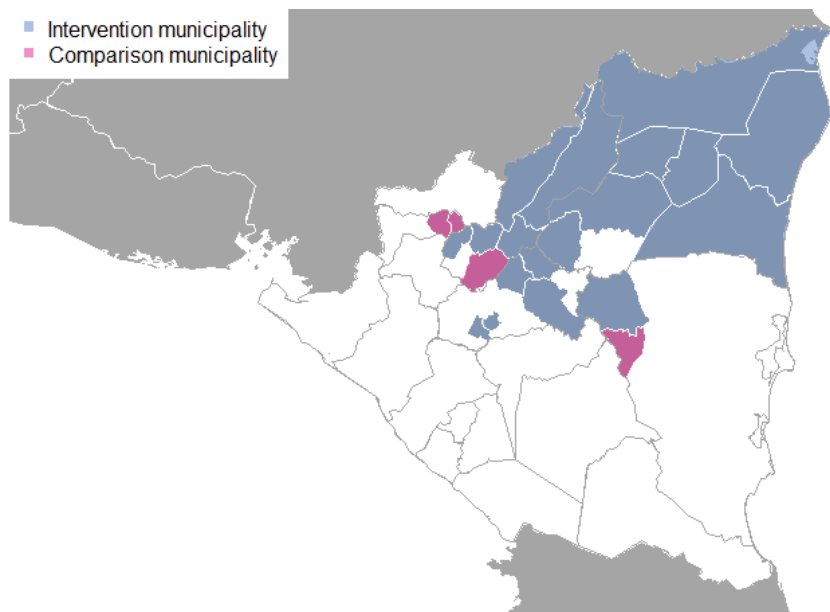
1.3 Methodology

The study design for the SMI-Nicaragua second follow-up household survey provides representative estimates of the coverage of key health interventions and indicators for a geographic area that approximates the lowest wealth quintile of the population of Nicaragua.

1.3.1 Study area

The primary administrative unit in Nicaragua is the department. Nicaragua has 15 departments, including two autonomous regions. Five departments were purposefully selected for the SMI-Nicaragua initiative. From those five departments, IDB identified 20 intervention municipalities in which to conduct the baseline SMI household survey for the Initiative on the basis of their high concentration of residents in the country's lowest wealth quintile, and 4 comparison municipalities with similar socioeconomic characteristics and ethnic composition (Figure 1.3). From these 24 municipalities, a two-stage clustered random sample of eligible households was selected to reach the sample sizes shown in Table 1.1.

Figure 1.3: Map of Salud Mesoamérica Initiative study area



1.3.2 First-stage sample selection: census segments

The household survey uses a two-stage random sampling design in order to balance survey administration costs with the ability to make estimates representative of the population in the study area. For the SMI-Nicaragua household census, the primary sampling unit (PSU) is the *segmento censal* (*census segment*) from the 2005 Nicaragua Population Census. A representative sample of these clusters ("segments") was randomly selected from a sampling frame of all segments in SMI municipalities with probability proportional to size, where size is measured by the number of occupied households.

Samples for intervention and comparison strata, and for baseline and follow-up rounds, were selected independently.

A set of alternate segments was selected using identical methodology, to be surveyed in the event that any of the selected segments could not be surveyed and needed to be replaced due to security concerns, community rejection of the study, or a high proportion of absent households. No segments were replaced in the second follow-up. At the baseline, safety issues in the Department of Jinotega and especially in the North Atlantic Autonomous Region (RAAN, *Región Autónoma del Atlántico Norte*) complicated data collection. Though no personnel were injured, a very threatening event occurred in the RAAN, where interviewers were assaulted, threatened, and tied. In order to avoid becoming an easy target for future violent events in the regions, we were forced to stop activities in that region, and 22 selected segments were not surveyed. Counts by municipality of segments where data collection was and was not completed successfully are shown in Table 1.1.

Table 1.1: Number of segments per municipality in SMI area

Intervention				Comparison			
Department	Municipality	2013	2017	Department	Municipality	2013	2017
Jinotega	El Cuá	3	0	Jinotega	Jinotega	13	17
Jinotega	San José Bocay	0	7	Matriz	San Juan Río Coco	6	3
Jinotega	San Sebastián de Yalí	3	2	Matriz	Telpaneca	6	3
Jinotega	Santa María de Pantasma	5	5	Región Atlántico Sur	El Ayote	0	2
Jinotega	Wiwili	3	6				
Matagalpa	Matiguás	3	3				
Matagalpa	Rancho Grande	2	2				
Matagalpa	San Dionisio	0	1				
Matagalpa	Terrabona	1	2				
Matagalpa	Tuma-la Dalia	10	2				
Región Atlántico Norte	Bonanza	0	3				
Región Atlántico Norte	Mulukuku	2	1				
Región Atlántico Norte	Prinzapolka	1	3				
Región Atlántico Norte	Puerto Cabezas	8	5				
Región Atlántico Norte	Rosita	1	3				
Región Atlántico Norte	Siuna	0	6				
Región Atlántico Norte	Waslala	0	3				
Región Atlántico Norte	Waspán	0	3				
Región Atlántico Sur	Bocana de Paiwás	2	4				

Table 1.2: Selected segments per municipality in SMI area that were not interviewed at baseline

Intervention			Comparison		
Department	Municipality	# Segments	Department	Municipality	# Segments
Región Atlántico Norte	Waspan	5	Región Atlántico Sur	El Ayote	2
Región Atlántico Norte	Bonanza	3			
Región Atlántico Norte	Waslala	6			
Región Atlántico Norte	Siuna	4			
Región Atlántico Norte	Prizapolka	1			
Región Atlántico Norte	Rosita	1			

1.3.3 *Second-stage sample selection: households*

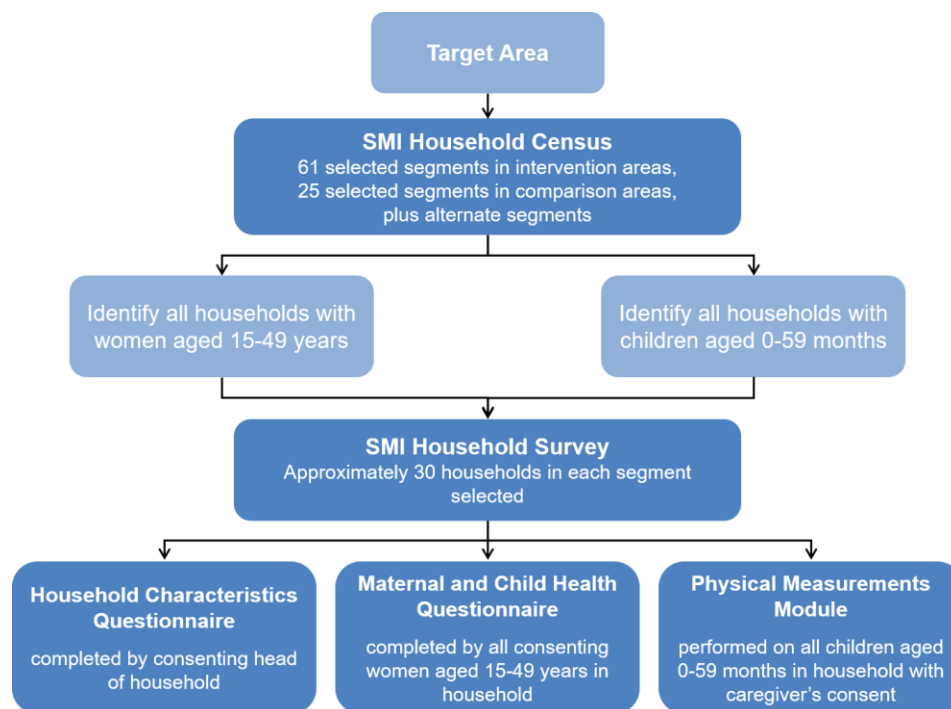
The SMI-Nicaragua second follow-up household census is conducted in each of the randomly selected segments prior to the SMI-Nicaragua second follow-up household survey in order to identify all eligible women and children for second-stage sampling. Interviewers visit every household in the segment and create a household roster capturing the age and sex distribution of household members.

Eligible households are systematically selected from the complete census listing for participation in the SMI-Nicaragua Household Survey. Thirty households are selected for participation, 25 households with at least one eligible child and five households with only eligible women. In order to ensure at least 30 complete interviews per segment, 10 backup households, eight with at least one eligible child and two with only eligible women, are selected at random in case of refusals or absent households.

All women aged 15-49 years who are members of the selected household are eligible to be interviewed, and all children aged 0-59 months who are members of the selected household are eligible for the physical measurement module. Any household head or other individual knowledgeable about household characteristics and expenditures is permitted to respond to the household characteristics module, while any primary caregiver of a child 0-59 months is eligible to inform for the child health interview module, regardless of sex or age.

A schematic diagram of the survey implementation is shown in Figure 1.4. Appendix A provides a detailed description of sampling methods.

Figure 1.4: Schematic diagram of SMI survey implementation



1.4 Survey implementation

1.4.1 Data collection instruments

Questionnaires were initially developed in English, and then translated to Spanish during the baseline measurement. To best reflect the issues most relevant to the region under study and the local language, the Spanish-language questionnaires were revised following input from key stakeholders and at the conclusion of the baseline and first follow-up pilot studies (described below). The revised Spanish-language surveys were then back-translated to English. Study areas included a substantial proportion of indigenous populations, many of them also Spanish speakers. In order to allow the participation of non-Spanish speakers in the survey, the data collection team includes interviewers proficient in Miskito, Sumo, and Rama who interpret as needed as they administer the survey. During the Second Follow-up 9.26% (unweighted) of household interviews were conducted partly or completely in a language other than Spanish, compared to 2.43% (unweighted) at baseline.

All surveys were conducted using a computer-assisted personal interview (CAPI). The CAPI was programmed using DatStat Illume and installed onto computer netbooks. CAPI supports skip patterns,

inter-question answer consistency, and data entry ranges. The aim of introducing CAPI to the field was to reduce survey time by prompting only relevant questions, maintain a logical answering pattern across different questions, decrease data entry errors, and permit rapid data verification.

1.4.2 Training and supervision of data collectors

At the baseline, a total of 26 people were trained in December 2012 to serve as supervisors and interviewers. Training sessions for the second follow-up survey were conducted in Nicaragua in June 2017. For household and census data collection, 16 surveyors and four anthropometrists were trained. All surveyors underwent a weeklong training, which included three days of in-classroom instruction and practice of interview application. Teams were split into their respective groups and given in-depth training and practice for each relevant component of data collection. The training included content of each survey, proper conduct of the survey, in-depth review of the instrument, and hands-on training on the CAPI software. Surveyors participated in a two-day pilot data collection exercise in communities that were not selected to be part of the SMI sample, where they applied the census and household survey. IHME held debriefing and re-training sessions with surveyors post-pilot and provided continued training during the first week of data collection in sampled communities.

1.4.3 Data collection, management, and analysis

The SMI-Nicaragua household census, which captures basic demographic characteristics of all usual household occupants, was carried out between March 1, 2013, and August 29, 2013, at the baseline, and between June 14 and November 16, 2017, in the second follow-up.

Data collection for the SMI-Nicaragua household survey at the baseline began on May 1, 2013 and was completed on September 3, 2013. At the follow-up, data collection began June 23, 2017, and was completed on December 20, 2017. To assure completeness of the sample, field staff were instructed to return to selected households up to three times (on different days, and at least once on a weekend) in an attempt to complete the Household Characteristics Questionnaire, the Maternal and Child Health Questionnaire, and the Physical Measurements Module. Households that refused to participate or were absent at all three visits are substituted with randomly selected alternates.

Data collection teams, consisting of one supervisor and three to five interviewers were deployed to conduct the SMI household census and the SMI household survey. Supervisors were responsible for reviewing questionnaires for quality and consistency prior to departing each segment. There were six supervisors overseeing the SMI household census and SMI household survey at baseline, and five supervisors overseeing the follow-up survey.

Data were collected using computer netbooks equipped with CAPI software. Field team leaders monitored the implementation of the survey and report feedback. Data collection using CAPI allowed data to be transferred instantaneously once a survey was completed via a secure connection to IHME. IHME monitored collected data on a continuous basis and provided feedback. Suggestions, surveyor feedback, and any modifications were incorporated into the instruments and readily transmitted to the field.

Data analysis was conducted at IHME using STATA version 14 and R version 3. Performance and monitoring indicators were calculated at IHME following indicator definitions provided by IDB.

The total number of completed interviews with heads of households in the census is shown in Table 1.3, and the total number of completed interviews with heads of households in the household survey is shown in Table 1.4. The total number women of reproductive age who participated in the household survey for each department in Nicaragua is shown in Table 1.5, and the total number of physical measurements of children aged 0-59 months performed, with corresponding response rates by department is shown in Table 1.6. Response rates were calculated using the following formula: ($[\# \text{ surveyed}] \div [\# \text{ selected participants}]$). High non-response may affect the reliability of the estimates.

According to the 2005 Nicaragua Population Census, we expected a total of 13,312 occupied households in the 86 selected segments in the second follow-up. The SMI household listing exercise found 13,148 occupied households in these segments. Of the 13,148 occupied households, 12,897 completed the SMI household census, yielding a response rate of 98% for this portion of the survey.

Based on information collected during the SMI household census, a subset of households were visited for individual interviews. A total of 2,733 households were visited for the individual interviews in intervention and comparison areas during the second follow-up. Of these, a total of 2,625 Household Characteristics Questionnaires were completed with heads of households, yielding a household response rate of 97.1% in intervention areas and 93.8% in comparison areas.

Using the household roster completed as part of the SMI household survey, 3,410 women of reproductive age (15-49 years) were identified in the intervention and comparison areas during the second follow-up from the sub-sample of interviewed households as eligible for the Maternal and Child Health Questionnaire. Of these women, 3,372 successfully completed the questionnaire (99% in intervention areas and 98.7% in comparison areas). The household roster completed as part of the SMI household survey was also used to identify 2,567 children aged 0-59 months as eligible for the Physical Measurements Module among the interviewed households in intervention and comparison areas during the second follow-up. 2,553 of these children participated in either the interview or measurements module (99.6% in intervention areas and 99.1% in comparison areas).

Among those households that were occupied but did not complete the SMI household census, the majority of the non-response for households and individuals was due to household members refusing the interview or being absent.

Table 1.3: Households participating in the SMI census and response rates by department

	Baseline 2013					Second Follow-Up 2018				
	No. segments	No. households	No. households eligible	No. households censused	Census response rate, %	No. segments	No. households	No. households eligible	No. households censused	Census response rate, %
Jinotega	26	3641	3484	3414	98.0	37	6354	5942	5831	98.1
Madríz	12	1625	1566	1555	99.3	6	917	898	894	99.6
Matagalpa	16	2124	2089	2061	98.7	10	1433	1384	1373	99.2
Región Atlántico Norte	12	1712	1666	1634	98.1	27	4433	4093	4036	98.6
Región Atlántico Sur	2	209	207	205	99.0	6	814	768	763	99.3
Intervention	43	5918	5775	5697	98.6	61	9572	8970	8883	99.0
Comparison	25	3393	3237	3172	98.0	25	4379	4115	4014	97.5

*Response rate calculated as the number of complete or partial interviews over total occupied households.
Overall response rate = household response rate * census response rate.

Table 1.4: Households participating in SMI household survey and response rates by department

	Baseline 2013					Second Follow-Up 2018				
	No. segments	No. households selected	No. households interviewed	Household response rate, %	Overall response rate, %	No. segments	No. households selected	No. households interviewed	Household response rate, %	Overall response rate, %
Jinotega	26	830	799	96.3	94.3	37	1203	1138	94.6	92.8
Madríz	12	381	364	95.5	94.9	6	184	184	100.0	99.6
Matagalpa	16	506	483	95.5	94.2	10	313	303	96.8	96.0
Región Atlántico Norte	12	417	364	87.3	85.6	27	845	815	96.4	95.1
Región Atlántico Sur	2	61	60	98.4	97.4	6	188	187	99.5	98.8
Intervention	43	1396	1300	93.1	91.9	61	1908	1853	97.1	96.2
Comparison	25	799	770	96.4	94.4	25	825	774	93.8	91.5

*Response rate calculated as the number of complete or partial interviews over total selected households

Table 1.5: Women participating in SMI women's health and/or pregnancy interview by department

	Baseline 2013				Second Follow-Up 2017			
	No. women eligible	No. women interviewed	Woman response rate, %	Overall response rate, %	No. women eligible	No. women interviewed	Woman response rate, %	Overall response rate, %
Jinotega	1190	1095	92.0	86.8	1503	1482	98.6	91.5
Madríz	548	511	93.2	88.5	228	226	99.1	98.7
Matagalpa	692	653	94.4	88.9	370	369	99.7	95.8
Región Atlántico Norte	544	479	88.1	75.4	1040	1027	98.8	93.9
Región Atlántico Sur	86	85	98.8	96.3	269	268	99.6	98.5
Intervention	1860	1720	92.5	85.0	2349	2325	99.0	95.2
Comparison	1200	1103	91.9	86.8	1061	1047	98.7	90.3

*Response rate calculated as the number of complete or partial interviews over total eligible women. All children aged 0-59 months who reside in interviewed households, based on the household roster completed as part of the SMI census, are selected for the caregiver interview and physical measurements.

Table 1.6: Children participating in SMI child health interview and/or physical measurements by department

	Baseline 2013				Second Follow-Up 2017			
	No. children eligible	No. children participated	Child response rate, %	Overall response rate, %	No. children eligible	No. children participated	Child response rate, %	Overall response rate, %
Jinotega	883	863	97.7	92.2	1140	1132	99.3	92.2
Madríz	399	391	98.0	93.0	170	170	100.0	99.6
Matagalpa	541	538	99.4	93.7	278	278	100.0	96.0
Región Atlántico Norte	371	363	97.8	83.8	804	800	99.5	94.6
Región Atlántico Sur	70	70	100.0	97.4	175	173	98.9	97.7
Intervention	1422	1407	98.9	90.9	1825	1818	99.6	95.8
Comparison	842	818	97.1	91.7	742	735	99.1	90.7

*Response rate calculated as the number of complete or partial interviews over total eligible women. All women aged 15-49 years who reside in interviewed households, based on the household roster completed as part of the SMI census, are selected for the interview.

1.5 Characteristics of Non-Participating Households

Data on selected households that were absent or declined to participate in the SMI Household Survey are drawn from the SMI Household Census. A total of 106 of the 2,733 households that were selected at the second follow-up did not complete the SMI Household Survey. This non-response varies by department, from a low of 0.4% in Madriz to a high of 7.2% in Jinotega. Households that did not complete the SMI Household Survey are referred to as “replaced” households because they were substituted with alternate households selected from the same segment.

Replaced households consisted of one to 21 members (median five members). Six percent of these households were headed by a man, 26.4% of households were headed by a woman, and 67.9% were identified as dual-headed.

Table 1.7: Household characteristics, nonparticipating households

	Baseline 2013			Second Follow-Up 2017		
	n	%	SE	n	%	SE
Head of household						
Dual-headed household	92	69.7	4.1	72	67.9	5.5
Single head, female	32	24.2	4.1	28	26.4	4.2
Single head, male	8	6.1	2.1	6	5.7	2.3

Dual-headed households are those where (a) two individuals were identified as “head” by the respondent or (b) both the person identified as “head” and his or her spouse or partner are household members

	N	DK/DTR	Min	p25	Median	p75	Max
Baseline 2013							
Number of usual household members	132	0	2	4	5	7	15
Second Follow-Up 2017							
Number of usual household members	106	0	1	3	5	7	21

1.6 Report structure

The subsequent chapters present characteristics of the surveyed SMI-Nicaragua sample in intervention areas only. Each table is presented for comparison areas only in Appendix D, and pooled intervention and comparison areas in Appendix E. Most tables take one of three forms. Tabulations of select-only-one question types are similar to Table 2.2(a). The categories are mutually exclusive, so the proportions sum to 100%. Counts are shown for non-response (“Don’t know” or “Decline to respond” recorded), but these cases are always excluded from the denominator.

Tabulations of select-all-that-apply question types look like Table 2.4(a). As respondents can report more than one option, categories are not mutually exclusive, and thus proportions do not sum to 100%. The table shows affirmative cases (n) and non-missing cases (N). Non-response is the difference between non-missing cases (N) and the total sample eligible for that section of the questionnaire, indicated at the start of the chapter. Where statistics are reported for subpopulations, the size of the subpopulation is reported in the same table or the preceding table for straightforward comparison.

Tabulations of continuous variables, where respondents were requested to provide a numeric response, appear similar to Table 2.2(b) and present the range and quartiles (25th percentile, median, 75th percentile) in order to illustrate the distribution of responses across the sample. Counts of non-response are listed in the table and excluded from the count of non-missing cases (N).

2 CHAPTER 2: CHARACTERISTICS OF HOUSEHOLDS

This chapter provides a descriptive summary of the basic demographic, socioeconomic, and environmental characteristics of the households sampled for the SMI-Nicaragua Baseline and Second Follow-up Household Survey.

2.1 Characteristics of Participating Households

A total of 1,851 households in the Nicaragua second follow-up completed the household characteristics questionnaire. In the baseline, 1,295 completed the survey. The remainder of this chapter is dedicated to a summary of the basic demographic, socioeconomic, and environmental characteristics of the households completing the household characteristics questionnaire.

2.2 Age and Sex Composition, SMI Census

The unweighted distribution of the de facto household population in the surveyed households in the SMI-Nicaragua household census by five-year age groups and by sex is shown for baseline (Figure 2.1) and second follow-up (Figure 2.2). Nicaragua has a larger proportion of its population in the younger age groups than in the older age groups. Figure 2.2 indicates that in the second follow-up, just under 35 % of the population in the Second Follow-up is under age 15 years, more than half (60%) of the population is in the economically productive age range (15-64), and the remaining 4% is age 65 and above.

Figure 2.1: Age and sex of census sample, unweighted percent distribution of de facto household population by five-year age groups, baseline survey

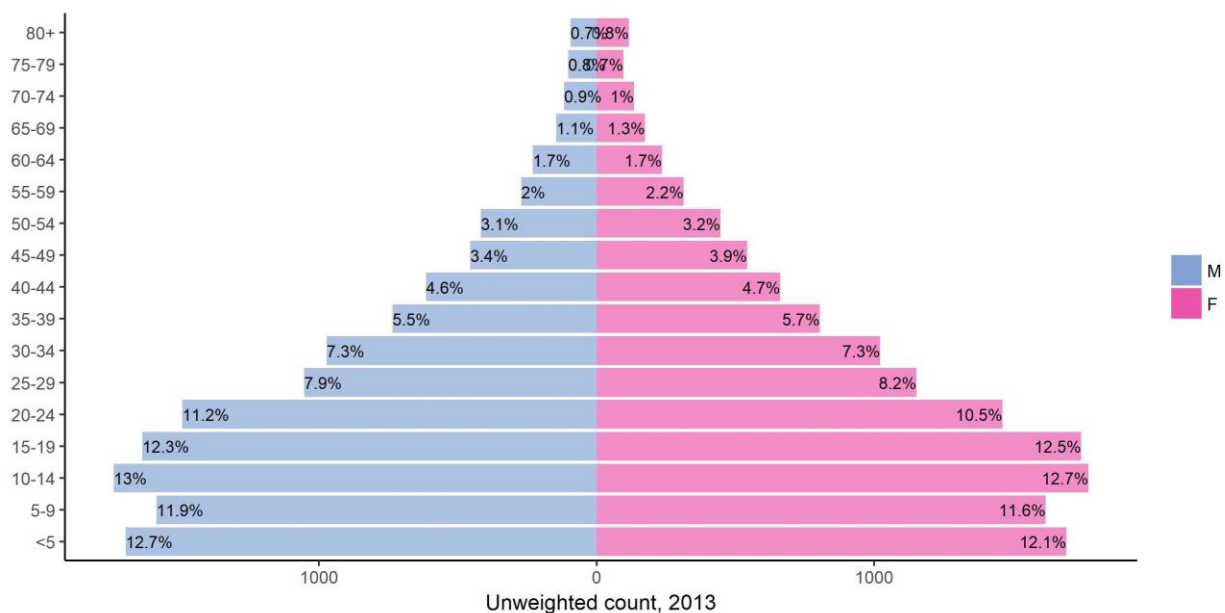
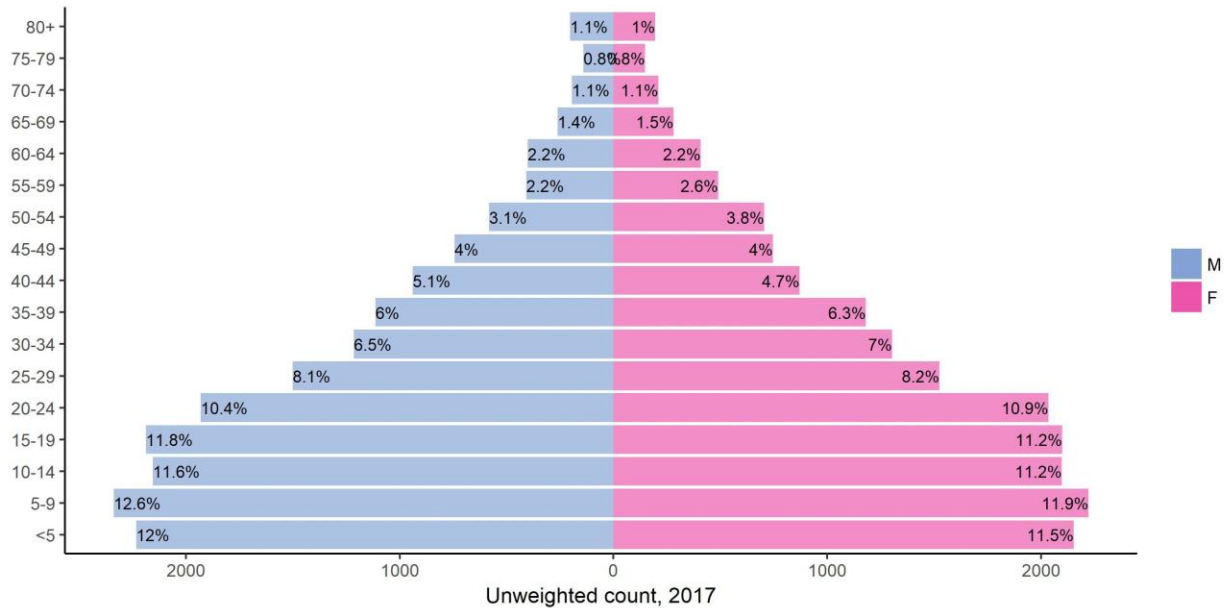


Figure 2.2: Age and sex of census sample, unweighted percent distribution of de facto household population by five-year age groups, follow-up survey



2.3 Household Characteristics, SMI Household Survey

The number of households, women, and children in the sample are displayed in Table 2.1; and the percent distribution of households by head of household, number of usual members, and marital status are shown in Table 2.2.

Seventy seven percent of households in Nicaragua identify as dual-headed in the second follow-up. Males are the head of the household in 3.6% of surveyed households in Nicaragua, with females as the head of household in the remaining 19.7%. The median household size in Nicaragua is four members, with another 15% of households having six or more members.

Table 2.1: SMI household survey sample sizes: number of total households, women 15-49 years of age, and children 0-59 months

	Baseline 2013	Second Follow-Up 2017
Households	1295	1851
Women	1720	2323
Children	1407	1820

Table 2.2: Household characteristics, SMI household sample

	Baseline 2013			Second Follow-Up 2017		
	n	%	SE	n	%	SE
Head of household						
Dual-headed household	966	72.2	2.4	1441	76.7	2.0
Single head, female	260	22.6	2.1	348	19.7	1.9
Single head, male	69	5.2	0.9	62	3.6	0.6

Dual-headed households are those where (a) two individuals were identified as "head" by the respondent or (b) both the person identified as "head" and his or her spouse or partner are household members

	N	DK/DTR	Min	p25	Median	p75	Max
Baseline 2013							
Number of usual household members	1295	0	1	4	5	6	18
Second Follow-Up 2017							
Number of usual household members	1851	0	1	3	4	6	19

2.4 Drinking Water Access and Treatment

2.4.1 Sanitation facilities and waste disposal

A household's source of drinking water is an important determinant of the health status of household members. Contaminated drinking water can spread waterborne diseases, such as diarrhea or dysentery. Piped water, protected wells, and protected springs are expected to be relatively free of these diseases; whereas other sources like unprotected wells, rainwater, or surface water are more likely to carry disease-causing agents.

The percent distribution of households by source of drinking water, location of water source, and information about sanitation facilities is shown in Table 2.3. The majority of surveyed households (43.4%) have water piped to dwelling, and 56.6% of households have to go outside their home or yard to a water source.

Many households (73.2%) use a pit latrine and 12.4% of households use a flush toilet. Nine percent of households report having no toilet compared to 10.6% at baseline.

Table 2.3: Household water source and sanitation facilities

	Baseline 2013			Second Follow-Up 2017		
	n	%	SE	n	%	SE
Household water source						
Piped to dwelling	568	45.2	5.2	781	43.4	4.5
Protected dug well	161	13.4	3.0	262	14.6	2.6
Unprotected dug well	109	7.5	1.4	213	10.6	1.9
Piped to yard/plot	238	17.4	2.9	143	8.3	1.1
Tubewell/borehole	39	3.3	1.0	94	5.0	0.9
Unprotected spring	37	2.4	0.7	93	4.9	1.3
Surface water	19	1.3	0.5	102	4.9	1.2
Protected spring	52	3.4	0.8	41	2.1	0.6
Rainwater collection	19	1.8	1.1	33	1.9	1.0
Public tap/standpipe	24	2.0	0.7	21	1.1	0.4
Bottled water	9	1.1	0.6	11	0.5	0.3
Water jug	2	0.2	0.1	10	0.5	0.2
Tanker truck	0	0.0	-	1	0.0	-
Cart with small tank/drum	0	0.0	-	0	0.0	-
Other	18	1.0	0.3	44	2.3	0.6
Don't know	0	-	-	2	-	-
Decline to respond	0	-	-	0	-	-
Time to retrieve water						
Water on premises	1021	82.4	2.5	1370	77.2	2.9
Less than 30 minutes	244	15.7	2.2	417	20.8	2.6
30 minutes or longer	22	1.9	0.6	41	2.0	0.5
Don't know	8	-	-	22	-	-
Decline to respond	0	-	-	1	-	-
Sanitation facilities						
Pit latrine	974	74.7	2.5	1365	73.2	2.6
Flush toilet	127	12.3	2.5	211	12.4	2.2
No toilet	163	10.6	2.0	183	9.3	1.8
Pour flush toilet	24	1.6	0.4	38	2.3	0.7
Dry toilet	3	0.3	0.1	26	1.3	0.5
Other	4	0.5	0.3	28	1.5	0.5
Don't know	0	-	-	0	-	-
Decline to respond	0	-	-	0	-	-

	Baseline 2013				Second Follow-Up 2017			
	n	N	%	SE	n	N	%	SE
Shared toilet/facilities	167	1128	15.6	1.8	236	1639	13.4	1.5

2.4.2 Cooking fuel sources

Cooking fuel source and the location for cooking food are included in Table 2.4. The percentage of households with a separate kitchen is also shown. The two most commonly reported cooking fuel sources

used in households during the second follow-up are wood (79.5%) and gas tank (34.9%). Among those households with non-missing responses as to what cooking fuel sources they use, 74.1% report normally cooking food in the house, 23.4% normally cook food in a separate building, and 2.5% normally cook food outdoors. Sixty three percent of households have a separate kitchen.

Table 2.4: Cooking fuel source and cooking location

	Baseline 2013				Second Follow-Up 2017			
	n	N	%	SE	n	N	%	SE
Wood	1057	1295	77.1	4.9	1486	1851	79.5	3.5
Gas tank	391	1295	36.0	6.0	615	1851	34.9	4.1
Straw/twigs/grass	31	1295	2.3	0.6	48	1851	2.5	1.1
Coal	35	1295	3.7	1.4	37	1851	2.2	0.6
Electricity	29	1295	2.3	0.7	33	1851	1.7	0.4
Agricultural crops	18	1295	1.5	0.5	1	1851	0.0	-
No food cooked at home	2	1295	0.2	0.2	0	1851	0.0	-
Other	1	1295	0.1	0.1	1	1851	0.0	-

*categories not mutually exclusive (select all that apply)

	Baseline 2013			Second Follow-Up 2017		
	n	%	SE	n	%	SE
Location for cooking food, if cooking fuel source reported						
Inside house	877	67.9	2.5	1344	74.1	2.0
In a separate building	376	29.1	2.6	452	23.4	1.8
Outdoors	39	3.0	0.6	53	2.5	0.6
Other	0	0.0	-	0	0.0	-
Don't know	0	-	-	0	-	-
Decline to respond	0	-	-	0	-	-

	Baseline 2013				Second Follow-Up 2017			
	n	N	%	SE	n	N	%	SE
Separate kitchen, if cooking fuel source reported and food cooked in the home	640	876	72.5	2.2	867	1343	63.2	3.2

2.4.3 Household wealth

The median number of bedrooms per household is two (Table 2.5). Twenty one percent of households in the second follow-up own agricultural land and 7.1% of households rent agricultural land (Table 2.6).

The availability of durable consumer goods is a good indicator of a household's socioeconomic status. Table 2.6 shows the availability of selected consumer goods by household. The large majority of households (75.9%) have mobile phone, and the most commonly owned items are electricity (73%),

radio (53.5%), and television (51.3%). Many households (16.4%) own a bicycle and 16.2% own a motorcycle/scooter.

Table 2.5: Number of bedrooms per household

	N	DK/DTR	Min	p25	Median	p75	Max
Baseline 2013							
Number of bedrooms	1295	0	0	1	2	2	8
Second Follow-Up 2017							
Number of bedrooms	1848	3	0	1	2	2	6

Table 2.6: Household assets

	Baseline 2013				Second Follow-Up 2017			
	n	N	%	SE	n	N	%	SE
Household assets								
Mobile phone	848	1294	68.0	2.9	1381	1851	75.9	2.6
Electricity	949	1294	77.5	3.7	1317	1851	73.0	4.0
Radio	881	1294	66.5	2.1	987	1849	53.5	2.0
Television	702	1294	58.7	3.7	937	1851	51.3	3.4
Watch	413	1294	33.1	1.4	411	1850	24.2	1.9
Refrigerator	285	1294	24.7	2.7	384	1851	22.7	2.7
Sound system	278	1293	24.0	3.3	328	1848	20.2	2.1
Bank account	60	1292	5.6	1.2	96	1834	5.7	1.1
Computer	60	1294	5.8	1.5	71	1850	4.5	1.1
Washing machine	17	1293	1.5	0.5	58	1851	3.2	0.8
Guitar	42	1294	3.3	0.7	46	1850	2.7	0.5
Landline phone	15	1293	0.9	0.3	41	1850	2.4	0.6
Transportation assets								
Bicycle	283	1294	23.1	2.5	297	1849	16.4	1.8
Motorcycle/scooter	123	1294	8.8	1.1	283	1848	16.2	1.6
Car	37	1294	3.1	0.8	55	1850	3.3	0.8
Animal cart	7	1294	0.6	0.3	17	1850	1.1	0.4
Truck	8	1294	0.4	0.2	10	1850	0.5	0.2
Agricultural assets: Livestock ownership								
Chickens	768	1294	54.5	4.7	1066	1851	55.4	3.6
Pigs	452	1294	32.1	3.9	828	1851	43.6	3.2
Horses, donkeys, or mules	165	1294	11.6	1.9	259	1849	14.1	2.1
Cattle	165	1294	11.9	1.9	226	1850	11.5	1.6
Sheep or goats	4	1294	0.2	0.1	13	1851	0.7	0.2

	Baseline 2013			Second Follow-Up 2017		
	n	%	SE	n	%	SE
Agricultural assets: Own or rent agricultural land						
No agricultural land	790	65.8	4.1	1243	69.6	3.1
Owens agricultural land	314	22.3	2.7	423	21.4	2.6
Rents agricultural land	123	7.7	1.3	138	7.1	1.3
Shared/community-held land	63	4.2	1.0	43	1.8	0.8
Don't know	1	-	-	4	-	-
Decline to respond	4	-	-	0	-	-

2.5 Household expenditure

2.5.1 Total expenditures by type

Households are surveyed about the amount of money spent over the last month. After reporting total household expenditures, households are then asked how much was spent on specific categories (e.g., food, housing, education, and medical care) over the last four weeks. Table 2.7 shows the itemized monthly expenditure per person living in the household summarized by expenditure quintile. All data are presented in current Córdoba (C), with no adjustment for inflation. Itemized expenditure information was sufficiently complete to report for 1,707 households at the second follow-up. The lowest quintile in the study area spent less than 524 C per person over the last month in the second follow-up.

Table 2.8 shows the budget share, defined as the weighted average expenditure on each category across a quintile divided by the weighted average total itemized household expenditure in the same quintile. Table 2.8 shows that the poorest 20% of households in the study area spend 74.2% of their monthly expenditure on food, on average. In comparison, the wealthiest households spend 58.4% on food. The poorest households spent 1.4% of their expenditure on medical care, while the wealthiest spent 5%.

Table 2.7: Total itemized per-capita expenditure quintiles, current Nicaragua Córdoba

	N	DK/DTR	p20	p40	p60	p80
Baseline 2013						
Per capita monthly household expenditure	1252	1	338	535	798	1362
Second Follow-Up 2017						
Per capita monthly household expenditure	1707	11	524	843	1326	2195

*Not adjusted for inflation

Table 2.8: Itemized household expenditure by total household budget share

	Bottom quintile	2nd quintile	3rd quintile	4th quintile	Top quintile
Baseline 2013					
Food	76.7	74.6	69.7	65.8	61.3
Alcoholic beverages and tobacco	1.7	1.6	1.2	0.9	1.5
Education expenses	6.0	4.5	4.3	3.3	3.0
Furniture and domestic appliances	0.0	0.3	0.3	0.7	1.3
Recreation	0.0	0.0	0.0	0.0	0.9
Housing and utilities	5.6	6.9	7.9	8.6	10.3
Clothing and shoes	3.5	3.7	7.0	10.8	8.2
Transportation	3.3	3.3	4.7	3.2	5.4
Communication	1.7	2.3	2.4	2.0	1.9
Out-of-pocket medical expenses	1.4	2.6	2.3	4.0	5.7
Social security premiums	0.1	0.1	0.2	0.6	0.4
Private insurance premiums	0.0	0.0	0.0	0.0	0.0
Other costs to access health care	0.0	0.0	0.0	0.1	0.0
Second Follow-Up 2017					
Food	74.2	71.5	67.2	61.3	58.4
Alcoholic beverages and tobacco	2.2	2.1	1.4	3.3	1.5
Education expenses	4.3	4.3	3.7	3.2	2.8
Furniture and domestic appliances	0.2	0.4	0.9	1.1	2.9
Recreation	0.1	0.2	0.2	0.3	0.9
Housing and utilities	6.9	7.9	8.1	8.7	9.5
Clothing and shoes	4.0	5.5	8.6	9.4	9.7
Transportation	3.4	3.0	3.7	4.7	5.9
Communication	2.9	2.9	2.4	3.0	2.3
Out-of-pocket medical expenses	1.4	1.9	3.4	4.2	5.0
Social security premiums	0.2	0.0	0.2	0.4	0.9
Private insurance premiums	0.0	0.0	0.1	0.4	0.1
Other costs to access health care	0.1	0.3	0.0	0.0	0.0

2.5.2 Health expenditures

Of the 1,707 households with expenditure data at the second follow-up, 406 reported having health expenditures in the last four weeks. Table 2.9 shows health expenditure by type among households reporting non-zero out-of-pocket health expenditure. Very few households had spending in each category.

Table 2.9: Out-of-pocket medical expenditures by type, last four weeks, current Nicaragua Córdoba

	N	DK/DTR	Min	p25	Median	p75	Max
Baseline 2013							
Medications prescribed by health personnel	273	0	0	0	0	500	10000
Care that required overnight stay in hospital/clinic	273	0	0	0	0	0	8000
Dentists	273	0	0	0	0	0	8000
Care or non-prescription medications from pharmacist	273	0	0	0	0	100	7000
Care by health professionals not requiring overnight stay	273	0	0	0	0	0	2400
Other health care products or services	273	0	0	0	0	0	2000
Diagnostic and laboratory tests, X-rays, blood tests	273	0	0	0	0	0	1600
Other costs associated with overnight stay in hospital/clinic	273	0	0	0	0	0	1400
Health products (glasses, hearing aids, prosthetics, etc.)	273	0	0	0	0	0	1000
Care by traditional/alternative healers/birth attendants	273	0	0	0	0	0	150
Second Follow-Up 2017							
Medications prescribed by health personnel	406	0	0	0	0	500	15000
Care that required overnight stay in hospital/clinic	406	0	0	0	0	0	3000
Dentists	406	0	0	0	0	0	12000
Care or non-prescription medications from pharmacist	406	0	0	0	0	150	3000
Care by health professionals not requiring overnight stay	406	0	0	0	0	0	10000
Other health care products or services	406	0	0	0	0	0	520
Diagnostic and laboratory tests, X-rays, blood tests	406	0	0	0	0	0	3000
Other costs associated with overnight stay in hospital/clinic	406	0	0	0	0	0	2000
Health products (glasses, hearing aids, prosthetics, etc.)	406	0	0	0	0	0	7000
Care by traditional/alternative healers/birth attendants	406	0	0	0	0	0	3000

*Not adjusted for inflation

2.5.3 Source of health expenditure financing

Of the 1,707 households with expenditure data at the second follow-up, 162 reported that members of the household went to a hospital and stayed overnight at least once during the last 12 months and paid for expenses associated with the overnight stays. The maximum paid for a hospital stay was 3,000 C.

Table 2.10 shows the source and amount of financing for medical expenditures for overnight hospital stays. The most common source of health care financing was current income from any household member (median amount 400 C).

Table 2.10: Health care financing by source, last 12 months, current Nicaragua Córdoba

	N	DK/DTR	Min	p25	Median	p75	Max
Baseline 2013							
Savings	125	0	0	0	0	0	1e+05
Items sold	125	0	0	0	0	0	21000
Money from relatives or friends outside the household	125	0	0	0	0	0	11500
Loan from a source other than family or friends	125	0	0	0	0	0	8000
Any household member's current income	125	0	0	0	100	1000	6000
Remittances from family or friends abroad	125	0	0	0	0	0	5000
Other source	125	0	0	0	0	0	4000
Reducing other household spending	125	0	0	0	0	0	2000
Property sold	125	0	0	0	0	0	800
Health insurance plan payment/reimbursement	125	0	0	0	0	0	0
Social security payments	125	0	0	0	0	0	0
Conditional cash transfer programs	125	0	0	0	0	0	0
Political donations or grants	125	0	0	0	0	0	0
Second Follow-Up 2017							
Savings	162	0	0	0	0	0	15000
Items sold	162	0	0	0	0	0	30000
Money from relatives or friends outside the household	162	0	0	0	0	0	25000
Loan from a source other than family or friends	162	0	0	0	0	0	20000
Any household member's current income	161	1	0	0	400	1500	20000
Remittances from family or friends abroad	162	0	0	0	0	0	0
Other source	162	0	0	0	0	0	40000
Reducing other household spending	162	0	0	0	0	0	2700
Property sold	162	0	0	0	0	0	0
Health insurance plan payment/reimbursement	162	0	0	0	0	0	0
Social security payments	162	0	0	0	0	0	0
Conditional cash transfer programs	162	0	0	0	0	0	0
Political donations or grants	162	0	0	0	0	0	1000

*Not adjusted for inflation

3 CHAPTER 3: GENERAL CHARACTERISTICS OF RESPONDENTS

This chapter summarizes the demographic characteristics, socioeconomic status, and health status of women of reproductive age (15-49 years) participating in the SMI-Nicaragua second follow-up household survey.

3.1 Demographic Characteristics

3.1.1 Age, marital status, relation to head of household

The age distribution of the de facto population of women of reproductive age participating in the women’s health or pregnancy interviews in Nicaragua is shown in Figure 3.1 by five-year age groups. About 62% of all women participating in the second follow-up SMI-Nicaragua household survey were younger than 30 years of age, 25% were between the ages of 30 and 39, and 13% were between the ages of 40 and 49. While 29% of women reported being married and 41% being partnered, 18% indicated they were never married. Thirty two percent of women were reported at the SMI-Nicaragua census to be the head of household’s spouse, 23.3% to be the biological child of the head of the household, and 18.7% to be the partner of the head of the household.

Figure 3.1: Age of respondents, unweighted

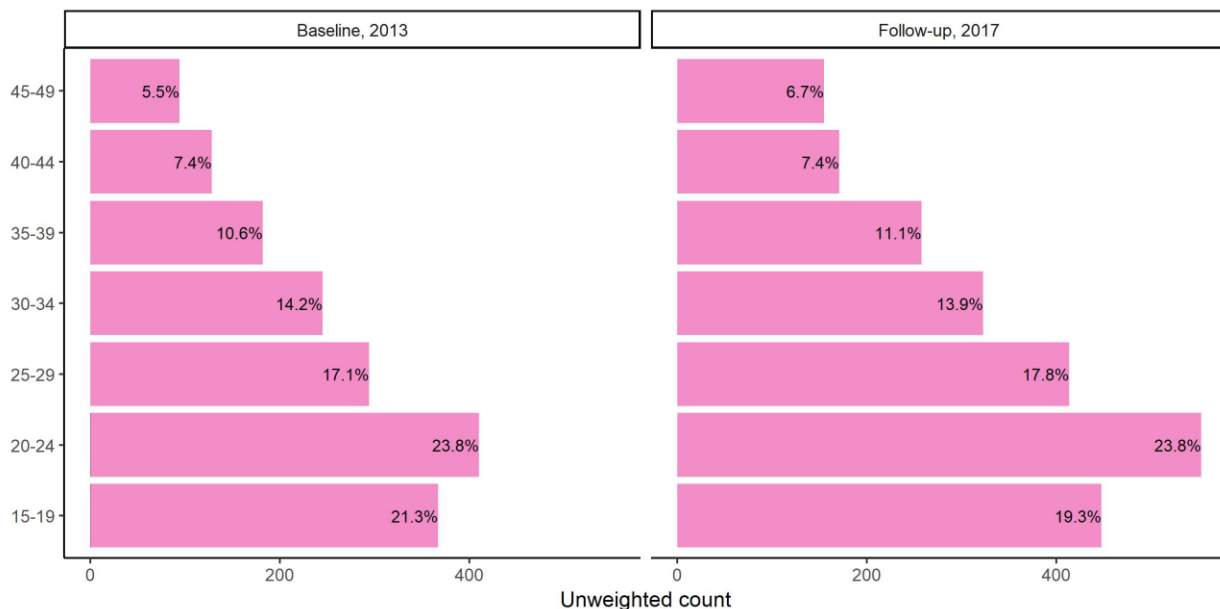


Table 3.1: Demographic characteristics of respondents

	Baseline 2013		Second Follow-Up 2017	
	n	%	n	%
Marital status				
Civil union/partnered	603	35.1	929	40.0
Divorced	2	0.1	7	0.3
Married	518	30.1	673	29.0
Separated	68	4.0	263	11.3
Single	510	29.7	436	18.8
Widowed	19	1.1	15	0.6
Other	0	0.0	0	0.0
Don't know	0	0.0	0	0.0
Decline to respond	0	0.0	0	0.0
Respondent's relationship to head of household				
-	2	0.1	7	0.3
Adopted or stepchild	21	1.2	24	1.0
Biological child	410	23.8	541	23.3
Daughter-in-law/son-in-law	116	6.7	86	3.7
Grandchild	38	2.2	46	2.0
Grandparent	0	0.0	0	0.0
Head of household	213	12.4	367	15.8
Mother-in-law/father-in-law	1	0.1	2	0.1
Niece/nephew	22	1.3	14	0.6
Other relative	4	0.2	3	0.1
Parent	4	0.2	2	0.1
Partner	386	22.4	434	18.7
Sibling	28	1.6	21	0.9
Sister-in-law/brother-in-law	14	0.8	11	0.5
Spouse	424	24.7	746	32.1
Unrelated person	35	2.0	15	0.6
Other	2	0.1	4	0.2
Don't know	0	0.0	0	0.0
Decline to respond	0	0.0	0	0.0

*At baseline, marital status is reported by the respondent in the Census. In the second follow-up, marital status is reported by the woman at the start of the Household Survey

* "0" represents women who were missed in the census and added individually into the household survey, so relationship to the head of household was not registered.

3.2 Education Attainment and Literacy

Eighty six percent of second follow-up survey participants had some formal education (Table 3.2). For 47.2% of these women, the highest level of education completed was primary schooling. Literacy was assessed by asking respondents to read from a card the following sentence: "La salud del niño es muy importante para su desarrollo en la vida." Seventy two percent of women surveyed were able to read the whole sentence. Thirteen percent of women could not read the sentence at all.

Table 3.2: Education attainment and literacy

	Baseline 2013				Second Follow-Up 2017			
	n	N	%	SE	n	N	%	SE
Ever attended school	1469	1712	85.6	1.8	2017	2318	86.1	1.3
Attended literacy course	131	1713	8.0	1.2	378	2316	16.4	1.8

	Baseline 2013			Second Follow-Up 2017		
	n	%	SE	n	%	SE
Educational attainment and literacy						
Primary	777	47.2	4.2	981	47.2	3.0
Secondary	485	35.9	2.0	762	38.9	2.2
High school	34	2.2	0.5	90	5.1	1.4
University	151	13.0	2.6	158	7.9	1.8
Technical school	21	1.6	0.5	21	1.1	0.3
Don't know	1	-	-	4	-	-
Decline to respond	0	-	-	1	-	-
Literacy						
Cannot read at all	190	10.8	1.4	302	13.4	1.1
Can read parts	233	13.5	1.3	339	14.8	1.3
Can read entire sentence	1281	75.4	2.2	1666	71.6	2.0
Visually impaired	7	0.3	0.1	6	0.3	0.1
Don't know	1	-	-	4	-	-
Decline to respond	1	-	-	2	-	-

3.3 Employment

As summarized in Table 3.3, the majority of respondents in the second follow-up were homemakers (68.7%). Of the 228 women who reported being employed and working at the time of the interview, most (95.1%) identified "Employee" as their occupational role.

Table 3.3: Employment

	Baseline 2013			Second Follow-Up 2017		
	n	%	SE	n	%	SE
Employment status						
Homemaker	1300	70.6	3.1	1743	68.7	2.5
Student	168	12.2	1.6	194	11.7	1.4
Employed/paid for work	171	11.6	1.7	228	10.6	1.5
Self-employed	57	4.5	1.2	128	7.9	1.4
Unable to work due to disability	7	0.3	0.1	10	0.7	0.3
Employed by a family member without pay	2	0.2	0.2	5	0.3	0.2
Employed, but did not work in last week	4	0.4	0.3	3	0.1	0.0
Retired	1	0.0	-	0	0.0	-
Employed in a cooperative	3	0.1	0.1	1	0.0	-
Don't know	0	-	-	4	-	-
Decline to respond	0	-	-	3	-	-
Occupational role, among women employed and being paid for work						
Employee	167	96.0	2.1	215	95.1	1.9
Proprietor	0	0.0	-	8	2.5	1.3
Employer	3	2.4	1.6	1	1.2	1.2
Independent contractor	1	1.6	1.5	3	1.1	0.6
Don't know	0	-	-	1	-	-
Decline to respond	0	-	-	0	-	-

* Self-employed option was not included in the baseline survey

3.4 Exposure to Mass Media

Respondents were asked about their exposure to newspapers, radio, and television. As displayed in Table 3.4, among women who demonstrated full or partial literacy in the second follow-up, 30% had weekly exposure to newspapers. Fifty three percent of all women had weekly exposure to radio, and 54.8% had weekly exposure to television.

Table 3.4: Exposure to mass media

	Baseline 2013			Second Follow-Up 2017		
	n	%	SE	n	%	SE
Newspapers, among literate women						
Never	583	38.4	2.4	1112	54.4	3.2
At least once a week	727	49.2	2.6	561	30.0	3.1
Less than once a week	200	12.4	1.3	324	15.5	1.5
Don't know	3	-	-	5	-	-
Decline to respond	0	-	-	1	-	-
Not applicable	1	-	-	2	-	-
Radio						
At least once a week	1241	72.3	2.4	1195	53.0	2.8
Never	308	19.5	2.2	797	33.5	2.6
Less than once a week	142	8.2	1.3	304	13.4	1.2
Don't know	1	-	-	2	-	-
Decline to respond	0	-	-	1	-	-
Not applicable	21	-	-	20	-	-
Television						
At least once a week	989	66.9	3.2	1208	54.8	3.3
Never	546	26.5	3.3	841	34.9	3.3
Less than once a week	111	6.6	1.0	204	10.3	1.3
Don't know	1	-	-	5	-	-
Decline to respond	3	-	-	0	-	-
Not applicable	63	-	-	61	-	-

3.5 Access to Health Services

3.5.1 Proximity to health care facilities

Table 3.5 - Table 3.7 display the responses to several survey questions that were used to assess access to health care facilities. Respondents were asked to estimate proximity to health care facilities in terms of distance (kilometers) and travel time. Not surprisingly, respondents typically had more difficulty estimating distance to health care facilities. As shown in the tables below, “Don’t know” responses to the distance questions were exceedingly common.

Excluding the 787 women who were unable to estimate the distance to the closest health facility in the second follow-up, 75% of women reported living 3 kilometers or less from a health facility (Table 3.5). Three-quarters of the sample indicated that it took less than 40 minutes to reach this facility by the usual means of transportation. One-quarter estimated the travel time from their household to the closest health facility to be 40 minutes or more.

Women were also asked for the travel distance and time to their usual health facility, if they had a usual health facility. Excluding the 699 women who did not know the distance to the facility in the second follow-up, three-quarters of the women reported traveling up to 3 kilometers, and three-quarters of the women could travel to the closest facility in less than 50 minutes (Table 3.6).

Of the 1,518 women who reported a recent health facility visit for themselves or for family members in the second follow-up, three-quarters traveled less than 3 kilometers for care. Twenty-five percent of women traveled 3 to 730 kilometers for care. Half of women traveled for less than 20 minutes, and one-quarter spent 40 minutes or more traveling for care. The longest travel time reported for a recent illness was approximately 72 hours.

Table 3.5: Proximity to health care facilities: nearest health facility

	N	DK/DTR	Min	25th Percentile	Median	75th Percentile	Max
Baseline 2013							
Distance, km	1561	152	0	1	2	5	300
Travel time, min	1645	8	1	10	20	45	1800
Second Follow-Up 2017							
Distance, km	1532	787	0	0.5	1	3	100
Travel time, min	2092	116	1	10	20	40	3000

Table 3.6: Proximity to health care facilities: usual health facility

	N	DK/DTR	Min	25th Percentile	Median	75th Percentile	Max
Baseline 2013							
Distance, km	1462	151	0	1	2	6	300
Travel time, min	1604	6	1	15	25	60	2700
Second Follow-Up 2017							
Distance, km	1416	699	0	0.5	1	3	580
Travel time, min	2014	67	1	10	20	50	1800

Table 3.7: Proximity to health care facilities: health facility for recent illness

	N	DK/DTR	Min	25th Percentile	Median	75th Percentile	Max
Baseline 2013							
Distance, km	1403	149	0	1	2	6.6	300
Travel time, min	1544	2	1	15	30	60	2400
Second Follow-Up 2017							
Distance, km	1035	455	0	0.5	1	3	730
Travel time, min	1448	16	1	10	20	40	4320

3.6 Health Status

3.6.1 Current health status

Table 3.8 shows the self-rated current health status of all women participating in the survey. When asked to evaluate their current health status relative to the past year, 51.5% reported that their health was “about the same” in the second follow-up. While 37.9% reported that their health had improved, 10.6% reported worse health on the day of the interview, compared to last year. Eighty two percent could “easily” perform their daily activities (e.g., work, housework, and childcare). About 18% of women reported at least some degree of difficulty performing these tasks that was related to their health status.

Table 3.8: Current health status

	Baseline 2013			Second Follow-Up 2017		
	n	%	SE	n	%	SE
Current health relative to last year						
Better	707	44.5	1.5	866	37.9	1.9
Worse	174	8.4	0.7	242	10.6	1.0
About the same	831	47.1	1.5	1203	51.5	2.1
Don't know	1	-	-	5	-	-
Decline to respond	0	-	-	3	-	-
Ability to perform daily activities						
Easily	1471	86.5	1.1	1917	81.6	1.6
With some difficulty	217	12.4	1.0	330	14.9	1.4
With much difficulty	23	1.0	0.2	63	3.4	0.6
Unable to do	2	0.1	0.1	4	0.1	0.1
Don't know	0	-	-	1	-	-
Decline to respond	0	-	-	4	-	-

	Baseline 2013			Second Follow-Up 2017		
	n	%	SE	n	%	SE
Days in the last month that physical health was not good						
No days	1188	69.0	1.5	1590	69.7	2.1
1 to 3 days	169	12.1	1.2	203	8.4	1.1
4 to 7 days	355	18.9	1.7	521	22.0	1.4
7 to 29 days	0	0.0	-	0	0.0	-
All month	0	0.0	-	0	0.0	-
Don't know	1	-	-	5	-	-
Decline to respond	0	-	-	0	-	-
Days in the last month that mental health was not good						
No days	1375	79.4	1.9	1831	78.4	1.9
1 to 3 days	116	6.8	0.9	129	6.0	0.8
4 to 7 days	219	13.8	1.6	352	15.6	1.4
7 to 29 days	0	0.0	-	0	0.0	-
All month	0	0.0	-	0	0.0	-
Don't know	3	-	-	7	-	-
Decline to respond	0	-	-	0	-	-

3.6.2 Recent illness

Women were asked a series of questions about any illnesses or health problems they had in the two weeks preceding the interview. Out of the women in the second follow-up, 20.4% reported being sick during that time (Table 3.9). Of the 473 women who reported a recent illness, headache (19.9%), cough (10.1%), fever (9.4), and abdominal pain (7.8%) were the most commonly elicited specific complaints. Thirty two percent of women specified a different health problem not listed in the questionnaire.

Table 3.9: Recent illness (in the last two weeks)

	Baseline 2013				Second Follow-Up 2017			
	n	N	%	SE	n	N	%	SE
Respondent was sick during the past two weeks	413	1711	22.7	1.7	473	2318	20.4	1.4

	Baseline 2013			Second Follow-Up 2017		
	n	%	SE	n	%	SE
Type of illness, among those sick in the past two weeks						
Headache	98	25.6	3.3	89	19.9	3.1
Cough	0	0.0	-	49	10.1	1.8
Fever	52	12.4	2.6	57	9.4	1.5
Abdominal pain	41	9.1	2.3	38	7.8	1.4
Gynecologic problem	17	4.1	1.2	28	5.4	1.3
Hypertension	11	6.3	2.5	17	4.1	1.3
Skin rash/infection	4	0.6	0.3	7	3.0	2.0
Vomiting	4	1.9	1.4	6	2.4	1.2
Swelling in legs, ankles, or feet	0	0.0	-	6	1.8	0.8
Toothache	11	1.5	0.5	4	0.8	0.5
Diabetes	2	2.0	1.5	1	0.8	0.8
Paralysis	0	0.0	-	1	0.6	0.7
Diarrhea without blood	2	0.3	0.2	3	0.5	0.3
Eye/ear infection	4	0.9	0.4	3	0.4	0.3
Anemia	0	0.0	-	2	0.3	0.3
Bronchitis	1	0.3	0.2	1	0.2	0.2
Chest infection	0	0.0	-	1	0.2	0.2
Asthma	3	0.6	0.4	1	0.1	0.1
Obstetric problem	1	0.2	0.2	1	0.1	0.1
Poisoning	0	0.0	-	1	0.1	0.1
Malaria	1	0.2	0.2	0	0.0	-
Cough/chest infection	32	6.0	1.5	0	0.0	-
Tuberculosis	0	0.0	-	0	0.0	-
Pneumonia	1	0.2	0.2	0	0.0	-
Diarrhea with blood	0	0.0	-	0	0.0	-
Diarrhea with vomiting	2	0.4	0.3	0	0.0	-
Measles	0	0.0	-	0	0.0	-
Jaundice	1	0.1	0.1	0	0.0	-
Stroke	0	0.0	-	0	0.0	-
HIV/AIDS	0	0.0	-	0	0.0	-
Blood in urine	0	0.0	-	0	0.0	-
Other	125	27.3	3.5	154	31.8	2.7
Don't know	0	-	-	1	-	-
Decline to respond	0	-	-	2	-	-

* Options for "Swelling in legs, ankles, or feet", "Blood in urine", "Poisoning", "Chest infection" and "Cough" were only available only in the follow-up survey. Option "Cough/Chest infection" was only available at the baseline.

3.6.3 Utilization of health services

Table 3.10 summarizes data regarding the utilization of health services among the 473 women who reported an illness in the two weeks preceding the second follow-up interview. Two hundred twenty three (49.8%) of these women sought care at a health care facility. Many of these women attended a Public health post health unit (44.5%); another 26% attended a Public health center/clinic. Only ten women were hospitalized for their recent illness (4.7% of those who sought care).

Table 3.10: Utilization of health services for illness in the last two weeks

	Baseline 2013				Second Follow-Up 2017			
	n	N	%	SE	n	N	%	SE
Sought care for recent illness	166	413	43.4	4.1	223	472	49.8	4.2
Admitted to hospital for care*	8	164	4.1	1.4	10	220	4.7	2.1

Among women who sought care at a public or private hospital, health center/clinic, mobile clinic, or other health facility; public health unit; private office; or pharmacy.

	Baseline 2013			Second Follow-Up 2017		
	n	%	SE	n	%	SE
Type of facility where care was sought						
Public health post	0	0.0	-	107	44.5	7.5
Public health center/clinic	53	33.7	6.9	51	26.0	5.3
Public hospital	50	31.5	7.6	30	13.1	4.2
Private health clinic	2	1.4	1.0	10	6.0	3.0
Private doctor's office	5	4.7	3.4	11	4.3	1.5
Casa base	0	0.0	-	9	3.0	1.9
Pharmacy	1	0.5	0.5	2	1.6	1.2
Other public health facility	0	0.0	-	1	1.3	1.3
Private hospital	1	0.6	0.6	1	0.2	0.2
Public mobile clinic	1	0.7	0.7	0	0.0	-
Private mobile clinic	0	0.0	-	0	0.0	-
Other private health facility	1	0.3	0.3	0	0.0	-
Community health worker	0	0.0	-	0	0.0	-
Traditional healer	0	0.0	-	0	0.0	-
Home of a community health worker	0	0.0	-	0	0.0	-
School	0	0.0	-	0	0.0	-
Public health unit	50	23.1	4.4	0	0.0	-
Other	2	3.6	3.2	0	0.0	-
Don't know	0	-	-	0	-	-
Decline to respond	0	-	-	1	-	-

* A casa base is an ambulatory health unit that provides services in remote communities on specified days and times, and may depend on mobile medical professionals that serve multiple units.

* Options for "Public health center", "Public health post", "Home of a traditional healer", "School", and "Casa base" were not available at baseline. Options for "Public health unit and "Public health clinic/center" were not available at follow-up.

3.6.4 Insurance coverage

About 6% of women reported being covered by any type of health insurance in the second follow-up (Table 3.11).

Table 3.11: Insurance coverage

	Baseline 2013			Second Follow-Up 2017		
	n	%	SE	n	%	SE
No insurance	1644	94.4	1.6	2178	93.9	1.0
INSS	62	5.0	1.4	124	5.6	1.0
Government/Armed forces	2	0.1	0.1	4	0.2	0.1
Private insurance	4	0.4	0.3	2	0.1	0.0
Other	1	0.0	-	6	0.3	0.2
Don't know	0	-	-	4	-	-
Decline to respond	0	-	-	1	-	-

3.6.5 Other barriers to health care access

There are many other barriers to accessing health care. Women who reported that they sometimes or never sought care when they felt sick were asked what reasons prevented them from receiving health care when it was needed. Interviewers were instructed to ask in an open-ended manner for all applicable reasons, and to mark the appropriate response options in the questionnaire based on the woman's response. Table 3.12 summarizes the responses to this section. The most commonly cited factors influencing health care access in the second follow-up were the preference for treatment at home (33%) and the belief that the health center does not have sufficient medicines (22%). Twelve percent of women did not believe they were ill enough to seek treatment. Access and quality of care were also important barriers: 9% of women said the health center was too far away, 4.4% said care was too expensive, and 5.2% said the health center personnel were too difficult to deal with.

Table 3.12: Other barriers to health care utilization, women 15-49 years of age who were sick in the last two weeks but did not seek care

	Baseline 2013				Second Follow-Up 2017			
	n	N	%	SE	n	N	%	SE
Treated self at home	92	247	44.5	5.8	86	246	33.0	4.2
Health center does not have sufficient medicines	58	247	17.7	2.7	53	246	22.0	4.2
Not sick enough to seek treatment	33	247	15.6	3.8	30	246	12.5	3.1
Health center is not well-equipped	9	247	2.7	1.0	15	246	10.3	3.2
Health center is too far away	10	247	4.0	1.9	26	246	9.0	2.8
Too busy with work, children, or other commitments	21	247	8.5	2.9	17	246	8.5	2.5
Was previously mistreated	10	247	3.3	1.2	14	246	6.5	2.8
It is difficult to deal with health center personnel	15	247	5.3	1.8	15	246	5.2	1.8
Health center personnel not knowledgeable	2	247	0.6	0.4	8	246	4.8	2.2
Care is too expensive	10	247	3.4	1.1	8	246	4.4	2.2
Do not trust the personnel	3	247	3.5	2.4	11	246	4.2	2.0
Tried, but no staff was at the center	2	247	0.5	0.4	8	246	2.4	1.2
Could not afford transportation	33	247	10.4	3.3	5	246	1.9	1.0
Health center infrastructure is poor	5	247	1.6	0.9	2	246	1.9	1.7
Did not want to go alone	3	247	0.9	0.6	4	246	1.8	1.0
Tried, but was refused care	9	247	3.8	1.6	4	246	1.0	0.6
Could not get permission to go to the doctor	1	247	0.3	0.3	1	246	0.3	0.3
Could not find transportation	7	247	1.9	0.7	1	246	0.2	0.2
Did not know where to go	0	247	0.0	-	0	246	0.0	-
Religious or cultural beliefs	3	247	0.8	0.4	0	246	0.0	-
Other	18	247	5.3	1.3	42	246	19.6	4.0

*categories not mutually exclusive (select all that apply)

4 CHAPTER 4: EXPOSURE TO HEALTH SYSTEM INTERVENTIONS

This chapter summarizes the exposure of women to four health system interventions: community health worker interventions, breastfeeding interventions, child nutrition interventions, and child health interventions.

4.1 Exposure to Community Health Workers

Respondents were asked about their exposure to community health workers. Four percent of women reported meeting with a community health worker in the month preceding the second follow-up interview (Table 4.1). Two percent met only once, and 1.5% met two or more times.

Table 4.1: Exposure to community health workers, women 15-49 years

	Baseline 2013			Second Follow-Up 2017		
	n	%	SE	n	%	SE
Did not meet	1683	98.5	0.4	2220	96.4	0.6
One time	20	1.0	0.4	57	2.1	0.4
Two times	6	0.3	0.1	23	1.1	0.4
Three times	2	0.1	0.1	8	0.3	0.2
Four or more times	1	0.1	0.1	3	0.1	0.0
Don't know	1	-	-	6	-	-
Decline to respond	0	-	-	0	-	-

Referral and advice services provided by community health workers are summarized in Table 4.2. Among women who met with a community health worker in the last month during the second follow-up, family planning methods or counseling was the most common service provided (73.5%). Advice about vaccination for children (65.3%) and referral for voluntary hiv/syphilis counseling and testing* (55.1%) was also frequently reported.

Table 4.2: Services provided by community health workers, women 15-49 years

	Baseline 2013				Second Follow-Up 2017			
	n	N	%	SE	n	N	%	SE
Family planning methods or counseling	23	30	77.0	9.2	70	96	73.5	6.4
Vaccination for children	20	30	51.8	13.4	64	96	65.3	7.5
Referral for voluntary HIV/syphilis counseling and testing*	9	30	26.0	8.3	50	96	55.1	7.8
Child nutrition counseling	21	30	53.9	13.0	43	96	47.7	7.8
Referral for antenatal care	13	30	34.6	9.3	41	96	46.7	7.8
Referral for in-facility delivery	9	30	26.4	8.8	34	96	36.2	6.8
Information, education, and communication sessions (IEC)	11	30	33.4	10.3	22	96	18.9	5.1

* For the prevention of HIV/syphilis transmission from mother to child

	Second Follow-Up 2017			
	n	N	%	SE
Deworming	62	96	63.2	7.7
Diarrhea treatment with ORS and zinc	48	96	50.8	7.0
Micronutrients	46	96	48.4	7.5
Referral for postnatal care	37	96	41.9	7.8
Other	14	96	13.1	4.1

Questions about these topics were not asked at baseline. They were added to the second follow-up survey to track exposure to SMI interventions.

4.2 Satisfaction with Community Health Workers

Women who met with a community health worker in the month preceding the interview were asked to assess their satisfaction with the following: number of visits, information provided by community health workers, and respectfulness of community health workers. Results are displayed in Table 4.3.

Table 4.3: Satisfaction with community health workers, women 15-49 years of age who met with community health workers in the last month

	Baseline 2013			Second Follow-Up 2017		
	n	%	SE	n	%	SE
Satisfaction with number of visits from community health workers						
Very dissatisfied	1	2.5	2.4	8	9.2	4.2
Dissatisfied	2	4.2	3.0	13	12.3	3.6
Satisfied	21	80.6	7.0	67	71.9	7.4
Very satisfied	5	12.7	5.9	4	6.6	4.0
Don't know	0	-	-	0	-	-
Decline to respond	0	-	-	1	-	-
Satisfaction of knowledge and training of community health workers						
Very dissatisfied	1	2.6	2.5	6	8.0	4.0
Dissatisfied	2	4.3	3.1	12	11.5	3.6
Satisfied	21	83.4	6.3	66	66.5	8.0
Very satisfied	4	9.8	5.0	8	14.0	6.0
Don't know	0	-	-	0	-	-
Decline to respond	1	-	-	1	-	-
Satisfaction with information provided by community health workers						
Very dissatisfied	2	5.6	4.0	7	8.6	4.1
Dissatisfied	1	2.1	2.1	11	10.8	3.6
Satisfied	20	76.9	8.2	66	66.4	7.9
Very satisfied	6	15.4	7.2	8	14.2	6.1
Don't know	0	-	-	0	-	-
Decline to respond	0	-	-	1	-	-
Satisfaction with respectfulness shown by community health workers						
Very dissatisfied	2	5.6	4.0	5	7.2	4.0
Dissatisfied	1	2.1	2.1	10	13.8	5.6
Satisfied	22	82.8	6.5	71	70.7	8.1
Very satisfied	4	9.5	4.8	6	8.3	4.1
Don't know	0	-	-	0	-	-
Decline to respond	0	-	-	1	-	-

4.3 Counseling provided in health facilities

Respondents who had visited a health facility in the last 12 months (1,361 women at the second follow-up) were asked whether they were given counseling about certain topics by health center personnel. Approximately 17.6% of women in the second follow-up reported receiving guidance or advice about breastfeeding in the 12 months preceding the interview (Table 4.4). Approximately 18.7% of women in the second follow-up reported receiving guidance or advice about child nutrition in the 12 months preceding the interview (Table 4.4). Approximately 24.3% of women in the second follow-up reported receiving guidance or advice about danger signs for children's health in the 12 months preceding the interview (Table 4.4).

Table 4.4: Exposure to breastfeeding, child nutrition, and child health interventions, women 15-49 years

	Baseline 2013				Second Follow-Up 2017			
	n	N	%	SE	n	N	%	SE
Breastfeeding	329	1135	29.4	2.3	286	1360	17.6	1.7
Child nutrition	312	1135	28.1	2.2	305	1360	18.7	1.8
Danger signs for children's health	320	1135	28.8	2.2	381	1360	24.3	1.9

4.4 Counseling provided in health facilities to women with children

In the follow-up survey, respondents who had visited a health facility in the last 12 months and who had children (1,199 women at the second follow-up) were asked whether they were given counseling about certain topics by health center personnel.

Table 4.5: Counseling provided in health facilities to women with children

	Second Follow-Up 2017			
	n	N	%	SE
Provided deworming treatment	271	1194	21.3	2.1
Provided diarrhea treatment with ORS and zinc	254	1195	19.1	1.8
Provided micronutrients	192	1195	14.6	1.6

Questions about these topics were not asked at baseline. They were added to the second follow-up survey to track exposure to SMI interventions.

5 CHAPTER 5: FAMILY PLANNING

This chapter summarizes key indicators related to the knowledge of, access to, need for, and use of family planning methods among women of reproductive age (15-49 years) participating in the SMI-Nicaragua second follow-up household survey.

Family planning questions were asked only to women of reproductive age who were married or partnered. During the SMI-Nicaragua baseline household survey, family planning questions were asked to women whose marital status was reported as “married” or “partnered” by the SMI-Nicaragua household census respondent. During the second follow-up, the family planning section was instead conditioned on a question about marital status asked to the respondent herself at the start of the woman’s health interview. This captured participants who had a change in marital status between the census and household survey and participants whose marital status was incorrectly recorded in the census. At the baseline, 1,115 women qualified for the family planning questions, and at the second follow-up, 1,600 women qualified.

5.1 Knowledge of the Fertile Period

The successful use of family planning methods depends on an understanding of when during the menstrual cycle a woman is most likely to conceive. This is especially true for traditional methods such as the rhythm method (i.e., periodic abstinence) and the withdrawal method. To assess knowledge of the fertile period, women were asked if there are certain days when a woman is more likely to become pregnant, and when during the menstrual cycle those days occur. Responses to these questions are summarized in Table 5.1. In the second follow-up, 86% of women indicated that there were certain days when a woman is more likely to become pregnant, and of these women, only 9.1% identified the correct timing of the fertile period (halfway between two periods).

Table 5.1: Knowledge of the fertile period, women 15-49 years of age who are married or partnered

	Baseline 2013				Second Follow-Up 2017			
	n	N	%	SE	n	N	%	SE
Are there certain days when a woman is more likely to become pregnant?	778	1008	77.6	2.1	1185	1379	86	1.8

	Baseline 2013			Second Follow-Up 2017		
	n	%	SE	n	%	SE
Time of a woman’s fertile period						
Just before period	186	24.7	2.8	153	12.2	1.6
During period	44	6.6	1.3	39	3.3	0.7
Just after period	389	49.4	3.7	843	74.7	2.4
Halfway between periods	138	18.4	2.6	100	9.1	1.4
Other	6	0.9	0.3	6	0.7	0.4
Don’t know	13	-	-	42	-	-
Decline to respond	2	-	-	2	-	-

5.2 Use of Family Planning Methods

5.2.1 Current use

The coverage of contraceptive methods is one of the indicators most frequently used to assess the success of family planning program activities. It is also widely used as a determinant of fertility. Women who said they had heard of a family planning method were asked if they were currently using that method. Table 5.2 displays the percentage of all women using at least one family planning method, as well as the percentage of women reporting use of more than one family planning method at the time of the interview. Sixty nine percent of all survey respondents in the second follow-up reported current use of at least one family planning method.

Women considered “in need” of family planning methods are those who are married or partnered, excluding those who report the following characteristics: does not have sexual relations, virgin, menopausal, infertile, pregnant, or wants to become pregnant. Even women not considered “in need” of contraception may use a method. Table 5.3 shows the uptake of modern family planning methods among all married and partnered women (69.2%), and among women considered “in need” of contraception (80.4%).

Table 5.2: Current use of family planning methods, women 15-49 years of age who are married or partnered

	Baseline 2013				Second Follow-Up 2017			
	n	N	%	SE	n	N	%	SE
Currently in need of contraception	958	1115	81.9	2.0	1369	1600	82.0	1.6
Current use of any method, among all women	829	1115	69.5	2.2	1148	1600	69.2	2.1

Table 5.3: Current use of modern family planning methods, women 15-49 years of age who are married or partnered and in need of contraception

	Baseline 2013				Second Follow-Up 2017			
	n	N	%	SE	n	N	%	SE
Current use of any method	819	958	83.6	1.7	1110	1369	80.4	2
Current use of modern method	813	958	83.1	1.7	1092	1369	79.3	2

	Baseline 2013			Second Follow-Up 2017		
	n	%	SE	n	%	SE
Number of methods the respondent is currently using						
Not using any family planning methods	143	17.0	1.8	263	20.0	1.9
Using 1 family planning method	812	82.7	1.7	1084	78.0	2.1
Using 2 family planning methods	3	0.2	0.1	22	1.9	0.8

Table 5.4 displays the percentage of all women using specific family planning methods. The methods most commonly in use during the second follow-up are injectables (41.1%) and female sterilization (15.8%).

Table 5.4: Current use of family planning methods, by type of method, for women 15-49 years of age who are married or partnered

	Baseline 2013				Second Follow-Up 2017			
	n	N	%	SE	n	N	%	SE
Injectable	523	1115	41.6	2.1	746	1593	41.1	2.2
Female sterilization	167	1114	16.8	1.6	225	1593	15.8	1.4
Oral contraceptive	87	1113	6.9	1.2	104	1590	7.5	1.1
Male condom	24	1114	1.9	0.5	37	1593	2.6	0.7
Intrauterine device (IUD)	21	1114	1.9	0.6	29	1592	2.2	0.5
Implant	0	1114	0.0	-	4	1592	0.4	0.3
Withdrawal	3	1114	0.2	0.1	6	1596	0.4	0.2
Rhythm	3	1115	0.2	0.2	7	1596	0.3	0.2
Emergency contraception (Plan B)	0	1113	0.0	-	1	1590	0.3	0.3
Lactational amenorrhea	1	1114	0.1	0.1	7	1594	0.2	0.1
Male sterilization	0	1115	0.0	-	0	1593	0.0	-
Female condom	0	1115	0.0	-	0	1593	0.0	-
Diaphragm	0	1115	0.0	-	0	1597	0.0	-
Sponge	0	1115	0.0	-	0	1590	0.0	-
Other modern method	0	1115	0.0	-	0	1590	0.0	-
Other traditional method	0	1113	0.0	-	0	1592	0.0	-

* categories not mutually exclusive (select all that apply)

5.3 Sources of Family Planning Methods

Information on where women obtain contraceptive methods is important for family planning program managers. The places where the currently-used family planning methods were acquired are summarized in Table 5.5.

The public sector is the source most commonly reported by users of most modern family planning methods, including female sterilization. Pharmacies are important sources for injectables, the pill, and male condoms. Women report learning about traditional methods in the public sector, from friends or relatives, or at church (Table 5.6).

Table 5.5: Source of modern family planning methods, women 15-49 years of age who are married or partnered

	Baseline 2013			Second Follow-Up 2017		
	n	%	SE	n	%	SE
Injectable						

(continued)

	n	%	SE	n	%	SE
Public hospital	130	24.8	3.5	150	18.5	3.0
Public health center/clinic	112	19.9	2.7	155	19.6	3.1
Public health post	0	0.0	-	302	39.4	4.1
Public mobile clinic	0	0.0	-	0	0.0	-
Other public health facility	2	0.2	0.2	1	0.1	0.1
Private hospital	1	0.2	0.2	1	0.1	0.1
Private health clinic	5	1.1	0.8	5	1.1	0.7
Private doctor's office	3	0.9	0.6	1	0.1	0.1
Private mobile clinic	1	0.1	0.1	0	0.0	-
Other private health facility	1	0.1	0.1	1	0.1	0.1
Pharmacy	48	11.2	2.7	79	12.6	2.5
Community health worker	34	5.2	1.4	6	1.9	1.0
Traditional healer	0	0.0	-	0	0.0	-
Store	1	0.2	0.2	0	0.0	-
Market	0	0.0	-	0	0.0	-
Church	0	0.0	-	0	0.0	-
Friend/relative	3	0.4	0.2	3	1.0	0.7
Home of a community health worker	0	0.0	-	5	0.6	0.3
School	0	0.0	-	0	0.0	-
Casa base	0	0.0	-	31	4.5	1.6
Casa materna	0	0.0	-	0	0.0	-
Public health unit	179	35.2	3.7	0	0.0	-
Other	3	0.5	0.3	4	0.6	0.4
Don't know	0	-	-	1	-	-
Decline to respond	0	-	-	2	-	-
Female sterilization						
Public hospital	141	86.2	3.7	208	95.1	2.1
Public health center/clinic	7	3.7	1.8	6	2.2	1.4
Public health post	0	0.0	-	3	0.6	0.3
Public mobile clinic	0	0.0	-	1	0.5	0.5
Other public health facility	0	0.0	-	0	0.0	-
Private hospital	0	0.0	-	0	0.0	-
Private health clinic	5	2.3	1.0	6	1.5	0.8
Private doctor's office	2	2.7	2.3	0	0.0	-
Private mobile clinic	1	0.3	0.3	0	0.0	-
Other private health facility	0	0.0	-	0	0.0	-
Pharmacy	0	0.0	-	1	0.2	0.2
Community health worker	0	0.0	-	0	0.0	-
Traditional healer	0	0.0	-	0	0.0	-
Store	0	0.0	-	0	0.0	-
Market	0	0.0	-	0	0.0	-
Church	0	0.0	-	0	0.0	-
Friend/relative	0	0.0	-	0	0.0	-
Home of a community health worker	0	0.0	-	0	0.0	-
School	0	0.0	-	0	0.0	-
Casa base	0	0.0	-	0	0.0	-
Casa materna	0	0.0	-	0	0.0	-
Public health unit	11	4.8	2.0	0	0.0	-
Other	0	0.0	-	0	0.0	-
Don't know	0	-	-	0	-	-

(continued)

	n	%	SE	n	%	SE
Decline to respond	0	-	-	0	-	-
Oral contraceptive						
Public hospital	11	10.6	3.9	11	13.1	5.6
Public health center/clinic	18	16.6	4.6	24	32.6	7.4
Public health post	0	0.0	-	41	27.9	6.5
Public mobile clinic	0	0.0	-	0	0.0	-
Other public health facility	1	0.7	0.7	0	0.0	-
Private hospital	0	0.0	-	1	0.4	0.4
Private health clinic	1	1.4	1.4	0	0.0	-
Private doctor's office	0	0.0	-	0	0.0	-
Private mobile clinic	0	0.0	-	0	0.0	-
Other private health facility	0	0.0	-	0	0.0	-
Pharmacy	17	37.8	10.1	16	16.5	6.0
Community health worker	4	3.6	1.8	0	0.0	-
Traditional healer	0	0.0	-	0	0.0	-
Store	0	0.0	-	0	0.0	-
Market	0	0.0	-	0	0.0	-
Church	0	0.0	-	0	0.0	-
Friend/relative	0	0.0	-	1	1.7	1.6
Home of a community health worker	0	0.0	-	2	1.2	1.2
School	0	0.0	-	0	0.0	-
Casa base	0	0.0	-	9	6.5	3.8
Casa materna	0	0.0	-	0	0.0	-
Public health unit	34	28.7	6.5	0	0.0	-
Other	1	0.6	0.6	0	0.0	-
Don't know	0	-	-	0	-	-
Decline to respond	0	-	-	0	-	-
Intrauterine device (IUD)						
Public hospital	13	40.9	14.2	15	46.8	13.3
Public health center/clinic	1	4.2	4.2	5	20.2	9.7
Public health post	0	0.0	-	4	12.6	8.9
Public mobile clinic	0	0.0	-	0	0.0	-
Other public health facility	0	0.0	-	1	8.9	8.5
Private hospital	0	0.0	-	0	0.0	-
Private health clinic	0	0.0	-	4	10.3	6.1
Private doctor's office	0	0.0	-	1	1.1	1.1
Private mobile clinic	0	0.0	-	0	0.0	-
Other private health facility	0	0.0	-	0	0.0	-
Pharmacy	0	0.0	-	0	0.0	-
Community health worker	0	0.0	-	0	0.0	-
Traditional healer	0	0.0	-	0	0.0	-
Store	0	0.0	-	0	0.0	-
Market	0	0.0	-	0	0.0	-
Church	0	0.0	-	0	0.0	-
Friend/relative	0	0.0	-	0	0.0	-
Home of a community health worker	0	0.0	-	0	0.0	-
School	0	0.0	-	0	0.0	-
Casa base	0	0.0	-	0	0.0	-
Casa materna	0	0.0	-	0	0.0	-
Public health unit	7	54.8	15.9	0	0.0	-

(continued)

	n	%	SE	n	%	SE
Other	0	0.0	-	0	0.0	-
Don't know	0	-	-	0	-	-
Decline to respond	0	-	-	0	-	-
Public hospital	1	100.0	0.0	0	0.0	-
Public health center/clinic	0	0.0	-	1	68.8	24.2
Public health post	0	0.0	-	2	14.1	13.1
Public mobile clinic	0	0.0	-	0	0.0	-
Other public health facility	0	0.0	-	0	0.0	-
Private hospital	0	0.0	-	0	0.0	-
Private health clinic	0	0.0	-	0	0.0	-
Private doctor's office	0	0.0	-	0	0.0	-
Private mobile clinic	0	0.0	-	0	0.0	-
Other private health facility	0	0.0	-	0	0.0	-
Pharmacy	0	0.0	-	0	0.0	-
Community health worker	0	0.0	-	0	0.0	-
Traditional healer	0	0.0	-	0	0.0	-
Store	0	0.0	-	0	0.0	-
Market	0	0.0	-	0	0.0	-
Church	0	0.0	-	0	0.0	-
Friend/relative	0	0.0	-	0	0.0	-
Home of a community health worker	0	0.0	-	0	0.0	-
School	0	0.0	-	0	0.0	-
Casa base	0	0.0	-	1	8.5	9.9
Casa materna	0	0.0	-	0	0.0	-
Public health unit	0	0.0	-	0	0.0	-
Other	0	0.0	-	1	8.6	10.0
Don't know	0	-	-	0	-	-
Decline to respond	1	-	-	0	-	-
Male condom						
Public hospital	3	23.0	12.6	10	28.0	13.3
Public health center/clinic	8	30.0	10.1	8	26.1	10.7
Public health post	0	0.0	-	7	17.4	6.7
Public mobile clinic	0	0.0	-	0	0.0	-
Other public health facility	0	0.0	-	0	0.0	-
Private hospital	1	3.7	3.7	0	0.0	-
Private health clinic	0	0.0	-	1	1.3	1.3
Private doctor's office	0	0.0	-	0	0.0	-
Private mobile clinic	0	0.0	-	0	0.0	-
Other private health facility	0	0.0	-	0	0.0	-
Pharmacy	5	22.6	9.7	11	27.2	9.1
Community health worker	0	0.0	-	0	0.0	-
Traditional healer	0	0.0	-	0	0.0	-
Store	0	0.0	-	0	0.0	-
Market	0	0.0	-	0	0.0	-
Church	0	0.0	-	0	0.0	-
Friend/relative	0	0.0	-	0	0.0	-
Home of a community health worker	0	0.0	-	0	0.0	-
School	0	0.0	-	0	0.0	-
Casa base	0	0.0	-	0	0.0	-

(continued)

	n	%	SE	n	%	SE
Casa materna	0	0.0	-	0	0.0	-
Public health unit	7	20.8	7.5	0	0.0	-
Other	0	0.0	-	0	0.0	-
Don't know	0	-	-	0	-	-
Decline to respond	0	-	-	0	-	-

* "Female condom", "Sponge", and "Diaphragm" were omitted from table because no women reported receiving them in baseline or follow-up.

* Options for "Public health center", "Public health post", "Home of a traditional healer", "School", and "Casa base" were not available at baseline.

Options for "Public health unit" and "Public health center/clinic" were not available at follow-up. "Public health center" responses from follow-up are grouped within "Public health center/clinic".

Table 5.6: Source of knowledge about traditional family planning methods, women 15-49 years of age who are married or partnered

	Baseline 2013			Second Follow-Up 2017		
	n	%	SE	n	%	SE
Lactational amenorrhea						
Public hospital	1	100.0	0.0	1	10.5	10.3
Public health center/clinic	0	0.0	-	2	32.7	18.8
Public health post	0	0.0	-	2	33.6	19.1
Public mobile clinic	0	0.0	-	0	0.0	-
Other public health facility	0	0.0	-	0	0.0	-
Private hospital	0	0.0	-	0	0.0	-
Private health clinic	0	0.0	-	0	0.0	-
Private doctor's office	0	0.0	-	0	0.0	-
Private mobile clinic	0	0.0	-	0	0.0	-
Other private health facility	0	0.0	-	0	0.0	-
Pharmacy	0	0.0	-	0	0.0	-
Community health worker	0	0.0	-	0	0.0	-
Traditional healer	0	0.0	-	0	0.0	-
Store	0	0.0	-	0	0.0	-
Market	0	0.0	-	0	0.0	-
Church	0	0.0	-	0	0.0	-
Friend/relative	0	0.0	-	2	23.2	15.8
Home of a community health worker	0	0.0	-	0	0.0	-
School	0	0.0	-	0	0.0	-
Casa base	0	0.0	-	0	0.0	-
Casa materna	0	0.0	-	0	0.0	-
Public health unit	0	0.0	-	0	0.0	-
Other	0	0.0	-	0	0.0	-
Don't know	1	-	-	0	-	-
Decline to respond	0	-	-	0	-	-
Rhythm						
Public hospital	0	0.0	-	0	0.0	-
Public health center/clinic	0	0.0	-	1	8.7	9.0
Public health post	0	0.0	-	1	15.4	14.8

Public mobile clinic	0	0.0	-	0	0.0	-
Other public health facility	0	0.0	-	0	0.0	-
Private hospital	0	0.0	-	0	0.0	-
Private health clinic	0	0.0	-	0	0.0	-
Private doctor's office	0	0.0	-	0	0.0	-
Private mobile clinic	0	0.0	-	0	0.0	-
Other private health facility	0	0.0	-	0	0.0	-
Pharmacy	0	0.0	-	0	0.0	-
Community health worker	0	0.0	-	0	0.0	-
Traditional healer	0	0.0	-	0	0.0	-
Store	0	0.0	-	0	0.0	-
Market	0	0.0	-	0	0.0	-
Church	1	25.0	26.8	0	0.0	-
Friend/relative	2	75.0	26.8	2	48.0	24.1
Home of a community health worker	0	0.0	-	1	9.1	9.4
School	0	0.0	-	0	0.0	-
Casa base	0	0.0	-	0	0.0	-
Casa materna	0	0.0	-	0	0.0	-
Public health unit	0	0.0	-	0	0.0	-
Other	0	0.0	-	2	18.7	13.8
Don't know	0	-	-	0	-	-
Decline to respond	0	-	-	0	-	-
Withdrawal						
Public hospital	0	0.0	-	0	0.0	-
Public health center/clinic	0	0.0	-	1	46.4	27.8
Public health post	0	0.0	-	0	0.0	-
Public mobile clinic	0	0.0	-	0	0.0	-
Other public health facility	0	0.0	-	0	0.0	-
Private hospital	0	0.0	-	0	0.0	-
Private health clinic	0	0.0	-	0	0.0	-
Private doctor's office	1	35.8	28.5	0	0.0	-
Private mobile clinic	0	0.0	-	0	0.0	-
Other private health facility	0	0.0	-	0	0.0	-
Pharmacy	0	0.0	-	0	0.0	-
Community health worker	0	0.0	-	0	0.0	-
Traditional healer	0	0.0	-	0	0.0	-
Store	0	0.0	-	0	0.0	-
Market	0	0.0	-	0	0.0	-
Church	0	0.0	-	0	0.0	-
Friend/relative	0	0.0	-	4	45.9	25.5
Home of a community health worker	0	0.0	-	0	0.0	-
School	0	0.0	-	0	0.0	-
Casa base	0	0.0	-	0	0.0	-
Casa materna	0	0.0	-	0	0.0	-
Public health unit	1	34.6	28.1	0	0.0	-
Other	1	29.6	25.8	1	7.7	8.2
Don't know	0	-	-	0	-	-
Decline to respond	0	-	-	0	-	-

* Options for "Public health center", "Public health post", "Home of a traditional healer", "School", and "Casa base" were not available at baseline. Options for "Public health unit" and "Public health center/clinic" were not available at follow-up. "Public health center" responses from follow-up are

grouped within "Public health center/clinic".

5.4 Non-Use and Interruption of Use of Family Planning Methods

Non-use and interruption of use of family planning methods are major concerns for family planning program managers.

5.4.1 Prevalence of interruption

The prevalence of interruption and non-use of family planning methods is summarized in Table 5.7. Of women participating in the second follow-up survey, 82% are considered "in need" of contraception (i.e., they did not report any of the following: does not have sexual relations, virgin, menopausal, infertile, hysterectomy, pregnant, or wants to become pregnant). Among these women in need, 2.3% reported any interruption in the use of family planning methods in the previous year.

Table 5.7: Interruption and non-use of family planning methods, among women 15-49 years of age who are married or partnered and in need of contraception

	Baseline 2013				Second Follow-Up 2017			
	n	N	%	SE	n	N	%	SE
Discontinuation rate*	32	958	3.4	0.8	36	1369	2.3	0.4

* any interruption in use during the last year, among women in need of contraception

	Baseline 2013			Second Follow-Up 2017		
	n	%	SE	n	%	SE
Number of interruptions in use during the last year						
none	926	96.6	0.8	1333	97.7	0.4
once	32	3.4	0.8	36	2.3	0.4
2-6 times per year	0	0.0	-	0	0.0	-
7-12 times per year	0	0.0	-	0	0.0	-
>12 times per year	0	0.0	-	0	0.0	-

5.4.2 Reasons for non-use

Women who indicated they were not using any method on the day of the interview were asked to specify all reasons why they did not use a method. The interviewer matched responses provided by the respondent to a list of reasons in the questionnaire (Table 5.8). The most commonly cited reasons for non-use at the time of the second follow-up interview were, do not like to use contraception (15.9%), respondent is trying to become pregnant (12.5%), and respondent is other reason (10.6%).

Table 5.8: Reasons for non-use of family planning methods, women 15-49 years of age who are married or partnered and who are not currently using family planning methods

	Baseline 2013				Second Follow-Up 2017			
	n	N	%	SE	n	N	%	SE
Do not like to use contraception	61	248	27.0	4.7	74	439	15.9	3.1
Trying to become pregnant	41	248	22.1	3.9	49	439	12.5	2.6
Other reason	25	248	7.6	1.9	51	439	10.6	1.9
Not sexually active	20	248	7.3	2.0	35	439	8.7	2.1
Menopausal	12	248	3.8	1.6	21	439	7.3	2.0
Infrequently sexually active	11	248	5.6	2.4	35	439	7.0	1.8
Married	1	248	0.4	0.4	22	439	6.3	2.1
Spouse or partner opposed to use	6	248	1.5	0.7	33	439	6.2	1.4
Currently pregnant	15	248	6.6	2.2	23	439	6.0	2.0
Using contraception interferes with normal body processes	17	248	5.3	1.5	28	439	5.1	1.0
Opposed to use	8	248	1.9	0.7	26	439	4.7	1.4
Using contraception is uncomfortable	1	248	0.2	0.2	17	439	3.2	1.2
Unmarried	7	248	2.1	0.8	9	439	3.0	1.2
Concerned about side effects	9	248	2.3	0.9	20	439	3.0	0.8
Infertile	14	248	8.3	3.0	12	439	2.8	1.0
Against religious beliefs	4	248	5.3	2.9	6	439	1.8	0.9
Others opposed to use	0	248	0.0	-	8	439	1.7	0.7
Knows no method	2	248	0.8	0.6	6	439	1.7	0.9
The health facility is too far away	1	248	0.2	0.2	5	439	1.2	0.7
Have undergone hysterectomy	4	248	1.9	1.2	4	439	1.1	0.8
No menstrual period since giving birth	5	248	1.6	0.7	7	439	1.0	0.5
Breastfeeding	10	248	2.3	0.7	7	439	1.0	0.4
Mistrust health center staff	0	248	0.0	-	4	439	1.0	0.8
Virgin	1	248	0.1	0.2	1	439	0.6	0.6
No method was available	0	248	0.0	-	1	439	0.6	0.5
Preferred method was not available	1	248	0.4	0.4	2	439	0.3	0.2
Knows no source for methods	0	248	0.0	-	1	439	0.1	0.1
Could not find transportation to a health facility	0	248	0.0	-	1	439	0.1	0.1
Health facility staff difficult to deal with	2	248	0.5	0.4	1	439	0.1	0.1
Could not afford transportation	3	248	0.9	0.5	0	439	0.0	-
The method is too expensive	2	248	0.6	0.6	0	439	0.0	-

* "Using contraception affects health" was an option offered in the second follow-up, but was not available at baseline.

63 women selected this as a reason for not using family planning at the second follow-up.

* categories not mutually exclusive (select all that apply)

5.5 Family Planning Intentions and Decision-Making

5.5.1 Participation in family planning decision

In this setting in the second follow-up, 73.6% of women report that decisions about family planning methods are jointly made by the respondent and her partner. In only 4% of cases, the decision to use family planning methods is up to the respondent's partner alone.

Table 5.9: Participation in family planning decision-making, women 15-49 years of age who are married or partnered and are currently using family planning methods

	Baseline 2013			Second Follow-Up 2017		
	n	%	SE	n	%	SE
Joint decision	753	74.1	1.8	998	73.6	2.2
Mostly the respondent	182	19.0	1.7	284	22.1	2.0
Mostly respondent's spouse/partner	75	6.3	1.0	49	4.0	1.0
Not applicable - not partnered	3	0.2	0.1	0	0.0	-
Other	4	0.4	0.2	4	0.3	0.2
Don't know	1	-	-	3	-	-
Decline to respond	0	-	-	4	-	-

5.5.2 Informed choice

With respect to use of family planning methods, “informed choice” refers to whether or not health care workers described other options for family planning methods, possible side effects associated with the method of choice, and how to respond to side effects if they occur. This information can be used to help women select an appropriate contraceptive method, and to assist users in coping with side effects (thus decreasing discontinuation rates for non-permanent methods).

Table 5.10 shows the percent of women currently using family planning methods who were told about other options for contraception (50.3% of women in the second follow-up).

Table 5.10: Family planning decision-making, informed choice, women 15-49 years of age who are married or partnered and who are currently using family planning methods

	Baseline 2013				Second Follow-Up 2017			
	n	N	%	SE	n	N	%	SE
Informed about other family planning options by a doctor, nurse, or community health worker	642	1017	63.6	2.6	683	1338	50.3	2.8

5.6 Exposure to Family Planning Information

5.6.1 Family planning messages delivered by health care providers

Respondents were asked about their exposure to family planning messages delivered by health care providers (Table 5.11). Thirty percent of women in the second follow-up reported being advised about family planning at the health care facility they attend during the past 12 months. Twenty percent of all respondents indicated that they had been visited by a health promoter who provided information about family planning in the last 12 months. Just 7.6% of respondents who had not attended a health facility in the last 12 months were visited by a health promoter who provided information about family planning.

Table 5.11: Family planning messages delivered by health care providers in the last 12 months, women 15-49 years of age who are married or partnered

	Baseline 2013				Second Follow-Up 2017			
	n	N	%	SE	n	N	%	SE
Discussion about family planning methods with staff member at a health facility	417	752	57.1	3.1	487	1596	30.4	2.3
Discussion about family planning methods during health promoter visit	99	1110	7.5	1.0	331	1593	20.5	1.8
Visit by promotor, among women who had not visited a health facility	23	363	5.7	1.7	60	964	7.6	1.9

Figure 5.1: Family planning information received from health facility or community health workers in the last 12 months by municipality, women 15-49 years of age who are married or partnered, second follow-up survey

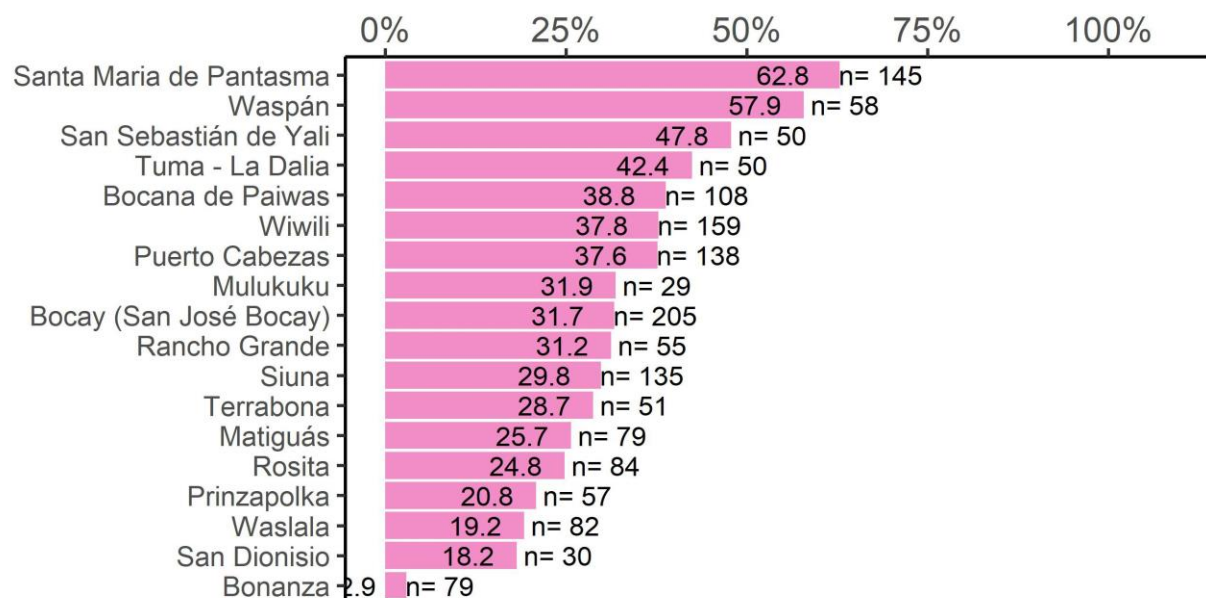
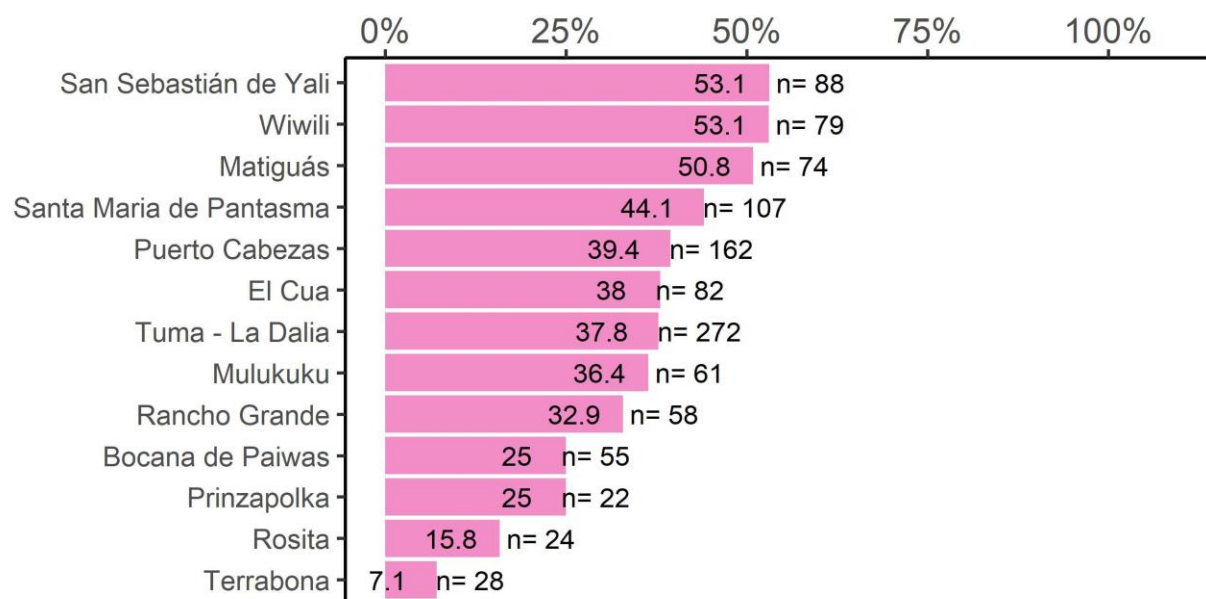


Figure 5.2: Family planning information received from health facility or community health workers in the last 12 months by municipality, women 15-49 years of age who are married or partnered, baseline survey



5.7 Age at First Birth

5.7.1 Age at first birth

Seventy four percent of respondents in the second follow-up had ever given birth (Table 5.12). Of these women, the median age of the women when their first child was born was 18 years old. Only a quarter of women were 20 years old or older when their first child was born. Seven percent of women reported a history of stillbirth, miscarriage, and/or abortion.

Table 5.12: Parity and age at first birth, women 15-49 years of age

	Baseline 2013				Second Follow-Up 2017			
	n	N	%	SE	n	N	%	SE
Ever given birth	1403	1713	75.0	1.6	1908	2313	74.2	1.5
Ever had a stillbirth, miscarriage, or abortion	162	1712	8.7	1.0	158	2313	7.4	0.7

	N	DK/DTR	Min	25th Percentile	Median	75th Percentile	Max
Baseline 2013							
Age at first birth, among parous women	1399	0	12	16	18	20	38
Second follow-up 2017							
Age at first birth, among parous women	1893	0	12	16	18	20	43

6 CHAPTER 6: MATERNAL HEALTH CARE

This chapter summarizes key indicators pertaining to antenatal care, delivery care, and postpartum care for the most recent live birth in the last two years as reported by women of reproductive age (15-49 years) participating in the SMI-Nicaragua second follow-up household survey. Participating women were interviewed about all live births in the last five years, but to reduce the impact of recall bias, results reported here are for each woman's most recent birth in the last two years. At the baseline, 657 women were interviewed about at least one birth in the last two years. At the second follow-up, 877 women were interviewed about births in the last two years.

6.1 Antenatal Care

To reduce recall bias, data pertaining to antenatal care are summarized for a woman's most recent birth in the last two years.

6.1.1 *Antenatal care coverage*

Early and regular checkups by trained medical providers are important in assessing the physical status of women during pregnancy and provide an opportunity to intervene in a timely manner if any problems are detected. The Maternal and Child Health Questionnaire captured information from women on both overall coverage of antenatal care and the content of care received. To obtain information on source of antenatal care, interviewers recorded all persons a woman consulted for care. Timing of antenatal care was assessed by asking women how many weeks or months pregnant they were when they attended their first antenatal care visit. The same details were recorded for up to eight antenatal care visits.

The percentage of women with a birth in the last two years who attended at least one antenatal care visit for the most recent birth, and the percent distribution of timing of care among those who received any antenatal care are presented in Table 6.1. Definition of "most recent birth" changed between baseline and second follow-up. The type of facility where antenatal care was sought is detailed in Table 6.2.

Among women with a child under the age of 2 in the second follow-up, 91.7% attended at least one antenatal care visit and 89.1% of women had at least one antenatal care visit with a doctor or professional nurse. At the second follow-up, 48.1% of women had an antenatal care visit during the first trimester (first 12 weeks) with a doctor or professional nurse, compared to 44.3% at the baseline. The median age of gestation at the first antenatal care visit during the second follow-up was 2 months.

Table 6.1: Antenatal care coverage for the most recent birth in the last two years, women 15-49 years of age

	Baseline 2013				Second Follow-Up 2017			
	n	N	%	SE	n	N	%	SE
Attended at least one antenatal care visit	635	657	97.1	0.8	798	877	91.7	1.8
Attended at least one antenatal care visit with doctor or professional nurse	635	657	97.1	0.8	774	877	89.1	2.0
Antenatal care visit with doctor or professional nurse in the first trimester (12 weeks)	282	654	44.3	2.7	409	866	48.1	2.2

* Definition of most recent birth changed between baseline and second follow-up

	N	DK/DTR	Min	25th Percentile	Median	75th Percentile	Max
Baseline 2013							
Month of gestation of first ANC visit	632	1	0.2	2	3	4	8
Second follow-up 2017							
Month of gestation of first ANC visit	787	11	0.2	1	2	4	9

Regarding the type of facility where antenatal care was usually sought during the second follow-up (Table 6.2), most women who attended antenatal care for their most recent delivery in the last two years sought care in a Public health post (41.8%) or Public health center/clinic (29.7%). Only 19.4% of women sought antenatal care in a public hospital.

Table 6.2: Usual antenatal care location, women 15-49 years of age who attended at least one antenatal care visit for most recent birth in the last two years

	Baseline 2013			Second Follow-Up 2017		
	n	%	SE	n	%	SE
Public health post	0	0.0	-	322	41.8	4.1
Public health center/clinic	186	28.8	3.7	233	29.7	3.5
Public hospital	160	27.1	4.8	167	19.4	3.9
Private health clinic	14	2.6	0.9	24	3.2	0.7
Casa base	0	0.0	-	22	2.1	0.8
Private doctor's office	16	1.8	0.6	14	2.0	0.7
Private hospital	3	0.5	0.3	3	0.4	0.3
Other public health facility	3	0.3	0.2	2	0.2	0.2
Home of a community health worker	0	0.0	-	2	0.2	0.1
Community health worker	0	0.0	-	1	0.1	0.1
Casa materna	0	0.0	-	1	0.1	0.1
Public mobile clinic	1	0.1	0.1	0	0.0	-
Private mobile clinic	1	0.1	0.1	0	0.0	-
Other private health facility	0	0.0	-	0	0.0	-
Pharmacy	0	0.0	-	0	0.0	-
Traditional healer	1	0.2	0.2	0	0.0	-
School	0	0.0	-	0	0.0	-
Public health unit	248	38.0	4.1	0	0.0	-
Other	2	0.3	0.2	7	0.9	0.4
Don't know	0	-	-	0	-	-
Decline to respond	0	-	-	0	-	-

* Options for "Public health center", "Public health post", "Home of a traditional healer", "School", and "Casa base" were not available at baseline. Options for "Public health unit" and "Public health center/clinic" were not available at follow-up. "Public health center" responses from follow-up are grouped within "Public health center/clinic".

6.1.2 Frequency of antenatal care visits

Antenatal care can be more effective in avoiding adverse pregnancy outcomes when it is sought early in the pregnancy and continues until delivery. According to the national norm in Nicaragua, it is recommended that women receive a minimum of four antenatal care visits. The frequency of antenatal care visits is summarized in Table 6.3. Table 6.4 shows the percentage of women with four or more visits with skilled providers and according to best practices.

In the second follow-up, 77.9% of women reported having four or more antenatal care visits during their most recent pregnancy in the last two years. Forty percent of women reported having seven or more antenatal care visits during their most recent pregnancy.

The content of antenatal care is as crucial as the frequency of visits. As shown in Table 6.4, 42.2 percent of all women in the second follow-up survey had four or more antenatal care visits with a doctor or professional nurse, and with each of 9 defined best practices performed at least once during pregnancy (measurement of blood type, test for anemia, test for syphilis, test for HIV, test of blood glucose,

measurement of maternal blood pressure, measurement of maternal weight, measurement of fundal height, and measurement of fetal heartbeat).

Table 6.3: Frequency of antenatal care visits for the most recent birth in the last two years, women 15-49 years of age

	Baseline 2013			Second Follow-Up 2017		
	n	%	SE	n	%	SE
None	22	2.9	0.8	79	8.5	1.9
1-3 visits	91	13.9	1.2	113	13.5	1.6
4-6 visits	305	45.5	2.3	330	38.3	2.5
7-9 visits	238	37.5	2.5	333	39.1	2.6
10+ visits	1	0.1	0.1	3	0.5	0.3
Don't know	0	-	-	19	-	-
Decline to respond	0	-	-	0	-	-

Table 6.4: Frequency of antenatal care visits with skilled provider for the most recent birth in the last two years, women 15-49 years of age

	Baseline 2013				Second Follow-Up 2017			
	n	N	%	SE	n	N	%	SE
At least four antenatal care visits with doctor or professional nurse	544	657	83.1	1.5	638	858	75.2	2.7
At least four antenatal care visits with doctor or professional nurse according to best practices*	265	657	42.0	2.7	363	858	42.2	3.0

*measuring blood type, anemia, syphilis, HIV, glucose, blood pressure, weight, fundal height, and fetal heartbeat.

6.1.3 Content of antenatal care

The content of antenatal care is an important indicator of quality of care. The coverage of key procedures was assessed among women who received any antenatal care for a birth in the last two years (Table 6.5 and Table 6.6). It is important to remember that the validity of these data hinge on the respondent's understanding of the question and her ability to recall events that may have occurred several years prior to the interview.

There was variation in performance of the 9 "best practice" procedures during the second follow-up: measured maternal weight (98%), measured maternal blood pressure (97.7%), measured fundal height (96.8%), measured fetal heartbeat (95.4%), measured blood type (90.8%), tested for anemia (90.2%), tested for HIV (81.8%), measured blood glucose (78.3%), and tested for syphilis (72.2%). Women were unfamiliar with several tests, as evidenced by the high number of missing responses for syphilis.

Table 6.5: Content of antenatal care visits - best practices, among women 15-49 years who attended at least one antenatal care visit for most recent birth in the last two years

	Baseline 2013				Second Follow-Up 2017			
	n	N	%	SE	n	N	%	SE
Measured maternal weight	628	635	99.0	0.4	780	796	98.0	0.6
Measured maternal blood pressure	625	634	98.7	0.4	778	797	97.7	0.7
Measured fundal height	601	633	94.8	1.1	766	795	96.8	0.9
Measured fetal heartbeat	601	635	95.3	1.0	758	798	95.4	1.0
Measured blood type	494	573	87.4	1.9	689	756	90.8	1.3
Tested for anemia	518	568	92.0	1.5	679	757	90.2	1.6
Tested for HIV	469	631	75.1	2.6	631	775	81.8	1.6
Measured blood glucose	409	565	73.7	2.2	588	740	78.3	2.3
Tested for syphilis	370	562	68.5	3.2	530	725	72.2	2.3

Most women in the second follow-up had a collected urine specimen (97.4%) and a collected blood specimen (96.4%) collected during their antenatal care visits for the most recent birth during the past two years.

Table 6.6: Content of antenatal care visits - other services provided, among women 15-49 years who attended at least one antenatal care visit for most recent birth in the last two years

	Baseline 2013				Second Follow-Up 2017			
	n	N	%	SE	n	N	%	SE
Collected urine specimen	587	635	93.0	1.2	775	797	97.4	0.7
Collected blood specimen	584	635	90.6	1.8	769	797	96.4	0.9
Performed an ultrasound	522	635	82.0	1.6	736	797	91.8	1.4
Offered an HIV test	494	631	78.9	2.8	664	778	85.9	1.8
Tested for diabetes	311	409	77.1	2.2	452	583	77.8	2.1

6.1.4 Coverage of tetanus toxoid vaccinations during pregnancy

Tetanus toxoid injections are given during pregnancy for the prevention of neonatal tetanus. To prevent transmission of this potentially fatal infection, all women should be vaccinated with tetanus toxoid when they become pregnant. A baby is considered protected if the mother receives two doses of tetanus toxoid during pregnancy, with the second at least two weeks before delivery. However, if a woman was vaccinated previously, she only requires one dose during the current pregnancy. Five doses are considered adequate to confer lifetime immunity. To assess the coverage of tetanus toxoid vaccination, women who reported receiving any antenatal care during their most recent pregnancy were asked if they received tetanus toxoid injections.

As shown in Table 6.7, the coverage of sufficient tetanus toxoid vaccination during pregnancy was 56.3% among women who received antenatal care during the second follow-up. Fifty six percent of women

received one vaccination during the pregnancy and 32% received two or more. Among women with antenatal care, 38.9% had never been vaccinated before and 29.1% had received a vaccine in the last 10 years. Among women who were not vaccinated during prenatal care visits, 6.9% had never been vaccinated.

Table 6.7: Coverage of tetanus toxoid vaccinations during pregnancy, among women 15-49 years who attended at least one antenatal care visit for most recent birth in the last two years

	Baseline 2013			Second Follow-Up 2017		
	n	%	SE	n	%	SE
Two or more injections during pregnancy	132	29.5	2.9	159	32.0	3.2
One injection during pregnancy, one <10 years before	128	23.8	1.9	129	24.3	2.0
One injection during pregnancy, none <10 years before	193	39.8	2.7	165	32.0	2.6
No injections during pregnancy, one or more <10 years before	21	3.5	0.8	26	4.8	1.3
No injections during pregnancy nor during the 10 years prior	21	3.4	0.9	38	6.9	1.0
Don't know	140	-	-	278	-	-
Decline to respond	0	-	-	3	-	-

6.1.5 Exposure to safe pregnancy messages

Women who received antenatal care were asked about a series of topics for which they might have received counseling or advice during their pregnancy. Table 6.8 shows the percentage of women in the second follow-up who were exposed to the following messages: counseled about pregnancy (92.7%); counseled about danger signs during pregnancy (90.7%); advised to deliver in a facility (90.3%); given information about in-facility delivery (87.1%); counseled about breastfeeding (86.2%); counseled about nutrition during pregnancy (84.1%); counseled about childcare (83.7%).

Exposure to safe pregnancy practices increased from baseline to second follow-up for all counseling categories. In the second follow-up, 78.8% of women were counseled about contraception after delivery compared to 84.6% at baseline. 46.9% of women in the second follow-up, compared to 39.2% at baseline, were advised to have a Cesarean section. Compared to 22.9% of women at baseline, 40.4% of women in the second follow-up were counseled about making a transportation plan for delivery.

Table 6.8: Exposure to safe pregnancy practices, women 15-49 years of age who attended at least one antenatal care visit for most recent birth in the last two years

	Baseline 2013				Second Follow-Up 2017			
	n	N	%	SE	n	N	%	SE
Counseled about pregnancy	596	635	94.3	1.0	740	797	92.7	1.3
Counseled about danger signs during pregnancy	590	635	92.5	1.4	726	796	90.7	1.4
Advised to deliver in a facility	554	635	88.5	1.7	718	796	90.3	1.5
Given information about in-facility delivery	546	633	87.6	1.7	691	796	87.1	1.4
Counseled about breastfeeding	547	632	86.4	2.0	681	797	86.2	1.4
Counseled about nutrition during pregnancy	557	633	88.9	1.2	658	792	84.1	1.6
Counseled about childcare	499	635	80.2	2.6	671	797	83.7	1.5
Counseled about contraception after delivery	535	635	84.6	2.1	630	796	78.8	2.0
Advised to have a Cesarean section	238	635	39.2	3.1	372	791	46.9	2.9
Counseled about making a transportation plan for delivery	140	635	22.9	2.3	320	793	40.4	2.4

6.2 Delivery Care

Proper medical attention and hygienic conditions during delivery can reduce the risk of complications, infections, and even death for the mother and newborn baby. Characteristics of the delivery, including place of delivery and assistance at delivery were captured for all births in the five years preceding the survey. To reduce recall bias, only data from the most recent delivery within the last two years are summarized.

6.2.1 Place of delivery

The location of the most recent birth and the means of transportation used to get to the facility are shown in Table 6.9. The majority of births occurred in public hospitals (73.8%). Deliveries in private-sector facilities were rare (2%). Among women who delivered in a facility, 29.1% indicated that they used a other public transit for transport (Table 6.10).

Table 6.9: Place of delivery for most recent birth in the last two years, women 15-49 years of age

	Baseline 2013			Second Follow-Up 2017		
	n	%	SE	n	%	SE
Public hospital	488	75.9	3.1	643	73.8	2.3
Own home	66	10.4	2.2	115	12.2	2.0
Public health center/clinic	72	8.8	1.7	83	10.0	1.8
Private health center/clinic	11	2.2	0.7	9	1.2	0.4
Other public health facility	7	0.7	0.3	11	1.1	0.4
Private hospital	5	0.6	0.3	4	0.6	0.3
Other house	5	0.7	0.3	4	0.4	0.3
Home of a community health worker	0	0.0	-	3	0.3	0.2
Other private health facility	0	0.0	-	2	0.2	0.2
Casa base	0	0.0	-	2	0.1	0.1
Public health ward	0	0.0	-	0	0.0	-
Private health ward	0	0.0	-	0	0.0	-
School	0	0.0	-	0	0.0	-
Casa materna	0	0.0	-	0	0.0	-
Other	3	0.7	0.4	1	0.1	0.1
Don't know	0	-	-	0	-	-
Decline to respond	0	-	-	0	-	-

* Options for "Home of a traditional healer", "School", "Casa base", and "Casa materna" were not available at baseline.

Table 6.10: Transportation to place of delivery for most recent birth in the last two years, among women 15-49 years of age who delivered in a facility

	Baseline 2013				Second Follow-Up 2017			
	n	N	%	SE	n	N	%	SE
Other public transit	255	582	45.3	3.2	227	755	29.1	2.7
Private vehicle	130	582	21.9	2.1	223	755	27.3	2.8
Ambulance	134	582	20.6	2.5	200	755	26.9	3.2
On foot	79	582	15.3	2.7	69	755	9.8	1.6

*categories not mutually exclusive (select all that apply)

Women were asked about the proximity to the health facility used to deliver. Of the 756 women from the second follow-up who delivered in a facility, 369 were able to estimate the distance to the facility (Table 6.11). The median number of women reported travelling less than 10 km. Fifty percent of women traveled more than one hours to the facility to deliver.

Table 6.11: Proximity to health care facilities: health facility for delivery

	N	DK/DTR	Min	25th Percentile	Median	75th Percentile	Max
Baseline 2013							
Distance, km	449	134	0.4	2	7	30	100
Travel time, min	576	7	1	15	60	120	2700
Second follow-up 2017							
Distance, km	369	387	0	2	10	50	163
Travel time, min	653	103	1	15	60	150	12000

6.2.2 Assistance at delivery

The assistance a woman receives during childbirth has important health consequences for both mother and child. For women who did not deliver alone in the last two years (98.5% of all births in the second follow-up), the percentage by type of delivery attendant is detailed in Table 6.12. Among women who did not report being alone for delivery, several categories of personnel may have been in attendance. As can be seen in Table 6.12, most in-facility deliveries during the second follow-up were accompanied by a medical doctor (82.8%) and/or a professional nurse (62.2%). For 27.6% of the deliveries an auxiliary nurse was in attendance. For 20.8% a relative was in attendance.

Table 6.12: Types of attendants: assistance at delivery for most recent birth in the last two years, women 15-49 years of age

	Baseline 2013				Second Follow-Up 2017			
	n	N	%	SE	n	N	%	SE
Medical doctor	564	657	85.7	2.3	714	876	82.8	2.1
Professional nurse	528	657	79.3	2.1	524	848	62.2	2.6
Auxiliary nurse	112	654	18.3	2.2	235	837	27.6	2.5
Relative	66	655	10.3	1.4	176	871	20.8	2.0
Midwife/comadrona	49	647	7.1	1.7	95	864	10.9	2.1
Laboratory technician	11	641	2.0	0.6	25	845	2.8	0.7
Community health worker	1	656	0.2	0.2	7	865	0.7	0.3
Traditional healer	1	655	0.2	0.2	2	868	0.3	0.2
Pharmacist	3	656	0.7	0.4	2	868	0.2	0.1
Other	5	654	2.1	1.2	23	867	2.8	0.7

* Option "Nurse (title unknown)" was added for the follow-up, but was not available at baseline

Twenty four percent of women in the second follow-up delivered with one attendant, 39% with two attendants, and 27.5% with three attendants (Table 6.13). For women's most recent live birth in the past two years, 88% of deliveries had a skilled attendant present and 86.6% delivered with a skilled attendant in a health facility (Table 6.14).

Table 6.13: Number of attendants: assistance at delivery for most recent birth in the last two years, women 15-49 years of age

	Baseline 2013			Second Follow-Up 2017		
	n	%	SE	n	%	SE
None	3	0.8	0.5	15	1.5	0.4
One	113	17.6	2.1	211	23.5	2.6
Two	428	62.8	2.7	344	39.0	2.3
Three	87	14.3	1.9	238	27.5	2.1
Four or more	26	4.4	0.9	69	8.4	1.6
Don't know	0	-	-	0	-	-
Decline to respond	0	-	-	0	-	-

Table 6.14: In-facility delivery with skilled birth attendant: assistance at delivery for most recent birth in the last two years, women 15-49 years of age

	Baseline 2013				Second Follow-Up 2017			
	n	N	%	SE	n	N	%	SE
Delivery with a skilled birth attendant	587	657	88.6	2.2	760	876	88.0	2.0
Delivery with a skilled birth attendant in any health facility*	582	657	87.7	2.3	749	876	86.6	2.1

* In-facility deliveries include deliveries at public and private hospitals, health centers/clinics, health wards, other health facilities, and casas base

6.2.3 Complications

Pregnancy complications are an important source of maternal and child morbidity and mortality. The type of delivery (vaginal or Caesarian section) among women with births in the last two years is detailed in Table 6.15 along with the percentage of planned in-facility deliveries. Table 6.16 displays the percentage of women with specific complications.

As previously described, the vast majority of births occurred in institutional settings. In 46.4% of these cases during the second follow-up, women indicated that they attended the facility for emergency care. Few women reported seizures prior to delivery (2.4%). Approximately 9.4% of infants were transferred to an intensive care unit after delivery, and 19.3% of women reported excessive bleeding after delivery (more than 1 cup over a two-day period of time).

Table 6.15: Mode of delivery for most recent birth in the last two years, women 15-49 years of age

	Baseline 2013			Second Follow-Up 2017		
	n	%	SE	n	%	SE
Mode of delivery						
Vaginal	542	82.2	2.0	677	77.3	2.2
Emergency c-section	79	12.0	1.8	110	13.0	1.8
Planned c-section	36	5.8	0.9	88	9.7	1.1
Don't know	0	-	-	0	-	-
Decline to respond	0	-	-	1	-	-
Reason for seeking delivery care, among in-facility births						
According to birth plan	229	38.0	2.4	397	53.4	3.2
Because of emergency	353	61.8	2.4	355	46.4	3.2
Other reason	1	0.2	0.2	2	0.2	0.2
Don't know	0	-	-	0	-	-
Decline to respond	0	-	-	2	-	-

Table 6.16: Delivery complications for most recent birth in the last two years, women 15-49 years of age

	Baseline 2013				Second Follow-Up 2017			
	n	N	%	SE	n	N	%	SE
Respondent experienced excessive bleeding in the first day after delivery	116	657	16.3	1.8	161	870	19.3	1.8
Child entered neonatal intensive care unit after delivery	43	656	5.8	1.0	77	876	9.4	1.4
Respondent experienced seizures prior to delivery	19	655	2.8	0.6	21	876	2.4	0.5

6.2.4 Birth size and weight

Birth weight is a major determinant of infant and child health and mortality. Birth weight of less than 2.5 kilograms is considered low. For all births during the five-year period preceding the survey, mothers were asked about their perception of the child's size at birth: very large, larger than average, smaller than average, or very small. They were then asked to report the actual weight in kilograms if the child had been weighed after delivery. To reduce recall bias, only data from the most recent birth within the last two years are summarized below (Table 6.17).

In the second follow-up, many women perceived their infant to be average in size (87.9%). With most births occurring in institutional settings, it is not surprising that 87.1% of newborns were weighed at birth. Among those who were weighed, 14.3% weighed less than 2.5 kilograms according to the mother's recall (low birth weight).

Table 6.17: Birth size and weight for most recent live birth in the past two years, women 15-49 years of age

	Baseline 2013			Second Follow-Up 2017		
	n	%	SE	n	%	SE
Very large	10	1.6	0.6	21	2.5	0.6
Larger than average	44	7.1	1.2	35	4.0	0.8
Average	547	83.6	2.0	759	87.9	1.5
Smaller than average	38	6.8	1.8	29	3.4	0.8
Very small	6	0.9	0.4	16	2.3	0.6
Don't know	11	-	-	15	-	-
Decline to respond	1	-	-	1	-	-

	Baseline 2013				Second Follow-Up 2017			
	n	N	%	SE	n	N	%	SE
Child was weighed at birth	578	646	90.1	2	701	817	87.1	2.3
Low birth weight (<2.5kg), among those weighed	60	544	12.0	2	75	577	14.3	1.6

6.3 Early initiation of breastfeeding

Coverage of early initiation of breastfeeding is defined as the percentage of women who had a live birth in the past two years and put the child to the breast with one hour of birth. Table 6.18 shows that 78.2% of women initiated breastfeeding within one hour of birth.

Table 6.18: Early initiation of breastfeeding for most recent live birth in the past two years, women 15-49 years of age

	Baseline 2013				Second Follow-Up 2017			
	n	N	%	SE	n	N	%	SE
Early initiation of breastfeeding among children <24 months	543	656	82.8	1.8	686	870	78.2	2.4

6.4 Postnatal Care

Postnatal care is important both for the mother and the child to treat complications arising from the delivery, as well as to provide the mother with important information on how to care for herself and her child. The postnatal period is defined as the time between the delivery of the placenta and 42 days (six weeks) following the delivery. The timing of postnatal care is important: the first two days after delivery are critical, because most maternal and neonatal deaths occur during this period.

Characteristics of postnatal care, including timing, location, and personnel providing care were captured for all births in the five years preceding the survey. To reduce recall bias, only data from the most recent delivery in the last two years are summarized in the tables below.

6.4.1 Postnatal checkup for the mother

Data on postnatal care for the mother are summarized in Table 6.19. Table 6.19 shows the percentage of women with a birth in the last two years who were checked at any time after delivery and within 10 days after delivery; and percentage by timing of the check for women with an in-facility delivery.

Only 48.9% of women recalled being checked after delivery during the second follow-up, and numeric(0)% reported being checked one week after delivery by a health care provider. Only 48.2% of women with an institutional birth recalled being checked every 15 minutes for the first hour post-partum.

Table 6.20 shows the percent distribution of women who were checked at any time after delivery by type of personnel. Among women with postnatal care visits in the second follow-up, most received care from a doctor (82.2%) or professional nurse (10.2%).

Table 6.19: Postnatal checkup for the mother for most recent live birth in the past two years, women 15-49 years of age

	Baseline 2013				Second Follow-Up 2017			
	n	N	%	SE	n	N	%	SE
Any checkup after delivery	428	657	62.9	3.0	427	868	48.9	2.7
Checked every 15 minutes during the first hour after delivery, among in-facility births	150	407	37.3	3.2	186	394	48.2	3.0
Checked within 10 days after delivery by a skilled provider*	409	657	60.1	2.9	716	874	82.6	2.3

* The second follow-up survey included an additional question that asked if women were checked before discharge after delivering in facility. If a women was checked before discharge, she was considered to have passed this indicator. Due to the addition of this question, the baseline and follow-up values are not strictly comparable.

Figure 6.1: Postnatal check for mother with skilled attendant within 10 days for most recent live birth in the past two years by municipality, women 15-49 years of age, second follow-up survey

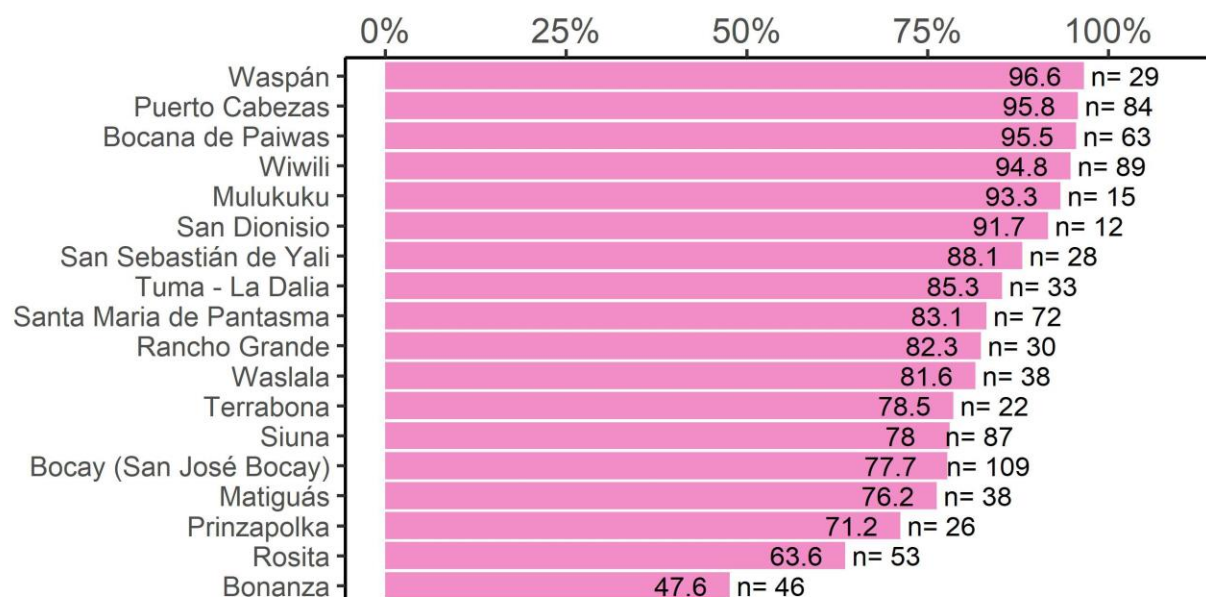


Table 6.20: Provider of care at first postnatal checkup for the mother, most recent live birth in the past two years, among women who attended at least one postnatal care visit

	Baseline 2013			Second Follow-Up 2017		
	n	%	SE	n	%	SE
Doctor	347	81.4	2.1	351	82.2	2.5
Professional nurse	73	17.1	2.0	43	10.2	1.9
Nurse (title unknown)	0	0.0	-	13	2.8	0.8
Auxiliary nurse	4	0.9	0.4	9	2.1	1.0
Midwife/comadrona	1	0.2	0.2	7	1.6	0.8
Relative	0	0.0	-	1	0.3	0.3
Laboratory technician	1	0.3	0.3	1	0.2	0.2
Community health worker	0	0.0	-	0	0.0	-
Pharmacy assistant	0	0.0	-	0	0.0	-
Traditional healer	0	0.0	-	0	0.0	-
Other	0	0.0	-	2	0.5	0.4
Don't know	1	-	-	0	-	-
Decline to respond	1	-	-	0	-	-

* Option "Nurse (title unknown)" was added for the follow-up, but was not available at baseline

6.4.2 Postnatal checkup for the infant

The results regarding postnatal care for the neonate are shown in Table 6.21: percentage of women with a birth in the last two years whose infants were checked after delivery; percent distributions of infants who were checked by skilled personnel within 24 hours of delivery; and percent distributions of infants who were checked by skilled personnel within one week of delivery.

Approximately 75.7% of women in the second follow-up reported that their infant was checked at any time after delivery. Among all deliveries, 30.3% of women reported that a qualified medical professional checked on their infant within 24 hours of delivery. Table 6.22 shows the attendants for neonatal postnatal care. Most women indicated that a doctor performed a checkup (84.3%). Professional nurse and auxiliary nurse were also reported, though much less frequently.

Table 6.21: Postnatal checkup for neonate for woman's most recent live birth in the past two years, women 15-49 years of age

	Baseline 2013				Second Follow-Up 2017			
	n	N	%	SE	n	N	%	SE
Any checkup after delivery	552	655	83.6	2.4	650	865	75.7	2.7
Checked within 24 hours after delivery by a skilled provider	231	612	35.5	2.7	229	792	30.3	2.5
Checked within 10 days after delivery by a skilled provider	487	612	79.0	2.9	502	792	64.3	3.1

Table 6.22: Provider of care at first postnatal checkup for the infant, woman's most recent live birth in the past two years, among women whose child attended at least one postnatal care visit

	Baseline 2013			Second Follow-Up 2017		
	n	%	SE	n	%	SE
Doctor	462	83.7	2.2	549	84.3	2.0
Professional nurse	81	15.0	2.0	71	11.7	1.6
Auxiliary nurse	6	1.0	0.4	18	2.7	0.9
Nurse (title unknown)	0	0.0	-	8	1.1	0.4
Midwife/comadrona	0	0.0	-	1	0.2	0.2
Laboratory technician	0	0.0	-	0	0.0	-
Community health worker	1	0.1	0.1	0	0.0	-
Pharmacy assistant	0	0.0	-	0	0.0	-
Traditional healer	1	0.1	0.1	0	0.0	-
Relative	0	0.0	-	0	0.0	-
Other	0	0.0	-	0	0.0	-
Don't know	1	-	-	3	-	-
Decline to respond	0	-	-	0	-	-

* Option "Nurse (title unknown)" was added for the follow-up, but was not available at baseline

6.5 Vouchers, Incentives, and Maternal Waiting Homes

To increase use of their services, some facilities and waiting homes offer vouchers and incentives to women to attend care. Table 6.23 displays the percentage of women in the second follow-up who gave birth the past two years and received a voucher at a health facility. Five percent of women received a voucher or financial assistance to attend antenatal care, 3.2% received a voucher or financial assistance for delivery at a health facility, and 0.6% received a voucher or financial assistance for postpartum or postnatal care at a health facility.

Table 6.23: Voucher incentives for care-seeking for most recent live birth in the past two years, women 15-49 years of age

	Baseline 2013				Second Follow-Up 2017			
	n	N	%	SE	n	N	%	SE
Received a voucher or other form of financial assistance to attend antenatal care at a health facility	2	635	0.3	0.2	43	797	4.8	1.3
Received a voucher or other form of financial assistance to deliver at a health facility	7	581	0.9	0.4	28	756	3.2	1.1

	Baseline 2013			Second Follow-Up 2017		
	n	%	SE	n	%	SE
No voucher	583	100	0	746	99.4	0.3
Yes, for infant's care	0	0	-	2	0.3	0.2
Yes, for woman's care	0	0	-	2	0.2	0.2
Yes, for both woman and infant	0	0	-	1	0.1	0.1
Don't know	0	-	-	0	-	-
Decline to respond	0	-	-	0	-	-

Some facilities that attend deliveries have a *casa materna* or maternal waiting home nearby to provide women who live far away a place to stay while they await delivery or while they recover and prepare to travel home with their infant. Table 6.24 displays how women have commonly used maternal waiting homes during their most recent pregnancy in the past two years. 26.1% of women in the second follow-up report using a maternal waiting home before giving birth and 76.2% of these women report receiving counseling while staying at a maternal waiting home. On average, women stayed at a maternal waiting home for twelve days and spent 0 Córdoba.

Table 6.24: Use of maternal waiting homes for most recent live birth in the past two years, women 15-49 years of age

	Baseline 2013				Second Follow-Up 2017			
	n	N	%	SE	n	N	%	SE
Used a maternal waiting home before giving birth	83	657	11.4	1.8	226	876	26.1	3.5
Among women who used maternal waiting homes								
Received counseling on health and parenting topics while at waiting home	83	83	100.0	-	166	217	76.2	4.4

	N	DK/DTR	Min	25th Percentile	Median	75th Percentile	Max
Second Follow-Up 2017							
Days spent in maternal home	226	0	1	5	12	22	100
Out-of-pocket cost to use maternal home, Córdoba	226	0	0	0	0	0	150

7 Chapter 7: CHILD HEALTH

This chapter summarizes the health status of children aged 0-59 months whose caregivers participated in the SMI-Nicaragua Second Follow-up Household Survey. All data summarized in this chapter are based on the caregiver's report.

7.1 Health status

The age and sex distribution of the de facto population of children aged 0-59 months participating in the caregiver interview module or the anthropometric measures in Nicaragua for the second follow-up is shown in Figure 7.2 by six- or 12-month age groups.

Twenty one percent of children surveyed at baseline and 20% of children surveyed at the second follow-up were under 1 year old at the time of the interview. The age distributions of female and male children are similar.

Figure 7.1: Age and sex of children aged 0-59 months in child health survey or anthropometric measures of the de facto population by six- to twelve-month age groups, baseline survey unweighted

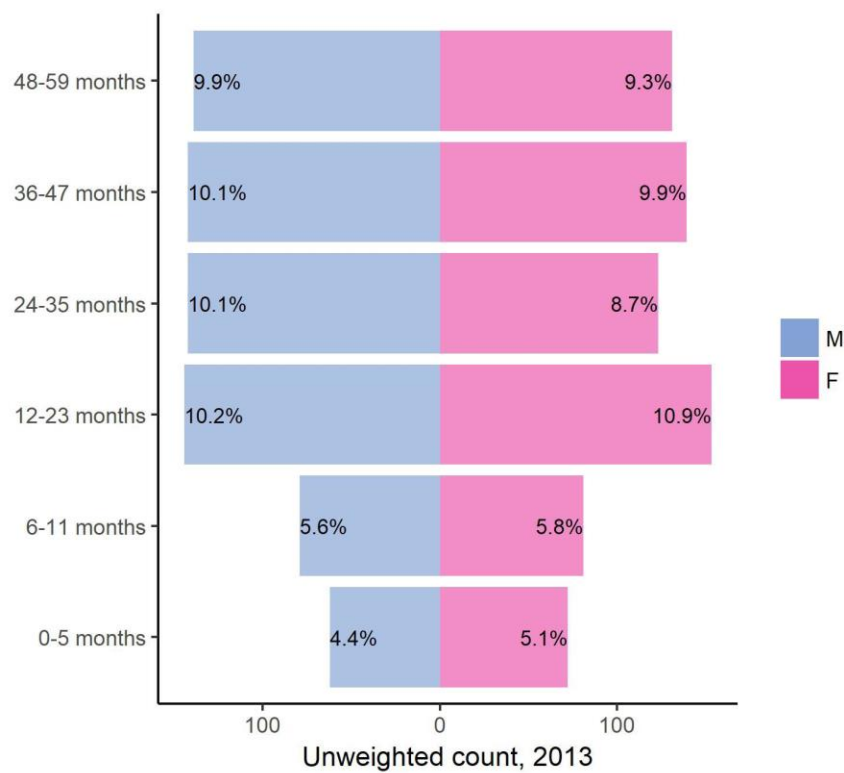
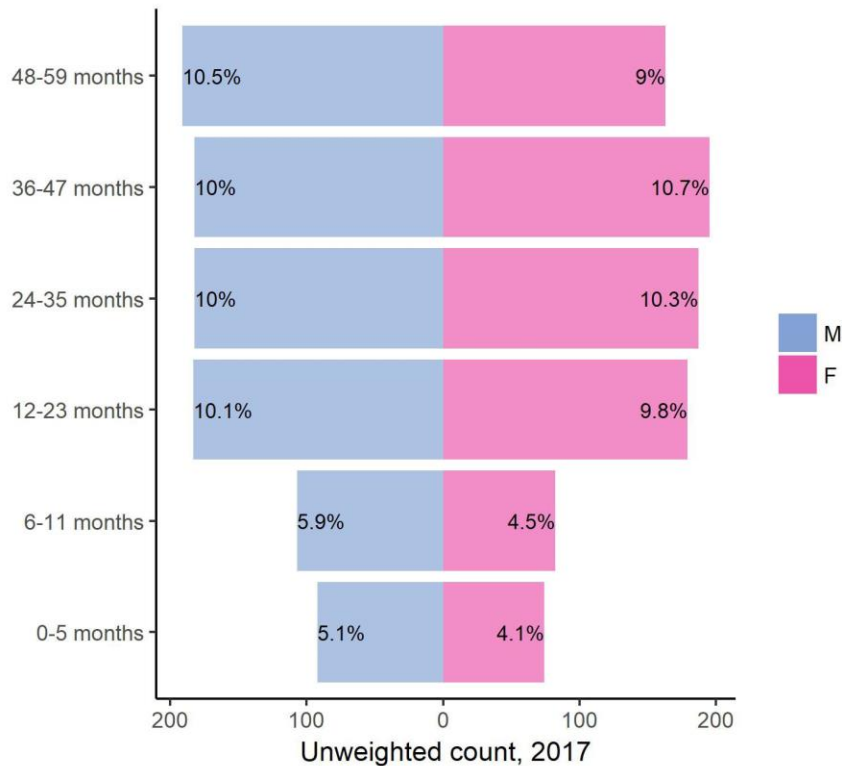


Figure 7.2: Age and sex of children aged 0-59 months in child health survey or anthropometric measures of the de facto population by six- to twelve-month age groups, follow-up survey unweighted



7.1.1 Current health status

Table 7.1 shows the current health status of all children aged 0-59 months, as reported by their caregivers. The table includes the caregiver’s evaluation of current health relative to health the previous year and the percentage of children who can easily perform daily activities. In the second follow-up, approximately 72% of children’s health was considered by their caregiver to be “good,” “very good,” or “excellent,” compared to 71.4% at baseline.

Relative to the past year, caregivers in the second follow-up evaluation reported that 41.7% of children’s health was “about the same” in the second follow-up. While 50.3% of children’s health had improved, 8% of children experienced reportedly worse health on the day of the interview, compared to last year. Ninety three percent of children could “easily” perform their daily activities (e.g., playing and going to school) according to their caregivers. Six percent of children had some degree of difficulty performing these activities, 0.8% of children had a significant degree of difficulty performing these activities, and 0.6% of children were unable to complete daily activities, according to their caregivers.

Table 7.1: Current health status, among children aged 0-59 months

	Baseline 2013			Second Follow-Up 2017		
	n	%	SE	n	%	SE
Current health status						
Excellent	218	16.4	1.8	337	18.4	1.2
Very good	321	22.4	1.8	267	14.2	1.3
Good	464	32.6	1.7	720	39.4	1.1
Fair	346	24.8	1.9	404	23.1	1.5
Poor	53	3.7	0.7	89	5.0	0.6
Don't know	0	-	-	0	-	-
Decline to respond	1	-	-	0	-	-
Health status relative to a year ago						
Better	600	55.7	2.1	699	50.3	1.4
Worse	51	5.5	0.9	107	8.0	1.2
About the same	424	38.8	2.0	602	41.7	1.5
Don't know	0	-	-	0	-	-
Decline to respond	0	-	-	0	-	-
Ability to perform daily activities						
Easily	1309	92.7	1.1	1682	92.9	1.0
With some difficulty	61	4.7	0.7	101	5.6	0.9
With much difficulty	5	0.5	0.3	16	0.8	0.3
Unable to do	26	2.1	0.4	11	0.6	0.3
Don't know	2	-	-	6	-	-
Decline to respond	0	-	-	1	-	-

7.1.2 Recent illness

Caregivers were asked a series of questions about any illnesses or health problems that their children had in the two weeks preceding the interview. In the second follow-up survey, approximately 34% of children were reported as sick during that time (Table 7.2). Of the 598 children who were recently ill, fever (39.3%), cough (26.1%), and diarrhea without blood (9%) were the most commonly specified complaints.

Table 7.2: Recent illness, among children aged 0-59 months

	Baseline 2013				Second Follow-Up 2017			
	n	N	%	SE	n	N	%	SE
Child was sick in the last two weeks	467	1403	32.9	1.9	598	1817	34.3	2.2

	Baseline 2013			Second Follow-Up 2017		
	n	%	SE	n	%	SE
Recent illness among children ill in the last 2 weeks						
Fever	125	27.2	2.1	230	39.3	2.7
Malaria	0	0.0	-	0	0.0	-
Cough/Chest Infection	130	26.9	2.4	0	0.0	-
Tuberculosis	0	0.0	-	0	0.0	-
Asthma	7	1.9	0.9	12	2.0	0.7
Bronchitis	2	0.5	0.4	3	0.5	0.3
Pneumonia	14	3.4	0.9	12	2.2	0.8
Diarrhea without blood	92	19.9	1.9	53	9.0	1.0
Diarrhea with blood	5	0.9	0.4	10	1.8	0.5
Vomiting	4	0.9	0.4	3	0.5	0.3
Abdominal pain	1	0.2	0.2	5	0.9	0.4
Anemia	1	0.3	0.3	0	0.0	-
Skin rash/infection	13	2.6	0.7	17	2.8	0.7
Eye/ear infection	3	0.6	0.4	4	0.6	0.4
Measles	1	0.3	0.3	1	0.2	0.2
Jaundice	0	0.0	-	0	0.0	-
Headache	3	0.5	0.3	2	0.3	0.2
Stroke	0	0.0	-	0	0.0	-
Diabetes	0	0.0	-	0	0.0	-
HIV/AIDS	0	0.0	-	0	0.0	-
Paralysis	0	0.0	-	0	0.0	-
Blood in urine	0	0.0	-	0	0.0	-
Difficulty urinating	0	0.0	-	0	0.0	-
Swelling in legs, ankles, or feet	0	0.0	-	1	0.2	0.2
Cough	0	0.0	-	166	26.1	2.3
Chest infection	0	0.0	-	1	0.2	0.2
Other	66	13.9	1.7	78	13.4	2.2
Don't know	0	-	-	0	-	-
Decline to respond	0	-	-	0	-	-

* Options for "Swelling in legs, ankles, or feet", "Blood in urine", "Poisoning", "Chest infection" and "Cough" were only available only in the follow-up survey. Option "Cough/Chest infection" was only available at the baseline.

7.1.3 Utilization of health services for recent illness

Table 7.3 summarizes data regarding the utilization of health services among the 598 children who were sick in the two weeks preceding the interview. The table shows the percentage of children 0-59 months who were sick in the last two weeks for whom care was sought for recent illness and among these, the percent distribution by type of medical facility where care was sought and whether the child was hospitalized.

In the second follow-up survey, care was sought for 63.3% of these cases. Care was typically sought at Public hospital (9.7%) or Public health center/clinic (17.7%) facilities; some attended public health posts (47.4%). Only nineteen children were hospitalized for their recent illness.

Table 7.3: Utilization of health services for recent illness in the last two weeks, among children 0-59 months

	Baseline 2013				Second Follow-Up 2017			
	n	N	%	SE	n	N	%	SE
Sought care for recent illness	259	467	54.9	3.2	374	598	63.3	2.9
Child was hospitalized for recent illness	13	150	10.7	2.9	19	188	10.1	2.1

	Baseline 2013			Second Follow-Up 2017		
	n	%	SE	n	%	SE
Type of medical facility where care was sought						
Public hospital	59	25.3	4.7	37	9.7	3.0
Public health center/clinic	69	26.4	3.7	68	17.7	2.9
Public health post	0	0.0	-	171	47.4	5.0
Public mobile clinic	0	0.0	-	0	0.0	-
Other public facility	0	0.0	-	0	0.0	-
Private hospital	2	0.8	0.5	2	0.5	0.4
Private health center/clinic	4	1.8	1.1	23	5.9	1.4
Private practice	18	6.9	1.5	12	3.0	1.0
Private mobile clinic	0	0.0	-	0	0.0	-
Other private facility	0	0.0	-	0	0.0	-
Pharmacy	32	11.1	2.5	26	6.7	1.7
Community health worker	2	0.5	0.4	0	0.0	-
Traditional healer	1	0.5	0.6	0	0.0	-
Home of a community health worker	0	0.0	-	0	0.0	-
School	0	0.0	-	0	0.0	-
Casa base	0	0.0	-	15	3.6	1.5
Public health unit	62	23.2	2.9	0	0.0	-
Other	10	3.6	1.3	19	5.4	1.7
Don't know	0	-	-	0	-	-
Decline to respond	0	-	-	1	-	-

* Options for "Public health center", "Public health post", "Home of a traditional healer", "School", and "Casa base" were not available at baseline.

Options for "Public health unit" and "Public health center/clinic" were not available at follow-up. "Public health center" responses from follow-up are grouped within "Public health center/clinic".

7.2 Acute respiratory infection

Acute respiratory infection is a leading cause of morbidity and mortality among children. Early diagnosis and treatment with antibiotics can prevent deaths resulting from pneumonia, a common acute respiratory disease. The prevalence of acute respiratory infection was estimated by asking caregivers whether their children aged 0-59 months had been ill with a cough accompanied by short, rapid breathing in the two weeks preceding the interview. If the child had symptoms of an acute respiratory infection, the caregiver was asked about what was done to treat the symptoms and feeding practices during the illness.

7.2.1 Prevalence of acute respiratory infection and fever

The prevalence of cough, suspected acute respiratory infection, and fever among children aged 0-59 months, as reported by their caregivers, is displayed in Table 7.4. In the second follow-up, 30% of children experienced cough, 19.5% had symptoms of an acute respiratory infection (cough with difficulty breathing), and 25.9% had a fever in the two weeks preceding the interview.

Table 7.4: Prevalence of suspected acute respiratory infection and fever in the last two weeks, among children 0-59 months

	Baseline 2013			Second Follow-Up 2017		
	n	%	SE	n	%	SE
Child had cough in the last two weeks, by type						
No cough	1107	79.9	1.7	1285	70.0	1.9
Cough without difficulty breathing	143	9.9	1.0	186	10.5	1.0
With difficulty breathing due to congested/runny nose	53	3.6	0.6	124	7.0	0.7
With difficulty breathing due to chest problem	50	3.2	0.6	116	6.8	1.1
With difficulty breathing due to chest problem and congested/runny nose	48	3.4	0.6	97	5.4	0.6
With difficulty breathing due to other reason	0	0.0	-	4	0.3	0.2
Don't know	2	-	-	5	-	-
Decline to respond	0	-	-	0	-	-

	Baseline 2013				Second Follow-Up 2017			
	n	N	%	SE	n	N	%	SE
Symptoms of acute respiratory infection in the last two weeks	151	1401	10.2	1.1	342	1813	19.5	1.6
Fever in last two weeks	263	1402	18.5	1.3	448	1817	25.9	1.9

7.2.2 Utilization of health services for suspected acute respiratory infection

Fifty nine percent of children with symptoms of acute respiratory infection were taken for evaluation and/or treatment of their condition at the second follow-up (Table 7.5).

Table 7.5: Utilization of health services for suspected acute respiratory infection in the last two weeks, among children 0-59 months

	Baseline 2013				Second Follow-Up 2017			
	n	N	%	SE	n	N	%	SE
Sought care for suspected acute respiratory infection	196	388	50.2	3.3	379	647	59.4	2.9

	Baseline 2013			Second Follow-Up 2017		
	n	%	SE	n	%	SE
Type of medical facility where care was sought						
Public hospital	36	19.8	4.7	34	8.9	2.9
Public health center/clinic	53	26.9	4.2	65	16.7	3.0
Public health post	0	0.0	-	175	48.1	5.3
Public mobile clinic	0	0.0	-	0	0.0	-
Other public facility	0	0.0	-	0	0.0	-
Private hospital	1	0.4	0.4	1	0.2	0.2
Private health center/clinic	3	1.8	1.4	23	5.9	1.4
Private practice	11	5.6	1.6	11	2.7	1.0
Private mobile clinic	0	0.0	-	0	0.0	-
Other private facility	0	0.0	-	0	0.0	-
Pharmacy	30	14.1	3.1	34	8.9	2.1
Community health worker	1	0.3	0.3	1	0.3	0.3
Traditional healer	1	0.7	0.8	0	0.0	-
Home of a community health worker	0	0.0	-	0	0.0	-
School	0	0.0	-	0	0.0	-
Casa base	0	0.0	-	16	3.7	1.5
Public health unit	50	25.7	3.8	0	0.0	-
Other	10	4.7	1.8	18	4.7	1.2
Don't know	0	-	-	0	-	-
Decline to respond	0	-	-	1	-	-

* Options for "Public health center", "Public health post", "Home of a traditional healer", "School", and "Casa base" were not available at baseline. Options for "Public health unit" and "Public health center/clinic" were not available at follow-up. "Public health center" responses from follow-up are grouped within "Public health center/clinic".

7.2.3 Utilization of medications for suspected acute respiratory infection

Eighty six percent of children with symptoms of acute respiratory infection were given some type of medication for their condition during the second follow-up (Table 7.6). Fifty eight percent of children were administered antibiotic syrups for a suspected acute respiratory infection. Acetaminophen (71.4%) and ibuprofen (6.6%) were also commonly administered. Eighteen percent of children received a treatment other than those listed.

Table 7.6: Utilization of medications for suspected acute respiratory infection in the last two weeks, among children 0-59 months

	Baseline 2013				Second Follow-Up 2017			
	n	N	%	SE	n	N	%	SE
Any treatment	312	388	79.9	1.7	552	647	85.8	1.7
Antibiotic injection	7	311	2.4	1.1	25	552	5.0	1.3
Antibiotic pill	23	311	7.1	2.1	61	552	10.4	1.6
Antibiotic syrup	127	311	39.3	3.1	320	552	58.1	2.6
Aspirin	7	311	2.4	1.0	13	552	2.3	0.6
Acetaminophen	196	311	63.8	3.0	386	552	71.4	2.2
Ibuprofen	12	311	3.6	1.0	38	552	6.6	1.0
Oral rehydration therapy	12	311	4.0	1.2	25	552	4.3	1.0
Other	45	311	14.9	2.1	99	551	18.3	1.9

7.2.4 Feeding practices during suspected acute respiratory infection

Data on feeding practices during the recent episode of suspected acute respiratory infection are summarized in Table 7.7. The table shows the volume of fluids and the volume of solids given during the illness. At the second follow-up, only 5% of children were given more fluids than usual. In total, 62% of children were offered less fluid than usual (or none at all). Twenty eight percent of children were offered the same volume of solid food as usual during their illness. Approximately 71% of children were given less than the usual amount of solid food (or none at all).

Table 7.7: Feeding practices during suspected acute respiratory infection in the last two weeks, among children 0-59 months

	Baseline 2013			Second Follow-Up 2017		
	n	%	SE	n	%	SE
Volume of fluids (including breastmilk) given during illness						
No fluids	6	1.7	0.7	24	4.0	0.8
Much less	52	12.9	1.7	79	12.5	1.4
Somewhat less	182	46.5	3.3	294	45.8	2.4
About the same	141	37.3	3.4	217	32.7	2.7
More	6	1.6	0.6	32	5.0	1.1
Don't know	1	-	-	1	-	-
Decline to respond	0	-	-	0	-	-
Volume of solid foods given during illness						
No solids	8	1.7	0.7	29	4.7	1.0
Much less	43	11.3	1.8	83	13.0	1.8
Somewhat less	198	51.0	3.6	337	52.9	2.1
About the same	135	35.1	3.3	186	28.4	2.4
More	3	0.9	0.5	6	1.1	0.5
Don't know	1	-	-	4	-	-
Decline to respond	0	-	-	2	-	-

7.3 Diarrhea

Dehydration caused by severe diarrhea in a major cause of morbidity and mortality among children. Exposure to diarrheal disease-causing agents is frequently a result of use of contaminated water and unhygienic practices related to food preparation and disposal of feces. The prevalence of diarrhea was estimated by asking caregivers whether their children aged 0-59 months had had diarrhea in the two weeks preceding the interview. If the child had had diarrhea, the caregiver was asked about treatment and feeding practices during the diarrheal episode.

7.3.1 Prevalence

Table 7.8 shows the proportion of children aged 0-59 months with diarrhea in the two weeks preceding the interview, as reported by their caregivers (14.5% at the second follow-up). Two percent of children had bloody diarrhea.

Table 7.8: Prevalence of diarrhea in the last two weeks, among children aged 0-59 months

	Baseline 2013			Second Follow-Up 2017		
	n	%	SE	n	%	SE
No diarrhea	1202	85.6	1.4	1559	85.5	1.6
Diarrhea without blood	186	13.6	1.3	211	12.3	1.1
Diarrhea with blood	11	0.8	0.2	36	2.2	0.6
Don't know	4	-	-	11	-	-
Decline to respond	0	-	-	0	-	-

7.3.2 Utilization of health services for diarrhea

Nearly half of children with diarrhea were taken for evaluation and/or treatment of their condition (Table 7.9). Care for these children was often sought in the public sector, although private health centers were visited by 7% of these cases at the second follow-up.

Table 7.9: Utilization of health services for diarrhea in the last two weeks, among children aged 0-59 months

	Baseline 2013				Second Follow-Up 2017			
	n	N	%	SE	n	N	%	SE
Sought care for diarrhea	100	197	51.2	4.6	145	247	60	5.1

	Baseline 2013			Second Follow-Up 2017		
	n	%	SE	n	%	SE
Type of medical facility where care was sought						
Public hospital	25	27.9	6.1	6	3.9	2.2
Public health center/clinic	32	31.1	4.9	23	15.5	4.1
Public health post	0	0.0	-	75	54.1	7.1
Public mobile clinic	0	0.0	-	0	0.0	-
Other public facility	0	0.0	-	0	0.0	-
Private hospital	0	0.0	-	0	0.0	-
Private health center/clinic	2	2.0	1.4	5	3.2	1.7
Private practice	8	8.9	2.6	6	3.5	1.6
Private mobile clinic	0	0.0	-	0	0.0	-
Other private facility	0	0.0	-	0	0.0	-
Pharmacy	13	11.9	3.8	15	10.0	3.0
Community health worker	1	0.7	0.7	0	0.0	-
Traditional healer	0	0.0	-	0	0.0	-
Home of a community health worker	0	0.0	-	0	0.0	-
School	0	0.0	-	0	0.0	-
Casa base	0	0.0	-	4	2.3	1.2
Public health unit	12	10.5	3.3	0	0.0	-
Other	7	7.0	2.9	10	7.4	2.4
Don't know	0	-	-	0	-	-
Decline to respond	0	-	-	1	-	-

* Options for "Public health center", "Public health post", "Home of a traditional healer", "School", and "Casa base" were not available at baseline. Options for "Public health unit" and "Public health center/clinic" were not available at follow-up. "Public health center" responses from follow-up are grouped within "Public health center/clinic".

7.3.3 Utilization of treatments for diarrhea

A simple and effective response to dehydration caused by diarrhea is a prompt increase in the child's fluid intake through some form of oral rehydration therapy. Oral rehydration therapy may include the use of a solution prepared from commercially produced packets of powdered oral rehydration salts, commercially-produced bottled oral serums, or homemade fluids usually prepared from sugar, salt, and water. Other treatments, including zinc, may be administered as well.

Although care was sought in only 60% of diarrhea cases, 84.6% of cases were given some form of treatment at the second follow-up. Fluid made with powdered oral rehydration salts was the most common form oral rehydration therapy (41.9%). Twelve percent of cases were treated with zinc syrup or pills. Fourteen percent of cases were treated with an antibiotic pill.

Table 7.10: Utilization of treatments for diarrhea during the last two weeks, among children aged 0-59 months

	Baseline 2013				Second Follow-Up 2017			
	n	N	%	SE	n	N	%	SE
Any treatment	160	197	81.9	2.7	207	247	84.6	3.0
Fluids								
Fluid made with powdered oral rehydration salts	85	197	43.8	3.9	100	247	41.9	4.8
Bottled oral rehydration serum	17	197	10.0	2.7	38	247	15.0	2.3
Homemade fluid recommended by health authorities	11	197	6.4	2.5	26	247	11.0	2.3
Medications								
Antibiotic pill	21	197	11.3	3.0	36	246	14.3	2.4
Antidiarrheal pill	14	197	7.4	2.2	36	246	15.2	2.9
Zinc pill	1	197	0.6	0.6	11	246	4.8	1.5
Other type of pill	10	197	5.8	1.6	9	246	3.7	1.3
Unknown pill	23	197	11.7	2.5	3	246	1.4	0.9
Antibiotic injection	2	197	0.8	0.6	6	246	2.5	1.0
Non-antibiotic injection	0	196	0.0	-	0	246	0.0	-
Unknown injection	1	196	0.5	0.5	1	245	0.6	0.6
Intravenous therapy	2	196	0.7	0.5	1	246	0.6	0.6
Home remedy/herbal medicine	35	196	16.8	3.0	21	245	8.5	2.1
Antibiotic syrup	49	196	24.7	4.0	76	246	31.1	3.7
Antidiarrheal syrup	10	195	4.7	1.3	32	246	13.3	2.6
Zinc syrup	5	197	2.6	1.1	18	246	7.3	1.7
Other syrup	10	197	5.0	1.3	12	246	5.2	1.3
Unknown syrup	2	197	1.3	1.0	6	246	2.2	0.9

*We did not have a category for "other" diarrhea treatment besides pills, injections, or syrups in Nicaragua.

7.3.4 Feeding practices during diarrhea

Caregivers are encouraged to continue feeding children normally when they suffer from diarrheal diseases and to increase the fluids they are given. These practices help to prevent dehydration and minimize the adverse consequences of diarrhea on the child's nutritional status.

Data on feeding practices during the recent diarrheal episode are summarized in Table 7.11. The table shows the volume of fluids and the volume of solids given during the illness. Only 9.5% of children were given more fluids than usual in the second follow-up survey. Approximately 59% of children were offered less fluid than usual (or none at all). Twenty four percent of children were offered the same volume of solid food as usual during their illness. Approximately 73% of children were given less than the usual amount of solid food (or none at all).

Table 7.11: Feeding practices among children aged 0-59 months who had diarrhea in the last two weeks

	Baseline 2013			Second Follow-Up 2017		
	n	%	SE	n	%	SE
Volume of fluids (including breastmilk) given during illness						
No fluids	4	2.5	1.2	4	1.7	0.7
Much less	34	17.1	2.6	26	10.6	1.8
Somewhat less	98	50.6	2.6	119	46.9	4.2
About the same	55	27.2	2.6	76	31.4	3.7
More	6	2.7	1.1	21	9.5	3.1
Don't know	0	-	-	1	-	-
Decline to respond	0	-	-	0	-	-
Volume of solid foods given during illness						
No solids	10	5.2	1.5	15	6.1	1.4
Much less	28	14.4	2.8	37	15.3	2.9
Somewhat less	98	50.1	2.9	126	51.6	3.4
About the same	58	29.6	2.8	60	24.1	2.9
More	2	0.8	0.6	6	2.8	1.1
Don't know	1	-	-	3	-	-
Decline to respond	0	-	-	0	-	-

7.4 Immunization against common childhood illnesses

Information on immunization coverage was collected for all children aged 0-59 months whose caregivers participated in the survey. Both caregiver's report and review of vaccination card (if available) were used to determine coverage. A vaccination card was available for review for 1,253 children at the second follow-up (69% of the sample, unweighted). In Table 7.12, coverage is estimated by vaccine type to include all children with full compliance for age as specified in the national immunization scheme at the time of the survey, according to either an affirmative response from the caregiver that the immunization was received, or a mark that the immunization was received on the vaccination card (for children with a vaccination card available for review at the time of the interview). Children too young to have received a specific vaccine are counted as covered in order to maintain a comparable all-ages sample across vaccine types.

Table 7.12: Immunization against common childhood illnesses, children aged 0-59 months, according to caretaker recall and vaccination card

	Baseline 2013				Second Follow-Up 2017			
	n	N	%	SE	n	N	%	SE
BCG vaccine (tuberculosis)	1317	1350	97.5	0.6	1633	1671	97.6	0.5
Polio vaccine	1158	1349	84.9	1.9	1436	1656	86.4	1.2
Pentavalent vaccine (DPT, HepB, HiB)	1152	1350	84.5	1.8	1470	1652	89.0	1.2
Rotavirus vaccine	1046	1339	76.7	2.4	1382	1636	84.7	1.5
Pneumococcal conjugate vaccine	1306	1379	94.2	0.9	1366	1628	83.9	1.5
Measles, mumps, and rubella (MMR) vaccine	1247	1351	92.1	1.2	1564	1639	95.4	0.8
Diphtheria, tetanus, and pertussis (DPT) vaccine	1146	1359	83.6	1.6	1471	1660	88.8	1.2

*Pneumococcal vaccine was added to national vaccine scheme during 2012, so children born before 2012 are compliant without receiving the vaccine.

*In November 2014, Nicaragua switched from 3-dose rotavirus vaccine to 2-dose (at 2 and 4 months). Supplies of 3-dose vaccine were to be applied until used up. Therefore, children born after September 2014 are considered compliant with two doses.

* MMR compliance is defined consistent with the indicator manual as one dose at 12 months, and does not take into account the second dose required by the national scheme at 18 months.

In Table 7.13, coverage estimates based on recall are summarized for the full sample, and coverage estimates based on vaccination card data are summarized among the subset with a vaccination card available for review. When considering only caregivers' recall, only 58.1% of children aged 0-59 months were fully immunized for age at the second follow-up survey, reflecting many "Don't know" or "Decline" responses that call into question the reliability and validity of the caregiver recall data. Caregivers were able to definitively answer the entire vaccine recall section for only 1290 children at the second follow-up. Immunization coverage for children 0-59 months based only upon the vaccine card is 46.7%, and when combined with recall-based information, the estimate of full vaccination for age among children 0-59 months is 71.7%.

Table 7.13: Full immunization compliance for age, children aged 0-59 months

	Baseline 2013				Second Follow-Up 2017			
	n	N	%	SE	n	N	%	SE
According to recall + card	914	1325	67.5	2.9	1132	1577	71.7	2.0
According to caregiver's recall	685	1149	58.7	2.6	752	1290	58.1	2.3
According to vaccine card	706	1398	48.0	3.1	836	1802	46.7	2.3

7.5 Deworming treatment

Administration of deworming treatment every six months has been shown to reduce the prevalence of anemia in children. Only 31.8% of children aged 12-59 months received at least two doses of deworming treatment in the year preceding the second follow-up interview (Table 7.14).

Table 7.14: Deworming treatment among children aged 12-59 months

	Baseline 2013			Second Follow-Up 2017		
	n	%	SE	n	%	SE
No deworming	410	38.6	1.7	510	35.6	1.9
One dose	316	29.4	1.5	447	32.5	1.5
Two or more doses	348	32.0	1.3	445	31.8	1.8
Don't know	1	-	-	5	-	-
Decline to respond	0	-	-	0	-	-

Figure 7.3: Children 18-59 months of age who received 2 doses of deworming treatment in the past year by municipality, second follow-up survey

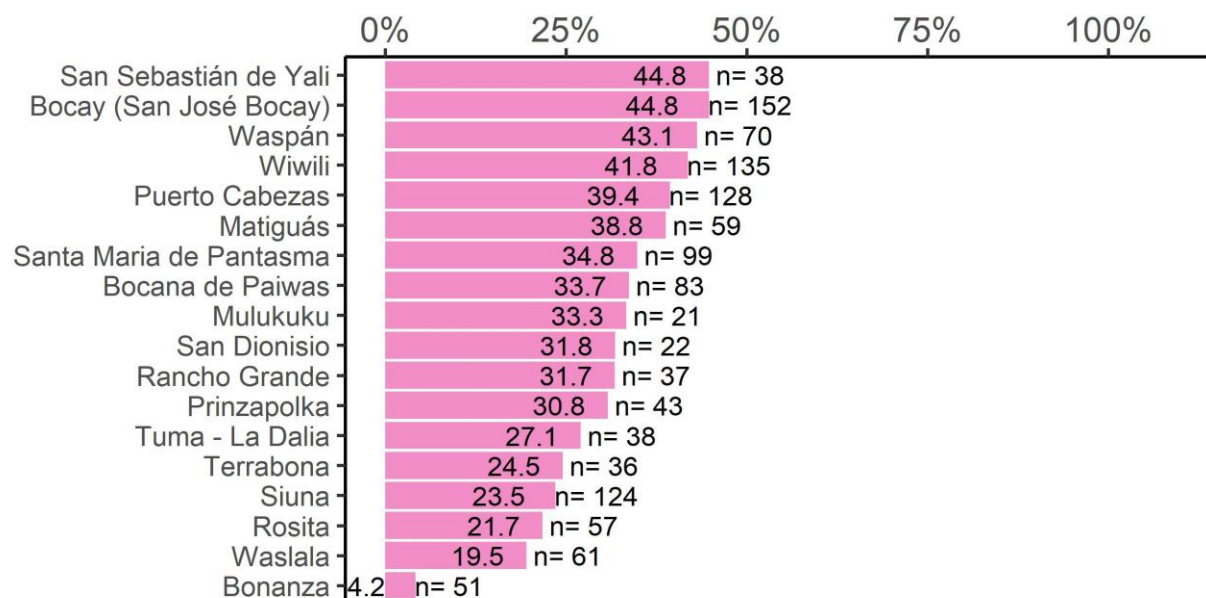
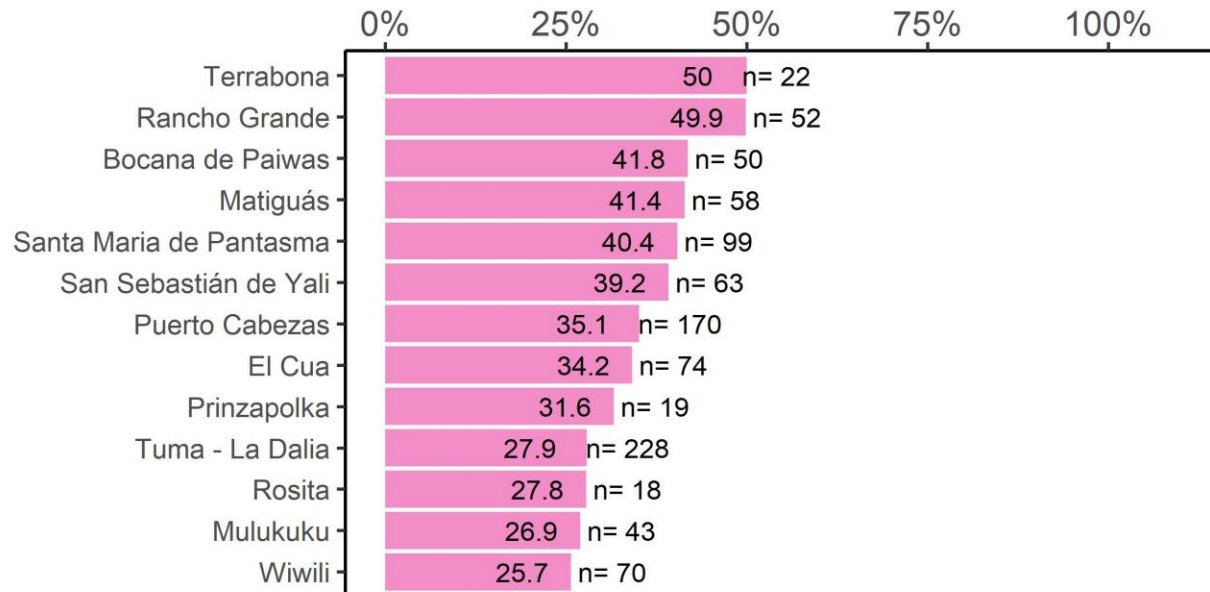


Figure 7.4: Children 18-59 months of age who received 2 doses of deworming treatment in the past year by municipality, baseline survey



8 Chapter 8: INFANT AND YOUNG CHILDREN FEEDING PRACTICES

This chapter summarizes the feeding practices of infants and children aged 0-59 months whose caregivers participated in the SMI-Nicaragua Household Survey. All data summarized in this chapter are based on the caregiver's report.

8.1 Breastfeeding

8.1.1 Exclusive breastfeeding

Coverage of exclusive breastfeeding is defined as the percentage of infants born in the six months prior to the survey who received only breast milk during the previous day. This information is obtained through a 24-hour dietary recall in which the caregiver indicates what the child consumed during the previous day and night. In Nicaragua during the second follow-up, the sample includes 167 children who are under 6 months of age, and 66 of those children have sufficiently complete dietary recall information to determine whether they are exclusively breastfed. Table 8.1 shows that 40.2% of children under 6 months of age are exclusively breastfed.

8.1.2 Continued breastfeeding at 1 year

Coverage of continued breastfeeding at 1 year is defined as the percentage of children 12-15 months old who received breast milk during the previous day according to caregiver's dietary recall. In Nicaragua during the second follow-up, the sample includes 148 children who are between 12 and 15 months of age, and 88 of those children have adequate responses to determine their breastfeeding status. Table 8.1 shows that 62.6% of children continue to receive breast milk at 1 year.

Table 8.1: Breastfeeding among children

	Baseline 2013				Second Follow-Up 2017			
	n	N	%	SE	n	N	%	SE
Exclusive breastfeeding among children <6 months	78	134	59.5	5.6	66	165	40.2	4.0
Continued breastfeeding at one year among children 12-15 months	57	95	56.5	6.1	88	146	62.6	4.2

8.2 Acceptable diet

8.2.1 Introduction of solid, semi-solid, or soft foods

Coverage of appropriate introduction of solid foods is measured as the percentage of infants 6-8 months of age who received solid or semi-soft foods during the previous day according to caregiver's dietary recall. In Nicaragua during the second follow-up, the sample includes 90 children who are 6-8 months of age, and

70 of those children have sufficiently complete dietary recall information. Table 8.2 shows that 75.8% of children consumed solid or semi-soft foods.

8.2.2 Dietary diversity

Coverage of minimum dietary diversity is measured as the percentage of children 6-23 months of age who received foods from at least four food groups during the previous day according to caregiver's dietary recall. In Nicaragua during the second follow-up, the sample includes 550 children who are 6-23 months of age, and 253 of those children have sufficiently complete dietary recall information to determine dietary diversity. Table 8.2 shows that 45.8% of children achieved the minimum dietary diversity during the previous day.

8.2.3 Meal frequency

Coverage of minimum meal frequency is measured as the percentage of children 6-23 months of age who received solid foods at least the minimum number of times the previous day, based on age and breastfeeding status. For breastfed children, the minimum is two times for children 6-8 months of age and three times for children 9-23 months of age. For non-breastfed children, the minimum number is four times for all children 6-23 months of age. This information is obtained through caregiver's dietary recall. In Nicaragua during the second follow-up, the sample includes 550 children who are 6-23 months of age, and 266 of those children have sufficiently complete dietary recall information to determine meal frequency. Table 8.2 shows that 49.3% of children achieved the minimum meal frequency during the previous day.

8.2.4 Minimum acceptable diet

Coverage of minimum acceptable diet is measured for children 6-23 months of age. For breastfed children to meet the minimum acceptable diet they must have had at least the minimum dietary diversity and the minimum meal frequency during the previous day. For non-breastfed children to meet the minimum acceptable diet they must have had at least two milk feedings, as well as at least the minimum dietary diversity (not including milk feedings) and the minimum meal frequency during the previous day. This information is obtained through caregiver's dietary recall. In Nicaragua during the second follow-up, the sample includes 550 children who are 6-23 months of age, and 152 of those children have sufficiently complete dietary recall information to determine minimum acceptable diet. Table 8.2 shows that 27.2% of children achieved the minimum acceptable diet during the previous day.

8.2.5 Consumption of iron-rich or iron-fortified foods

Consumption of iron-rich foods is measured as the percentage of children 6-23 months of age who receive an iron-rich food (e.g., liver, beef, or fish), an iron supplement, or a fortified food that is specially designed for infants and young children, or a food fortified in the home with a product that included iron during the previous day. This information is obtained through caregiver's dietary recall. In Nicaragua during the

second follow-up, the sample includes 550 children who are 6-23 months of age and 309 of those children have sufficiently complete dietary recall information to determine iron consumption. Table 8.2 shows that 56.8% of children consumed an iron-rich food during the previous day.

Table 8.2: Acceptable diet among children 6-23 months

	Baseline 2013				Second Follow-Up 2017			
	n	N	%	SE	n	N	%	SE
Introduction of solid foods among children 6-8 months	49	59	80.4	6.1	70	90	75.8	5.8
Consumption of iron-rich foods among children 6-23 months	157	456	34.8	3.1	309	550	56.8	2.8
Minimum meal frequency among children 6-23 months	221	437	48.6	2.8	266	530	49.3	3.0
Minimum dietary diversity among children 6-23 months	204	456	43.1	3.1	253	550	45.8	2.4
Minimum acceptable diet among children 6-23 months	103	450	21.6	2.3	152	544	27.2	2.5

8.3 Micronutrient supplementation

8.3.1 Vitamin A

Interviewers asked the caregiver if their child received a dose of vitamin A in the last six months. Table 8.3 shows that of the 1,816 sampled children 0-59 months of age in the second follow-up, 56.8% received a dose of vitamin A in the last six months.

8.3.2 Iron

Interviewers showed the caregiver photos of common types of bottles, powders, or syrups and asked if their child received iron pills, powder, or syrup in the last day. Table 8.3 shows that of the 1,816 children 0-59 months of age in the second follow-up sample, 12.3% received a dose of iron in the last day.

Table 8.3: Vitamin A and Iron consumption among children 0-59 months

	Baseline 2013				Second Follow-Up 2017			
	n	N	%	SE	n	N	%	SE
Vitamin A in the last six months	502	1396	36.6	2.4	966	1728	56.8	2.3
Iron supplement the previous day	75	1401	5.4	0.9	213	1806	12.3	0.8

8.3.3 Packets of micronutrients

Interviewers showed the caregiver a card with packets of micronutrients and asked how many packets their child received from a health facility and consumed in the last six months. Children are intended

to take 60 consecutive daily doses of micronutrient powder in each of three rounds, beginning at age 6, 12, and 18 months, with an adequate consumption considered to be 50 packets. Table 8.4 shows that among children 6-23 months of age sampled in the second follow-up, 96.9% received no packets of micronutrients from a health facility in the last six months.

Table 8.4: Micronutrient powders among children 6-23 months

	Baseline 2013				Second Follow-Up 2017			
	n	N	%	SE	n	N	%	SE
Received any micronutrient packets from health facility in the last six months	1	454	0.2	0.2	16	539	3.1	0.8
Consumed any micronutrient packets	1	454	0.2	0.2	13	538	2.6	0.8
Consumed adequate dose (≥ 50 packets) of micronutrient powders	1	454	0.2	0.2	1	538	0.2	0.2

* Identical questions were asked in baseline and second follow-up surveys, but the second follow-up interview included photos of the micronutrient products. The baseline survey predated the intervention, so it is possible that questions about receipt and consumption were interpreted by caregivers to include different types of micronutrient supplements at baseline.

9 CHAPTER 9: NUTRITIONAL STATUS IN CHILDREN

The nutritional status of children aged 0-59 months is an important outcome measure of children's health. The SMI-Nicaragua Second Follow-up Household Survey collected data on the nutritional status of children by measuring the height and weight of all children aged 0-59 months residing in surveyed households, using standard procedures. Hemoglobin levels of these children were also assessed in the field, using a portable HemoCue™ machine, and these data were used to estimate anemia prevalence. As described in Chapter 1, medically trained personnel who were specifically trained to standardize the anthropometric and hemoglobin measurements conducted the testing. This evaluation allows identification of subgroups of the child population that are at increased risk of malnutrition. The parents of anemic children (hemoglobin level <11.0 g/dL, with altitude adjustment) were informed of this result in real-time and were referred for treatment to the appropriate health service.

Three indicators were calculated using the weight and height data – weight-for-age, height-for-age, and weight-for-height. For this report, indicators of the children's nutritional status were calculated using growth standards published by the World Health Organization (WHO) in 2006. The growth standards were generated using data collected in the WHO Multicenter Growth Reference Study. The findings of the study, whose sample included children in six countries (Brazil, Ghana, India, Norway, Oman, and the United States), describe how children should grow under optimal conditions. As such, the WHO Child Growth Standards can be used to assess children all over the world, regardless of ethnicity, social and economic influences, and feeding practices. The three indicators are expressed in standard deviation units from the median in the Multicenter Growth Reference Study.

A total of 1,730 children aged 0-59 months participated in the SMI-Nicaragua second follow-up. In practice, 1,730 of these children underwent the physical measurement module. Height and weight data are presented for 1,716 of these children (99.2%, unweighted). One thousand five hundred seventy one children 6-59 months of age were eligible for the anemia test. Hemoglobin was measured in 1,491 children (94.9%, unweighted, of children 6-59 months of age). Parental consent was refused for 67 children, zero were not measured because anthropometrists could not obtain a sufficient capillary blood sample or any sample at all, and five cases were not tested for other reasons (for example, because the child did not cooperate). The age and sex distribution of children participating in the physical measurement module in the second follow-up is displayed in Figure 9.2 and Figure 9.4.

Figure 9.1: Height and weight measured: Age and sex of sample, unweighted percent distribution of the de facto population, baseline survey

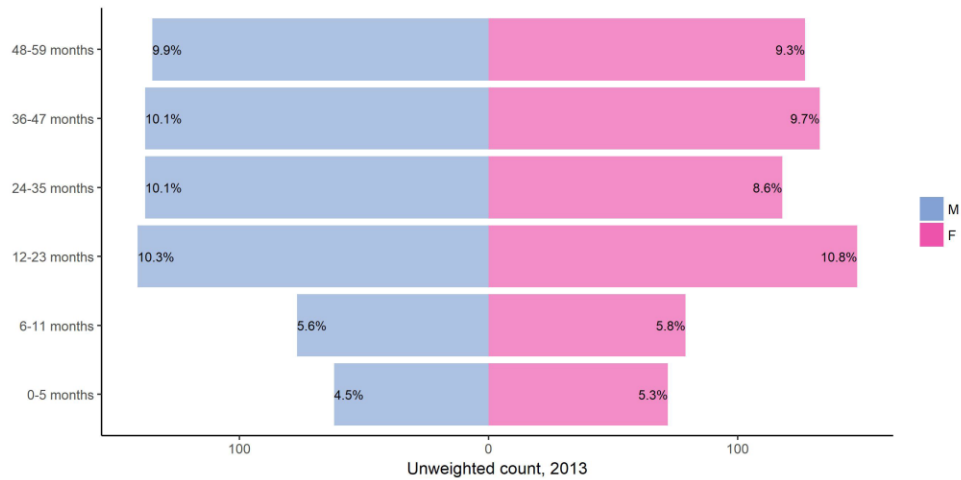


Figure 9.2: Height and weight measured: Age and sex of sample, unweighted percent distribution of the de facto population, follow-up survey

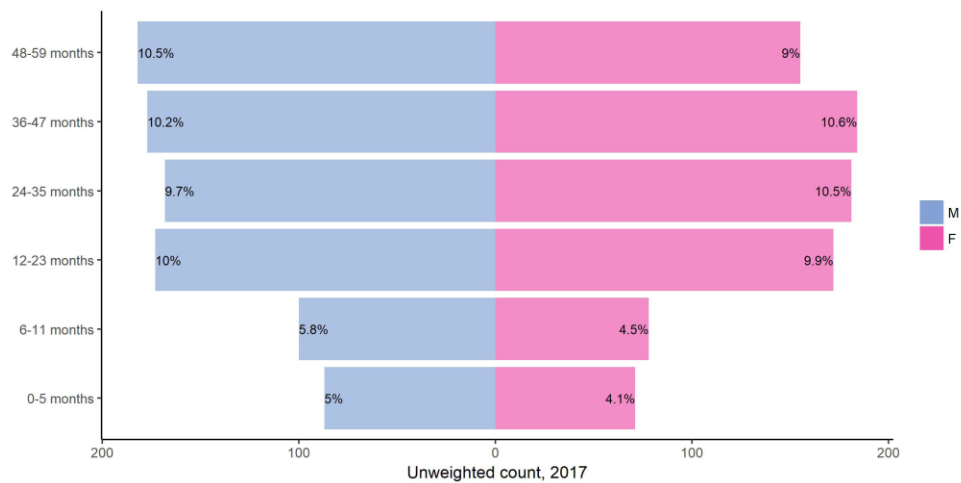


Figure 9.3: Hemoglobin measured: Age and sex of sample, unweighted percent distribution of the de facto population, baseline survey

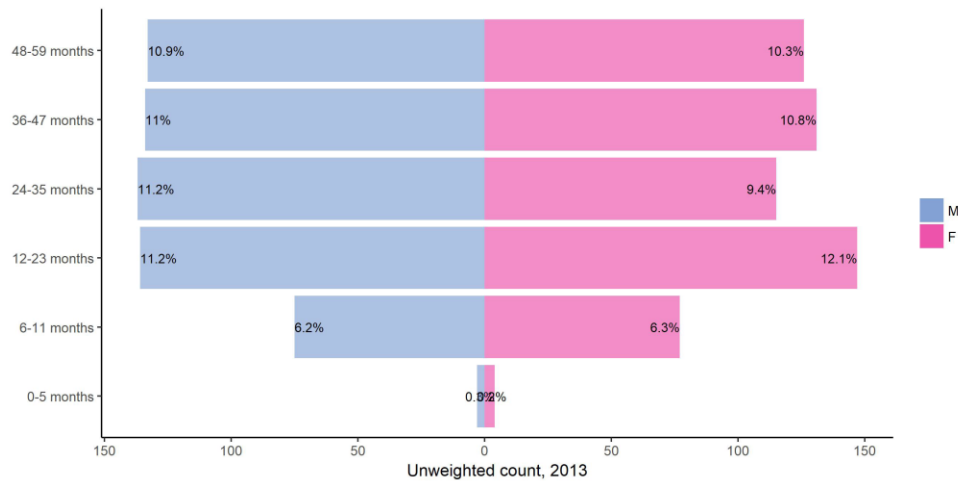
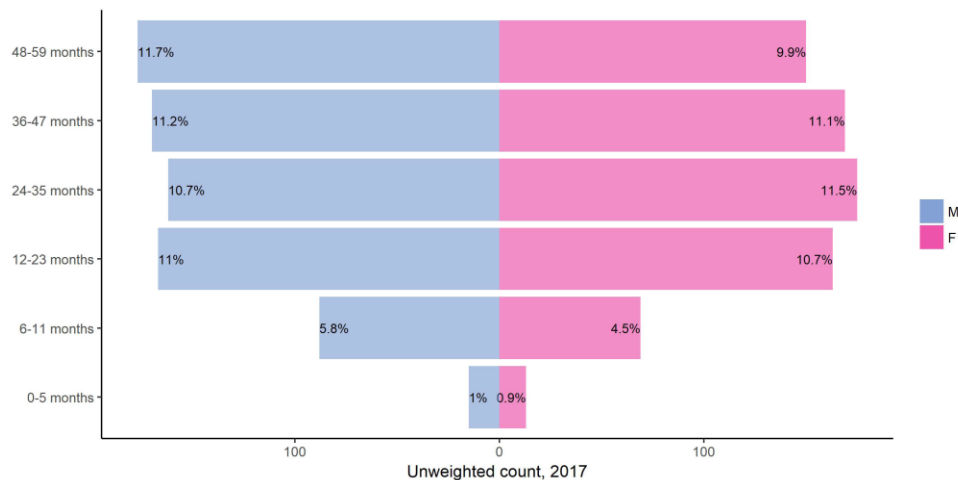


Figure 9.4: Hemoglobin measured: Age and sex of sample, unweighted percent distribution of the de facto population, follow-up survey



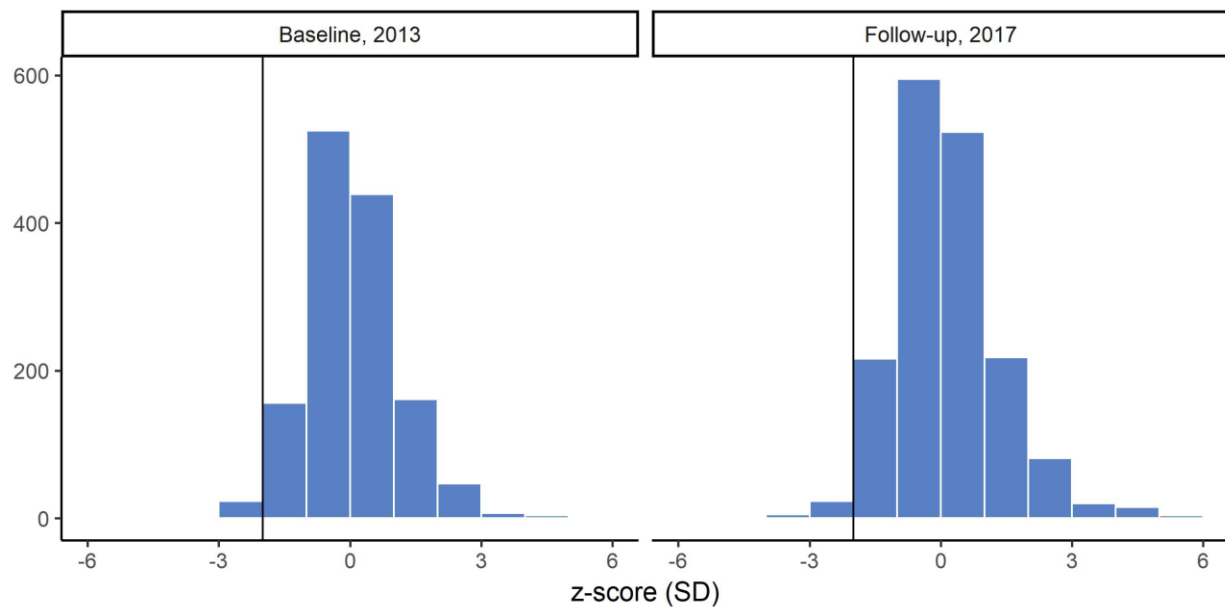
9.1 Weight-for-Age

Weight-for-age is a good overall indicator of a population's general health, as it reflects the effects of both acute and chronic undernutrition. The weight-for-age indicator does not distinguish between chronic malnutrition (stunting) and acute malnutrition (wasting); a child can be underweight because of stunting, wasting, or both. Children with weight-for-age below minus two standard deviations (-2 SD) are classified as underweight. Children with weight-for-age below minus three standard deviations (-3 SD) are considered severely underweight.

9.1.1 Unweighted distribution of weight-for-age z-scores

Figure 9.5 shows the distribution of weight-for-age z-scores among all children aged 0-59 months whose measurements were taken. The vertical black lines in the figure denote minus two standard deviations – children to the left of the line are classified as underweight.

Figure 9.5: Distribution of weight-for-age z-scores among children 0-59 months, unweighted



9.1.2 Prevalence of underweight

As shown in Table 9.1, 4% of children aged 0-59 months in the second follow-up are underweight (have low weight-for-age) and 1.1% are severely underweight. The proportion of underweight children is highest (4.8%) in the age groups 24 to 59 months and lowest (1.3%) among those under 6 months. Female children (3.7%) are less likely to be underweight than male children (4.2%).

Table 9.1: Prevalence of underweight in children aged 0-59 months

	Baseline 2013				Second Follow-Up 2017			
	n	N	%	SE	n	N	%	SE
Prevalence of underweight in children 0-59 months, by sex and age (< -2 SD)								
Male	24	690	3.7	0.8	36	881	4.2	0.9
Female	31	677	5.3	1.2	29	837	3.7	0.7
0-5 months	3	134	2.6	1.5	1	157	1.3	1.2
6-11 months	2	156	1.5	1.2	8	178	5.1	1.7
12-23 months	7	289	2.5	1.0	7	341	2.0	0.7
24-59 months	43	788	6.1	1.3	49	1042	4.8	0.7
0-59 months	55	1367	4.5	0.9	65	1718	4.0	0.6
6-23 months	9	445	2.2	0.8	15	519	3.1	0.8
Prevalence of severe underweight in children 0-59 months, by sex and age (< -3 SD)								
Male	4	690	0.8	0.4	10	881	1.1	0.4
Female	5	677	1.2	0.6	9	837	1.0	0.3
0-5 months	1	134	1.3	1.3	0	157	0.0	-
6-11 months	1	156	1.1	1.1	1	178	0.4	0.4
12-23 months	0	289	0.0	-	6	341	1.7	0.7
24-59 months	7	788	1.3	0.6	12	1042	1.1	0.3
0-59 months	9	1367	1.0	0.5	19	1718	1.1	0.3
6-23 months	1	445	0.4	0.4	7	519	1.3	0.5
Prevalence of high weight for age in children 0-59 months, by sex and age (> 2 SD)								
Male	28	690	4.0	0.7	60	881	6.8	0.8
Female	23	677	3.8	0.9	49	837	6.2	0.8
0-5 months	13	134	9.6	2.5	44	157	29.0	3.7
6-11 months	10	156	6.9	2.4	14	178	8.2	2.0
12-23 months	15	289	5.4	1.3	24	341	7.5	1.4
24-59 months	13	788	1.7	0.5	27	1042	2.5	0.5
0-59 months	51	1367	3.9	0.6	109	1718	6.5	0.6
6-23 months	25	445	5.9	1.1	38	519	7.8	1.0

9.2 Height-for-Age

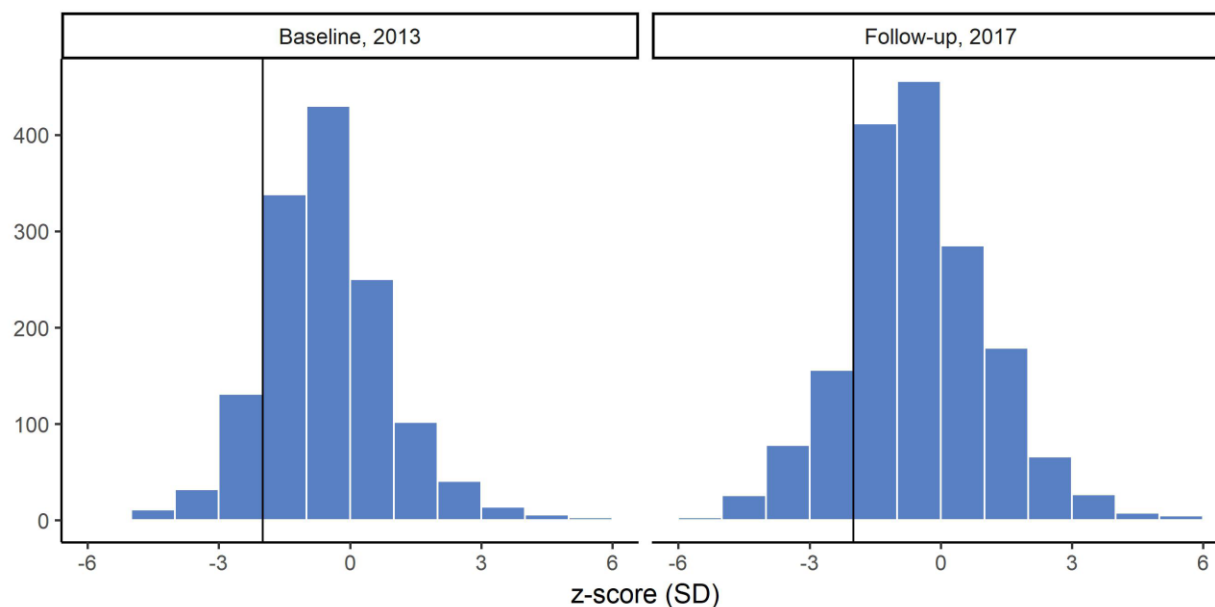
Height-for-age is an indicator of linear growth retardation and cumulative growth deficits in children. Children whose height-for-age z-score is below minus two standard deviations (-2 SD) from the median of the WHO reference population are considered short for their age (stunted) or chronically malnourished. Children who are below minus three standard deviations (-3 SD) are considered severely stunted. Stunting reflects failure to receive adequate nutrition over a long period of time and is affected by recurrent and chronic illness. Height-for-age, therefore, represents the long-term effects of malnutrition in a population and is not sensitive to recent, short-term changes in dietary intake.

9.2.1 Distribution of height-for-age z-scores

Figure 9.6 presents the distribution of height-for-age z-scores among all children aged 0-59 months whose measurements were taken. The vertical black lines in the figure denote minus two standard deviations –

children to the left of the line are classified as stunted.

Figure 9.6: Distribution of height-for-age z-scores among children 0-59 months, unweighted



9.2.2 Prevalence of stunting

Table 9.2 presents the prevalence of stunting in children aged 0-59 months as measured by height-for-age. In the second follow-up, 15.6% of children under age 5 are stunted and 6.6% are severely stunted. Analysis of the indicator by age group shows that stunting is highest (18.9%) in children 24-59 months and lowest (3.4%) in children aged 0-5 months. Children 12-23 months old have the highest proportion of severely stunted children (7.2%) while the youngest age group (0-5 months) has the lowest proportion (0.7%). A higher proportion (14.1%) of male children is stunted compared with the proportion of female children (17.1%).

Table 9.2: Prevalence of stunting in children aged 0-59 months

	Baseline 2013				Second Follow-Up 2017			
	n	N	%	SE	n	N	%	SE
Prevalence of stunting in children 0-59 months, by sex and age (< -2 SD)								
Male	98	689	15.0	2.0	124	885	14.1	1.6
Female	75	677	11.6	1.4	150	837	17.1	1.8
0-5 months	1	134	0.6	0.6	5	158	3.4	1.4
6-11 months	7	156	4.5	1.9	17	177	9.2	2.5
12-23 months	31	289	12.0	1.9	50	343	14.5	1.9
24-59 months	134	787	17.6	2.1	202	1044	18.9	1.9
0-59 months	173	1366	13.3	1.4	274	1722	15.6	1.4
6-23 months	38	445	9.4	1.4	67	520	12.7	1.6
Prevalence of severe stunting in children 0-59 months, by sex and age (< -3 SD)								
Male	29	689	5.0	1.1	50	885	5.7	1.1
Female	15	677	2.7	0.9	66	837	7.5	1.1
0-5 months	0	134	0.0	-	1	158	0.7	0.7
6-11 months	1	156	1.1	1.1	9	177	4.8	1.8
12-23 months	5	289	2.1	1.2	24	343	7.2	1.5
24-59 months	38	787	5.7	1.3	82	1044	7.6	0.9
0-59 months	44	1366	3.9	0.8	116	1722	6.6	0.8
6-23 months	6	445	1.7	0.8	33	520	6.4	1.3

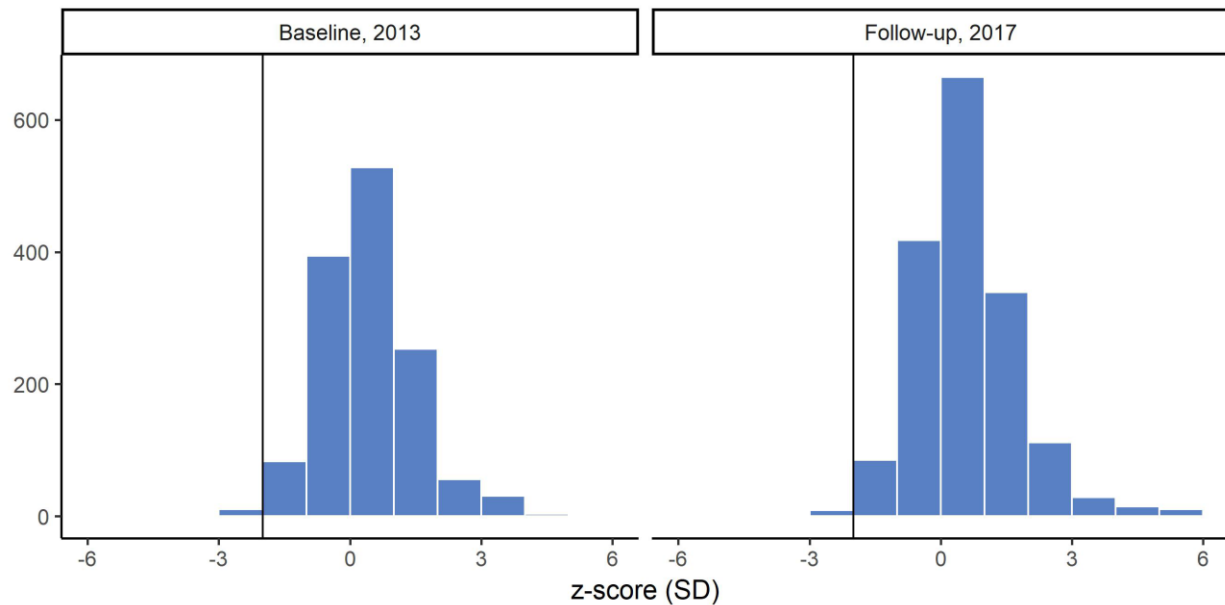
9.3 Weight-for-Height

The weight-for-height indicator measures body mass in relation to body height or length and describes current nutritional status. Children with z-scores below minus two standard deviations (-2 SD) are considered thin (wasted) or acutely malnourished. Wasting represents the failure to receive adequate nutrition in the period immediately preceding the survey and may be the result of inadequate food intake or a recent episode of illness causing loss of weight and the onset of malnutrition. Children with a weight-for-height index below minus three standard deviations (-3 SD) are considered severely wasted. This weight-for-height indicator also provides data on over-weight and obesity. Children more than two standard deviations (+2 SD) above the median weight-for-height are considered overweight or obese.

9.3.1 Distribution of weight-for-height z-scores

Figure 9.7 shows the distribution of weight-for-height z-scores among all children aged 0-59 months whose measurements were taken. The vertical black lines in the figure denote minus two standard deviations – children to the left of the line are classified as wasted.

Figure 9.7: Distribution of weight-for-height z-scores among children 0-59 months, unweighted



9.4 Prevalence of Wasting

Table 9.3 shows the breakdown of nutritional status of children aged 0-59 months as measured by weight-for-height by age groups and sex. In the second follow-up, 2.1% of children are wasted and 0.7% of children are severely wasted. Analysis of the indicator by age group shows that wasting is highest (1.7%) in children 12-23 months old and lowest (5.3%) in children aged 6-11 months. Male children are more likely to be wasted than female children (3% to 1.2%). Male children are slightly more likely to be severely wasted (1%) than females (0.4%).

Overweight and obesity affect a greater proportion of children in SMI areas Nicaragua than wasting. In this sample, 9.2% of children are overweight or obese (weight-for-height more than +2 SD). The coexistence of both growth retardation and obesity reveals the burden of malnutrition in Nicaragua.

Table 9.3: Prevalence of underweight in children aged 0-59 months

	Baseline 2013				Second Follow-Up 2017			
	n	N	%	SE	n	N	%	SE
Prevalence of wasting in children 0-59 months, by sex and age (< -2 SD)								
Male	9	688	1.4	0.5	26	883	3.0	0.7
Female	10	677	1.6	0.6	10	834	1.2	0.4
0-5 months	5	134	4.2	1.8	7	158	5.1	1.9
6-11 months	1	156	0.5	0.5	9	176	5.3	2.1
12-23 months	4	289	1.2	0.6	6	342	1.7	0.7
24-59 months	9	786	1.3	0.4	14	1040	1.2	0.3
0-59 months	19	1365	1.5	0.4	36	1716	2.1	0.4
6-23 months	5	445	1.0	0.4	15	518	3.0	1.0
Prevalence of severe wasting in children 0-59 months, by sex and age (< -3 SD)								
Male	2	688	0.4	0.3	10	883	1.0	0.5
Female	4	677	0.8	0.5	4	834	0.4	0.2
0-5 months	2	134	2.3	1.5	2	158	0.9	0.9
6-11 months	0	156	0.0	-	5	176	2.7	1.3
12-23 months	0	289	0.0	-	3	342	0.8	0.5
24-59 months	4	786	0.7	0.3	4	1040	0.3	0.2
0-59 months	6	1365	0.6	0.3	14	1716	0.7	0.3
6-23 months	0	445	0.0	-	8	518	1.5	0.6
Prevalence of overweight in children 0-59 months, by sex and age (> 2 SD)								
Male	49	688	7.5	1.8	84	883	9.3	1.0
Female	30	677	4.9	1.2	82	834	9.1	1.1
0-5 months	6	134	5.9	2.8	25	158	16.9	3.4
6-11 months	12	156	8.3	3.0	22	176	12.0	2.4
12-23 months	23	289	7.8	1.7	43	342	12.6	1.9
24-59 months	38	786	5.2	1.4	76	1040	6.4	0.8
0-59 months	79	1365	6.2	1.3	166	1716	9.2	0.8
6-23 months	35	445	8.0	1.6	65	518	12.4	1.6

9.5 Anemia

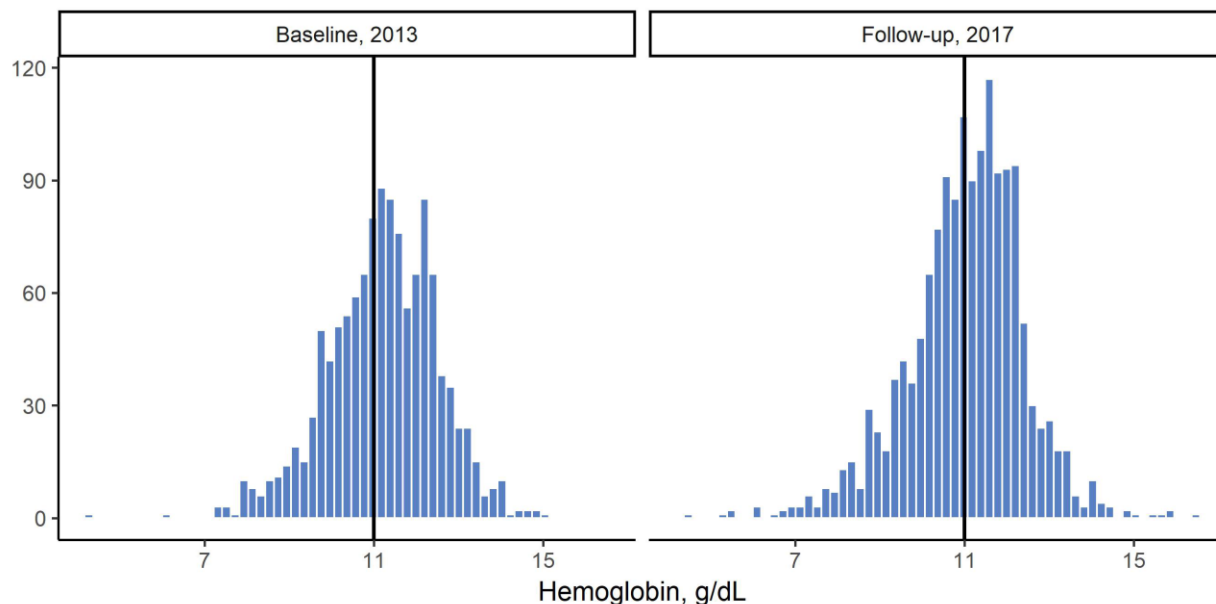
Anemia is a condition characterized by low concentration of hemoglobin in the blood. Hemoglobin is necessary for transporting oxygen to tissues and organs in the body. The reduction in oxygen available to organs and tissues when hemoglobin levels are low is responsible for most of the symptoms experienced by anemic persons. The consequences of anemia include general body weakness, frequent tiredness, and lowered resistance to disease. It is of concern in children because anemia is associated with impaired mental and motor development. Overall, morbidity and mortality risks increase for individuals suffering from anemia.

Common causes of anemia include inadequate intake of iron, folate, vitamin B12, or other nutrients. This form of anemia is commonly referred to as iron-deficiency anemia and is the most widespread form of anemia in the world. Anemia can also be the result of thalassemia, sickle cell disease, malaria, or intestinal worm infestation.

9.5.1 Distribution of hemoglobin values

Figure 9.8 shows the distribution of hemoglobin values (in g/dL) among children 0-59 months of age. The vertical black lines in the figure denote a hemoglobin concentration of 11.0 g/dL – children to the left of the line are classified as anemic.

Figure 9.8: Distribution of altitude-adjusted hemoglobin values among children 0-59 months, unweighted



9.5.2 Prevalence of anemia

Levels of anemia were classified as severe (<7.0 g/dL) and any (<11.0 g/dL) based on the hemoglobin concentration in the blood. The cutpoints for anemia are adjusted (raised) in settings where altitude is more than 1,000 meters above sea level, to account for lower oxygen partial pressure, a reduction in oxygen saturation of blood, and an increase in red blood cell production. Although some regions of Nicaragua are mountainous and well above 1,000 meters, the majority of the population resides at lower levels. The highest elevation of a surveyed household at the second follow-up was 1,143 meters above sea level; 0.8% of children (unweighted) lived above 1,000 meters. Correction for elevation was applied to anemia diagnosis where data collectors measured altitude over 1,000m (using a handheld GPS device).

Children whose hemoglobin levels are below 11 g/dL are considered anemic, and children who have hemoglobin levels below 7 g/dL are considered severely anemic. Table 9.4 indicates that 44.4% of children under age 5 in Nicaragua are anemic. Overall, the anemia prevalence is mostly mild to moderate (43.6%), with only 0.8% of children under 5 years presenting as severely anemic. Anemia prevalence is highest among children aged 0-5 months (69.3%) compared with the other children. More than 51.3% of all children aged 6-23 months, our targeted population for anemia intervention, were found to be anemic.

Table 9.4: Prevalence of anemia, children aged 0-59 months

	Baseline 2013				Second Follow-Up 2017			
	n	N	%	SE	n	N	%	SE
Prevalence of anemia in children 0-59 months, by sex and age								
Male	247	618	39.0	2.3	345	780	44.5	2.5
Female	232	600	38.7	2.4	323	739	44.4	2.8
0-5 months	5	7	70.6	13.3	19	28	69.3	8.8
6-11 months	105	152	67.4	4.5	88	157	55.0	4.3
12-23 months	131	283	46.9	3.5	163	330	49.4	3.7
24-59 months	238	776	30.0	2.0	397	1004	40.2	2.3
0-59 months	479	1218	38.8	1.9	667	1519	44.4	2.3
6-23 months	236	435	53.9	2.9	251	487	51.3	3.3
Prevalence of severe anemia in children 0-59 months, by sex and age								
Male	1	618	0.2	0.2	7	780	0.8	0.4
Female	1	600	0.2	0.2	5	739	0.7	0.3
0-5 months	0	7	0.0	-	0	28	0.0	-
6-11 months	1	152	0.6	0.7	2	157	1.3	1.3
12-23 months	1	283	0.3	0.3	4	330	1.2	0.6
24-59 months	0	776	0.0	-	6	1004	0.6	0.2
0-59 months	2	1218	0.2	0.1	12	1519	0.8	0.3
6-23 months	2	435	0.4	0.3	6	487	1.2	0.7

APPENDIX A. SAMPLING DESIGN AND METHODOLOGY

A.1 Sample Size

Sample sizes were determined based on IDB's pre-specified plan for the second follow-up measurement to complete a full census of sampled segments (described in section A.2 "Sampling Procedures", below), followed by a survey of 1,809 selected eligible households in intervention areas, and 750 selected eligible households in comparison areas. Households were eligible if they had at least one child aged 0-59 months or one woman aged 15-49 years.

In order to achieve the desired sample size of 2,559 households, we sought to complete interviews with residents of 30 randomly-selected households in each of the 61 randomly selected segments in intervention areas (25 in comparison areas). More specifically, we drew a sample of 30 randomly-selected households with age-eligible women and/or children as residents, and then drew a backup sample of 10 households from the remaining households with eligible participants in the segment. In some cases, selected households were absent or declined to participate in the SMI-Nicaragua Household Survey. These households were replaced in order by households from the backup sample for the same segment. In each selected household, all eligible women and children were selected to participate in the study. Informed consent was sought from each respondent to the household questionnaire and woman's health interview, and from the guardian of each child participating in physical measurements. Occasionally, one or more eligible participant refused the interview despite other household members participating, or a survey was refused in course, resulting in a partially complete household result. Because multiple interviewers worked the sample simultaneously, in a handful of instances, more than 30 surveys were completed. In the second follow-up, counts of complete households by segment range from 28 to 33 households. Twelve segments with fewer than 30 complete households had one or two partially complete households, and two segments with 30 complete households have additional partially complete households. Data from partially complete households is used wherever individual modules are sufficiently complete.

A.2 Sampling Procedures

IDB identified 20 intervention municipalities in which to conduct the SMI household survey for the Initiative on the basis of their high concentration of residents in the country's lowest wealth quintile, and 4 comparison municipalities with similar socioeconomic characteristics and ethnic composition. From these 24 municipalities, a two-stage clustered random sample of eligible households was selected.

In this section, we describe the random sampling procedures for selecting the segments from the target area, and the households within the segment. An alternative sample was also selected in the event that the survey could not be conducted in the selected segments. Below we describe the selection of the primary and alternate samples.

A.2.1 Cluster sampling

Cluster sample sizes were determined based on the total estimated household sample size divided by a fixed cluster size “ μ ” of 30 households per segment. The primary sample at the second follow-up of 61 intervention and 25 comparison clusters (segments) was randomly selected from a total of 1,774 intervention segments in 20 municipalities and 281 comparison segments in 4 municipalities which, based on data from the 2005 Nicaragua Population Census, contained and occupied households respectively. As stated previously, segments were selected in each study arm with probability proportional to size and with replacement, as follows:

Size was represented by the number of occupied households within the segment, based on data from the 2005 Nicaragua Population Census. We generated a variable for the cumulative number of households in each of the intervention and comparison sampling frames. We divided the cumulative total by the number of segments we meant to sample to obtain an interval length “ Δ ”. A random starting point “ Σ ” was drawn from a uniform distribution between 1 and the interval length Δ . The n^{th} segment in the sample was the first segment whose cumulative number of households was greater than $\Sigma + (n - 1) * \Delta$.

After selecting the 86 total segments to be surveyed, a set of 20 alternate segments in intervention areas and 15 alternate segments in comparison areas were randomly selected with probability proportional to size. These segments could be used in the event that any of the selected segments could not be surveyed and needed to be replaced due to security concerns, community rejection of the study, or a high proportion of absent households. No segments were replaced in the second follow-up. At the baseline, safety issues in the Department of Jinotega and especially in the North Atlantic Autonomous Region (RAAN, Región Autónoma del Atlántico Norte) complicated data collection. Though no personnel were injured, a very threatening event occurred in the RAAN, where interviewers were assaulted, threatened, and tied. In order to avoid becoming an easy target for future violent events in the regions, we were forced to stop activities in that region, and 22 selected segments were not surveyed.

A.2.2 Household sampling

Within each randomly-selected cluster, a complete household listing exercise was carried out, enabling the systematic selection of households for participation in the survey, based on household composition. All households in which women aged 15-49 years and/or children aged 0-59 months resided were eligible to be selected for the survey. Eligible households were sorted according to a random variable. The first 25 households with eligible children were selected for participation. The first five households with eligible women only were selected to complete the sample of 30 households. Ten additional households were identified as an alternate sample, eight with eligible children and two with eligible women only. These alternate households were substituted in order for selected households that were absent throughout the data collection or refused participation in the study.

APPENDIX B. SURVEY WEIGHTS, SAMPLING ERROR, AND DESIGN EFFECTS

B.1 Weighting Methodology

Survey weights reflect the three-stage cluster sampling design of the study. The primary sampling unit is referred to as the “segment.” The segment is censused, and 30 households with eligible participants selected at random. Within selected households, all women 15-49 years of age and all children 0-59 months of age are selected for participation in the survey. Design weights for households, women and children were generated according to the inverse probability of selection of the unit and incorporated into the merged datasets for analyses. The weights were calculated as follows for households:

$$\text{Weight} = \frac{1}{p(\text{selecting Household } Y)} = \frac{1}{p(\text{selecting Segment } X) * p(\text{selecting Household } Y \text{ in segment } X)}$$

where

$$p(\text{selecting Segment } X) = \frac{\# \text{ occupied households in Segment } X \text{ in 2005 Population Census}}{\text{Total } \# \text{ occupied households in target municipalities in 2005 Population Census}} * \# \text{ draws}$$

and the number of draws corresponds to the number of segments in the corresponding study arm (61 for intervention areas and 25 for comparison areas at the second follow-up), and the total number of occupied households in target municipalities in the 2005 Nicaragua Population Census corresponds to 120,786 in intervention areas and 28,482 in comparison areas, and

if the household includes children under 5 according to the SMI-Nicaragua census:

$$p(\text{selecting household } Y \text{ in segment } X) = \frac{\# \text{ households with age-eligible children interviewed for SMI in segment } X}{\# \text{ occupied households with age-eligible children in Segment } X \text{ from SMI census}}$$

or if the household does not include children under 5 according to the SMI-Nicaragua census:

$$p(\text{selecting household } Y \text{ in segment } X) = \frac{\# \text{ households with eligible women but no eligible children interviewed for SMI in segment } X}{\# \text{ occupied households with age-eligible women but no children in Segment } X \text{ from SMI census}}$$

Minor modifications to this formula were used to calculate weights for women and children as follows:

$p(\text{selecting woman } Z)$

$$= \frac{p(\text{selecting Segment } X) * p(\text{selecting Household } Y \text{ in Segment } X)}{\text{average number of women 15-49 years old per household in SMI census}} * p(\text{selecting Woman } Z \text{ in household } Y)$$

where the average number of women 15-49 years old per household in the sample was 1.1 in intervention areas and 1.17 in comparison areas (according to the SMI-Nicaragua Household Census), and

if the household includes children under 5 according to the SMI-Nicaragua census:

$p(\text{selecting Household } Y \text{ in Segment } X)$

$$= \frac{\# \text{ households with eligible children completing women's health survey for SMI in Segment } X}{\# \text{ occupied households with age-eligible children in Segment } X \text{ from SMI census}},$$

or if the household does not include children under 5 according to the SMI-Nicaragua census:

$p(\text{selecting Household } Y \text{ in Segment } X)$

$$= \frac{\# \text{ households with eligible women but not children completing women's health survey for SMI in Segment } X}{\# \text{ occupied households with age-eligible women but not children in Segment } X \text{ from SMI census}},$$

and

$p(\text{selecting Woman } Z \text{ in Household } Y) =$

$$\frac{\# \text{ women in Household } Y \text{ completing the survey}}{\# \text{ women 15-49 years old residing in Household } Y \text{ from SMI census'}}$$

and

$p(\text{selecting Child } W)$

$$= \frac{p(\text{selecting Segment } X) * p(\text{selecting Household } Y \text{ in Segment } X)}{\text{average number of children 0-59 months old per household in sample}} * p(\text{selecting child } W \text{ in Household } Y)$$

where the average number of children 0-59 months old per household in the sample was 0.49 in intervention areas and 0.43 in comparison areas (according to the SMI-Nicaragua Household Census), and

$p(\text{selecting Household } Y \text{ in Segment } X)$

$$= \frac{\# \text{ households completing children's health survey for SMI in Segment } X}{\# \text{ occupied households with age-eligible children in Segment } X \text{ from SMI census'}}$$

and

$p(\text{selecting Child } W \text{ in Household } Y)$

$$= \frac{\# \text{ children in Household } Y \text{ completing the survey}}{\# \text{ children 0-59 months residing in Household } Y \text{ from SMI census}}$$

The weights yielded results which were similar to the unweighted results.

B.2 Sampling Errors

As described in Appendix A, a random sample of eligible households was selected from each of 61 clusters (segments) in intervention areas and 25 clusters in comparison areas which had been randomly sampled with probability proportional to size from the target intervention and comparison areas of the initiative. Although cluster sampling can improve efficiency when the target population is spread out over a large area, the resultant sample consists of observations that are not completely independent of one another. The standard errors presented throughout this report and in Appendix C account for this intra-class correlation, using Taylor-linearized variance estimation.

APPENDIX C. SMI HOUSEHOLD INDICATORS

Table C.1: Performance of payment indicators

Indicator	Baseline 2013				Second Follow-Up 2017			
	n	N	%	SE	n	N	%	SE
NA Married or partnered women (age 15-49) who received family planning counseling by CHW or at facility	456	1112	39.2	2.6	550	1594	34.2	2.4
4030 Women (age 15-49) who received postpartum care within 10 days with skilled personnel in their most recent pregnancy in the last two years	409	657	60.1	2.9	716	874	82.6	2.3
5025 Children 12-23 months who received MMR vaccine according to card	213	296	70.9	3.8	262	360	73.8	2.9
5030 Children 18-59 months who received 2 doses of deworming in the last year	335	966	34.1	1.5	423	1254	33.8	2.0

* The second follow-up survey included an additional question that asked if women were checked before discharge after delivering in facility. If a women was checked before discharge, she was considered to have passed this indicator. Due to the addition of this question, the baseline and follow-up values are not strictly comparable. Calculation comparable to baseline: 41.1 percent.

Table C.2: Performance of monitoring indicators

Indicator	Baseline 2013				Second Follow-Up 2017			
	n	N	%	SE	n	N	%	SE
2010 Women (age 15-49) currently using (or whose partner is using) a modern method of family planning	813	958	83.1	1.7	1092	1369	79.3	2.0
1080 Women (age 15-49) with a live birth in the last year	275	1713	11.9	0.8	325	2319	8.8	0.5
1090 Women (age 15-19) with a live birth in the last year	69	364	13.9	2.0	76	448	9.8	1.1
2020 Women (age 15-49) who did not wish to become pregnant and who were not using/not have access to family planning methods (temporary and permanent)	145	958	16.9	1.7	277	1369	20.7	2.0
2030 Women (age 15-49) who report having stopped using a method of family planning during the previous year	32	846	4.0	1.0	36	1151	2.7	0.5
4110 Women (age 15-49) with a birth in the last two years who can recognize at least 5 danger signs in newborns	175	551	33.9	2.2	156	641	23.3	3.0
3010 Women (age 15-49) who received at least one antenatal care visit by skilled personnel in their most recent pregnancy in the last two years	635	657	97.1	0.8	774	877	89.1	2.0
3020 Women (age 15-49) who received at least four antenatal care visits by skilled personnel in their most recent pregnancy in the last two years	544	657	83.1	1.5	638	858	75.2	2.7
4101 Children born in the last two years receiving neonatal care by skilled personnel in a health facility within 10 days of birth in the last two years	508	635	79.3	2.9	512	811	64.1	3.1
5050 Children born in the last two years who were breastfed within one hour after birth	560	681	82.2	1.8	704	892	78.3	2.4
4010 Women (age 15-49) who delivered in facility with skilled attendant in their most recent pregnancy in the last two years	582	657	87.7	2.3	749	876	86.6	2.1
4030 Women (age 15-49) who received postpartum care within 7 days with skilled personnel in their most recent pregnancy in the last two years*	398	657	58.1	2.9	291	868	33.6	2.6
NA Women (age 15-49) who used a maternal waiting home during their most recent pregnancy in the last two years	83	657	11.4	1.8	226	876	26.1	3.5
5060 Children 0-59 months who received ORS and zinc in the last episode of diarrhea in the past two weeks	3	197	1.4	0.8	16	246	6.5	1.7

(continued)

Indicator	Baseline 2013				Second Follow-Up 2017			
	n	N	%	SE	n	N	%	SE
NA Children 0-59 months fully vaccinated for age, according to vaccine card	706	1398	48.0	3.1	836	1802	46.7	2.3
5040 Children 0-5 months who were exclusively breastfed on the previous day	78	134	59.5	5.6	66	165	40.2	4.0
1060 Children 6-23 months with hemoglobin <110g/L	236	435	53.9	2.9	251	487	51.3	3.3
NA Children 0-59 months with hemoglobin <110g/L	479	1218	38.8	1.9	667	1519	44.4	2.3
1070 Children 0-59 months with height <-2 SD of the mean of the reference population for age	173	1366	13.3	1.4	275	1723	15.6	1.3

APPENDIX D. COMPARISON AREAS

D1. CHAPTER 1

D1.1 Report structure

The chapters in the main body of the report present characteristics of the surveyed SMI-Nicaragua sample in intervention areas only. Each table is presented for comparison areas only in Appendix D, and pooled intervention and comparison areas in Appendix E. Most tables take one of three types. Tabulations of select-only-one question types are mutually exclusive, so the proportions sum to 100%. Counts are shown for non-response (“Don’t know” or “Decline to respond” recorded), but these cases are always excluded from the denominator.

Tabulations of select-all-that-apply question types do not have mutually-exclusive categories, as respondents can report more than one option, and thus proportions do not sum to 100%. The table shows affirmative cases (n) and non-missing cases (N). Non-response is the difference between non-missing cases (N) and the total sample eligible for that section of the questionnaire, indicated at the start of the chapter. Where statistics are reported for subpopulations, the size of the subpopulation is reported in the same table or the preceding table for straightforward comparison.

Tabulations of continuous variables, where respondents were requested to provide a numeric response, present the range and quartiles (25th percentile, median, 75th percentile) in order to illustrate the distribution of responses across the sample. Counts of non-response are listed in the table and excluded from the count of non-missing cases (N).

D2. CHAPTER 2: CHARACTERISTICS OF HOUSEHOLDS

This chapter provides a descriptive summary of the basic demographic, socioeconomic, and environmental characteristics of the households sampled for the SMI-Nicaragua Baseline and Second Follow-up Household Survey.

D2.1 Characteristics of Participating Households

A total of 774 households in the Nicaragua second follow-up completed the household characteristics questionnaire. In the baseline, 762 completed the survey. The remainder of this chapter is dedicated to a summary of the basic demographic, socioeconomic, and environmental characteristics of the households completing the household characteristics questionnaire.

D2.2 Age and Sex Composition, SMI Census

The unweighted distribution of the de facto household population in the surveyed households in the SMI-Nicaragua household census by five-year age groups and by sex is shown for baseline (Figure D2.1) and second follow-up (Figure D2.2). Nicaragua has a larger proportion of its population in the younger age groups than in the older age groups. Figure D2.2 indicates that in the second follow-up, just under 31% of the population in the Second Follow-up is under age 15 years, more than half (64%) of the population is in the economically productive age range (15-64), and the remaining 5% is age 65 and above.

Figure D2.1: Age and sex of census sample, unweighted percent distribution of de facto household population by five-year age groups, baseline survey

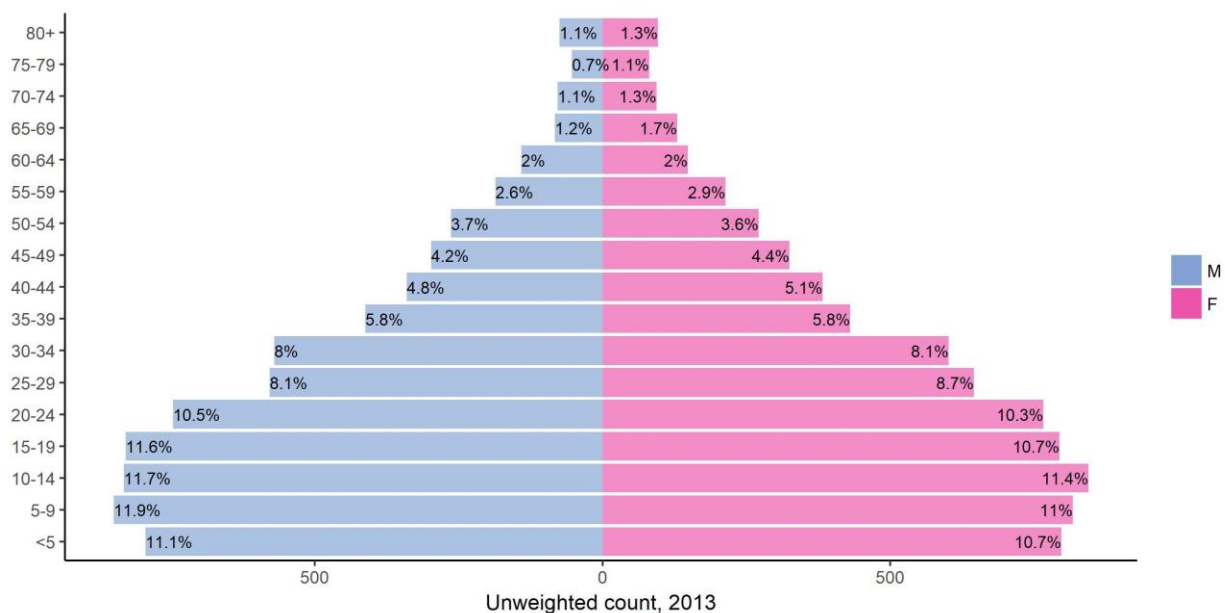
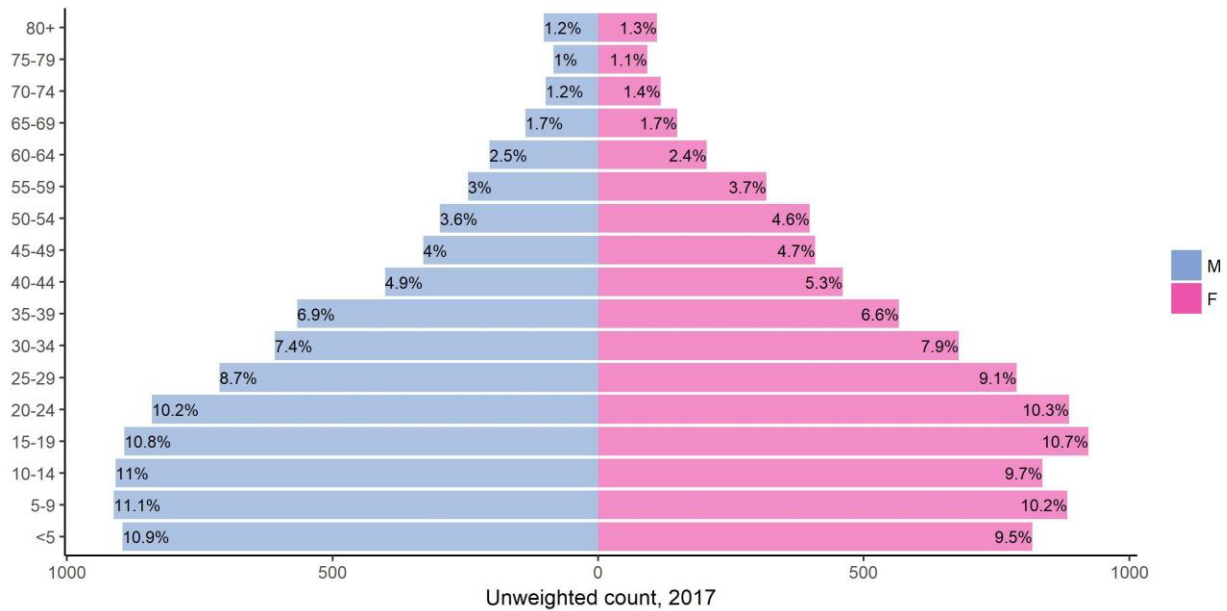


Figure D2.2: Age and sex of census sample, unweighted percent distribution of de facto household population by five-year age groups, follow-up survey



D2.3 Household Characteristics, SMI Household Survey

The number of households, women, and children in the sample are displayed in Table D2.1; and the percent distribution of households by head of household, number of usual members, and marital status are shown in Table D2.2.

Seventy four percent of households in Nicaragua identify as dual-headed in the second follow-up. Males are the head of the household in 5% of surveyed households in Nicaragua, with females as the head of household in the remaining 21.3%. The median household size in Nicaragua is four members, with another 15% of households having five or more members.

Table D2.1: SMI household survey sample sizes: number of total households, women 15-49 years of age, and children 0-59 months

	Baseline 2013	Second Follow-Up 2017
Households	762	774
Women	1103	1047
Children	818	738

Table D2.2: Household characteristics, SMI household sample

	Baseline 2013			Second Follow-Up 2017		
	n	%	SE	n	%	SE
Head of household						
Dual-headed household	530	69.7	3.2	571	73.7	3.4
Single head, female	180	23.8	3.0	170	21.3	3.1
Single head, male	52	6.6	1.4	33	5.0	1.5

Dual-headed households are those where (a) two individuals were identified as "head" by the respondent or (b) both the person identified as "head" and his or her spouse or partner are household members

	N	DK/DTR	Min	p25	Median	p75	Max
Baseline 2013							
Number of usual household members	762	0	1	4	5	6	19
Second Follow-Up 2017							
Number of usual household members	774	0	1	3	4	5	18

D2.4 Drinking Water Access and Treatment

D2.4.1 Sanitation facilities and waste disposal

A household's source of drinking water is an important determinant of the health status of household members. Contaminated drinking water can spread waterborne diseases, such as diarrhea or dysentery. Piped water, protected wells, and protected springs are expected to be relatively free of these diseases; whereas other sources like unprotected wells, rainwater, or surface water are more likely to carry disease-causing agents.

The percent distribution of households by source of drinking water, location of water source, and information about sanitation facilities is shown in Table D2.3. The majority of surveyed households (65%) have water piped to dwelling, and 35% of households have to go outside their home or yard to a water source.

Many households (45.9%) use a pit latrine and 37% of households use a flush toilet. Twelve percent of households report having no toilet compared to 8.9% at baseline.

Table D2.3: Household water source and sanitation facilities

	Baseline 2013			Second Follow-Up 2017		
	n	%	SE	n	%	SE
Household water source						
Piped to dwelling	476	61.4	6.7	516	65.0	7.0
Piped to yard/plot	62	8.7	2.1	73	11.2	3.4
Protected dug well	73	9.9	2.7	50	6.8	1.6
Surface water	11	1.3	0.5	19	3.0	1.0
Protected spring	20	3.4	1.5	15	2.9	1.1
Unprotected spring	18	2.0	0.8	21	2.7	1.1
Unprotected dug well	44	5.7	1.8	32	2.6	0.9
Tubewell/borehole	26	3.8	1.7	21	2.5	1.1
Public tap/standpipe	13	2.1	1.1	13	2.1	1.5
Rainwater collection	0	0.0	-	1	0.1	0.1
Bottled water	4	0.3	0.1	2	0.1	0.1
Tanker truck	0	0.0	-	0	0.0	-
Cart with small tank/drum	0	0.0	-	0	0.0	-
Water jug	5	0.5	0.3	0	0.0	-
Other	10	0.9	0.3	11	0.9	0.3
Don't know	0	-	-	0	-	-
Decline to respond	0	-	-	0	-	-
Time to retrieve water						
Water on premises	599	79.5	4.6	649	85.7	4.1
Less than 30 minutes	136	17.1	4.2	107	13.2	3.9
30 minutes or longer	25	3.4	0.9	10	1.1	0.5
Don't know	2	-	-	8	-	-
Decline to respond	0	-	-	0	-	-
Sanitation facilities						
Pit latrine	455	61.4	7.0	361	45.9	7.2
Flush toilet	207	27.0	7.3	297	37.0	8.6
No toilet	76	8.9	2.6	78	12.3	3.6
Pour flush toilet	17	2.1	0.7	18	2.4	1.1
Dry toilet	3	0.3	0.2	6	0.8	0.5
Other	4	0.4	0.2	14	1.6	0.7
Don't know	0	-	-	0	-	-
Decline to respond	0	-	-	0	-	-

	Baseline 2013				Second Follow-Up 2017			
	n	N	%	SE	n	N	%	SE
Shared toilet/facilities	83	681	13.5	2.1	69	682	7.3	1.3

D2.4.2 *Cooking fuel sources*

Cooking fuel source and the location for cooking food are included in Table D2.4. The percentage of households with a separate kitchen is also shown. The two most commonly reported cooking fuel sources

used in households during the second follow-up are wood (68.9%) and gas tank (47.2%). Among those households with non-missing responses as to what cooking fuel sources they use, 77.2% report normally cooking food in the house, 20.7% normally cook food in a separate building, and 2.1% normally cook food outdoors. Seventy four percent of households have a separate kitchen.

Table D2.4: Cooking fuel source and cooking location

	Baseline 2013				Second Follow-Up 2017			
	n	N	%	SE	n	N	%	SE
Wood	637	762	84.8	4.6	519	774	68.9	7.1
Gas tank	219	762	29.6	6.8	355	774	47.2	8.3
Electricity	8	762	0.9	0.4	16	774	1.9	0.9
Straw/twigs/grass	4	762	0.3	0.2	9	774	1.0	0.6
Coal	1	762	0.4	0.4	7	774	0.9	0.4
Agricultural crops	0	762	0.0	-	0	774	0.0	-
No food cooked at home	0	762	0.0	-	0	774	0.0	-
Other	0	762	0.0	-	0	774	0.0	-

*categories not mutually exclusive (select all that apply)

	Baseline 2013			Second Follow-Up 2017		
	n	%	SE	n	%	SE
Location for cooking food, if cooking fuel source reported						
Inside house	588	77.9	2.8	594	77.2	3.1
In a separate building	145	18.7	2.5	165	20.7	3.0
Outdoors	27	3.2	1.0	15	2.1	0.7
Other	2	0.2	0.1	0	0.0	-
Don't know	0	-	-	0	-	-
Decline to respond	0	-	-	0	-	-

	Baseline 2013				Second Follow-Up 2017			
	n	N	%	SE	n	N	%	SE
Separate kitchen, if cooking fuel source reported and food cooked in the home	465	588	79.8	3.2	432	594	73.8	3.1

D2.4.3 Household wealth

The median number of bedrooms per household is two (Table D2.5). Twenty four percent of households in the second follow-up own agricultural land and 5.1% of households rent agricultural land (Table D2.6).

The availability of durable consumer goods is a good indicator of a household's socioeconomic status. Table D2.6 shows the availability of selected consumer goods by household. The large majority of households (90.2%) have mobile phone, and the most commonly owned items are electricity (87.2%),

television (71.5%), and radio (60.5%). Many households (31.1%) own a bicycle and 21.2% own a motorcycle/scooter.

Table D2.5: Number of bedrooms per household

	N	DK/DTR	Min	p25	Median	p75	Max
Baseline 2013							
Number of bedrooms	762	0	0	1	2	2	8
Second Follow-Up 2017							
Number of bedrooms	774	0	0	1	2	3	6

Table D2.6: Household assets

	Baseline 2013				Second Follow-Up 2017			
	n	N	%	SE	n	N	%	SE
Household assets								
Mobile phone	563	762	75.1	4.2	693	774	90.2	1.7
Electricity	593	762	78.9	6.0	682	774	87.2	4.7
Television	474	762	61.9	5.6	560	774	71.5	5.8
Radio	509	762	70.0	2.6	458	774	60.5	2.9
Refrigerator	212	762	27.3	5.4	294	773	37.8	6.4
Watch	276	762	39.8	3.3	268	772	37.0	4.9
Sound system	231	761	34.5	5.2	257	773	33.7	5.2
Computer	79	762	10.1	3.8	133	773	16.9	5.2
Bank account	63	762	7.7	2.4	103	770	15.7	3.3
Washing machine	37	762	5.0	2.3	94	773	14.2	4.4
Landline phone	42	761	5.2	2.5	40	773	7.1	2.8
Guitar	39	762	5.1	1.3	37	774	4.7	1.5
Transportation assets								
Bicycle	273	762	36.6	3.4	239	773	31.1	3.9
Motorcycle/scooter	119	762	14.5	1.9	168	772	21.2	3.1
Car	53	762	6.1	1.2	82	772	11.3	3.2
Truck	6	762	0.5	0.2	11	773	1.2	0.5
Animal cart	10	762	1.1	0.4	2	774	0.2	0.2
Agricultural assets: Livestock ownership								
Chickens	399	762	48.7	5.3	358	773	47.3	6.4
Pigs	177	762	20.1	2.9	144	774	17.7	3.5
Horses, donkeys, or mules	51	762	5.8	1.2	51	774	7.3	2.9
Cattle	34	762	3.3	0.7	29	774	4.4	2.2
Sheep or goats	3	762	0.3	0.2	5	774	0.6	0.4

	Baseline 2013			Second Follow-Up 2017		
	n	%	SE	n	%	SE
Agricultural assets: Own or rent agricultural land						
No agricultural land	527	72.1	3.1	545	69.7	4.0
Owens agricultural land	168	18.2	2.3	184	23.9	3.5
Rents agricultural land	50	7.1	1.5	36	5.1	1.6
Shared/community-held land	17	2.6	1.1	9	1.3	0.7
Don't know	0	-	-	0	-	-
Decline to respond	0	-	-	0	-	-

D2.5 Household expenditure

D2.5.1 Total expenditures by type

Households are surveyed about the amount of money spent over the last month. After reporting total household expenditures, households are then asked how much was spent on specific categories (e.g., food, housing, education, and medical care) over the last four weeks. Table D2.7 shows the itemized monthly expenditure per person living in the household summarized by expenditure quintile. All data are presented in current Córdoba (C), with no adjustment for inflation. Itemized expenditure information was sufficiently complete to report for 734 households at the second follow-up. The lowest quintile in the study area spent less than 575 C per person over the last month in the second follow-up.

Table D2.8 shows the budget share, defined as the weighted average expenditure on each category across a quintile divided by the weighted average total itemized household expenditure in the same quintile. Table D2.8 shows that the poorest 20% of households in the study area spend 75.7% of their monthly expenditure on food, on average. In comparison, the wealthiest households spend 47.1% on food. The poorest households spent 3% of their expenditure on medical care, while the wealthiest spent 6.7%.

Table D2.7: Total itemized per-capita expenditure quintiles, current Nicaragua Córdoba

	N	DK/DTR	p20	p40	p60	p80
Baseline 2013						
Per capita monthly household expenditure	701	0	340	612	882	1502
Second Follow-Up 2017						
Per capita monthly household expenditure	734	0	575	979	1455	2251

*Not adjusted for inflation

Table D2.8: Itemized household expenditure by total household budget share

	Bottom quintile	2nd quintile	3rd quintile	4th quintile	Top quintile
Baseline 2013					
Food	72.4	71.6	62.6	54.1	48.9
Alcoholic beverages and tobacco	4.4	1.3	1.6	0.9	2.6
Education expenses	5.3	6.4	5.8	4.6	6.3
Furniture and domestic appliances	0.2	0.2	0.6	1.5	3.2
Recreation	0.0	0.1	0.2	0.6	1.0
Housing and utilities	8.2	6.3	5.9	10.8	17.8
Clothing and shoes	3.2	4.7	12.0	10.3	6.1
Transportation	1.8	2.8	3.9	5.3	4.2
Communication	2.5	2.5	3.3	3.6	2.5
Out-of-pocket medical expenses	2.0	3.4	4.0	7.1	5.8
Social security premiums	0.0	0.5	0.2	1.3	1.2
Private insurance premiums	0.0	0.0	0.0	0.0	0.0
Other costs to access health care	0.0	0.0	0.0	0.0	0.1
Second Follow-Up 2017					
Food	75.7	63.7	58.2	54.9	47.1
Alcoholic beverages and tobacco	1.0	1.6	1.4	2.0	1.2
Education expenses	4.0	4.7	5.1	4.6	4.9
Furniture and domestic appliances	1.1	0.9	2.6	2.3	2.5
Recreation	0.2	0.4	0.7	0.6	2.3
Housing and utilities	6.6	9.1	8.7	9.5	9.6
Clothing and shoes	2.5	8.8	8.8	10.5	11.4
Transportation	2.4	3.5	4.3	5.5	5.4
Communication	3.4	3.9	3.9	4.3	4.2
Out-of-pocket medical expenses	3.0	2.8	5.0	4.1	6.7
Social security premiums	0.0	0.2	1.2	0.6	3.7
Private insurance premiums	0.0	0.2	0.1	1.0	0.7
Other costs to access health care	0.0	0.1	0.1	0.0	0.1

D2.5.2 Health expenditures

Of the 734 households with expenditure data at the second follow-up, 262 reported having health expenditures in the last four weeks. Table D2.9 shows health expenditure by type among households reporting non-zero out-of-pocket health expenditure. Very few households had spending in each category.

Table D2.9: Out-of-pocket medical expenditures by type, last four weeks, current Nicaragua Córdoba

	N	DK/DTR	Min	p25	Median	p75	Max
Baseline 2013							
Diagnostic and laboratory tests, X-rays, blood tests	231	0	0	0	0	0	14400
Other health care products or services	231	0	0	0	0	0	7000
Medications prescribed by health personnel	231	0	0	0	151.9	600	6000
Dentists	230	0	0	0	0	0	4392
Care or non-prescription medications from pharmacist	228	0	0	0	0	100	3500
Health products (glasses, hearing aids, prosthetics, etc.)	231	0	0	0	0	0	3000
Care by health professionals not requiring overnight stay	231	0	0	0	0	0	2000
Care that required overnight stay in hospital/clinic	230	0	0	0	0	0	1500
Other costs associated with overnight stay in hospital/clinic	231	0	0	0	0	0	1500
Care by traditional/alternative healers/birth attendants	231	0	0	0	0	0	0
Second Follow-Up 2017							
Diagnostic and laboratory tests, X-rays, blood tests	262	0	0	0	0	0	4500
Other health care products or services	262	0	0	0	0	0	3000
Medications prescribed by health personnel	262	0	0	0	0	800	11000
Dentists	262	0	0	0	0	0	6000
Care or non-prescription medications from pharmacist	261	0	0	0	0	200	5000
Health products (glasses, hearing aids, prosthetics, etc.)	262	0	0	0	0	0	6000
Care by health professionals not requiring overnight stay	262	0	0	0	0	0	10000
Care that required overnight stay in hospital/clinic	262	0	0	0	0	0	2000
Other costs associated with overnight stay in hospital/clinic	262	0	0	0	0	0	30000
Care by traditional/alternative healers/birth attendants	262	0	0	0	0	0	500

*Not adjusted for inflation

D2.5.3 Source of health expenditure financing

Of the 734 households with expenditure data at the second follow-up, 70 reported that members of the household went to a hospital and stayed overnight at least once during the last 12 months and paid for expenses associated with the overnight stays. The maximum paid for a hospital stay was 2,000 C.

Table D2.10 shows the source and amount of financing for medical expenditures for overnight hospital stays. The most common source of health care financing was current income from any household member (median amount 54 C).

Table D2.10: Health care financing by source. last 12 months. current Nicaragua

	N	DK/DTR	Min	p25	Median	p75	Max
Baseline 2013							
Remittances from family or friends abroad	99	0	0	0	0	0	351360
Property sold	99	0	0	0	0	0	150000
Items sold	99	0	0	0	0	0	70000
Any household member's current income	99	0	0	0	300	1055.8	60000
Loan from a source other than family or friends	99	0	0	0	0	0	60000
Reducing other household spending	99	0	0	0	0	0	14000
Money from relatives or friends outside the household	99	0	0	0	0	0	3000
Political donations or grants	99	0	0	0	0	0	3000
Other source	99	0	0	0	0	0	2000
Savings	99	0	0	0	0	0	1000
Social security payments	98	1	0	0	0	0	1000
Health insurance plan payment/reimbursement	99	0	0	0	0	0	0
Conditional cash transfer programs	99	0	0	0	0	0	0
Second Follow-Up 2017							
Remittances from family or friends abroad	70	1	0	0	0	0	7000
Property sold	70	1	0	0	0	0	1
Items sold	70	1	0	0	0	0	12500
Any household member's current income	70	1	0	0	54	2970.6	50000
Loan from a source other than family or friends	70	1	0	0	0	244.8	50000
Reducing other household spending	70	1	0	0	0	0	5000
Money from relatives or friends outside the household	70	1	0	0	0	0	4000
Political donations or grants	70	1	0	0	0	0	1
Other source	70	1	0	0	0	0	1
Savings	69	2	0	0	0	0	7000
Social security payments	70	1	0	0	0	0	7800
Health insurance plan payment/reimbursement	70	1	0	0	0	0	1
Conditional cash transfer programs	70	1	0	0	0	0	3000

*Not adjusted for inflation

D3. CHAPTER 3: GENERAL CHARACTERISTICS OF RESPONDENTS

This chapter summarizes the demographic characteristics, socioeconomic status, and health status of women of reproductive age (15-49 years) participating in the SMI-Nicaragua second follow-up household survey.

D3.1 Demographic Characteristics

D3.1.1 Age, marital status, relation to head of household

The age distribution of the de facto population of women of reproductive age participating in the women’s health or pregnancy interviews in Nicaragua is shown in Figure D3.1 by five-year age groups. About 60% of all women participating in the second follow-up SMI-Nicaragua household survey were younger than 30 years of age, 27% were between the ages of 30 and 39, and 13% were between the ages of 40 and 49. While 28% of women reported being married and 35% being partnered, 23% indicated they were never married. Thirty one percent of women were reported at the SMI-Nicaragua census to be the head of household’s spouse, 29.1% to be the biological child of the head of the household, and 11.4% to be the partner of the head of the household.

Figure D3.1: Age of respondents, unweighted

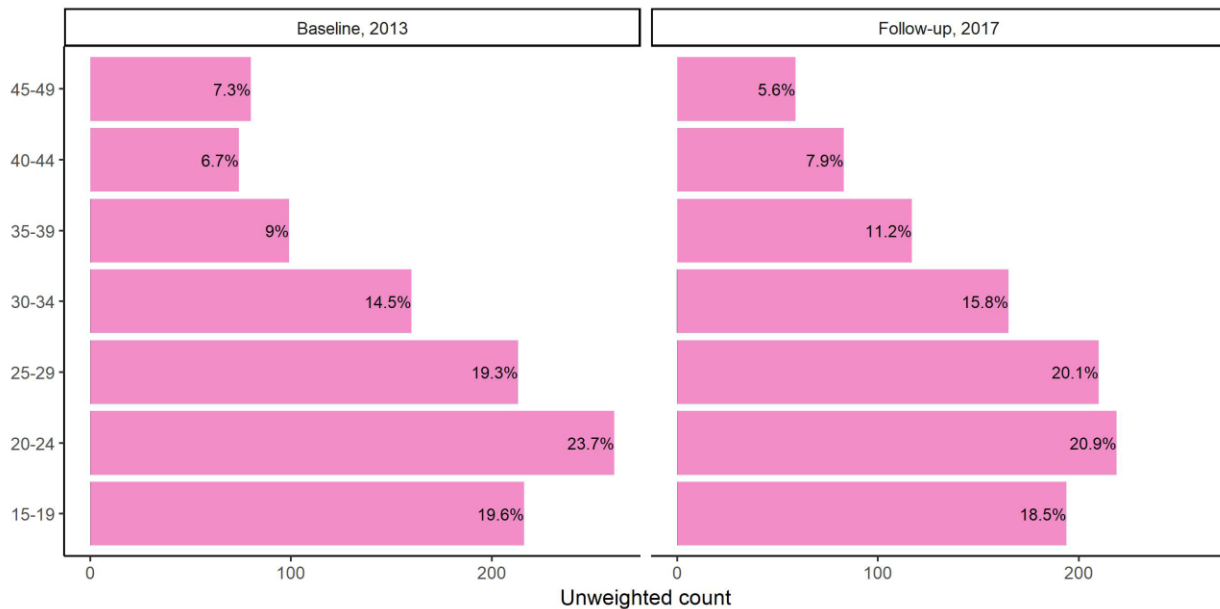


Table D3.1: Demographic characteristics of respondents

	Baseline 2013		Second Follow-Up 2017	
	n	%	n	%
Marital status				
Civil union/partnered	420	38.1	362	34.6
Divorced	4	0.4	8	0.8
Married	284	25.7	291	27.8
Separated	26	2.4	129	12.3
Single	364	33.0	251	24.0
Widowed	4	0.4	6	0.6
Other	0	0.0	0	0.0
Don't know	0	0.0	0	0.0
Decline to respond	1	0.1	0	0.0
Respondent's relationship to head of household				
NA	2	0.2	5	0.5
Adopted or stepchild	17	1.5	10	1.0
Biological child	330	29.9	305	29.1
Daughter-in-law/son-in-law	91	8.3	60	5.7
Grandchild	29	2.6	33	3.2
Grandparent	0	0.0	0	0.0
Head of household	126	11.4	140	13.4
Mother-in-law/father-in-law	0	0.0	1	0.1
Niece/nephew	11	1.0	11	1.1
Other relative	2	0.2	3	0.3
Parent	1	0.1	1	0.1
Partner	239	21.7	119	11.4
Sibling	16	1.5	14	1.3
Sister-in-law/brother-in-law	6	0.5	4	0.4
Spouse	208	18.9	327	31.2
Unrelated person	18	1.6	11	1.1
Other	7	0.6	3	0.3
Don't know	0	0.0	0	0.0
Decline to respond	0	0.0	0	0.0

*At baseline, marital status is reported by the respondent in the Census. In the second follow-up, marital status is reported by the woman at the start of the Household Survey

* "NA" represents women who were missed in the census and added individually into the household survey, so relationship to the head of household was not registered.

D3.2 Education Attainment and Literacy

Ninety one percent of second follow-up survey participants had some formal education (Table D3.2). For 39.1% of these women, the highest level of education completed was primary schooling. Literacy was assessed by asking respondents to read from a card the following sentence: "La salud del niño es muy importante para su desarrollo en la vida." Eighty one percent of women surveyed were able to read the whole sentence. Nine percent of women could not read the sentence at all.

Table D3.2: Education attainment and literacy

	Baseline 2013				Second Follow-Up 2017			
	n	N	%	SE	n	N	%	SE
Ever attended school	989	1096	87.6	2.4	944	1044	91.4	1.7
Attended literacy course	152	1097	15.5	2.0	130	1043	12.8	2.4

	Baseline 2013			Second Follow-Up 2017		
	n	%	SE	n	%	SE
Educational attainment and literacy						
Primary	419	45.2	4.8	350	39.1	5.3
Secondary	348	34.4	2.9	346	37.2	2.5
High school	20	1.8	0.7	25	2.3	0.8
University	155	13.2	2.8	195	19.4	4.2
Technical school	46	5.3	1.5	25	1.9	0.5
Don't know	1	-	-	3	-	-
Decline to respond	0	-	-	0	-	-
Literacy						
Cannot read at all	109	10.9	2.7	101	8.8	1.6
Can read parts	136	12.5	2.8	96	10.4	1.4
Can read entire sentence	840	75.3	3.8	843	80.7	2.6
Visually impaired	8	1.3	0.8	2	0.1	0.1
Don't know	3	-	-	3	-	-
Decline to respond	1	-	-	0	-	-

D3.3 Employment

As summarized in Table D3.3, the majority of respondents in the second follow-up were homemakers (56%). Of the 184 women who reported being employed and working at the time of the interview, most (90.9%) identified “Employee” as their occupational role.

Table D3.3: Employment

	Baseline 2013			Second Follow-Up 2017		
	n	%	SE	n	%	SE
Employment status						
Homemaker	725	62.8	4.1	617	56.0	5.1
Employed/paid for work	189	17.5	2.5	184	17.0	2.9
Student	104	12.7	2.6	127	14.9	1.7
Self-employed	59	5.0	1.1	96	9.4	2.2
Employed by a family member without pay	7	0.4	0.1	8	1.2	0.6
Unable to work due to disability	2	0.9	0.8	6	0.7	0.4
Employed, but did not work in last week	3	0.1	0.1	4	0.6	0.5
Retired	1	0.1	0.1	1	0.1	0.1
Employed in a cooperative	6	0.5	0.3	0	0.0	-
Don't know	0	-	-	1	-	-
Decline to respond	1	-	-	1	-	-
Occupational role, among women employed and being paid for work						
Employee	177	92.7	3.6	172	90.9	4.6
Proprietor	2	1.5	1.2	6	6.3	4.4
Independent contractor	7	5.0	2.6	6	2.8	1.8
Employer	3	0.8	0.5	0	0.0	-
Don't know	0	-	-	0	-	-
Decline to respond	0	-	-	0	-	-

* Self-employed option was not included in the baseline survey

D3.4 Exposure to Mass Media

Respondents were asked about their exposure to newspapers, radio, and television. As displayed in Table D3.4, among women who demonstrated full or partial literacy in the second follow-up, 33.2% had weekly exposure to newspapers. Sixty four percent of all women had weekly exposure to radio, and 68.7% had weekly exposure to television.

Table D3.4: Exposure to mass media

	Baseline 2013			Second Follow-Up 2017		
	n	%	SE	n	%	SE
Newspapers, among literate women						
Never	394	39.0	3.9	488	52.5	4.6
At least once a week	426	44.4	4.8	316	33.2	4.4
Less than once a week	153	16.6	2.4	134	14.3	1.9
Don't know	1	-	-	0	-	-
Decline to respond	0	-	-	0	-	-
Not applicable	2	-	-	1	-	-
Radio						
At least once a week	835	80.3	1.4	681	64.1	2.7
Never	157	11.7	1.3	253	24.4	2.4
Less than once a week	101	8.0	1.2	111	11.4	1.8
Don't know	0	-	-	0	-	-
Decline to respond	0	-	-	0	-	-
Not applicable	4	-	-	0	-	-
Television						
At least once a week	729	67.8	5.0	719	68.7	5.3
Never	268	24.0	4.7	222	23.5	5.1
Less than once a week	77	8.3	1.7	82	7.8	1.1
Don't know	4	-	-	1	-	-
Decline to respond	0	-	-	0	-	-
Not applicable	19	-	-	21	-	-

D3.5 Access to Health Services

D3.5.1 Proximity to health care facilities

Table D3.5 - Table 3.7 display the responses to several survey questions that were used to assess access to health care facilities. Respondents were asked to estimate proximity to health care facilities in terms of distance (kilometers) and travel time. Not surprisingly, respondents typically had more difficulty estimating distance to health care facilities. As shown in the tables below, "Don't know" responses to the distance questions were exceedingly common.

Excluding the 196 women who were unable to estimate the distance to the closest health facility in the second follow-up, 75% of women reported living 4 kilometers or less from a health facility (Table D3.5). Three-quarters of the sample indicated that it took less than 60 minutes to reach this facility by the usual means of transportation. One-quarter estimated the travel time from their household to the closest health facility to be 60 minutes or more.

Women were also asked for the travel distance and time to their usual health facility, if they had a usual health facility. Excluding the 174 women who did not know the distance to the facility in the second follow-up, three-quarters of the women reported traveling up to 4 kilometers, and three-quarters of the women could travel to the closest facility in less than 60 minutes (Table D3.6).

Of the 683 women who reported a recent health facility visit for themselves or for family members in the second follow-up, three-quarters traveled less than 4 kilometers for care. Twenty-five percent of women traveled 4 to 120 kilometers for care. Half of women traveled for less than 20 minutes, and one-quarter spent 60 minutes or more traveling for care. The longest travel time reported for a recent illness was approximately 45 hours.

Table D3.5: Proximity to health care facilities: nearest health facility

	N	DK/DTR	Min	25th Percentile	Median	75th Percentile	Max
Baseline 2013							
Distance, km	968	129	0	1	1.5	5	600
Travel time, min	1061	8	1	15	30	60	2700
Second Follow-Up 2017							
Distance, km	849	196	0	0.4	1	4	60
Travel time, min	975	20	1	10	15	60	2400

Table D3.6: Proximity to health care facilities: usual health facility

	N	DK/DTR	Min	25th Percentile	Median	75th Percentile	Max
Baseline 2013							
Distance, km	924	115	0	1	2	5	600
Travel time, min	1036	0	1	15	30	60	1800
Second Follow-Up 2017							
Distance, km	796	174	0	0.5	1	4	161
Travel time, min	925	9	1	10	20	60	1800

Table D3.7: Proximity to health care facilities: health facility for recent illness

	N	DK/DTR	Min	25th Percentile	Median	75th Percentile	Max
Baseline 2013							
Distance, km	861	130	0	1	2	5.4	600
Travel time, min	984	5	1	15	30	60	1800
Second Follow-Up 2017							
Distance, km	567	99	0	0.5	1	4	120
Travel time, min	651	0	1	10	20	60	2700

D3.6 Health Status

D3.6.1 Current health status

Table D3.8 shows the self-rated current health status of all women participating in the survey. When asked to evaluate their current health status relative to the past year, 56.9% reported that their health was “about the same” in the second follow-up. While 33.9% reported that their health had improved, 9.3% reported worse health on the day of the interview, compared to last year. Eighty two percent could “easily” perform their daily activities (e.g., work, housework, and childcare). About 18% of women reported at least some degree of difficulty performing these tasks that was related to their health status.

Table D3.8: Current health status

	Baseline 2013			Second Follow-Up 2017		
	n	%	SE	n	%	SE
Current health relative to last year						
Better	399	36.8	3.1	357	33.9	3.0
Worse	150	13.5	1.7	98	9.3	1.4
About the same	545	49.7	2.8	589	56.9	3.0
Don't know	3	-	-	1	-	-
Decline to respond	0	-	-	0	-	-
Ability to perform daily activities						
Easily	846	75.9	2.7	856	82.0	2.2
With some difficulty	220	21.1	2.1	156	14.5	1.9
With much difficulty	27	2.8	1.1	30	3.1	0.9
Unable to do	3	0.1	0.1	3	0.4	0.3
Don't know	0	-	-	0	-	-
Decline to respond	1	-	-	0	-	-

	Baseline 2013			Second Follow-Up 2017		
	n	%	SE	n	%	SE
Days in the last month that physical health was not good						
No days	690	65.1	3.4	665	67.1	3.7
1 to 3 days	123	10.5	1.5	118	10.3	1.9
4 to 7 days	279	24.4	3.1	259	22.5	2.4
7 to 29 days	0	0.0	-	0	0.0	-
All month	0	0.0	-	0	0.0	-
Don't know	5	-	-	3	-	-
Decline to respond	0	-	-	0	-	-
Days in the last month that mental health was not good						
No days	831	75.5	2.9	741	72.9	3.8
1 to 3 days	81	7.3	1.5	81	7.3	1.2
4 to 7 days	183	17.1	2.5	219	19.8	3.2
7 to 29 days	0	0.0	-	0	0.0	-
All month	0	0.0	-	0	0.0	-
Don't know	2	-	-	4	-	-
Decline to respond	0	-	-	0	-	-

D3.6.2 Recent illness

Women were asked a series of questions about any illnesses or health problems they had in the two weeks preceding the interview. Out of the women in the second follow-up, 24% reported being sick during that time (Table D3.9). Of the 268 women who reported a recent illness, headache (19.2%), fever (13.5%), cough (11), and abdominal pain (3.3%) were the most commonly elicited specific complaints. Thirty five percent of women specified a different health problem not listed in the questionnaire.

Table D3.9: Recent illness (in the last two weeks)

	Baseline 2013				Second Follow-Up 2017			
	n	N	%	SE	n	N	%	SE
Respondent was sick during the past two weeks	329	1097	29.7	3.3	268	1045	24	2.2

	Baseline 2013			Second Follow-Up 2017		
	n	%	SE	n	%	SE
Type of illness, among those sick in the past two weeks						
Headache	76	19.8	3.2	50	19.2	4.6
Fever	19	5.2	2.0	33	13.5	2.7
Cough	0	0.0	-	30	11.0	2.9
Abdominal pain	25	9.8	3.3	12	3.3	1.0
Swelling in legs, ankles, or feet	0	0.0	-	4	3.0	2.3
Toothache	6	1.2	0.6	2	2.7	2.3
Asthma	6	3.9	2.5	2	2.5	1.8
Diabetes	0	0.0	-	1	2.2	2.1
Gynecologic problem	7	1.2	0.5	5	1.9	1.1
Diarrhea without blood	1	0.3	0.3	2	1.3	1.1
Hypertension	7	2.4	1.3	4	1.1	0.5
Eye/ear infection	3	0.6	0.3	1	0.9	1.0
Vomiting	0	0.0	-	2	0.7	0.5
Skin rash/infection	1	0.2	0.2	3	0.6	0.3
Bronchitis	1	0.1	0.1	2	0.4	0.3
Paralysis	1	0.3	0.3	1	0.2	0.2
Chest infection	0	0.0	-	1	0.2	0.2
Malaria	0	0.0	-	0	0.0	-
Cough/chest infection	25	5.4	1.4	0	0.0	-
Tuberculosis	0	0.0	-	0	0.0	-
Pneumonia	0	0.0	-	0	0.0	-
Diarrhea with blood	1	0.2	0.2	0	0.0	-
Diarrhea with vomiting	0	0.0	-	0	0.0	-
Anemia	0	0.0	-	0	0.0	-
Measles	0	0.0	-	0	0.0	-
Jaundice	0	0.0	-	0	0.0	-
Stroke	0	0.0	-	0	0.0	-
HIV/AIDS	0	0.0	-	0	0.0	-
Obstetric problem	0	0.0	-	0	0.0	-
Blood in urine	0	0.0	-	0	0.0	-
Poisoning	0	0.0	-	0	0.0	-
Other	149	49.6	4.1	113	35.4	4.3
Don't know	0	-	-	0	-	-
Decline to respond	1	-	-	0	-	-

* Options for "Swelling in legs, ankles, or feet", "Blood in urine", "Poisoning", "Chest infection" and "Cough" were only available only in the follow-up survey. Option "Cough/Chest infection" was only available at the baseline.

D3.6.3 Utilization of health services

Table D3.10 summarizes data regarding the utilization of health services among the 268 women who reported an illness in the two weeks preceding the second follow-up interview. Ninety eight (33%) of these women sought care at a health care facility. Many of these women attended a Public health post health unit (32.1%); another 18.4% attended a Public health center/clinic. Only five women were hospitalized for their recent illness (6.4% of those who sought care).

Table D3.10: Utilization of health services for illness in the last two weeks

	Baseline 2013				Second Follow-Up 2017			
	n	N	%	SE	n	N	%	SE
Sought care for recent illness	139	329	44.6	5.2	98	268	33.0	3.4
Admitted to hospital for care*	9	135	13.2	7.6	5	95	6.4	2.9

Among women who sought care at a public or private hospital, health center/clinic, mobile clinic, or other health facility; public health unit; private office; or pharmacy.

	Baseline 2013			Second Follow-Up 2017		
	n	%	SE	n	%	SE
Type of facility where care was sought						
Public health post	0	0.0	-	29	32.1	8.7
Public health center/clinic	27	15.8	3.7	24	18.4	4.7
Public hospital	35	33.8	8.7	16	17.6	3.7
Private health clinic	11	7.0	3.3	10	13.5	7.6
Private hospital	0	0.0	-	2	7.4	7.0
Private doctor's office	9	5.4	2.9	10	6.7	2.1
Casa base	0	0.0	-	3	1.8	1.1
Pharmacy	1	0.4	0.4	2	1.4	1.0
Other public health facility	0	0.0	-	1	0.4	0.4
Public mobile clinic	0	0.0	-	0	0.0	-
Private mobile clinic	0	0.0	-	0	0.0	-
Other private health facility	1	0.5	0.5	0	0.0	-
Community health worker	0	0.0	-	0	0.0	-
Traditional healer	0	0.0	-	0	0.0	-
Home of a community health worker	0	0.0	-	0	0.0	-
School	0	0.0	-	0	0.0	-
Public health unit	51	35.5	8.7	0	0.0	-
Other	4	1.6	0.9	1	0.7	0.7
Don't know	0	-	-	0	-	-
Decline to respond	0	-	-	0	-	-

* A casa base is an ambulatory health unit that provides services in remote communities on specified days and times, and may depend on mobile medical professionals that serve multiple units.

* Options for "Public health center", "Public health post", "Home of a traditional healer", "School", and "Casa base" were not available at baseline. Options for "Public health unit and "Public health clinic/center" were not available at follow-up.

D3.6.4 Insurance coverage

About 9% of women reported being covered by any type of health insurance in the second follow-up (Table D3.11).

Table D3.11: Insurance coverage

	Baseline 2013			Second Follow-Up 2017		
	n	%	SE	n	%	SE
No insurance	1007	90.5	2.0	941	90.9	2.4
INSS	85	9.4	1.9	95	8.2	2.4
Private insurance	0	0.0	-	6	0.4	0.2
Government/Armed forces	1	0.0	-	0	0.0	-
Other	1	0.1	0.1	1	0.5	0.5
Don't know	2	-	-	2	-	-
Decline to respond	1	-	-	0	-	-

D3.6.5 Other barriers to health care access

There are many other barriers to accessing health care. Women who reported that they sometimes or never sought care when they felt sick were asked what reasons prevented them from receiving health care when it was needed. Interviewers were instructed to ask in an open-ended manner for all applicable reasons, and to mark the appropriate response options in the questionnaire based on the woman's response. Table D3.12 summarizes the responses to this section. The most commonly cited factors influencing health care access in the second follow-up were the preference for treatment at home (44.5%) and the belief that the health center does not have sufficient medicines (18%). Ten percent of women did not believe they were ill enough to seek treatment. Access and quality of care were also important barriers: 9.9% of women said the health center was too far away, 1.5% said care was too expensive, and 11.2% said the health center personnel were too difficult to deal with.

Table D3.12: Other barriers to health care utilization, women 15-49 years of age who were sick in the last two weeks but did not seek care

	Baseline 2013				Second Follow-Up 2017			
	n	N	%	SE	n	N	%	SE
Treated self at home	58	190	37.4	4.2	69	169	44.5	6.3
Health center does not have sufficient medicines	39	190	15.3	3.1	39	169	18.0	4.9
It is difficult to deal with health center personnel	8	190	7.2	4.5	14	169	11.2	3.7
Too busy with work, children, or other commitments	22	190	9.3	2.8	24	169	10.1	4.5
Health center is too far away	11	190	9.3	5.2	13	169	9.9	4.2
Not sick enough to seek treatment	24	190	16.7	4.8	24	169	9.5	3.0
Health center is not well-equipped	7	190	2.8	1.2	13	169	8.7	3.5
Do not trust the personnel	6	190	2.9	1.5	7	169	5.0	2.4
Could not afford transportation	12	190	4.5	1.6	7	169	3.7	1.8
Health center personnel not knowledgeable	4	190	1.4	0.6	6	169	3.6	2.2
Tried, but was refused care	5	190	2.9	1.5	6	169	3.4	1.7
Was previously mistreated	4	190	1.2	0.6	5	169	2.9	1.8
Health center infrastructure is poor	0	190	0.0	-	3	169	2.5	2.0
Did not want to go alone	2	190	0.6	0.5	3	169	2.0	1.4
Care is too expensive	15	190	5.2	1.5	3	169	1.5	0.9
Could not get permission to go to the doctor	2	190	0.5	0.4	1	169	0.4	0.4
Could not find transportation	5	190	2.0	0.9	0	169	0.0	-
Did not know where to go	0	190	0.0	-	0	169	0.0	-
Religious or cultural beliefs	0	190	0.0	-	0	169	0.0	-
Tried, but no staff was at the center	3	190	0.9	0.5	0	169	0.0	-
Other	33	190	13.9	4.1	32	169	17.5	3.7

*categories not mutually exclusive (select all that apply)

D4. CHAPTER 4: EXPOSURE TO HEALTH SYSTEM INTERVENTIONS

This chapter summarizes the exposure of women to four health system interventions: community health worker interventions, breastfeeding interventions, child nutrition interventions, and child health interventions.

D4.1 Exposure to Community Health Workers

Respondents were asked about their exposure to community health workers. Three percent of women reported meeting with a community health worker in the month preceding the second follow-up interview (Table D4.1). Two percent met only once, and 0.8% met two or more times.

Table D4.1: Exposure to community health workers, women 15-49 years

	Baseline 2013			Second Follow-Up 2017		
	n	%	SE	n	%	SE
Did not meet	1062	96.8	1.0	1006	97.3	0.7
One time	24	1.3	0.3	29	1.9	0.6
Two times	9	1.7	0.8	6	0.7	0.4
Three times	0	0.0	-	2	0.1	0.0
Four or more times	1	0.2	0.2	0	0.0	-
Don't know	0	-	-	2	-	-
Decline to respond	1	-	-	0	-	-

Referral and advice services provided by community health workers are summarized in Table D4.2. Among women who met with a community health worker in the last month during the second follow-up, family planning methods or counseling was the most common service provided (77.9%). Advice about vaccination for children (63.3%) and child nutrition counseling (59.6%) was also frequently reported.

Table D4.2: Services provided by community health workers, women 15-49 years

	Baseline 2013				Second Follow-Up 2017			
	n	N	%	SE	n	N	%	SE
Family planning methods or counseling	24	40	53.6	13.0	29	40	77.9	8.4
Vaccination for children	24	40	49.2	13.8	27	40	63.3	12.7
Child nutrition counseling	19	40	61.6	10.0	24	40	59.6	13.4
Referral for voluntary HIV/syphilis counseling and testing*	13	40	33.3	12.2	21	40	53.2	11.2
Referral for antenatal care	13	40	33.2	11.9	19	40	49.8	12.5
Information, education, and communication sessions (IEC)	18	40	65.1	7.3	18	40	48.5	12.6
Referral for in-facility delivery	7	40	11.5	6.0	16	40	37.8	7.9

* For the prevention of HIV/syphilis transmission from mother to child

	Second Follow-Up 2017			
	n	N	%	SE
Deworming	25	40	60.1	13.1
Diarrhea treatment with ORS and zinc	19	40	50.7	10.5
Micronutrients	18	40	48.9	11.3
Referral for postnatal care	17	40	42.1	9.5
Other	8	40	24.6	10.0

Questions about these topics were not asked at baseline. They were added to the second follow-up survey to track exposure to SMI interventions.

D4.2 Satisfaction with Community Health Workers

Women who met with a community health worker in the month preceding the interview were asked to assess their satisfaction with the following: number of visits, information provided by community health workers, and respectfulness of community health workers. Results are displayed in Table D4.3.

Table D4.3: Satisfaction with community health workers, women 15-49 years of age who met with community health workers in the last month

	Baseline 2013			Second Follow-Up 2017		
	n	%	SE	n	%	SE
Satisfaction with number of visits from community health workers						
Very dissatisfied	6	8.6	5.3	3	4.8	2.8
Dissatisfied	2	3.9	3.1	1	1.4	1.5
Satisfied	22	83.0	8.3	30	85.0	6.6
Very satisfied	3	4.5	3.3	4	8.8	5.1
Don't know	1	-	-	1	-	-
Decline to respond	0	-	-	0	-	-
Satisfaction of knowledge and training of community health workers						
Very dissatisfied	7	10.1	5.8	3	4.8	2.8
Dissatisfied	1	2.5	2.6	0	0.0	-
Satisfied	22	84.0	7.8	31	86.4	6.4
Very satisfied	2	3.3	2.5	4	8.8	5.1
Don't know	2	-	-	1	-	-
Decline to respond	0	-	-	0	-	-
Satisfaction with information provided by community health workers						
Very dissatisfied	7	13.3	6.6	3	4.8	2.8
Dissatisfied	1	3.3	3.3	1	1.8	1.7
Satisfied	21	76.2	9.0	30	84.6	6.3
Very satisfied	3	7.2	4.4	4	8.8	5.1
Don't know	2	-	-	1	-	-
Decline to respond	0	-	-	0	-	-
Satisfaction with respectfulness shown by community health workers						
Very dissatisfied	8	12.3	6.5	3	4.8	2.8
Dissatisfied	1	2.5	2.6	1	1.8	1.7
Satisfied	20	80.6	9.1	30	84.6	6.3
Very satisfied	3	4.6	3.4	4	8.8	5.1
Don't know	2	-	-	1	-	-
Decline to respond	0	-	-	0	-	-

D4.3 Counseling provided in health facilities

Respondents who had visited a health facility in the last 12 months (621 women at the second follow-up) were asked whether they were given counseling about certain topics by health center personnel. Approximately 18.4% of women in the second follow-up reported receiving guidance or advice about breastfeeding in the 12 months preceding the interview (Table D4.4). Approximately 18.7% of women in the second follow-up reported receiving guidance or advice about child nutrition in the 12 months preceding the interview (Table D4.4). Approximately 24.6% of women in the second follow-up reported receiving guidance or advice about danger signs for children's health in the 12 months preceding the interview (Table D4.4).

Table D4.4: Exposure to breastfeeding, child nutrition, and child health interventions, women 15-49 years

	Baseline 2013				Second Follow-Up 2017			
	n	N	%	SE	n	N	%	SE
Breastfeeding	277	732	30.6	2.1	154	619	18.4	2.8
Child nutrition	276	733	31.6	2.5	145	619	18.7	2.4
Danger signs for children's health	283	732	33.3	2.7	185	617	24.6	3.0

D4.4 Counseling provided in health facilities to women with children

In the follow-up survey, respondents who had visited a health facility in the last 12 months and who had children (551 women at the second follow-up) were asked whether they were given counseling about certain topics by health center personnel.

Table D4.5: Counseling provided in health facilities to women with children

	Second Follow-Up 2017			
	n	N	%	SE
Provided deworming treatment	157	549	25.8	3.3
Provided diarrhea treatment with ORS and zinc	130	550	21.3	2.7
Provided micronutrients	95	549	15.7	2.3

Questions about these topics were not asked at baseline. They were added to the second follow-up survey to track exposure to SMI interventions.

D5. CHAPTER 5: FAMILY PLANNING

This chapter summarizes key indicators related to the knowledge of, access to, need for, and use of family planning methods among women of reproductive age (15-49 years) participating in the SMI-Nicaragua second follow-up household survey.

Family planning questions were asked only to women of reproductive age who were married or partnered. During the SMI-Nicaragua baseline household survey, family planning questions were asked to women whose marital status was reported as “married” or “partnered” by the SMI-Nicaragua household census respondent. During the second follow-up, the family planning section was instead conditioned on a question about marital status asked to the respondent herself at the start of the woman’s health interview. This captured participants who had a change in marital status between the census and household survey and participants whose marital status was incorrectly recorded in the census. At the baseline, 702 women qualified for the family planning questions, and at the second follow-up, 650 women qualified.

D5.1 Knowledge of the Fertile Period

The successful use of family planning methods depends on an understanding of when during the menstrual cycle a woman is most likely to conceive. This is especially true for traditional methods such as the rhythm method (i.e., periodic abstinence) and the withdrawal method. To assess knowledge of the fertile period, women were asked if there are certain days when a woman is more likely to become pregnant, and when during the menstrual cycle those days occur. Responses to these questions are summarized in Table D5.1. In the second follow-up, 92% of women indicated that there were certain days when a woman is more likely to become pregnant, and of these women, only 12.7% identified the correct timing of the fertile period (halfway between two periods).

Table D5.1: Knowledge of the fertile period, women 15-49 years of age who are married or partnered

	Baseline 2013				Second Follow-Up 2017			
	n	N	%	SE	n	N	%	SE
Are there certain days when a woman is more likely to become pregnant?	568	654	86.2	3.6	562	602	92	2

	Baseline 2013			Second Follow-Up 2017		
	n	%	SE	n	%	SE
Time of a woman’s fertile period						
Just before period	98	17.3	4.0	94	19.0	4.0
During period	15	2.1	0.7	10	1.9	1.2
Just after period	325	58.9	5.2	376	66.0	4.4
Halfway between periods	99	19.5	3.6	57	12.7	3.0
Other	12	2.2	1.1	4	0.4	0.3
Don’t know	18	-	-	19	-	-
Decline to respond	1	-	-	2	-	-

D5.2 Use of Family Planning Methods

D5.2.1 Current use

The coverage of contraceptive methods is one of the indicators most frequently used to assess the success of family planning program activities. It is also widely used as a determinant of fertility. Women who said they had heard of a family planning method were asked if they were currently using that method. Table D5.2 displays the percentage of all women using at least one family planning method, as well as the percentage of women reporting use of more than one family planning method at the time of the interview. Seventy six percent of all survey respondents in the second follow-up reported current use of at least one family planning method.

Women considered “in need” of family planning methods are those who are married or partnered, excluding those who report the following characteristics: does not have sexual relations, virgin, menopausal, infertile, pregnant, or wants to become pregnant. Even women not considered “in need” of contraception may use a method. Table D5.3 shows the uptake of modern family planning methods among all married and partnered women (76.3%), and among women considered “in need” of contraception (84.5%).

Table D5.2: Current use of family planning methods, women 15-49 years of age who are married or partnered

	Baseline 2013				Second Follow-Up 2017			
	n	N	%	SE	n	N	%	SE
Currently in need of contraception	599	702	76.9	2.9	581	651	85.1	2.5
Current use of any method, among all women	550	702	73.1	2.7	531	651	76.3	2.8

Table D5.3: Current use of modern family planning methods, women 15-49 years of age who are married or partnered and in need of contraception

	Baseline 2013				Second Follow-Up 2017			
	n	N	%	SE	n	N	%	SE
Current use of any method	533	599	90.7	1.5	513	581	84.5	2.7
Current use of modern method	521	599	89.1	1.5	506	581	83.8	2.7

	Baseline 2013			Second Follow-Up 2017		
	n	%	SE	n	%	SE
Number of methods the respondent is currently using						
Not using any family planning methods	71	10.4	1.6	74	17.4	2.6
Using 1 family planning method	518	87.5	2.2	502	82.1	2.6
Using 2 family planning methods	10	2.1	1.2	5	0.5	0.3

Table D5.4 displays the percentage of all women using specific family planning methods. The methods most commonly in use during the second follow-up are injectables (34.5%) and female sterilization (19.7%).

Table D5.4: Current use of family planning methods, by type of method, for women 15-49 years of age who are married or partnered

	Baseline 2013				Second Follow-Up 2017			
	n	N	%	SE	n	N	%	SE
Injectable	260	702	31.5	2.8	239	650	34.5	2.6
Female sterilization	141	701	22.1	2.6	138	648	19.7	2.2
Oral contraceptive	79	702	9.8	1.9	66	650	9.6	1.7
Intrauterine device (IUD)	28	702	5.5	2.0	47	651	6.4	1.8
Male condom	27	702	3.3	1.4	27	651	3.5	1.0
Implant	1	702	0.0	-	4	649	0.7	0.5
Withdrawal	3	700	0.2	0.2	5	649	0.4	0.2
Rhythm	7	701	0.6	0.2	2	647	0.2	0.1
Other modern method	0	699	0.0	-	1	646	0.1	0.1
Other traditional method	1	700	0.4	0.4	1	649	0.1	0.1
Male sterilization	1	701	0.1	0.1	0	648	0.0	-
Female condom	0	700	0.0	-	0	651	0.0	-
Diaphragm	0	700	0.0	-	0	649	0.0	-
Sponge	0	701	0.0	-	0	650	0.0	-
Lactational amenorrhea	7	702	0.5	0.2	0	649	0.0	-
Emergency contraception (Plan B)	0	701	0.0	-	0	649	0.0	-

* categories not mutually exclusive (select all that apply)

D5.3 Sources of Family Planning Methods

Information on where women obtain contraceptive methods is important for family planning program managers. The places where the currently-used family planning methods were acquired are summarized in Table D5.5.

The public sector is the source most commonly reported by users of most modern family planning methods, including female sterilization. Pharmacies are important sources for injectables, the pill, and male condoms. Women report learning about traditional methods in the public sector, from friends or relatives, or at church (Table D5.6).

Table D5.5: Source of modern family planning methods, women 15-49 years of age who are married or partnered

	Baseline 2013			Second Follow-Up 2017		
	n	%	SE	n	%	SE
Injectable						
Public hospital	55	21.6	6.5	41	12.9	3.1
Public health center/clinic	38	14.3	3.0	59	23.8	5.2
Public health post	0	0.0	-	60	24.7	6.6
Public mobile clinic	0	0.0	-	0	0.0	-
Other public health facility	2	0.7	0.7	0	0.0	-
Private hospital	0	0.0	-	2	2.9	2.9
Private health clinic	3	1.7	1.2	6	1.4	0.6
Private doctor's office	1	0.2	0.2	0	0.0	-
Private mobile clinic	0	0.0	-	0	0.0	-
Other private health facility	1	0.3	0.3	0	0.0	-
Pharmacy	40	20.6	6.6	54	24.0	4.1
Community health worker	8	2.4	0.8	4	3.0	2.1
Traditional healer	0	0.0	-	0	0.0	-
Store	0	0.0	-	1	0.4	0.4
Market	0	0.0	-	0	0.0	-
Church	0	0.0	-	0	0.0	-
Friend/relative	0	0.0	-	0	0.0	-
Home of a community health worker	0	0.0	-	2	2.0	1.7
School	0	0.0	-	0	0.0	-
Casa base	0	0.0	-	9	4.7	3.5
Casa materna	0	0.0	-	0	0.0	-
Public health unit	110	37.7	5.0	0	0.0	-
Other	2	0.4	0.3	1	0.2	0.2
Don't know	0	-	-	0	-	-
Decline to respond	0	-	-	0	-	-
Female sterilization						
Public hospital	121	81.2	4.9	120	87.3	4.6
Public health center/clinic	1	0.3	0.4	1	2.3	2.3
Public health post	0	0.0	-	1	0.4	0.4
Public mobile clinic	0	0.0	-	0	0.0	-
Other public health facility	0	0.0	-	0	0.0	-
Private hospital	1	0.3	0.3	2	0.8	0.6
Private health clinic	7	8.9	4.1	9	7.0	3.6
Private doctor's office	0	0.0	-	1	0.5	0.5
Private mobile clinic	0	0.0	-	1	0.5	0.5
Other private health facility	0	0.0	-	0	0.0	-
Pharmacy	0	0.0	-	0	0.0	-
Community health worker	0	0.0	-	0	0.0	-
Traditional healer	0	0.0	-	0	0.0	-
Store	0	0.0	-	0	0.0	-
Market	0	0.0	-	0	0.0	-
Church	0	0.0	-	0	0.0	-
Friend/relative	0	0.0	-	0	0.0	-
Home of a community health worker	0	0.0	-	0	0.0	-
School	0	0.0	-	0	0.0	-
Casa base	0	0.0	-	1	0.6	0.6
Casa materna	0	0.0	-	0	0.0	-
Public health unit	7	6.6	4.3	0	0.0	-

(continued)

	n	%	SE	n	%	SE
Other	4	2.7	1.8	1	0.6	0.6
Don't know	0	-	-	0	-	-
Decline to respond	0	-	-	1	-	-
Oral contraceptive						
Public hospital	12	10.0	4.7	5	10.0	5.8
Public health center/clinic	18	24.8	7.7	14	14.5	5.3
Public health post	0	0.0	-	26	40.9	13.3
Public mobile clinic	0	0.0	-	0	0.0	-
Other public health facility	0	0.0	-	0	0.0	-
Private hospital	0	0.0	-	1	1.0	1.0
Private health clinic	1	0.8	0.9	0	0.0	-
Private doctor's office	1	0.7	0.7	1	0.5	0.5
Private mobile clinic	0	0.0	-	0	0.0	-
Other private health facility	0	0.0	-	0	0.0	-
Pharmacy	18	20.7	7.4	18	29.4	9.1
Community health worker	0	0.0	-	0	0.0	-
Traditional healer	0	0.0	-	0	0.0	-
Store	0	0.0	-	0	0.0	-
Market	0	0.0	-	0	0.0	-
Church	0	0.0	-	0	0.0	-
Friend/relative	0	0.0	-	1	3.6	3.5
Home of a community health worker	0	0.0	-	0	0.0	-
School	0	0.0	-	0	0.0	-
Casa base	0	0.0	-	0	0.0	-
Casa materna	0	0.0	-	0	0.0	-
Public health unit	29	42.9	11.8	0	0.0	-
Other	0	0.0	-	0	0.0	-
Don't know	0	-	-	0	-	-
Decline to respond	0	-	-	1	-	-
Intrauterine device (IUD)						
Public hospital	15	57.2	18.6	28	61.4	9.8
Public health center/clinic	3	4.3	3.0	8	14.3	5.1
Public health post	0	0.0	-	3	3.6	1.5
Public mobile clinic	0	0.0	-	0	0.0	-
Other public health facility	0	0.0	-	0	0.0	-
Private hospital	0	0.0	-	1	0.8	0.8
Private health clinic	3	26.6	19.4	4	11.5	5.6
Private doctor's office	1	1.2	1.3	3	8.4	5.3
Private mobile clinic	0	0.0	-	0	0.0	-
Other private health facility	0	0.0	-	0	0.0	-
Pharmacy	0	0.0	-	0	0.0	-
Community health worker	0	0.0	-	0	0.0	-
Traditional healer	0	0.0	-	0	0.0	-
Store	0	0.0	-	0	0.0	-
Market	0	0.0	-	0	0.0	-
Church	0	0.0	-	0	0.0	-
Friend/relative	0	0.0	-	0	0.0	-
Home of a community health worker	0	0.0	-	0	0.0	-
School	0	0.0	-	0	0.0	-
Casa base	0	0.0	-	0	0.0	-

(continued)

	n	%	SE	n	%	SE
Casa materna	0	0.0	-	0	0.0	-
Public health unit	4	6.8	2.9	0	0.0	-
Other	2	3.9	2.8	0	0.0	-
Don't know	0	-	-	0	-	-
Decline to respond	0	-	-	0	-	-
Public hospital	0	0.0	-	0	0.0	-
Public health center/clinic	0	0.0	-	0	0.0	-
Public health post	0	0.0	-	0	0.0	-
Public mobile clinic	0	0.0	-	0	0.0	-
Other public health facility	0	0.0	-	0	0.0	-
Private hospital	0	0.0	-	0	0.0	-
Private health clinic	1	100.0	0.0	2	24.3	21.2
Private doctor's office	0	0.0	-	2	75.7	21.2
Private mobile clinic	0	0.0	-	0	0.0	-
Other private health facility	0	0.0	-	0	0.0	-
Pharmacy	0	0.0	-	0	0.0	-
Community health worker	0	0.0	-	0	0.0	-
Traditional healer	0	0.0	-	0	0.0	-
Store	0	0.0	-	0	0.0	-
Market	0	0.0	-	0	0.0	-
Church	0	0.0	-	0	0.0	-
Friend/relative	0	0.0	-	0	0.0	-
Home of a community health worker	0	0.0	-	0	0.0	-
School	0	0.0	-	0	0.0	-
Casa base	0	0.0	-	0	0.0	-
Casa materna	0	0.0	-	0	0.0	-
Public health unit	0	0.0	-	0	0.0	-
Other	0	0.0	-	0	0.0	-
Don't know	0	-	-	0	-	-
Decline to respond	0	-	-	0	-	-
Male condom						
Public hospital	3	18.6	12.2	2	4.4	2.8
Public health center/clinic	2	4.7	3.8	7	19.3	7.0
Public health post	0	0.0	-	2	16.2	12.9
Public mobile clinic	0	0.0	-	0	0.0	-
Other public health facility	0	0.0	-	0	0.0	-
Private hospital	0	0.0	-	0	0.0	-
Private health clinic	0	0.0	-	0	0.0	-
Private doctor's office	0	0.0	-	0	0.0	-
Private mobile clinic	0	0.0	-	0	0.0	-
Other private health facility	0	0.0	-	0	0.0	-
Pharmacy	16	36.4	11.6	15	58.3	12.1
Community health worker	0	0.0	-	0	0.0	-
Traditional healer	0	0.0	-	0	0.0	-
Store	0	0.0	-	0	0.0	-
Market	0	0.0	-	0	0.0	-
Church	0	0.0	-	0	0.0	-
Friend/relative	1	2.5	2.7	0	0.0	-
Home of a community health worker	0	0.0	-	1	1.8	1.9

(continued)

	n	%	SE	n	%	SE
School	0	0.0	-	0	0.0	-
Casa base	0	0.0	-	0	0.0	-
Casa materna	0	0.0	-	0	0.0	-
Public health unit	4	36.1	17.4	0	0.0	-
Other	1	1.6	1.8	0	0.0	-
Don't know	0	-	-	0	-	-
Decline to respond	0	-	-	0	-	-

* "Female condom", "Sponge", and "Diaphragm" were omitted from table because no women reported receiving them in baseline or follow-up.

* Options for "Public health center", "Public health post", "Home of a traditional healer", "School", and "Casa base" were not available at baseline.

Options for "Public health unit" and "Public health center/clinic" were not available at follow-up. "Public health center" responses from follow-up are grouped within "Public health center/clinic".

Table D5.6: Source of knowledge about traditional family planning methods, women 15-49 years of age who are married or partnered

	Baseline 2013			Second Follow-Up 2017		
	n	%	SE	n	%	SE
Lactational amenorrhea						
Public hospital	2	30.8	19.5	0	0.0	-
Public health center/clinic	2	34.9	20.3	0	0.0	-
Public health post	0	0.0	-	0	0.0	-
Public mobile clinic	0	0.0	-	0	0.0	-
Other public health facility	0	0.0	-	0	0.0	-
Private hospital	0	0.0	-	0	0.0	-
Private health clinic	0	0.0	-	0	0.0	-
Private doctor's office	0	0.0	-	0	0.0	-
Private mobile clinic	0	0.0	-	0	0.0	-
Other private health facility	0	0.0	-	0	0.0	-
Pharmacy	0	0.0	-	0	0.0	-
Community health worker	1	15.2	14.5	0	0.0	-
Traditional healer	0	0.0	-	0	0.0	-
Store	0	0.0	-	0	0.0	-
Market	0	0.0	-	0	0.0	-
Church	0	0.0	-	0	0.0	-
Friend/relative	0	0.0	-	0	0.0	-
Home of a community health worker	0	0.0	-	0	0.0	-
School	0	0.0	-	0	0.0	-
Casa base	0	0.0	-	0	0.0	-
Casa materna	0	0.0	-	0	0.0	-
Public health unit	1	19.0	17.3	0	0.0	-
Other	0	0.0	-	0	0.0	-
Don't know	1	-	-	0	-	-
Decline to respond	0	-	-	0	-	-
Rhythm						
Public hospital	0	0.0	-	0	0.0	-

Public health center/clinic	0	0.0	-	1	58.2	35.1
Public health post	0	0.0	-	0	0.0	-
Public mobile clinic	0	0.0	-	0	0.0	-
Other public health facility	0	0.0	-	0	0.0	-
Private hospital	0	0.0	-	0	0.0	-
Private health clinic	0	0.0	-	0	0.0	-
Private doctor's office	0	0.0	-	0	0.0	-
Private mobile clinic	0	0.0	-	0	0.0	-
Other private health facility	0	0.0	-	0	0.0	-
Pharmacy	0	0.0	-	0	0.0	-
Community health worker	1	15.2	11.9	0	0.0	-
Traditional healer	0	0.0	-	0	0.0	-
Store	0	0.0	-	0	0.0	-
Market	0	0.0	-	0	0.0	-
Church	2	27.2	18.1	0	0.0	-
Friend/relative	1	15.2	11.9	1	41.8	35.1
Home of a community health worker	0	0.0	-	0	0.0	-
School	0	0.0	-	0	0.0	-
Casa base	0	0.0	-	0	0.0	-
Casa materna	0	0.0	-	0	0.0	-
Public health unit	0	0.0	-	0	0.0	-
Other	3	42.5	21.8	0	0.0	-
Don't know	0	-	-	0	-	-
Decline to respond	0	-	-	0	-	-
Withdrawal						
Public hospital	0	0.0	-	0	0.0	-
Public health center/clinic	0	0.0	-	1	24.6	21.2
Public health post	0	0.0	-	0	0.0	-
Public mobile clinic	0	0.0	-	0	0.0	-
Other public health facility	0	0.0	-	0	0.0	-
Private hospital	0	0.0	-	0	0.0	-
Private health clinic	0	0.0	-	0	0.0	-
Private doctor's office	0	0.0	-	0	0.0	-
Private mobile clinic	0	0.0	-	0	0.0	-
Other private health facility	0	0.0	-	0	0.0	-
Pharmacy	0	0.0	-	0	0.0	-
Community health worker	0	0.0	-	0	0.0	-
Traditional healer	0	0.0	-	0	0.0	-
Store	0	0.0	-	0	0.0	-
Market	0	0.0	-	0	0.0	-
Church	0	0.0	-	0	0.0	-
Friend/relative	0	0.0	-	4	75.4	21.2
Home of a community health worker	0	0.0	-	0	0.0	-
School	0	0.0	-	0	0.0	-
Casa base	0	0.0	-	0	0.0	-
Casa materna	0	0.0	-	0	0.0	-
Public health unit	1	19.1	19.6	0	0.0	-
Other	2	80.9	19.6	0	0.0	-
Don't know	0	-	-	0	-	-
Decline to respond	0	-	-	0	-	-

* Options for "Public health center", "Public health post", "Home of a traditional healer", "School", and "Casa base" were not available at baseline.

Options for "Public health unit" and "Public health center/clinic" were not available at follow-up. "Public health center" responses from follow-up are grouped within "Public health center/clinic".

D5.4 Non-Use and Interruption of Use of Family Planning Methods

Non-use and interruption of use of family planning methods are major concerns for family planning program managers.

D5.4.1 Prevalence of interruption

The prevalence of interruption and non-use of family planning methods is summarized in Table D5.7. Of women participating in the second follow-up survey, 85.1% are considered "in need" of contraception (i.e., they did not report any of the following: does not have sexual relations, virgin, menopausal, infertile, hysterectomy, pregnant, or wants to become pregnant). Among these women in need, 4.5% reported any interruption in the use of family planning methods in the previous year.

Table D5.7: Interruption and non-use of family planning methods, among women 15-49 years of age who are married or partnered and in need of contraception

	Baseline 2013				Second Follow-Up 2017			
	n	N	%	SE	n	N	%	SE
Discontinuation rate*	22	599	3.5	1.2	14	581	4.5	2.7

* any interruption in use during the last year, among women in need of contraception

	Baseline 2013			Second Follow-Up 2017		
	n	%	SE	n	%	SE
Number of interruptions in use during the last year						
none	577	96.5	1.2	567	95.5	2.7
once	15	2.4	0.8	14	4.5	2.7
2-6 times per year	7	1.1	0.7	0	0.0	-
7-12 times per year	0	0.0	-	0	0.0	-
>12 times per year	0	0.0	-	0	0.0	-

D5.4.2 Reasons for non-use

Women who indicated they were not using any method on the day of the interview were asked to specify all reasons why they did not use a method. The interviewer matched responses provided by the respondent to a list of reasons in the questionnaire (Table D5.8). The most commonly cited reasons for non-use at the time of the second follow-up interview were, using contraception interferes with normal body processes (16.8%), respondent is trying to become pregnant (11.6%), and respondent is not sexually active (10%).

Table D5.8: Reasons for non-use of family planning methods, women 15-49 years of age who are married or partnered and who are not currently using family planning methods

	Baseline 2013				Second Follow-Up 2017			
	n	N	%	SE	n	N	%	SE
Using contraception interferes with normal body processes	8	131	2.7	0.8	12	121	16.8	5.7
Trying to become pregnant	22	131	25.3	9.8	12	121	11.6	3.5
Not sexually active	23	131	17.6	6.9	14	121	10.0	4.2
Infertile	6	131	3.3	1.8	5	121	9.0	4.7
Other reason	12	131	5.6	2.0	20	121	8.2	2.6
Concerned about side effects	17	131	9.3	3.5	7	121	7.6	3.0
Do not like to use contraception	37	131	22.5	6.1	8	121	6.9	3.0
Have undergone hysterectomy	6	131	3.7	2.3	6	121	6.7	3.8
Menopausal	14	131	22.9	8.7	7	121	6.3	2.9
Spouse or partner opposed to use	4	131	3.0	1.8	5	121	6.0	3.2
Currently pregnant	10	131	10.2	4.9	12	121	5.3	1.9
Against religious beliefs	0	131	0.0	-	5	121	4.8	3.0
Using contraception is uncomfortable	2	131	0.6	0.5	2	121	4.1	2.8
Infrequently sexually active	30	131	19.5	6.3	6	121	3.9	2.8
Married	38	131	31.3	8.7	5	121	3.4	2.5
Opposed to use	5	131	1.9	1.0	4	121	3.1	1.9
Mistrust health center staff	6	131	1.8	0.8	2	121	2.8	2.1
Unmarried	10	131	8.8	5.9	2	121	2.5	2.1
The health facility is too far away	3	131	2.8	1.8	3	121	2.5	1.9
No menstrual period since giving birth	10	131	4.3	2.1	5	121	1.7	0.8
Breastfeeding	10	131	3.8	1.5	1	121	0.4	0.4
Others opposed to use	1	131	0.3	0.3	1	121	0.4	0.4
Virgin	0	131	0.0	-	0	121	0.0	-
Knows no method	6	131	1.8	0.8	0	121	0.0	-
Knows no source for methods	6	131	1.7	0.7	0	121	0.0	-
Could not find transportation to a health facility	1	131	0.3	0.3	0	121	0.0	-
Could not afford transportation	2	131	0.8	0.6	0	121	0.0	-
The method is too expensive	0	131	0.0	-	0	121	0.0	-
Preferred method was not available	3	131	4.3	3.5	0	121	0.0	-
No method was available	4	131	1.2	0.6	0	121	0.0	-
Health facility staff difficult to deal with	4	131	1.4	0.6	0	121	0.0	-

* "Using contraception affects health" was an option offered in the second follow-up, but was not available at baseline.

23 women selected this as a reason for not using family planning at the second follow-up.

* categories not mutually exclusive (select all that apply)

D5.5 Family Planning Intentions and Decision-Making

D5.5.1 Participation in family planning decision

In this setting in the second follow-up, 78.1% of women report that decisions about family planning methods are jointly made by the respondent and her partner. In only 3.6% of cases, the decision to use family planning methods is up to the respondent's partner alone.

Table D5.9: Participation in family planning decision-making, women 15-49 years of age who are married or partnered and are currently using family planning methods

	Baseline 2013			Second Follow-Up 2017		
	n	%	SE	n	%	SE
Joint decision	474	75.2	2.9	457	78.1	2.5
Mostly the respondent	113	16.7	2.2	116	18.1	2.4
Mostly respondent's spouse/partner	59	7.4	1.6	20	3.6	1.1
Not applicable - not partnered	1	0.1	0.1	0	0.0	-
Other	4	0.6	0.3	3	0.3	0.2
Don't know	1	-	-	2	-	-
Decline to respond	0	-	-	0	-	-

D5.5.2 Informed choice

With respect to use of family planning methods, “informed choice” refers to whether or not health care workers described other options for family planning methods, possible side effects associated with the method of choice, and how to respond to side effects if they occur. This information can be used to help women select an appropriate contraceptive method, and to assist users in coping with side effects (thus decreasing discontinuation rates for non-permanent methods).

Table D5.10 shows the percent of women currently using family planning methods who were told about other options for contraception (58.7% of women in the second follow-up).

Table D5.10: Family planning decision-making, informed choice, women 15-49 years of age who are married or partnered and who are currently using family planning methods

	Baseline 2013				Second Follow-Up 2017			
	n	N	%	SE	n	N	%	SE
Informed about other family planning options by a doctor, nurse, or community health worker	470	651	69.7	4	355	597	58.7	3.7

D5.6 Exposure to Family Planning Information

D5.6.1 Family planning messages delivered by health care providers

Respondents were asked about their exposure to family planning messages delivered by health care providers (Table D5.11). Twenty seven percent of women in the second follow-up reported being advised about family planning at the health care facility they attend during the past 12 months. Twenty three percent of all respondents indicated that they had been visited by a health promoter who provided information about family planning in the last 12 months. Just 6.5% of respondents who had not attended

a health facility in the last 12 months were visited by a health promoter who provided information about family planning.

Table D5.11: Family planning messages delivered by health care providers in the last 12 months, women 15-49 years of age who are married or partnered

	Baseline 2013				Second Follow-Up 2017			
	n	N	%	SE	n	N	%	SE
Discussion about family planning methods with staff member at a health facility	280	450	62.7	5.0	190	650	26.8	2.8
Discussion about family planning methods during health promoter visit	54	699	7.6	1.3	158	649	23.0	2.8
Visit by promotor, among women who had not visited a health facility	19	248	6.2	1.3	32	413	6.5	1.9

Figure D5.1: Family planning information received from health facility or community health workers in the last 12 months by municipality, women 15-49 years of age who are married or partnered, second follow-up survey

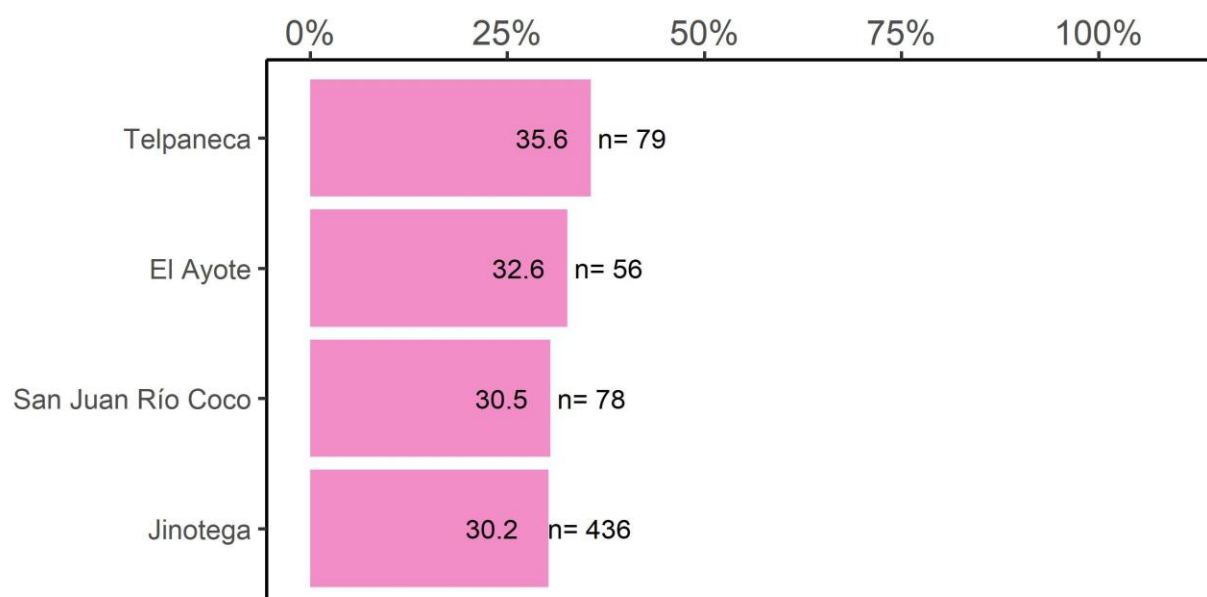
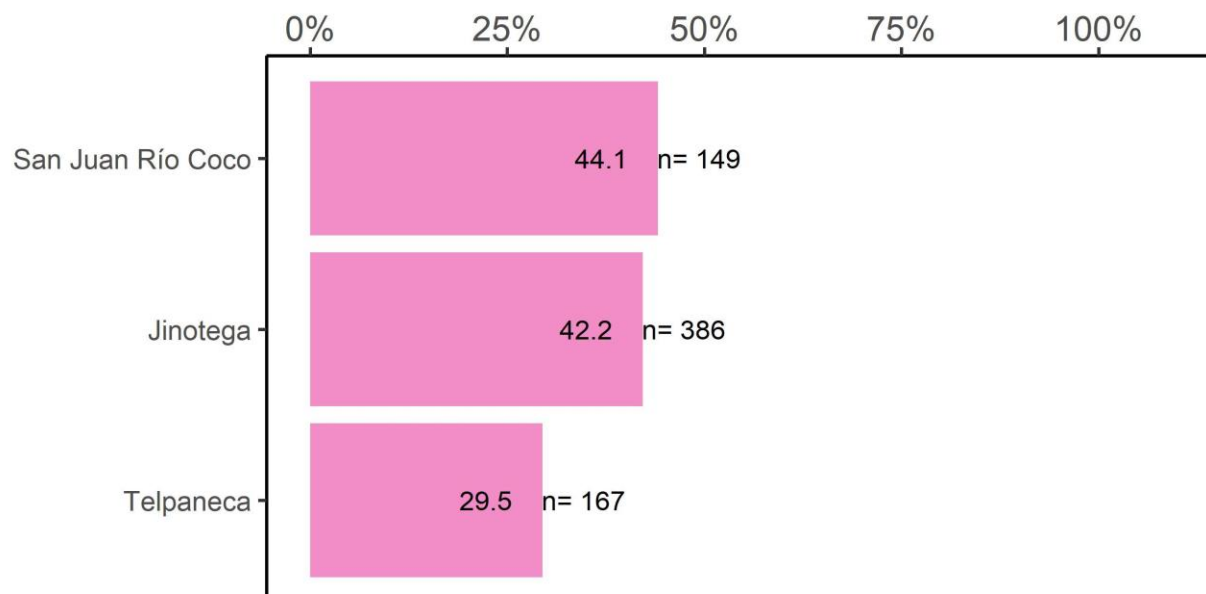


Figure D5.2: Family planning information received from health facility or community health workers in the last 12 months by municipality, women 15-49 years of age who are married or partnered, baseline survey



D5.7 Age at First Birth

D5.7.1 Age at first birth

Seventy two percent of respondents in the second follow-up had ever given birth (Table D5.12). Of these women, the median age of the women when their first child was born was 18 years old. Only a quarter of women were 21 years old or older when their first child was born. Nine percent of women reported a history of stillbirth, miscarriage, and/or abortion.

Table D5.12: Parity and age at first birth, women 15-49 years of age

	Baseline 2013				Second Follow-Up 2017			
	n	N	%	SE	n	N	%	SE
Ever given birth	887	1097	72.9	2.3	852	1045	72.0	2.4
Ever had a stillbirth, miscarriage, or abortion	99	1097	9.9	2.4	92	1043	8.6	1.6

	N	DK/DTR	Min	25th Percentile	Median	75th Percentile	Max
Baseline 2013							
Age at first birth, among parous women	885	0	12	16	18	20	37
Second follow-up 2017							
Age at first birth, among parous women	847	0	11	16	18	21	41

D6. CHAPTER 6: MATERNAL HEALTH CARE

This chapter summarizes key indicators pertaining to antenatal care, delivery care, and postpartum care for the most recent live birth in the last two years as reported by women of reproductive age (15-49 years) participating in the SMI-Nicaragua second follow-up household survey. Participating women were interviewed about all live births in the last five years, but to reduce the impact of recall bias, results reported here are for each woman's most recent birth in the last two years. At the baseline, 413 women were interviewed about at least one birth in the last two years. At the second follow-up, 338 women were interviewed about births in the last two years.

D6.1 Antenatal Care

To reduce recall bias, data pertaining to antenatal care are summarized for a woman's most recent birth in the last two years.

D6.1.1 *Antenatal care coverage*

Early and regular checkups by trained medical providers are important in assessing the physical status of women during pregnancy and provide an opportunity to intervene in a timely manner if any problems are detected. The Maternal and Child Health Questionnaire captured information from women on both overall coverage of antenatal care and the content of care received. To obtain information on source of antenatal care, interviewers recorded all persons a woman consulted for care. Timing of antenatal care was assessed by asking women how many weeks or months pregnant they were when they attended their first antenatal care visit. The same details were recorded for up to eight antenatal care visits.

The percentage of women with a birth in the last two years who attended at least one antenatal care visit for the most recent birth, and the percent distribution of timing of care among those who received any antenatal care are presented in Table D6.1. Definition of "most recent birth" changed between baseline and second follow-up. The type of facility where antenatal care was sought is detailed in Table D6.2.

Among women with a child under the age of 2 in the second follow-up, 98.2% attended at least one antenatal care visit and 93.9% of women had at least one antenatal care visit with a doctor or professional nurse. At the second follow-up, 52.9% of women had an antenatal care visit during the first trimester (first 12 weeks) with a doctor or professional nurse, compared to 48.4% at the baseline. The median age of gestation at the first antenatal care visit during the second follow-up was 2 months.

Table D6.1: Antenatal care coverage for the most recent birth in the last two years, women 15-49 years of age

	Baseline 2013				Second Follow-Up 2017			
	n	N	%	SE	n	N	%	SE
Attended at least one antenatal care visit	398	413	96.2	1.3	332	338	98.2	0.9
Attended at least one antenatal care visit with doctor or professional nurse	398	413	96.2	1.3	317	338	93.9	1.7
Antenatal care visit with doctor or professional nurse in the first trimester (12 weeks)	210	413	48.4	4.1	183	337	52.9	3.4

* Definition of most recent birth changed between baseline and second follow-up

	N	DK/DTR	Min	25th Percentile	Median	75th Percentile	Max
Baseline 2013							
Month of gestation of first ANC visit	398	0	0.2	1.9	2.8	4	9
Second follow-up 2017							
Month of gestation of first ANC visit	331	1	0.2	1	2	3	9

Regarding the type of facility where antenatal care was usually sought during the second follow-up (Table D6.2), most women who attended antenatal care for their most recent delivery in the last two years sought care in a Public health center/clinic (47.7%) or Public health post (26.6%). Only 7% of women sought antenatal care in a private health clinic.

Table D6.2: Usual antenatal care location, women 15-49 years of age who attended at least one antenatal care visit for most recent birth in the last two years

	Baseline 2013			Second Follow-Up 2017		
	n	%	SE	n	%	SE
Public health center/clinic	99	24.3	3.2	158	47.7	5.1
Public health post	0	0.0	-	93	26.6	5.6
Private health clinic	21	4.7	1.3	23	7.0	2.3
Public hospital	70	17.0	4.8	21	6.3	1.9
Casa base	0	0.0	-	14	6.3	2.8
Private doctor's office	10	1.9	0.8	11	3.1	1.2
Private hospital	0	0.0	-	4	1.1	0.7
Public mobile clinic	0	0.0	-	1	0.2	0.2
Other public health facility	5	1.0	0.4	0	0.0	-
Private mobile clinic	0	0.0	-	0	0.0	-
Other private health facility	0	0.0	-	0	0.0	-
Pharmacy	0	0.0	-	0	0.0	-
Community health worker	0	0.0	-	0	0.0	-
Traditional healer	1	0.2	0.2	0	0.0	-
Home of a community health worker	0	0.0	-	0	0.0	-
School	0	0.0	-	0	0.0	-
Casa materna	0	0.0	-	0	0.0	-
Public health unit	189	50.3	5.5	0	0.0	-
Other	3	0.6	0.3	6	1.7	0.9
Don't know	0	-	-	1	-	-
Decline to respond	0	-	-	0	-	-

* Options for "Public health center", "Public health post", "Home of a traditional healer", "School", and "Casa base" were not available at baseline. Options for "Public health unit" and "Public health center/clinic" were not available at follow-up. "Public health center" responses from follow-up are grouped within "Public health center/clinic".

D6.1.2 Frequency of antenatal care visits

Antenatal care can be more effective in avoiding adverse pregnancy outcomes when it is sought early in the pregnancy and continues until delivery. According to the national norm in Nicaragua, it is recommended that women receive a minimum of four antenatal care visits. The frequency of antenatal care visits is summarized in Table D6.3. Table D6.4 shows the percentage of women with four or more visits with skilled providers and according to best practices.

In the second follow-up, 88.1% of women reported having four or more antenatal care visits during their most recent pregnancy in the last two years. Forty two percent of women reported having seven or more antenatal care visits during their most recent pregnancy.

The content of antenatal care is as crucial as the frequency of visits. As shown in Table D6.4, 43.3 percent of all women in the second follow-up survey had four or more antenatal care visits with a doctor or professional nurse, and with each of 9 defined best practices performed at least once during pregnancy (measurement of blood type, test for anemia, test for syphilis, test for HIV, test of blood

glucose, measurement of maternal blood pressure, measurement of maternal weight, measurement of fundal height, and measurement of fetal heartbeat).

Table D6.3: Frequency of antenatal care visits for the most recent birth in the last two years, women 15-49 years of age

	Baseline 2013			Second Follow-Up 2017		
	n	%	SE	n	%	SE
None	15	3.8	1.3	6	1.8	0.9
1-3 visits	41	11.0	2.9	34	10.0	2.0
4-6 visits	166	42.9	3.1	153	46.4	2.6
7-9 visits	186	41.9	5.2	137	40.6	3.6
10+ visits	3	0.4	0.3	5	1.1	0.9
Don't know	2	-	-	3	-	-
Decline to respond	0	-	-	0	-	-

Table D6.4: Frequency of antenatal care visits with skilled provider for the most recent birth in the last two years, women 15-49 years of age

	Baseline 2013				Second Follow-Up 2017			
	n	N	%	SE	n	N	%	SE
At least four antenatal care visits with doctor or professional nurse	353	411	84.7	4.1	274	335	81.6	2.9
At least four antenatal care visits with doctor or professional nurse according to best practices*	156	411	36.7	4.3	154	335	43.3	4.2

*measuring blood type, anemia, syphilis, HIV, glucose, blood pressure, weight, fundal height, and fetal heartbeat.

D6.1.3 Content of antenatal care

The content of antenatal care is an important indicator of quality of care. The coverage of key procedures was assessed among women who received any antenatal care for a birth in the last two years (Table D6.5 and Table D6.6). It is important to remember that the validity of these data hinge on the respondent's understanding of the question and her ability to recall events that may have occurred several years prior to the interview.

There was variation in performance of the 9 "best practice" procedures during the second follow-up: measured fetal heartbeat (99.5%), measured fundal height (99.4%), measured maternal blood pressure (99.3%), measured maternal weight (99.2%), measured blood type (94.5%), tested for anemia (89.3%), tested for HIV (86.8%), measured blood glucose (80.4%), and tested for syphilis (74.7%). Women were unfamiliar with several tests, as evidenced by the high number of missing responses for syphilis.

Table D6.5: Content of antenatal care visits - best practices, among women 15-49 years who attended at least one antenatal care visit for most recent birth in the last two years

	Baseline 2013				Second Follow-Up 2017			
	n	N	%	SE	n	N	%	SE
Measured fetal heartbeat	387	397	97.2	0.9	329	331	99.5	0.3
Measured fundal height	378	396	94.9	2.0	330	332	99.4	0.4
Measured maternal blood pressure	397	398	99.8	0.2	329	332	99.3	0.4
Measured maternal weight	396	398	99.5	0.4	329	332	99.2	0.6
Measured blood type	322	372	86.8	2.4	291	309	94.5	1.6
Tested for anemia	320	374	85.1	2.1	277	309	89.3	2.3
Tested for HIV	338	397	83.8	3.4	277	312	86.8	2.6
Measured blood glucose	269	372	70.3	3.2	248	305	80.4	4.4
Tested for syphilis	232	365	62.7	3.7	221	293	74.7	4.3

Most women in the second follow-up had a collected urine specimen (98.3%) and a collected blood specimen (97.2%) collected during their antenatal care visits for the most recent birth during the past two years.

Table D6.6: Content of antenatal care visits - other services provided, among women 15-49 years who attended at least one antenatal care visit for most recent birth in the last two years

	Baseline 2013				Second Follow-Up 2017			
	n	N	%	SE	n	N	%	SE
Collected urine specimen	385	398	96.8	1.1	327	332	98.3	0.8
Collected blood specimen	377	397	94.4	1.8	323	332	97.2	0.7
Performed an ultrasound	347	398	85.5	2.7	311	332	93.2	1.7
Offered an HIV test	354	398	87.4	2.9	292	315	90.5	2.4
Tested for diabetes	183	268	68.1	2.8	212	248	82.7	3.2

D6.1.4 Coverage of tetanus toxoid vaccinations during pregnancy

Tetanus toxoid injections are given during pregnancy for the prevention of neonatal tetanus. To prevent transmission of this potentially fatal infection, all women should be vaccinated with tetanus toxoid when they become pregnant. A baby is considered protected if the mother receives two doses of tetanus toxoid during pregnancy, with the second at least two weeks before delivery. However, if a woman was vaccinated previously, she only requires one dose during the current pregnancy. Five doses are considered adequate to confer lifetime immunity. To assess the coverage of tetanus toxoid vaccination, women who reported receiving any antenatal care during their most recent pregnancy were asked if they received tetanus toxoid injections.

As shown in Table D6.7, the coverage of sufficient tetanus toxoid vaccination during pregnancy was 68.9% among women who received antenatal care during the second follow-up. Fifty four percent of women

received one vaccination during the pregnancy and 40.8% received two or more. Among women with antenatal care, 28.8% had never been vaccinated before and 30.4% had received a vaccine in the last 10 years. Among women who were not vaccinated during prenatal care visits, 3.4% had never been vaccinated.

Table D6.7: Coverage of tetanus toxoid vaccinations during pregnancy, among women 15-49 years who attended at least one antenatal care visit for most recent birth in the last two years

	Baseline 2013			Second Follow-Up 2017		
	n	%	SE	n	%	SE
Two or more injections during pregnancy	112	34.5	3.7	100	40.8	3.5
One injection during pregnancy, one <10 years before	100	29.7	3.5	71	28.1	3.2
One injection during pregnancy, none <10 years before	87	28.8	4.3	60	25.4	2.9
No injections during pregnancy, one or more <10 years before	13	4.5	1.3	4	2.3	1.8
No injections during pregnancy nor during the 10 years prior	7	2.4	1.0	7	3.4	1.4
Don't know	79	-	-	89	-	-
Decline to respond	0	-	-	1	-	-

D6.1.5 Exposure to safe pregnancy messages

Women who received antenatal care were asked about a series of topics for which they might have received counseling or advice during their pregnancy. Table D6.8 shows the percentage of women in the second follow-up who were exposed to the following messages: counseled about pregnancy (91.9%); advised to deliver in a facility (90.6%); counseled about danger signs during pregnancy (90.2%); counseled about breastfeeding (88%); counseled about nutrition during pregnancy (87.2%); given information about in-facility delivery (86.4%); counseled about childcare (83.2%).

Exposure to safe pregnancy practices increased from baseline to second follow-up for all counseling categories. In the second follow-up, 80.9% of women were counseled about contraception after delivery compared to 79.8% at baseline. 45.4% of women in the second follow-up, compared to 41.2% at baseline, were advised to have a Cesarean section. Compared to 25.1% of women at baseline, 42.5% of women in the second follow-up were counseled about making a transportation plan for delivery.

Table D6.8: Exposure to safe pregnancy practices, women 15-49 years of age who attended at least one antenatal care visit for most recent birth in the last two years

	Baseline 2013				Second Follow-Up 2017			
	n	N	%	SE	n	N	%	SE
Counseled about pregnancy	370	398	91.3	2.6	304	330	91.9	2.0
Advised to deliver in a facility	341	398	84.3	2.8	303	332	90.6	2.2
Counseled about danger signs during pregnancy	378	397	94.2	2.0	302	331	90.2	3.0
Counseled about breastfeeding	347	397	87.3	2.9	294	332	88.0	2.6
Counseled about nutrition during pregnancy	355	396	88.9	2.2	289	330	87.2	3.6
Given information about in-facility delivery	348	398	86.7	2.2	291	331	86.4	3.4
Counseled about childcare	285	395	71.4	3.1	278	332	83.2	3.5
Counseled about contraception after delivery	320	398	79.8	2.4	268	331	80.9	3.1
Advised to have a Cesarean section	167	398	41.2	3.0	144	330	45.4	4.3
Counseled about making a transportation plan for delivery	103	397	25.1	3.2	139	331	42.5	3.4

D6.2 Delivery Care

Proper medical attention and hygienic conditions during delivery can reduce the risk of complications, infections, and even death for the mother and newborn baby. Characteristics of the delivery, including place of delivery and assistance at delivery were captured for all births in the five years preceding the survey. To reduce recall bias, only data from the most recent delivery within the last two years are summarized.

D6.2.1 Place of delivery

The location of the most recent birth and the means of transportation used to get to the facility are shown in Table D6.9. The majority of births occurred in public hospitals (82%). Deliveries in private-sector facilities were rare (5.8%). Among women who delivered in a facility, 32.6% indicated that they used a private vehicle for transport (Table D6.10).

Table D6.9: Place of delivery for most recent birth in the last two years, women 15-49 years of age

	Baseline 2013			Second Follow-Up 2017		
	n	%	SE	n	%	SE
Public hospital	358	86.1	2.3	286	82.0	4.7
Own home	17	5.3	2.1	19	7.3	3.2
Public health center/clinic	24	5.6	1.3	12	3.8	1.8
Private health center/clinic	6	0.9	0.5	10	3.6	1.5
Private hospital	2	0.3	0.2	7	2.2	1.1
Other house	1	0.2	0.2	2	0.5	0.3
Casa materna	0	0.0	-	1	0.4	0.3
Other public health facility	1	0.4	0.4	1	0.2	0.3
Public health ward	0	0.0	-	0	0.0	-
Private health ward	0	0.0	-	0	0.0	-
Other private health facility	0	0.0	-	0	0.0	-
Home of a community health worker	0	0.0	-	0	0.0	-
School	0	0.0	-	0	0.0	-
Casa base	0	0.0	-	0	0.0	-
Other	4	1.1	0.5	0	0.0	-
Don't know	0	-	-	0	-	-
Decline to respond	0	-	-	0	-	-

* Options for "Home of a traditional healer", "School", "Casa base", and "Casa materna" were not available at baseline.

Table D6.10: Transportation to place of delivery for most recent birth in the last two years, among women 15-49 years of age who delivered in a facility

	Baseline 2013				Second Follow-Up 2017			
	n	N	%	SE	n	N	%	SE
Private vehicle	92	391	23.0	2.7	111	316	32.6	3.3
Ambulance	129	391	32.1	5.7	87	316	28.1	4.4
Other public transit	135	391	36.9	5.4	84	316	27.8	2.7
On foot	44	391	10.2	2.5	39	316	13.5	2.6

*categories not mutually exclusive (select all that apply)

Women were asked about the proximity to the health facility used to deliver. Of the 316 women from the second follow-up who delivered in a facility, 206 were able to estimate the distance to the facility (Table D6.11). The median number of women reported travelling less than 7 km. Fifty percent of women traveled more than one hours to the facility to deliver.

Table D6.11: Proximity to health care facilities: health facility for delivery

	N	DK/DTR	Min	25th Percentile	Median	75th Percentile	Max
Baseline 2013							
Distance, km	310	81	0	2	15	45	100
Travel time, min	383	8	1	30	60	120	2700
Second follow-up 2017							
Distance, km	206	110	0.1	1	7	40	100
Travel time, min	297	19	1	12.1	49.9	120	4320

D6.2.2 Assistance at delivery

The assistance a woman receives during childbirth has important health consequences for both mother and child. For women who did not deliver alone in the last two years (99.1% of all births in the second follow-up), the percentage by type of delivery attendant is detailed in Table D6.12. Among women who did not report being alone for delivery, several categories of personnel may have been in attendance. As can be seen in Table D6.12, most in-facility deliveries during the second follow-up were accompanied by a medical doctor (88.7%) and/or a professional nurse (73.6%). For 31.9% of the deliveries an auxiliary nurse was in attendance. For 18.6% a relative was in attendance.

Table D6.12: Types of attendants: assistance at delivery for most recent birth in the last two years, women 15-49 years of age

	Baseline 2013				Second Follow-Up 2017			
	n	N	%	SE	n	N	%	SE
Medical doctor	382	413	91.1	2.7	304	338	88.7	3.1
Professional nurse	339	410	82.4	3.0	230	312	73.6	3.8
Auxiliary nurse	95	400	23.8	3.0	89	292	31.9	4.6
Relative	60	412	16.7	2.9	60	329	18.6	2.4
Midwife/comadrona	13	412	3.2	1.4	20	323	7.6	3.6
Laboratory technician	11	403	2.4	0.6	15	314	5.3	1.7
Community health worker	1	411	0.3	0.3	4	325	1.5	0.9
Traditional healer	0	412	0.0	-	4	327	1.1	0.7
Pharmacist	2	411	0.4	0.3	3	324	0.8	0.6
Other	10	409	2.3	0.8	13	328	4.1	1.7

* Option "Nurse (title unknown)" was added for the follow-up, but was not available at baseline

Sixteen percent of women in the second follow-up delivered with one attendant, 46.5% with two attendants, and 25.9% with three attendants (Table D6.13). For women's most recent live birth in the past two years, 94.1% of deliveries had a skilled attendant present and 91.6% delivered with a skilled attendant in a health facility (Table D6.14).

Table D6.13: Number of attendants: assistance at delivery for most recent birth in the last two years, women 15-49 years of age

	Baseline 2013			Second Follow-Up 2017		
	n	%	SE	n	%	SE
None	4	1.6	1.0	3	0.9	0.5
One	57	13.4	2.3	55	16.3	2.2
Two	228	54.6	2.8	163	46.5	5.0
Three	99	23.8	2.6	85	25.9	3.8
Four or more	25	6.6	2.0	32	10.4	2.3
Don't know	0	-	-	0	-	-
Decline to respond	0	-	-	0	-	-

Table D6.14: In-facility delivery with skilled birth attendant: assistance at delivery for most recent birth in the last two years, women 15-49 years of age

	Baseline 2013				Second Follow-Up 2017			
	n	N	%	SE	n	N	%	SE
Delivery with a skilled birth attendant	391	413	93.7	2.1	323	338	94.1	3.1
Delivery with a skilled birth attendant in any health facility*	388	413	92.8	2.1	315	338	91.6	3.4

* In-facility deliveries include deliveries at public and private hospitals, health centers/clinics, health wards, other health facilities, and casas base

D6.2.3 Complications

Pregnancy complications are an important source of maternal and child morbidity and mortality. The type of delivery (vaginal or Caesarian section) among women with births in the last two years is detailed in Table D6.15 along with the percentage of planned in-facility deliveries. Table D6.16 displays the percentage of women with specific complications.

As previously described, the vast majority of births occurred in institutional settings. In 49.7% of these cases during the second follow-up, women indicated that they attended the facility for emergency care. Few women reported seizures prior to delivery (2.7%). Approximately 9.6% of infants were transferred to an intensive care unit after delivery, and 16.3% of women reported excessive bleeding after delivery (more than 1 cup over a two-day period of time).

Table D6.15: Mode of delivery for most recent birth in the last two years, women 15-49 years of age

	Baseline 2013			Second Follow-Up 2017		
	n	%	SE	n	%	SE
Mode of delivery						
Vaginal	278	68.7	2.9	221	66.7	3.9
Emergency c-section	89	20.9	2.2	70	19.8	3.3
Planned c-section	46	10.4	1.6	47	13.5	2.0
Don't know	0	-	-	0	-	-
Decline to respond	0	-	-	0	-	-
Reason for seeking delivery care, among in-facility births						
Because of emergency	225	56.3	2.8	164	49.7	3.3
According to birth plan	161	42.5	3.0	148	49.4	3.2
Other reason	5	1.2	0.6	3	0.9	0.5
Don't know	0	-	-	1	-	-
Decline to respond	0	-	-	0	-	-

Table D6.16: Delivery complications for most recent birth in the last two years, women 15-49 years of age

	Baseline 2013				Second Follow-Up 2017			
	n	N	%	SE	n	N	%	SE
Respondent experienced excessive bleeding in the first day after delivery	125	413	30.3	3.7	52	337	16.3	2.8
Child entered neonatal intensive care unit after delivery	48	412	12.7	1.6	31	338	9.6	1.6
Respondent experienced seizures prior to delivery	9	412	2.6	0.9	8	338	2.7	1.1

D6.2.4 Birth size and weight

Birth weight is a major determinant of infant and child health and mortality. Birth weight of less than 2.5 kilograms is considered low. For all births during the five-year period preceding the survey, mothers were asked about their perception of the child's size at birth: very large, larger than average, smaller than average, or very small. They were then asked to report the actual weight in kilograms if the child had been weighed after delivery. To reduce recall bias, only data from the most recent birth within the last two years are summarized below (Table D6.17).

In the second follow-up, many women perceived their infant to be average in size (87.5%). With most births occurring in institutional settings, it is not surprising that 93.4% of newborns were weighed at birth. Among those who were weighed, 14% weighed less than 2.5 kilograms according to the mother's recall (low birth weight).

Table D6.17: Birth size and weight for most recent live birth in the past two years, women 15-49 years of age

	Baseline 2013			Second Follow-Up 2017		
	n	%	SE	n	%	SE
Very large	9	2.0	0.7	3	0.9	0.7
Larger than average	37	9.1	1.6	18	5.1	1.3
Average	333	81.0	2.0	296	87.5	1.9
Smaller than average	20	5.5	1.4	13	4.6	1.4
Very small	10	2.3	0.7	7	1.8	0.9
Don't know	4	-	-	1	-	-
Decline to respond	0	-	-	0	-	-

	Baseline 2013				Second Follow-Up 2017			
	n	N	%	SE	n	N	%	SE
Child was weighed at birth	395	411	94.8	2.2	312	328	93.4	2.9
Low birth weight (<2.5kg), among those weighed	41	374	10.9	1.7	37	256	14.0	2.4

D6.3 Early initiation of breastfeeding

Coverage of early initiation of breastfeeding is defined as the percentage of women who had a live birth in the past two years and put the child to the breast with one hour of birth. Table D6.18 shows that 76.4% of women initiated breastfeeding within one hour of birth.

Table D6.18: Early initiation of breastfeeding for most recent live birth in the past two years, women 15-49 years of age

	Baseline 2013				Second Follow-Up 2017			
	n	N	%	SE	n	N	%	SE
Early initiation of breastfeeding among children <24 months	330	412	79.8	2.5	259	338	76.4	3.8

D6.4 Postnatal Care

Postnatal care is important both for the mother and the child to treat complications arising from the delivery, as well as to provide the mother with important information on how to care for herself and her child. The postnatal period is defined as the time between the delivery of the placenta and 42 days (six weeks) following the delivery. The timing of postnatal care is important: the first two days after delivery are critical, because most maternal and neonatal deaths occur during this period.

Characteristics of postnatal care, including timing, location, and personnel providing care were captured for all births in the five years preceding the survey. To reduce recall bias, only data from the most recent delivery in the last two years are summarized in the tables below.

D6.4.1 Postnatal checkup for the mother

Data on postnatal care for the mother are summarized in Table D6.19. Table D6.19 shows the percentage of women with a birth in the last two years who were checked at any time after delivery and within 10 days after delivery; and percentage by timing of the check for women with an in-facility delivery.

Only 68.4% of women recalled being checked after delivery during the second follow-up, and numeric(0)% reported being checked one week after delivery by a health care provider. Only 43.2% of women with an institutional birth recalled being checked every 15 minutes for the first hour post-partum.

Table D6.20 shows the percent distribution of women who were checked at any time after delivery by type of personnel. Among women with postnatal care visits in the second follow-up, most received care from a doctor (76.4%) or professional nurse (16.8%).

Table D6.19: Postnatal checkup for the mother for most recent live birth in the past two years, women 15-49 years of age

	Baseline 2013				Second Follow-Up 2017			
	n	N	%	SE	n	N	%	SE
Any checkup after delivery	331	413	79.3	3.2	232	335	68.4	3.5
Checked every 15 minutes during the first hour after delivery, among in-facility births	147	318	46.4	3.5	89	217	43.2	5.3
Checked within 10 days after delivery by a skilled provider*	309	413	74.1	2.9	308	338	89.4	2.8

* The second follow-up survey included an additional question that asked if women were checked before discharge after delivering in facility. If a women was checked before discharge, she was considered to have passed this indicator. Due to the addition of this question, the baseline and follow-up values are not strictly comparable.

Figure D6.1: Postnatal check for mother with skilled attendant within 10 days for most recent live birth in the past two years by municipality, women 15-49 years of age, second follow-up survey

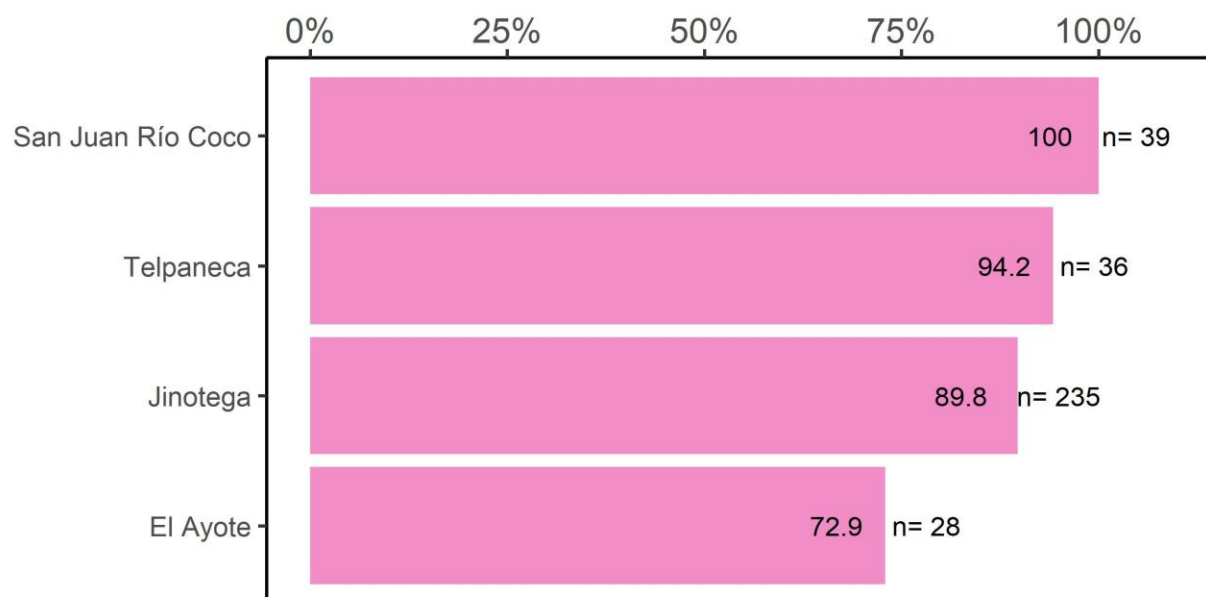


Table D6.20: Provider of care at first postnatal checkup for the mother, most recent live birth in the past two years, among women who attended at least one postnatal care visit

	Baseline 2013			Second Follow-Up 2017		
	n	%	SE	n	%	SE
Doctor	267	81.0	2.1	179	76.4	3.1
Professional nurse	55	16.6	2.0	39	16.8	3.5
Auxiliary nurse	2	0.9	0.6	7	3.1	1.3
Midwife/comadrona	4	1.2	0.7	1	1.6	1.5
Nurse (title unknown)	0	0.0	-	4	1.5	1.0
Pharmacy assistant	0	0.0	-	1	0.5	0.5
Laboratory technician	0	0.0	-	0	0.0	-
Community health worker	0	0.0	-	0	0.0	-
Traditional healer	0	0.0	-	0	0.0	-
Relative	0	0.0	-	0	0.0	-
Other	1	0.3	0.3	0	0.0	-
Don't know	2	-	-	0	-	-
Decline to respond	0	-	-	1	-	-

* Option "Nurse (title unknown)" was added for the follow-up, but was not available at baseline

D6.4.2 Postnatal checkup for the infant

The results regarding postnatal care for the neonate are shown in Table D6.21: percentage of women with a birth in the last two years whose infants were checked after delivery; percent distributions of infants who were checked by skilled personnel within 24 hours of delivery; and percent distributions of infants who were checked by skilled personnel within one week of delivery.

Approximately 90.5% of women in the second follow-up reported that their infant was checked at any time after delivery. Among all deliveries, 28% of women reported that a qualified medical professional checked on their infant within 24 hours of delivery. Table D6.22 shows the attendants for neonatal postnatal care. Most women indicated that a doctor performed a checkup (84.8%). Professional nurse and nurse (title unknown) were also reported, though much less frequently.

Table D6.21: Postnatal checkup for neonate for woman's most recent live birth in the past two years, women 15-49 years of age

	Baseline 2013				Second Follow-Up 2017			
	n	N	%	SE	n	N	%	SE
Any checkup after delivery	336	413	79.9	2.9	308	338	90.5	1.9
Checked within 24 hours after delivery by a skilled provider	127	365	35.6	3.6	86	307	28.0	2.7
Checked within 10 days after delivery by a skilled provider	271	365	72.2	3.8	241	307	78.0	3.2

Table D6.22: Provider of care at first postnatal checkup for the infant, woman's most recent live birth in the past two years, among women whose child attended at least one postnatal care visit

	Baseline 2013			Second Follow-Up 2017		
	n	%	SE	n	%	SE
Doctor	289	85.6	2.4	260	84.8	3.4
Professional nurse	43	13.4	2.3	30	10.7	2.7
Nurse (title unknown)	0	0.0	-	6	2.5	1.7
Auxiliary nurse	2	1.0	0.7	5	1.8	0.9
Laboratory technician	0	0.0	-	0	0.0	-
Midwife/comadrona	0	0.0	-	0	0.0	-
Community health worker	0	0.0	-	0	0.0	-
Pharmacy assistant	0	0.0	-	0	0.0	-
Traditional healer	0	0.0	-	0	0.0	-
Relative	0	0.0	-	0	0.0	-
Other	0	0.0	-	1	0.3	0.3
Don't know	2	-	-	6	-	-
Decline to respond	0	-	-	0	-	-

* Option "Nurse (title unknown)" was added for the follow-up, but was not available at baseline

D6.5 Vouchers, Incentives, and Maternal Waiting Homes

To increase use of their services, some facilities and waiting homes offer vouchers and incentives to women to attend care. Table D6.23 displays the percentage of women in the second follow-up who gave birth the past two years and received a voucher at a health facility. One percent of women received a voucher or financial assistance to attend antenatal care, 1% received a voucher or financial assistance for delivery at a health facility, and 0.3% received a voucher or financial assistance for postpartum or postnatal care at a health facility.

Table D6.23: Voucher incentives for care-seeking for most recent live birth in the past two years, women 15-49 years of age

	Baseline 2013				Second Follow-Up 2017			
	n	N	%	SE	n	N	%	SE
Received a voucher or other form of financial assistance to attend antenatal care at a health facility	3	398	0.6	0.4	4	332	1.3	0.7
Received a voucher or other form of financial assistance to deliver at a health facility	3	391	0.8	0.5	3	316	1.0	0.7

	Baseline 2013			Second Follow-Up 2017		
	n	%	SE	n	%	SE
No voucher	391	100	0	315	99.7	0.3
Yes, for infant's care	0	0	-	1	0.3	0.3
Yes, for woman's care	0	0	-	0	0.0	-
Yes, for both woman and infant	0	0	-	0	0.0	-
Don't know	0	-	-	0	-	-
Decline to respond	0	-	-	0	-	-

Some facilities that attend deliveries have a *casa materna* or maternal waiting home nearby to provide women who live far away a place to stay while they await delivery or while they recover and prepare to travel home with their infant. Table D6.24 displays how women have commonly used maternal waiting homes during their most recent pregnancy in the past two years. 20.9% of women in the second follow-up report using a maternal waiting home before giving birth and 76.5% of these women report receiving counseling while staying at a maternal waiting home. On average, women stayed at a maternal waiting home for eight days and spent 0 Córdoba.

Table D6.24: Use of maternal waiting homes for most recent live birth in the past two years, women 15-49 years of age

	Baseline 2013				Second Follow-Up 2017			
	n	N	%	SE	n	N	%	SE
Used a maternal waiting home before giving birth	58	413	14.5	3.7	63	338	20.9	4.1
Among women who used maternal waiting homes								
Received counseling on health and parenting topics while at waiting home	58	58	100.0	-	45	59	76.5	6.3

	N	DK/DTR	Min	25th Percentile	Median	75th Percentile	Max
Second Follow-Up 2017							
Days spent in maternal home	62	0	1	4	8	20	45
Out-of-pocket cost to use maternal home, Córdoba	63	0	0	0	0	0	50

D7. Chapter 7: CHILD HEALTH

This chapter summarizes the health status of children aged 0-59 months whose caregivers participated in the SMI-Nicaragua Second Follow-up Household Survey. All data summarized in this chapter are based on the caregiver's report.

D7.1 Health status

The age and sex distribution of the de facto population of children aged 0-59 months participating in the caregiver interview module or the anthropometric measures in Nicaragua for the second follow-up is shown in Figure D7.2 by six- or 12-month age groups.

Twenty percent of children surveyed at baseline and 19% of children surveyed at the second follow-up were under 1 year old at the time of the interview. The age distributions of female and male children are similar.

Figure D7.1: Age and sex of children aged 0-59 months in child health survey or anthropometric measures of the de facto population by six- to twelve-month age groups, baseline survey unweighted

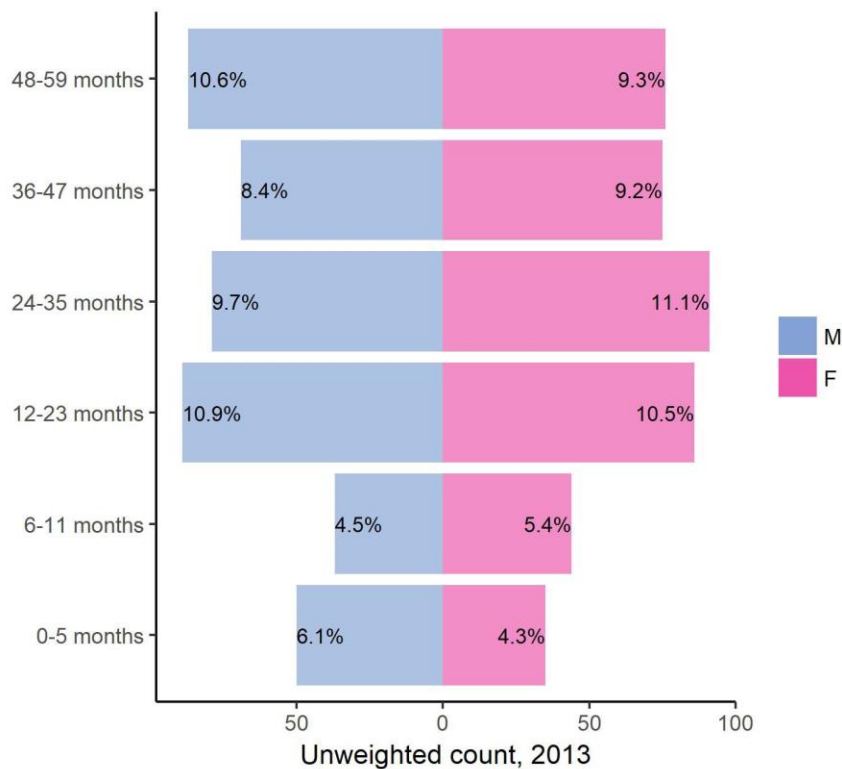
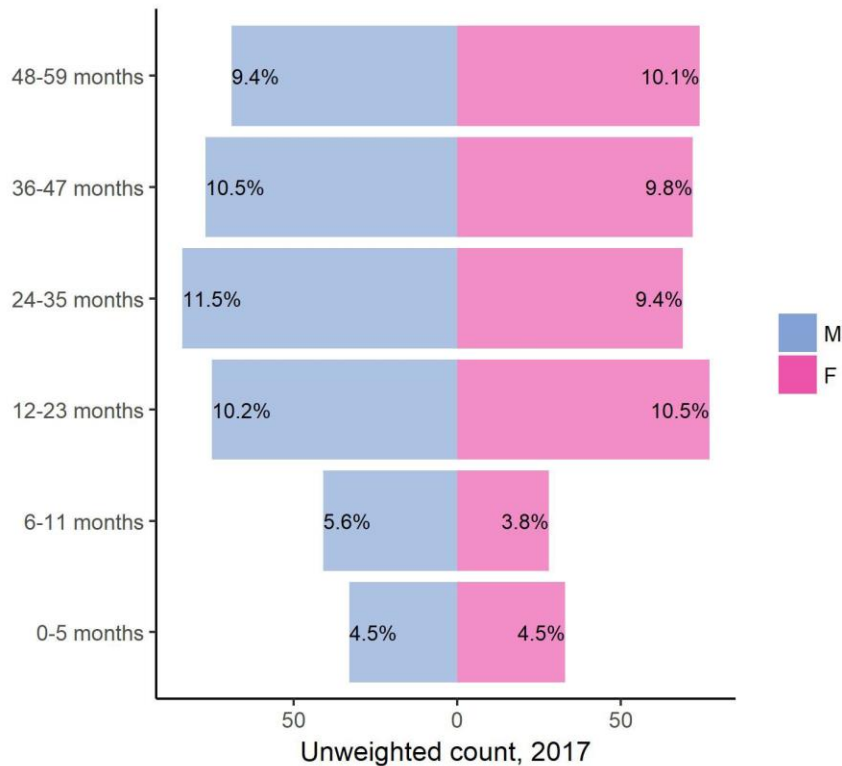


Figure D7.2: Age and sex of children aged 0-59 months in child health survey or anthropometric measures of the de facto population by six- to twelve-month age groups, follow-up survey unweighted



D7.1.1 Current health status

Table D7.1 shows the current health status of all children aged 0-59 months, as reported by their caregivers. The table includes the caregiver’s evaluation of current health relative to health the previous year and the percentage of children who can easily perform daily activities. In the second follow-up, approximately 70.2% of children’s health was considered by their caregiver to be “good,” “very good,” or “excellent,” compared to 74.6% at baseline.

Relative to the past year, caregivers in the second follow-up evaluation reported that 50% of children’s health was “about the same” in the second follow-up. While 43.8% of children’s health had improved, 6.2% of children experienced reportedly worse health on the day of the interview, compared to last year. Ninety four percent of children could “easily” perform their daily activities (e.g., playing and going to school) according to their caregivers. Five percent of children had some degree of difficulty performing these activities, 0.9% of children had a significant degree of difficulty performing these activities, and 0.4% of children were unable to complete daily activities, according to their caregivers.

Table D7.1: Current health status, among children aged 0-59 months

	Baseline 2013			Second Follow-Up 2017		
	n	%	SE	n	%	SE
Current health status						
Excellent	165	20.1	2.4	129	16.6	1.4
Very good	210	26.6	2.5	125	16.2	1.9
Good	220	27.9	2.5	271	37.4	2.0
Fair	182	21.9	1.9	182	25.8	2.6
Poor	28	3.5	0.7	28	3.9	0.8
Don't know	0	-	-	0	-	-
Decline to respond	0	-	-	0	-	-
Health status relative to a year ago						
Better	350	55.8	2.5	255	43.8	2.0
Worse	36	6.1	1.2	35	6.2	1.4
About the same	233	38.1	2.4	287	50.0	2.4
Don't know	2	-	-	2	-	-
Decline to respond	0	-	-	0	-	-
Ability to perform daily activities						
Easily	756	94.3	0.9	692	93.9	1.3
With some difficulty	33	4.0	0.8	32	4.8	1.2
With much difficulty	2	0.2	0.2	6	0.9	0.5
Unable to do	12	1.4	0.5	3	0.4	0.3
Don't know	2	-	-	2	-	-
Decline to respond	0	-	-	0	-	-

D7.1.2 Recent illness

Caregivers were asked a series of questions about any illnesses or health problems that their children had in the two weeks preceding the interview. In the second follow-up survey, approximately 35% of children were reported as sick during that time (Table D7.2). Of the 258 children who were recently ill, fever (27.9%), cough (32.1%), and diarrhea without blood (7.7%) were the most commonly specified complaints.

Table D7.2: Recent illness, among children aged 0-59 months

	Baseline 2013				Second Follow-Up 2017			
	n	N	%	SE	n	N	%	SE
Child was sick in the last two weeks	252	805	30.9	2.1	258	735	35	2.2

	Baseline 2013			Second Follow-Up 2017		
	n	%	SE	n	%	SE
Recent illness among children ill in the last 2 weeks						
Fever	53	21.2	2.6	70	27.9	3.0
Malaria	0	0.0	-	0	0.0	-
Cough/Chest Infection	79	31.9	3.5	0	0.0	-
Tuberculosis	0	0.0	-	0	0.0	-
Asthma	3	1.1	0.6	2	0.9	0.8
Bronchitis	1	0.6	0.6	1	0.4	0.4
Pneumonia	4	1.5	0.7	4	1.5	0.8
Diarrhea without blood	42	16.5	3.0	21	7.7	1.9
Diarrhea with blood	5	2.2	0.9	1	0.4	0.4
Vomiting	7	2.4	1.0	3	1.1	0.6
Abdominal pain	1	0.4	0.4	2	0.9	0.6
Anemia	0	0.0	-	0	0.0	-
Skin rash/infection	2	0.8	0.5	7	2.9	0.9
Eye/ear infection	3	1.0	0.6	1	0.5	0.5
Measles	0	0.0	-	0	0.0	-
Jaundice	0	0.0	-	0	0.0	-
Headache	0	0.0	-	0	0.0	-
Stroke	0	0.0	-	0	0.0	-
Diabetes	0	0.0	-	0	0.0	-
HIV/AIDS	0	0.0	-	0	0.0	-
Paralysis	0	0.0	-	0	0.0	-
Blood in urine	0	0.0	-	1	0.2	0.2
Difficulty urinating	0	0.0	-	0	0.0	-
Swelling in legs, ankles, or feet	0	0.0	-	0	0.0	-
Cough	0	0.0	-	82	32.1	4.3
Chest infection	0	0.0	-	0	0.0	-
Other	52	20.4	3.0	63	23.5	3.5
Don't know	0	-	-	0	-	-
Decline to respond	0	-	-	0	-	-

* Options for "Swelling in legs, ankles, or feet", "Blood in urine", "Poisoning", "Chest infection" and "Cough" were only available only in the follow-up survey. Option "Cough/Chest infection" was only available at the baseline.

D7.1.3 Utilization of health services for recent illness

Table D7.3 summarizes data regarding the utilization of health services among the 258 children who were sick in the two weeks preceding the interview. The table shows the percentage of children 0-59 months who were sick in the last two weeks for whom care was sought for recent illness and among these, the percent distribution by type of medical facility where care was sought and whether the child was hospitalized.

In the second follow-up survey, care was sought for 60.3% of these cases. Care was typically sought at Public hospital (11.1%) or Public health center/clinic (21.5%) facilities; some attended public health posts (26%). Only fourteen children were hospitalized for their recent illness.

Table D7.3: Utilization of health services for recent illness in the last two weeks, among children 0-59 months

	Baseline 2013				Second Follow-Up 2017			
	n	N	%	SE	n	N	%	SE
Sought care for recent illness	161	252	61.5	4.4	156	258	60.3	2.7
Child was hospitalized for recent illness	8	80	9.9	4.6	14	84	15.9	4.8

	Baseline 2013			Second Follow-Up 2017		
	n	%	SE	n	%	SE
Type of medical facility where care was sought						
Public hospital	28	17.6	4.0	18	11.1	2.8
Public health center/clinic	29	19.0	3.2	34	21.5	3.8
Public health post	0	0.0	-	39	26.0	6.7
Public mobile clinic	0	0.0	-	0	0.0	-
Other public facility	2	1.5	1.1	0	0.0	-
Private hospital	2	0.9	0.6	2	1.1	0.8
Private health center/clinic	9	4.6	1.7	20	11.0	3.5
Private practice	14	7.8	1.8	10	5.8	2.1
Private mobile clinic	0	0.0	-	0	0.0	-
Other private facility	0	0.0	-	0	0.0	-
Pharmacy	15	9.8	3.3	22	15.5	4.3
Community health worker	1	0.4	0.4	0	0.0	-
Traditional healer	1	0.5	0.5	0	0.0	-
Home of a community health worker	0	0.0	-	0	0.0	-
School	0	0.0	-	0	0.0	-
Casa base	0	0.0	-	4	3.2	2.4
Public health unit	51	31.7	5.5	0	0.0	-
Other	9	6.2	2.4	7	4.7	2.0
Don't know	0	-	-	0	-	-
Decline to respond	0	-	-	0	-	-

* Options for "Public health center", "Public health post", "Home of a traditional healer", "School", and "Casa base" were not available at baseline.

Options for "Public health unit" and "Public health center/clinic" were not available at follow-up. "Public health center" responses from follow-up are grouped within "Public health center/clinic".

D7.2 Acute respiratory infection

Acute respiratory infection is a leading cause of morbidity and mortality among children. Early diagnosis and treatment with antibiotics can prevent deaths resulting from pneumonia, a common acute respiratory disease. The prevalence of acute respiratory infection was estimated by asking caregivers whether their children aged 0-59 months had been ill with a cough accompanied by short, rapid breathing in the two weeks preceding the interview. If the child had symptoms of an acute respiratory infection, the caregiver was asked about what was done to treat the symptoms and feeding practices during the illness.

D7.2.1 Prevalence of acute respiratory infection and fever

The prevalence of cough, suspected acute respiratory infection, and fever among children aged 0-59 months, as reported by their caregivers, is displayed in Table D7.4. In the second follow-up, 30% of children experienced cough, 19.1% had symptoms of an acute respiratory infection (cough with difficulty breathing), and 21.5% had a fever in the two weeks preceding the interview.

Table D7.4: Prevalence of suspected acute respiratory infection and fever in the last two weeks, among children 0-59 months

	Baseline 2013			Second Follow-Up 2017		
	n	%	SE	n	%	SE
Child had cough in the last two weeks, by type						
No cough	594	73.7	1.8	515	69.8	2.3
Cough without difficulty breathing	94	11.9	1.2	84	11.2	1.3
With difficulty breathing due to congested/runny nose	60	7.4	1.2	55	7.7	1.2
With difficulty breathing due to chest problem	29	3.8	0.7	50	7.1	0.9
With difficulty breathing due to chest problem and congested/runny nose	24	3.1	0.8	30	4.2	0.6
With difficulty breathing due to other reason	1	0.1	0.1	0	0.0	-
Don't know	2	-	-	1	-	-
Decline to respond	1	-	-	0	-	-

	Baseline 2013				Second Follow-Up 2017			
	n	N	%	SE	n	N	%	SE
Symptoms of acute respiratory infection in the last two weeks	115	803	14.5	1.5	136	735	19.1	2.1
Fever in last two weeks	134	805	16.7	1.9	160	735	21.5	2.4

D7.2.2 Utilization of health services for suspected acute respiratory infection

Fifty seven percent of children with symptoms of acute respiratory infection were taken for evaluation and/or treatment of their condition at the second follow-up (Table D7.5).

Table D7.5: Utilization of health services for suspected acute respiratory infection in the last two weeks, among children 0-59 months

	Baseline 2013				Second Follow-Up 2017			
	n	N	%	SE	n	N	%	SE
Sought care for suspected acute respiratory infection	144	261	52	4.9	146	256	56.8	3.5

	Baseline 2013			Second Follow-Up 2017		
	n	%	SE	n	%	SE
Type of medical facility where care was sought						
Public hospital	26	17.9	4.3	14	9.4	2.3
Public health center/clinic	30	21.7	3.3	30	20.1	4.5
Public health post	0	0.0	-	35	25.1	6.6
Public mobile clinic	0	0.0	-	0	0.0	-
Other public facility	1	0.7	0.7	0	0.0	-
Private hospital	2	1.0	0.7	3	1.9	1.1
Private health center/clinic	5	2.8	1.6	23	14.2	3.6
Private practice	14	8.6	2.0	9	5.9	1.9
Private mobile clinic	0	0.0	-	1	0.7	0.7
Other private facility	0	0.0	-	0	0.0	-
Pharmacy	17	11.8	3.3	19	14.1	4.9
Community health worker	2	1.5	1.1	1	0.8	0.7
Traditional healer	0	0.0	-	0	0.0	-
Home of a community health worker	0	0.0	-	0	0.0	-
School	0	0.0	-	0	0.0	-
Casa base	0	0.0	-	5	4.2	2.6
Public health unit	39	27.8	4.7	0	0.0	-
Other	8	6.3	2.4	5	3.6	1.5
Don't know	0	-	-	0	-	-
Decline to respond	0	-	-	1	-	-

* Options for "Public health center", "Public health post", "Home of a traditional healer", "School", and "Casa base" were not available at baseline. Options for "Public health unit" and "Public health center/clinic" were not available at follow-up. "Public health center" responses from follow-up are grouped within "Public health center/clinic".

D7.2.3 Utilization of medications for suspected acute respiratory infection

Ninety one percent of children with symptoms of acute respiratory infection were given some type of medication for their condition during the second follow-up (Table D7.6). Fifty nine percent of children were administered antibiotic syrups for a suspected acute respiratory infection. Acetaminophen (69.1%) and ibuprofen (9.1%) were also commonly administered. Twenty six percent of children received a treatment other than those listed.

Table D7.6: Utilization of medications for suspected acute respiratory infection in the last two weeks, among children 0-59 months

	Baseline 2013				Second Follow-Up 2017			
	n	N	%	SE	n	N	%	SE
Any treatment	230	261	87.2	2.4	232	256	90.9	2.0
Antibiotic injection	6	230	2.7	1.1	8	230	3.6	1.1
Antibiotic pill	22	230	9.3	2.1	25	230	10.9	1.9
Antibiotic syrup	119	230	50.9	3.4	137	229	59.2	4.2
Aspirin	6	230	2.5	1.1	6	230	2.2	1.1
Acetaminophen	144	230	61.4	4.0	162	232	69.1	3.4
Ibuprofen	14	230	5.9	2.0	22	230	9.1	2.4
Oral rehydration therapy	15	230	6.0	1.9	20	231	8.9	2.2
Other	38	229	17.2	2.8	59	230	25.5	3.5

D7.2.4 Feeding practices during suspected acute respiratory infection

Data on feeding practices during the recent episode of suspected acute respiratory infection are summarized in Table D7.7. The table shows the volume of fluids and the volume of solids given during the illness. At the second follow-up, only 3.6% of children were given more fluids than usual. In total, 60% of children were offered less fluid than usual (or none at all). Thirty one percent of children were offered the same volume of solid food as usual during their illness. Approximately 68% of children were given less than the usual amount of solid food (or none at all).

Table D7.7: Feeding practices during suspected acute respiratory infection in the last two weeks, among children 0-59 months

	Baseline 2013			Second Follow-Up 2017		
	n	%	SE	n	%	SE
Volume of fluids (including breastmilk) given during illness						
No fluids	4	1.4	0.7	8	3.0	1.1
Much less	37	13.7	2.2	25	10.4	1.9
Somewhat less	72	28.7	3.6	117	46.4	5.1
About the same	140	53.6	2.9	94	36.6	5.4
More	7	2.6	1.2	10	3.6	1.2
Don't know	1	-	-	2	-	-
Decline to respond	0	-	-	0	-	-
Volume of solid foods given during illness						
No solids	9	3.5	1.0	12	5.1	2.1
Much less	42	15.9	2.8	33	12.8	2.4
Somewhat less	94	37.2	3.7	127	50.2	5.3
About the same	113	42.5	3.4	81	31.4	5.1
More	2	0.9	0.7	1	0.5	0.5
Don't know	1	-	-	1	-	-
Decline to respond	0	-	-	1	-	-

D7.3 Diarrhea

Dehydration caused by severe diarrhea in a major cause of morbidity and mortality among children. Exposure to diarrheal disease-causing agents is frequently a result of use of contaminated water and unhygienic practices related to food preparation and disposal of feces. The prevalence of diarrhea was estimated by asking caregivers whether their children aged 0-59 months had had diarrhea in the two weeks preceding the interview. If the child had had diarrhea, the caregiver was asked about treatment and feeding practices during the diarrheal episode.

D7.3.1 Prevalence

Table D7.8 shows the proportion of children aged 0-59 months with diarrhea in the two weeks preceding the interview, as reported by their caregivers (10.4% at the second follow-up). One percent of children had bloody diarrhea.

Table D7.8: Prevalence of diarrhea in the last two weeks, among children aged 0-59 months

	Baseline 2013			Second Follow-Up 2017		
	n	%	SE	n	%	SE
No diarrhea	686	86.5	1.3	655	89.6	1.4
Diarrhea without blood	91	12.0	1.3	70	9.4	1.3
Diarrhea with blood	13	1.5	0.4	7	1.0	0.4
Don't know	13	-	-	3	-	-
Decline to respond	2	-	-	0	-	-

D7.3.2 Utilization of health services for diarrhea

Nearly half of children with diarrhea were taken for evaluation and/or treatment of their condition (Table D7.9). Care for these children was often sought in the public sector, although private health centers were visited by 17% of these cases at the second follow-up.

Table D7.9: Utilization of health services for diarrhea in the last two weeks, among children aged 0-59 months

	Baseline 2013				Second Follow-Up 2017			
	n	N	%	SE	n	N	%	SE
Sought care for diarrhea	55	104	49.2	5.8	47	77	61.8	4.9

	Baseline 2013			Second Follow-Up 2017		
	n	%	SE	n	%	SE
Type of medical facility where care was sought						
Public hospital	9	17.3	5.6	5	10.6	4.2
Public health center/clinic	11	21.5	6.4	8	17.7	5.3
Public health post	0	0.0	-	10	21.2	9.0
Public mobile clinic	0	0.0	-	0	0.0	-
Other public facility	1	2.4	2.5	0	0.0	-
Private hospital	0	0.0	-	2	3.7	2.7
Private health center/clinic	4	6.6	3.1	7	11.8	5.7
Private practice	6	9.4	3.5	3	5.3	3.5
Private mobile clinic	0	0.0	-	0	0.0	-
Other private facility	0	0.0	-	0	0.0	-
Pharmacy	7	12.7	4.8	10	25.5	6.0
Community health worker	0	0.0	-	0	0.0	-
Traditional healer	1	1.5	1.5	0	0.0	-
Home of a community health worker	0	0.0	-	0	0.0	-
School	0	0.0	-	0	0.0	-
Casa base	0	0.0	-	1	2.4	2.2
Public health unit	11	19.8	5.8	0	0.0	-
Other	5	8.8	5.2	1	1.6	1.7
Don't know	0	-	-	0	-	-
Decline to respond	0	-	-	0	-	-

* Options for "Public health center", "Public health post", "Home of a traditional healer", "School", and "Casa base" were not available at baseline. Options for "Public health unit" and "Public health center/clinic" were not available at follow-up. "Public health center" responses from follow-up are grouped within "Public health center/clinic".

D7.3.3 Utilization of treatments for diarrhea

A simple and effective response to dehydration caused by diarrhea is a prompt increase in the child's fluid intake through some form of oral rehydration therapy. Oral rehydration therapy may include the use of a solution prepared from commercially produced packets of powdered oral rehydration salts, commercially-produced bottled oral serums, or homemade fluids usually prepared from sugar, salt, and water. Other treatments, including zinc, may be administered as well.

Although care was sought in only 61.8% of diarrhea cases, 90.4% of cases were given some form of treatment at the second follow-up. Fluid made with powdered oral rehydration salts was the most common form oral rehydration therapy (51%). Sixteen percent of cases were treated with zinc syrup or pills. Twenty six percent of cases were treated with an antibiotic pill.

Table D7.10: Utilization of treatments for diarrhea during the last two weeks, among children aged 0-59 months

	Baseline 2013				Second Follow-Up 2017			
	n	N	%	SE	n	N	%	SE
Any treatment	91	104	85.0	3.4	70	77	90.4	3.5
Fluids								
Fluid made with powdered oral rehydration salts	50	104	46.0	5.2	40	77	51.0	5.0
Bottled oral rehydration serum	10	104	9.2	2.0	22	77	28.2	6.5
Homemade fluid recommended by health authorities	11	103	10.0	3.5	19	77	25.5	5.4
Medications								
Antibiotic pill	15	104	14.8	3.0	19	76	25.6	6.4
Antidiarrheal pill	8	104	9.3	3.5	7	75	10.1	2.9
Zinc pill	6	104	5.3	2.4	6	75	7.9	3.5
Other type of pill	5	104	4.7	2.0	4	75	4.9	2.3
Unknown pill	13	103	14.4	3.5	4	75	5.7	3.2
Antibiotic injection	0	104	0.0	-	3	75	4.3	2.3
Non-antibiotic injection	0	104	0.0	-	0	75	0.0	-
Unknown injection	0	104	0.0	-	1	75	1.3	1.3
Intravenous therapy	0	104	0.0	-	0	75	0.0	-
Home remedy/herbal medicine	15	104	12.5	3.6	15	75	20.5	4.2
Antibiotic syrup	24	104	20.7	5.0	19	75	23.1	4.9
Antidiarrheal syrup	9	103	7.4	2.2	9	76	14.1	4.3
Zinc syrup	2	104	2.3	1.5	6	75	8.0	3.3
Other syrup	6	104	5.4	2.1	3	74	3.9	2.0
Unknown syrup	2	104	1.8	1.3	1	74	1.1	1.1

*We did not have a category for "other" diarrhea treatment besides pills, injections, or syrups in Nicaragua.

D7.3.4 Feeding practices during diarrhea

Caregivers are encouraged to continue feeding children normally when they suffer from diarrheal diseases and to increase the fluids they are given. These practices help to prevent dehydration and minimize the adverse consequences of diarrhea on the child's nutritional status.

Data on feeding practices during the recent diarrheal episode are summarized in Table D7.11. The table shows the volume of fluids and the volume of solids given during the illness. Only 3.8% of children were given more fluids than usual in the second follow-up survey. Approximately 59% of children were offered less fluid than usual (or none at all). Thirty five percent of children were offered the same volume of solid food as usual during their illness. Approximately 65% of children were given less than the usual amount of solid food (or none at all).

Table D7.11: Feeding practices among children aged 0-59 months who had diarrhea in the last two weeks

	Baseline 2013			Second Follow-Up 2017		
	n	%	SE	n	%	SE
Volume of fluids (including breastmilk) given during illness						
No fluids	2	1.5	1.1	4	5.3	2.6
Much less	13	12.4	3.1	8	9.4	3.5
Somewhat less	36	34.5	4.6	33	44.8	8.5
About the same	45	44.4	4.5	28	36.7	7.6
More	8	7.1	2.7	3	3.8	1.9
Don't know	0	-	-	1	-	-
Decline to respond	0	-	-	0	-	-
Volume of solid foods given during illness						
No solids	5	4.5	1.9	8	10.7	3.9
Much less	18	18.4	4.0	8	10.5	3.2
Somewhat less	33	30.9	3.4	34	44.2	7.8
About the same	46	44.0	4.2	27	34.6	7.3
More	2	2.2	1.6	0	0.0	-
Don't know	0	-	-	0	-	-
Decline to respond	0	-	-	0	-	-

D7.4 Immunization against common childhood illnesses

Information on immunization coverage was collected for all children aged 0-59 months whose caregivers participated in the survey. Both caregiver's report and review of vaccination card (if available) were used to determine coverage. A vaccination card was available for review for 557 children at the second follow-up (75.8% of the sample, unweighted). In Table D7.12, coverage is estimated by vaccine type to include all children with full compliance for age as specified in the national immunization scheme at the time of the survey, according to either an affirmative response from the caregiver that the immunization was received, or a mark that the immunization was received on the vaccination card (for children with a vaccination card available for review at the time of the interview). Children too young to have received a specific vaccine are counted as covered in order to maintain a comparable all-ages sample across vaccine types.

Table D7.12: Immunization against common childhood illnesses, children aged 0-59 months, according to caretaker recall and vaccination card

	Baseline 2013				Second Follow-Up 2017			
	n	N	%	SE	n	N	%	SE
BCG vaccine (tuberculosis)	787	799	98.2	1.0	704	711	99.1	0.3
Polio vaccine	686	797	85.0	2.3	636	707	89.9	1.1
Pentavalent vaccine (DPT, HepB, HiB)	688	797	85.3	2.3	650	709	91.5	1.1
Rotavirus vaccine	639	796	79.7	2.2	617	694	88.3	2.5
Pneumococcal conjugate vaccine	766	803	95.2	1.1	619	688	89.8	1.5
Measles, mumps, and rubella (MMR) vaccine	764	794	95.8	0.8	681	694	98.2	0.5
Diphtheria, tetanus, and pertussis (DPT) vaccine	670	795	83.2	2.3	641	702	91.3	0.9

*Pneumococcal vaccine was added to national vaccine scheme during 2012, so children born before 2012 are compliant without receiving the vaccine.

*In November 2014, Nicaragua switched from 3-dose rotavirus vaccine to 2-dose (at 2 and 4 months). Supplies of 3-dose vaccine were to be applied until used up. Therefore, children born after September 2014 are considered compliant with two doses.

* MMR compliance is defined consistent with the indicator manual as one dose at 12 months, and does not take into account the second dose required by the national scheme at 18 months.

In Table D7.13, coverage estimates based on recall are summarized for the full sample, and coverage estimates based on vaccination card data are summarized among the subset with a vaccination card available for review. When considering only caregivers' recall, only 65.9% of children aged 0-59 months were fully immunized for age at the second follow-up survey, reflecting many "Don't know" or "Decline" responses that call into question the reliability and validity of the caregiver recall data. Caregivers were able to definitively answer the entire vaccine recall section for only 555 children at the second follow-up. Immunization coverage for children 0-59 months based only upon the vaccine card is 60.7%, and when combined with recall-based information, the estimate of full vaccination for age among children 0-59 months is 81%.

Table D7.13: Full immunization compliance for age, children aged 0-59 months

	Baseline 2013				Second Follow-Up 2017			
	n	N	%	SE	n	N	%	SE
According to recall + card	569	790	71.2	3.0	550	677	81.0	2.6
According to caregiver's recall	454	743	61.3	3.1	372	555	65.9	3.1
According to vaccine card	458	795	56.8	2.9	438	733	60.7	2.9

D7.5 Deworming treatment

Administration of deworming treatment every six months has been shown to reduce the prevalence of anemia in children. Only 36% of children aged 12-59 months received at least two doses of deworming treatment in the year preceding the second follow-up interview (Table D7.14).

Table D7.14: Deworming treatment among children aged 12-59 months

	Baseline 2013			Second Follow-Up 2017		
	n	%	SE	n	%	SE
No deworming	176	28.5	1.9	175	30.3	2.8
One dose	226	36.5	1.7	192	33.7	2.3
Two or more doses	217	35.0	1.9	210	36.0	2.7
Don't know	2	-	-	2	-	-
Decline to respond	0	-	-	0	-	-

Figure D7.3: Children 18-59 months of age who received 2 doses of deworming treatment in the past year by municipality, second follow-up survey

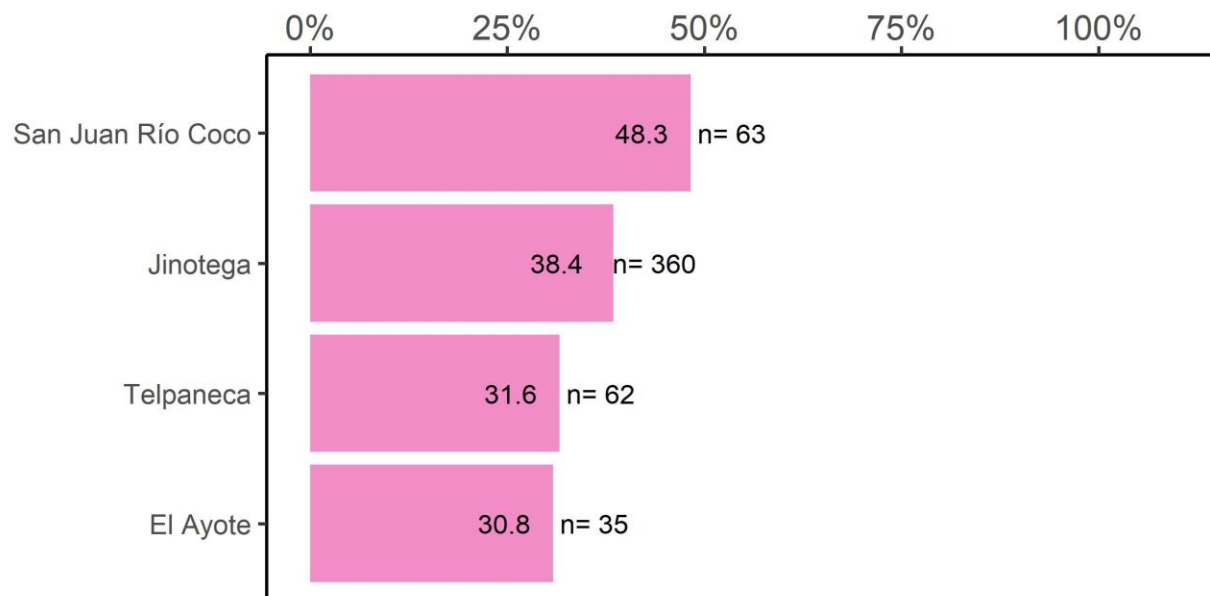
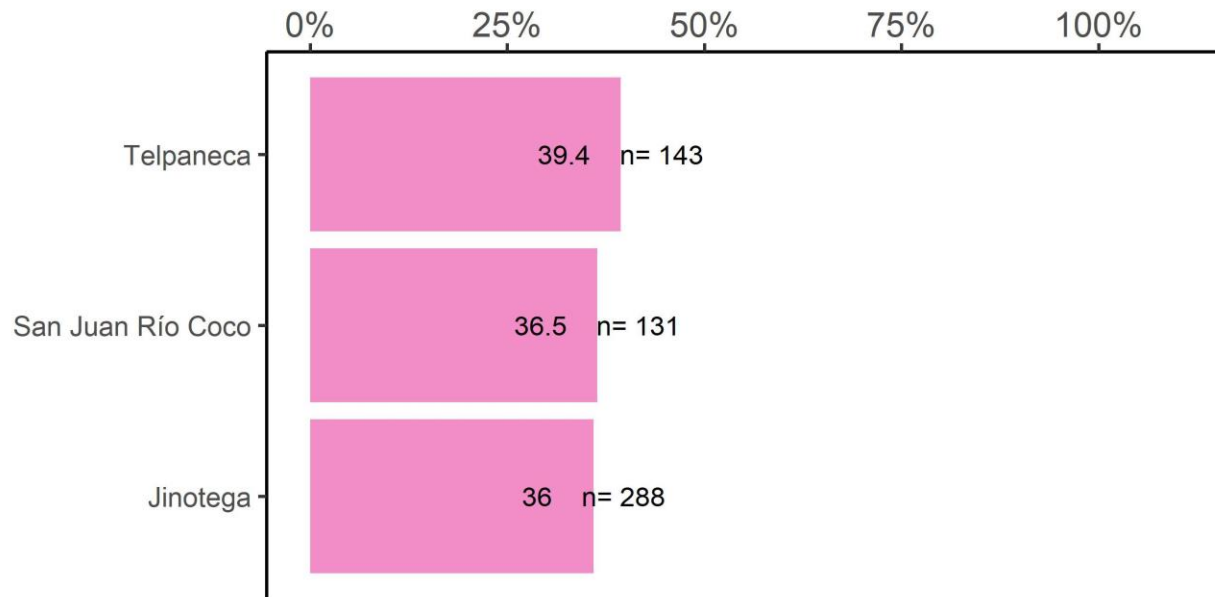


Figure D7.4: Children 18-59 months of age who received 2 doses of deworming treatment in the past year by municipality, baseline survey



D8. Chapter 8: INFANT AND YOUNG CHILDREN FEEDING PRACTICES

This chapter summarizes the feeding practices of infants and children aged 0-59 months whose caregivers participated in the SMI-Nicaragua Household Survey. All data summarized in this chapter are based on the caregiver's report.

D8.1 Breastfeeding

D8.1.1 Exclusive breastfeeding

Coverage of exclusive breastfeeding is defined as the percentage of infants born in the six months prior to the survey who received only breast milk during the previous day. This information is obtained through a 24-hour dietary recall in which the caregiver indicates what the child consumed during the previous day and night. In Nicaragua during the second follow-up, the sample includes 68 children who are under 6 months of age, and 25 of those children have sufficiently complete dietary recall information to determine whether they are exclusively breastfed. Table D8.1 shows that 37.8% of children under 6 months of age are exclusively breastfed.

D8.1.2 Continued breastfeeding at 1 year

Coverage of continued breastfeeding at 1 year is defined as the percentage of children 12-15 months old who received breast milk during the previous day according to caregiver's dietary recall. In Nicaragua during the second follow-up, the sample includes 55 children who are between 12 and 15 months of age, and 39 of those children have adequate responses to determine their breastfeeding status. Table D8.1 shows that 70.6% of children continue to receive breast milk at 1 year.

Table D8.1: Breastfeeding among children

	Baseline 2013				Second Follow-Up 2017			
	n	N	%	SE	n	N	%	SE
Exclusive breastfeeding among children <6 months	33	81	42.7	6.2	25	68	37.8	8.5
Continued breastfeeding at one year among children 12-15 months	32	55	55.9	7.1	39	55	70.6	7.5

D8.2 Acceptable diet

D8.2.1 Introduction of solid, semi-solid, or soft foods

Coverage of appropriate introduction of solid foods is measured as the percentage of infants 6-8 months of age who received solid or semi-soft foods during the previous day according to caregiver's dietary recall. In Nicaragua during the second follow-up, the sample includes 36 children who are 6-8 months of age, and

31 of those children have sufficiently complete dietary recall information. Table D8.2 shows that 88.1% of children consumed solid or semi-soft foods.

D8.2.2 Dietary diversity

Coverage of minimum dietary diversity is measured as the percentage of children 6-23 months of age who received foods from at least four food groups during the previous day according to caregiver's dietary recall. In Nicaragua during the second follow-up, the sample includes 221 children who are 6-23 months of age, and 127 of those children have sufficiently complete dietary recall information to determine dietary diversity. Table D8.2 shows that 56.5% of children achieved the minimum dietary diversity during the previous day.

D8.2.3 Meal frequency

Coverage of minimum meal frequency is measured as the percentage of children 6-23 months of age who received solid foods at least the minimum number of times the previous day, based on age and breastfeeding status. For breastfed children, the minimum is two times for children 6-8 months of age and three times for children 9-23 months of age. For non-breastfed children, the minimum number is four times for all children 6-23 months of age. This information is obtained through caregiver's dietary recall. In Nicaragua during the second follow-up, the sample includes 221 children who are 6-23 months of age, and 130 of those children have sufficiently complete dietary recall information to determine meal frequency. Table D8.2 shows that 60.2% of children achieved the minimum meal frequency during the previous day.

D8.2.4 Minimum acceptable diet

Coverage of minimum acceptable diet is measured for children 6-23 months of age. For breastfed children to meet the minimum acceptable diet they must have had at least the minimum dietary diversity and the minimum meal frequency during the previous day. For non-breastfed children to meet the minimum acceptable diet they must have had at least two milk feedings, as well as at least the minimum dietary diversity (not including milk feedings) and the minimum meal frequency during the previous day. This information is obtained through caregiver's dietary recall. In Nicaragua during the second follow-up, the sample includes 221 children who are 6-23 months of age, and 72 of those children have sufficiently complete dietary recall information to determine minimum acceptable diet. Table D8.2 shows that 32.6% of children achieved the minimum acceptable diet during the previous day.

D8.2.5 Consumption of iron-rich or iron-fortified foods

Consumption of iron-rich foods is measured as the percentage of children 6-23 months of age who receive an iron-rich food (e.g., liver, beef, or fish), an iron supplement, or a fortified food that is specially designed for infants and young children, or a food fortified in the home with a product that included iron during the previous day. This information is obtained through caregiver's dietary recall. In Nicaragua during the

second follow-up, the sample includes 221 children who are 6-23 months of age and 127 of those children have sufficiently complete dietary recall information to determine iron consumption. Table D8.2 shows that 55.7% of children consumed an iron-rich food during the previous day.

Table D8.2: Acceptable diet among children 6-23 months

	Baseline 2013				Second Follow-Up 2017			
	n	N	%	SE	n	N	%	SE
Introduction of solid foods among children 6-8 months	38	45	84.2	5.7	31	36	88.1	4.5
Minimum meal frequency among children 6-23 months	122	216	56.4	3.6	130	216	60.2	3.5
Minimum dietary diversity among children 6-23 months	133	251	51.8	4.5	127	221	56.5	5.3
Consumption of iron-rich foods among children 6-23 months	105	251	40.0	4.0	127	221	55.7	5.7
Minimum acceptable diet among children 6-23 months	59	247	23.3	4.1	72	220	32.6	4.1

D8.3 Micronutrient supplementation

D8.3.1 Vitamin A

Interviewers asked the caregiver if their child received a dose of vitamin A in the last six months. Table D8.3 shows that of the 734 sampled children 0-59 months of age in the second follow-up, 65.4% received a dose of vitamin A in the last six months.

D8.3.2 Iron

Interviewers showed the caregiver photos of common types of bottles, powders, or syrups and asked if their child received iron pills, powder, or syrup in the last day. Table D8.3 shows that of the 734 children 0-59 months of age in the second follow-up sample, 10.1% received a dose of iron in the last day.

Table D8.3: Vitamin A and Iron consumption among children 0-59 months

	Baseline 2013				Second Follow-Up 2017			
	n	N	%	SE	n	N	%	SE
Vitamin A in the last six months	416	795	50.9	2.4	441	673	65.4	2.7
Iron supplement the previous day	56	801	6.6	0.9	77	731	10.1	1.5

D8.3.3 Packets of micronutrients

Interviewers showed the caregiver a card with packets of micronutrients and asked how many packets their child received from a health facility and consumed in the last six months. Children are intended

to take 60 consecutive daily doses of micronutrient powder in each of three rounds, beginning at age 6, 12, and 18 months, with an adequate consumption considered to be 50 packets. Table D8.4 shows that among children 6-23 months of age sampled in the second follow-up, 96.5% received no packets of micronutrients from a health facility in the last six months.

Table D8.4: Micronutrient powders among children 6-23 months

	Baseline 2013				Second Follow-Up 2017			
	n	N	%	SE	n	N	%	SE
Received any micronutrient packets from health facility in the last six months	6	243	2.8	1.6	7	218	3.5	1.9
Consumed any micronutrient packets	6	243	2.8	1.6	8	219	4.0	1.9
Consumed adequate dose (≥ 50 packets) of micronutrient powders	3	243	1.3	1.0	1	219	0.3	0.3

* Identical questions were asked in baseline and second follow-up surveys, but the second follow-up interview included photos of the micronutrient products. The baseline survey predated the intervention, so it is possible that questions about receipt and consumption were interpreted by caregivers to include different types of micronutrient supplements at baseline.

D9. CHAPTER 9: NUTRITIONAL STATUS IN CHILDREN

The nutritional status of children aged 0-59 months is an important outcome measure of children's health. The SMI-Nicaragua Second Follow-up Household Survey collected data on the nutritional status of children by measuring the height and weight of all children aged 0-59 months residing in surveyed households, using standard procedures. Hemoglobin levels of these children were also assessed in the field, using a portable HemoCue™ machine, and these data were used to estimate anemia prevalence. As described in Chapter 1, medically trained personnel who were specifically trained to standardize the anthropometric and hemoglobin measurements conducted the testing. This evaluation allows identification of subgroups of the child population that are at increased risk of malnutrition. The parents of anemic children (hemoglobin level <11.0 g/dL, with altitude adjustment) were informed of this result in real-time and were referred for treatment to the appropriate health service.

Three indicators were calculated using the weight and height data – weight-for-age, height-for-age, and weight-for-height. For this report, indicators of the children's nutritional status were calculated using growth standards published by the World Health Organization (WHO) in 2006. The growth standards were generated using data collected in the WHO Multicenter Growth Reference Study. The findings of the study, whose sample included children in six countries (Brazil, Ghana, India, Norway, Oman, and the United States), describe how children should grow under optimal conditions. As such, the WHO Child Growth Standards can be used to assess children all over the world, regardless of ethnicity, social and economic influences, and feeding practices. The three indicators are expressed in standard deviation units from the median in the Multicenter Growth Reference Study.

A total of 711 children aged 0-59 months participated in the SMI-Nicaragua second follow-up. In practice, 711 of these children underwent the physical measurement module. Height and weight data are presented for 702 of these children (98.7%, unweighted). Six hundred forty three children 6-59 months of age were eligible for the anemia test. Hemoglobin was measured in 595 children (92.5%, unweighted, of children 6-59 months of age). Parental consent was refused for 41 children, three were not measured because anthropometrists could not obtain a sufficient capillary blood sample or any sample at all, and four cases were not tested for other reasons (for example, because the child did not cooperate). The age and sex distribution of children participating in the physical measurement module in the second follow-up is displayed in Figure D9.2 and Figure D9.4.

Figure D9.1: Height and weight measured: Age and sex of sample, unweighted percent distribution of the de facto population, baseline survey

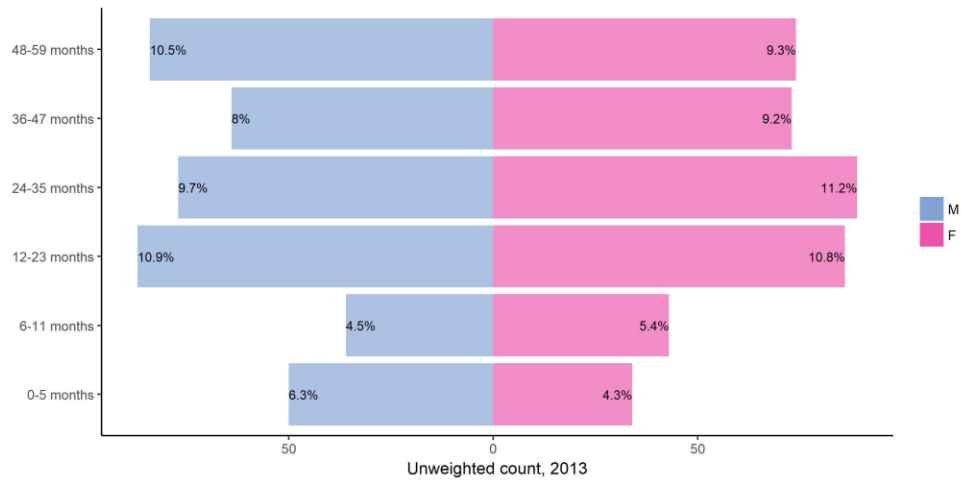


Figure D9.2: Height and weight measured: Age and sex of sample, unweighted percent distribution of the de facto population, follow-up survey

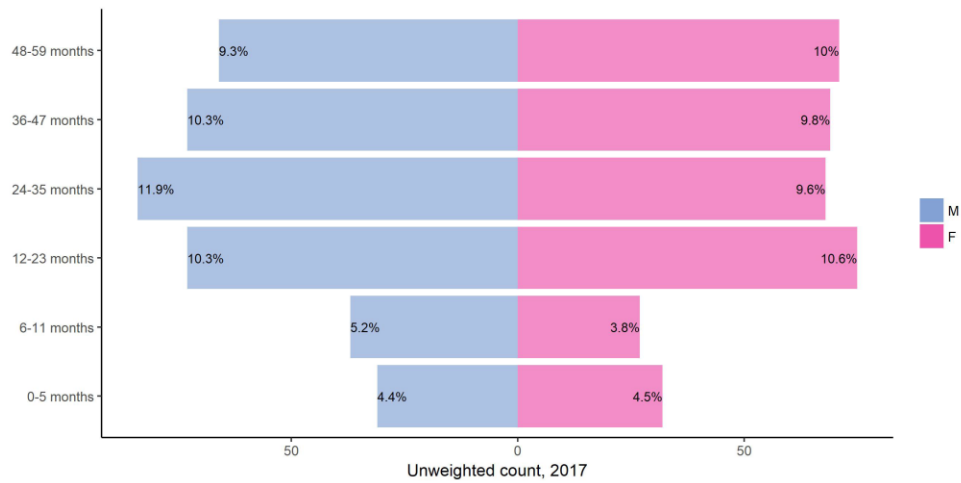


Figure D9.3: Hemoglobin measured: Age and sex of sample, unweighted percent distribution of the de facto population, baseline survey

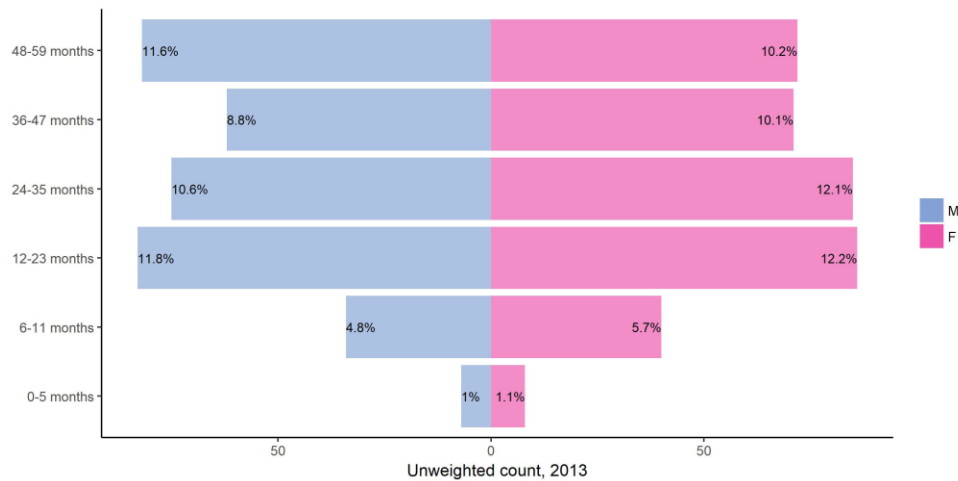
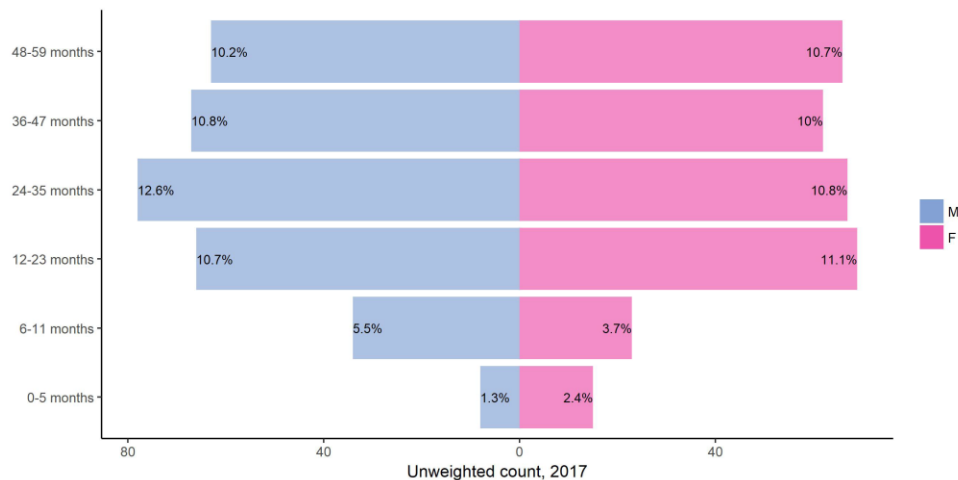


Figure D9.4: Hemoglobin measured: Age and sex of sample, unweighted percent distribution of the de facto population, follow-up survey



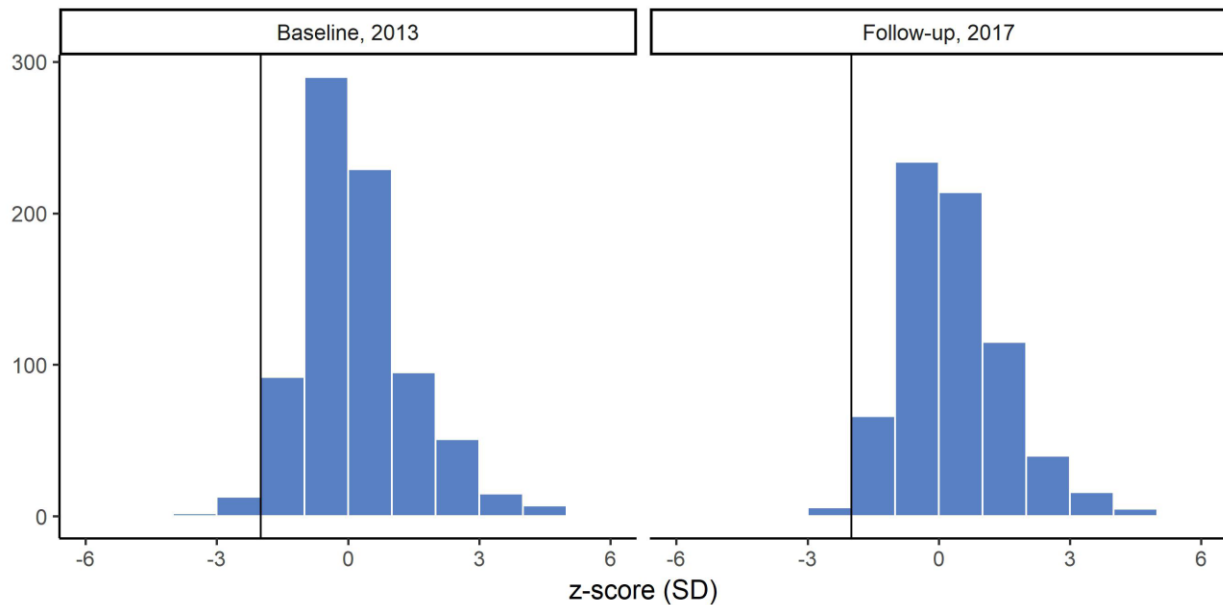
D9.1 Weight-for-Age

Weight-for-age is a good overall indicator of a population's general health, as it reflects the effects of both acute and chronic undernutrition. The weight-for-age indicator does not distinguish between chronic malnutrition (stunting) and acute malnutrition (wasting); a child can be underweight because of stunting, wasting, or both. Children with weight-for-age below minus two standard deviations (-2 SD) are classified as underweight. Children with weight-for-age below minus three standard deviations (-3 SD) are considered severely underweight.

D9.1.1 Unweighted distribution of weight-for-age z-scores

Figure D9.5 shows the distribution of weight-for-age z-scores among all children aged 0-59 months whose measurements were taken. The vertical black lines in the figure denote minus two standard deviations – children to the left of the line are classified as underweight.

Figure D9.5: Distribution of weight-for-age z-scores among children 0-59 months, unweighted



D9.1.2 Prevalence of underweight

As shown in Table D9.1, 3% of children aged 0-59 months in the second follow-up are underweight (have low weight-for-age) and 1% are severely underweight. The proportion of underweight children is highest (2.4%) in the age groups 24 to 59 months and lowest (8.7%) among those under 6 months. Female children (1.4%) are less likely to be underweight than male children (3.7%).

Table D9.1: Prevalence of underweight in children aged 0-59 months

	Baseline 2013				Second Follow-Up 2017			
	n	N	%	SE	n	N	%	SE
Prevalence of underweight in children 0-59 months, by sex and age (< -2 SD)								
Male	15	398	3.7	0.8	12	363	3.7	1.2
Female	14	399	3.6	0.9	5	340	1.4	0.7
0-5 months	2	84	2.1	1.4	5	67	8.7	4.1
6-11 months	0	79	0.0	-	1	64	1.2	1.2
12-23 months	1	173	0.5	0.5	4	146	3.1	1.8
24-59 months	26	461	5.8	1.0	10	429	2.4	0.7
0-59 months	29	797	3.7	0.6	20	706	3.0	0.6
6-23 months	1	252	0.3	0.3	5	210	2.5	1.2
Prevalence of severe underweight in children 0-59 months, by sex and age (< -3 SD)								
Male	4	398	0.9	0.4	2	363	0.6	0.4
Female	6	399	1.6	0.6	2	340	0.5	0.4
0-5 months	1	84	1.2	1.1	4	67	6.9	3.9
6-11 months	0	79	0.0	-	0	64	0.0	-
12-23 months	1	173	0.5	0.5	1	146	0.6	0.6
24-59 months	8	461	1.8	0.6	2	429	0.4	0.3
0-59 months	10	797	1.2	0.4	7	706	1.0	0.4
6-23 months	1	252	0.3	0.3	1	210	0.4	0.4
Prevalence of high weight for age in children 0-59 months, by sex and age (> 2 SD)								
Male	40	398	9.9	1.7	28	363	8.2	1.7
Female	25	399	6.0	1.1	29	340	8.6	1.2
0-5 months	26	84	29.6	4.0	24	67	35.5	4.8
6-11 months	10	79	14.5	4.3	5	64	7.0	2.8
12-23 months	13	173	7.2	2.2	14	146	9.7	2.4
24-59 months	16	461	3.1	1.0	14	429	3.7	1.2
0-59 months	65	797	7.9	1.1	57	706	8.3	1.1
6-23 months	23	252	9.4	2.4	19	210	8.8	1.9

D9.2 Height-for-Age

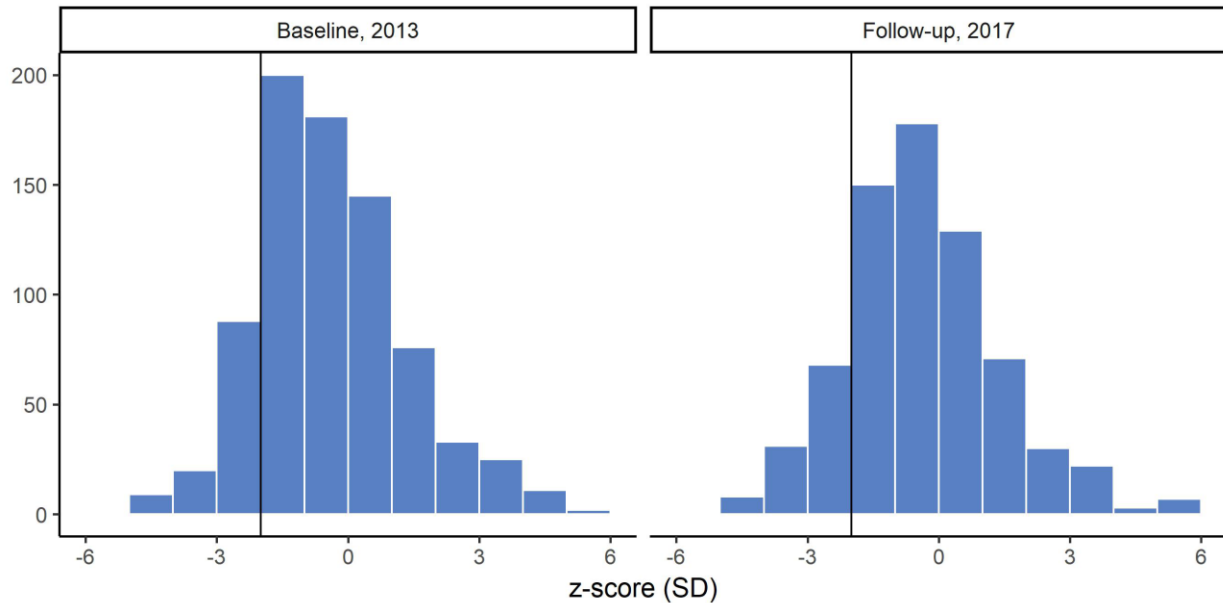
Height-for-age is an indicator of linear growth retardation and cumulative growth deficits in children. Children whose height-for-age z-score is below minus two standard deviations (-2 SD) from the median of the WHO reference population are considered short for their age (stunted) or chronically malnourished. Children who are below minus three standard deviations (-3 SD) are considered severely stunted. Stunting reflects failure to receive adequate nutrition over a long period of time and is affected by recurrent and chronic illness. Height-for-age, therefore, represents the long-term effects of malnutrition in a population and is not sensitive to recent, short-term changes in dietary intake.

D9.2.1 Distribution of height-for-age z-scores

Figure D9.6 presents the distribution of height-for-age z-scores among all children aged 0-59 months whose measurements were taken. The vertical black lines in the figure denote minus two standard

deviations – children to the left of the line are classified as stunted.

Figure D9.6: Distribution of height-for-age z-scores among children 0-59 months, unweighted



D9.2.2 Prevalence of stunting

Table D9.2 presents the prevalence of stunting in children aged 0-59 months as measured by height-for-age. In the second follow-up, 15.2% of children under age 5 are stunted and 5.9% are severely stunted. Analysis of the indicator by age group shows that stunting is highest (18.2%) in children 24-59 months and lowest (8.7%) in children aged 0-5 months. Children 12-23 months old have the highest proportion of severely stunted children (4.6%) while the youngest age group (0-5 months) has the lowest proportion (6.9%). A higher proportion (16.8%) of male children is stunted compared with the proportion of female children (12.7%).

Table D9.2: Prevalence of stunting in children aged 0-59 months

	Baseline 2013				Second Follow-Up 2017			
	n	N	%	SE	n	N	%	SE
Prevalence of stunting in children 0-59 months, by sex and age (< -2 SD)								
Male	60	398	16.4	2.5	61	363	16.8	3.3
Female	61	399	16.3	2.4	45	339	12.7	2.6
0-5 months	2	84	1.9	1.3	5	67	8.7	4.1
6-11 months	3	79	3.3	2.4	5	64	6.2	3.3
12-23 months	15	173	9.5	1.6	20	146	13.5	2.8
24-59 months	101	461	23.9	2.9	79	428	18.2	3.6
0-59 months	121	797	16.4	2.0	109	705	15.2	2.6
6-23 months	18	252	7.7	1.2	25	210	11.1	2.4
Prevalence of severe stunting in children 0-59 months, by sex and age (< -3 SD)								
Male	19	398	5.1	1.1	23	363	6.6	1.7
Female	15	399	3.9	0.9	15	339	4.2	1.3
0-5 months	0	84	0.0	-	4	67	6.9	3.9
6-11 months	1	79	1.1	1.2	2	64	2.4	1.8
12-23 months	6	173	3.8	1.4	6	146	4.6	1.6
24-59 months	27	461	6.2	1.2	29	428	6.7	1.7
0-59 months	34	797	4.5	0.8	41	705	5.9	1.3
6-23 months	7	252	3.0	1.0	8	210	3.9	1.1

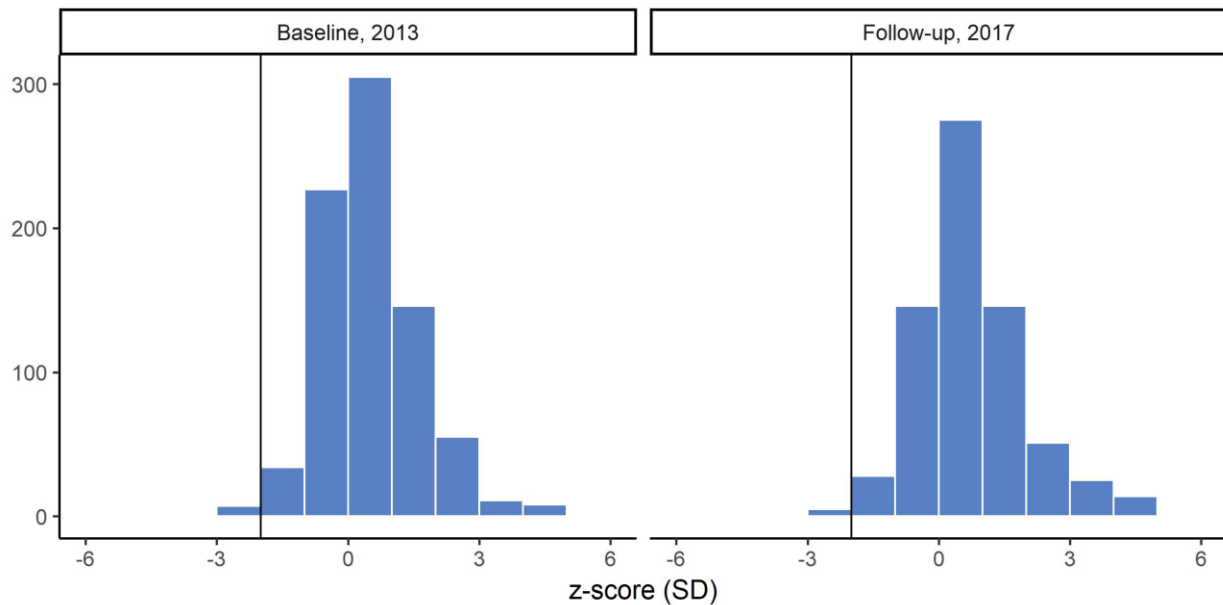
D9.3 Weight-for-Height

The weight-for-height indicator measures body mass in relation to body height or length and describes current nutritional status. Children with z-scores below minus two standard deviations (-2 SD) are considered thin (wasted) or acutely malnourished. Wasting represents the failure to receive adequate nutrition in the period immediately preceding the survey and may be the result of inadequate food intake or a recent episode of illness causing loss of weight and the onset of malnutrition. Children with a weight-for-height index below minus three standard deviations (-3 SD) are considered severely wasted. This weight-for-height indicator also provides data on over-weight and obesity. Children more than two standard deviations (+2 SD) above the median weight-for-height are considered overweight or obese.

D9.3.1 Distribution of weight-for-height z-scores

Figure D9.7 shows the distribution of weight-for-height z-scores among all children aged 0-59 months whose measurements were taken. The vertical black lines in the figure denote minus two standard deviations – children to the left of the line are classified as wasted.

Figure D9.7: Distribution of weight-for-height z-scores among children 0-59 months, unweighted



D9.4 Prevalence of Wasting

Table D9.3 shows the breakdown of nutritional status of children aged 0-59 months as measured by weight-for-height by age groups and sex. In the second follow-up, 1.1% of children are wasted and 0.2% of children are severely wasted. Analysis of the indicator by age group shows that wasting is highest (0%) in children 12-23 months old and lowest (1%) in children aged 6-11 months. Male children are more likely to be wasted than female children (1% to 1.2%). Male children are slightly more likely to be severely wasted (0.3%) than females (0.2%).

Overweight and obesity affect a greater proportion of children in SMI areas Nicaragua than wasting. In this sample, 13.8% of children are overweight or obese (weight-for-height more than +2 SD). The coexistence of both growth retardation and obesity reveals the burden of malnutrition in Nicaragua.

Table D9.3: Prevalence of underweight in children aged 0-59 months

	Baseline 2013				Second Follow-Up 2017			
	n	N	%	SE	n	N	%	SE
Prevalence of wasting in children 0-59 months, by sex and age (< -2 SD)								
Male	5	398	1.1	0.5	4	363	1.0	0.6
Female	9	398	2.3	0.7	4	339	1.2	0.6
0-5 months	3	84	3.2	1.7	1	63	2.0	1.9
6-11 months	0	79	0.0	-	1	64	1.0	1.1
12-23 months	3	173	1.9	1.1	0	146	0.0	-
24-59 months	8	460	1.7	0.8	6	428	1.4	0.5
0-59 months	14	796	1.7	0.5	8	701	1.1	0.4
6-23 months	3	252	1.3	0.7	1	210	0.3	0.3
Prevalence of severe wasting in children 0-59 months, by sex and age (< -3 SD)								
Male	2	398	0.4	0.3	1	363	0.3	0.3
Female	3	398	0.9	0.5	1	339	0.2	0.2
0-5 months	2	84	2.1	1.4	0	63	0.0	-
6-11 months	0	79	0.0	-	0	64	0.0	-
12-23 months	1	173	0.9	0.8	0	146	0.0	-
24-59 months	2	460	0.5	0.3	2	428	0.4	0.3
0-59 months	5	796	0.7	0.3	2	701	0.2	0.2
6-23 months	1	252	0.6	0.6	0	210	0.0	-
Prevalence of overweight in children 0-59 months, by sex and age (> 2 SD)								
Male	34	398	8.3	1.8	48	363	14.3	1.6
Female	36	398	9.2	1.7	46	339	13.3	2.5
0-5 months	8	84	7.5	2.3	11	63	17.3	4.7
6-11 months	11	79	16.9	6.1	5	64	9.1	4.7
12-23 months	12	173	6.6	2.4	19	146	13.7	2.5
24-59 months	39	460	8.4	1.7	59	428	14.1	1.8
0-59 months	70	796	8.7	1.3	94	701	13.8	1.5
6-23 months	23	252	9.7	2.2	24	210	12.2	2.1

D9.5 Anemia

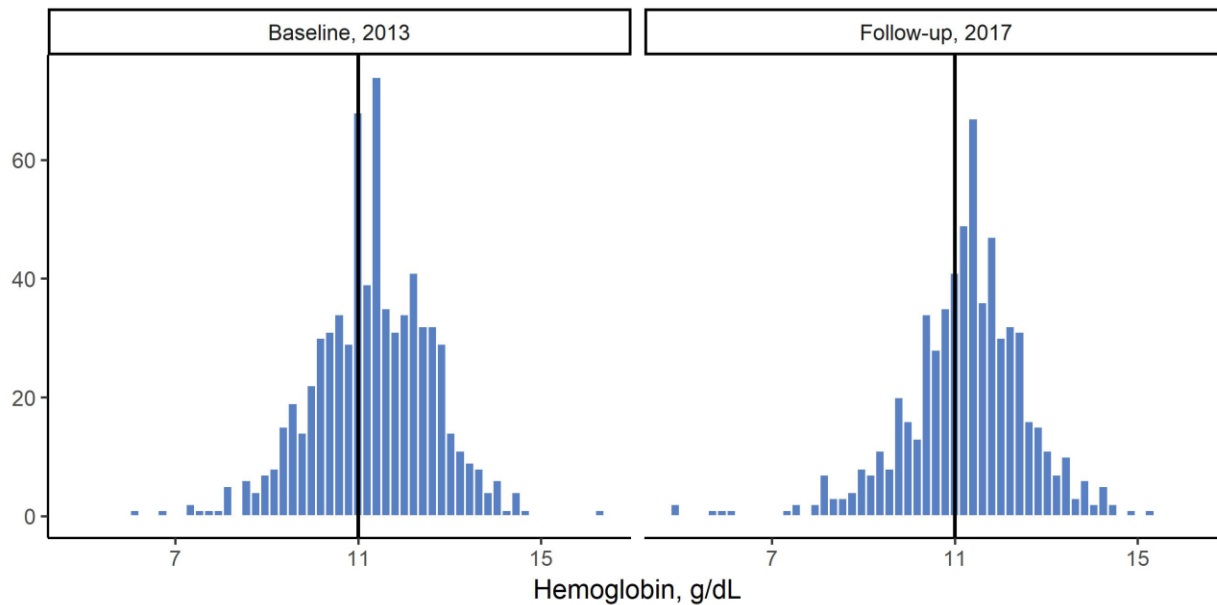
Anemia is a condition characterized by low concentration of hemoglobin in the blood. Hemoglobin is necessary for transporting oxygen to tissues and organs in the body. The reduction in oxygen available to organs and tissues when hemoglobin levels are low is responsible for most of the symptoms experienced by anemic persons. The consequences of anemia include general body weakness, frequent tiredness, and lowered resistance to disease. It is of concern in children because anemia is associated with impaired mental and motor development. Overall, morbidity and mortality risks increase for individuals suffering from anemia.

Common causes of anemia include inadequate intake of iron, folate, vitamin B12, or other nutrients. This form of anemia is commonly referred to as iron-deficiency anemia and is the most widespread form of anemia in the world. Anemia can also be the result of thalassemia, sickle cell disease, malaria, or intestinal worm infestation.

D9.5.1 Distribution of hemoglobin values

Figure D9.8 shows the distribution of hemoglobin values (in g/dL) among children 0-59 months of age. The vertical black lines in the figure denote a hemoglobin concentration of 11.0 g/dL – children to the left of the line are classified as anemic.

Figure D9.8: Distribution of altitude-adjusted hemoglobin values among children 0-59 months, unweighted



D9.5.2 Prevalence of anemia

Levels of anemia were classified as severe (<7.0 g/dL) and any (<11.0 g/dL) based on the hemoglobin concentration in the blood. The cutpoints for anemia are adjusted (raised) in settings where altitude is more than 1,000 meters above sea level, to account for lower oxygen partial pressure, a reduction in oxygen saturation of blood, and an increase in red blood cell production. Although some regions of Nicaragua are mountainous and well above 1,000 meters, the majority of the population resides at lower levels. The highest elevation of a surveyed household at the second follow-up was 1,384 meters above sea level; 49.5% of children (unweighted) lived above 1,000 meters. Correction for elevation was applied to anemia diagnosis where data collectors measured altitude over 1,000m (using a handheld GPS device).

Children whose hemoglobin levels are below 11 g/dL are considered anemic, and children who have hemoglobin levels below 7 g/dL are considered severely anemic. Table D9.4 indicates that 36.7% of children under age 5 in Nicaragua are anemic. Overall, the anemia prevalence is mostly mild to moderate (35.9%), with only 0.8% of children under 5 years presenting as severely anemic. Anemia prevalence is highest among children aged 0-5 months (48%) compared with the other children. More than 46.8% of all children aged 6-23 months, our targeted population for anemia intervention, were found to be anemic.

Table D9.4: Prevalence of anemia, children aged 0-59 months

	Baseline 2013				Second Follow-Up 2017			
	n	N	%	SE	n	N	%	SE
Prevalence of anemia in children 0-59 months, by sex and age								
Male	141	343	41.8	5.1	116	317	37.3	3.9
Female	149	362	40.8	4.2	105	302	35.9	2.9
0-5 months	8	15	53.3	9.8	11	23	48.0	14.4
6-11 months	45	74	59.2	7.3	26	57	48.1	8.0
12-23 months	79	169	46.5	5.9	59	135	46.1	5.3
24-59 months	158	447	35.8	4.4	125	403	31.4	3.4
0-59 months	290	705	41.2	4.1	221	618	36.7	2.9
6-23 months	124	243	50.2	5.9	85	192	46.8	4.8
Prevalence of severe anemia in children 0-59 months, by sex and age								
Male	2	343	0.8	0.5	2	317	0.6	0.4
Female	0	362	0.0	-	3	302	1.1	0.6
0-5 months	1	15	6.9	7.0	0	23	0.0	-
6-11 months	0	74	0.0	-	1	57	1.9	1.9
12-23 months	0	169	0.0	-	0	135	0.0	-
24-59 months	1	447	0.3	0.3	4	403	1.0	0.5
0-59 months	2	705	0.4	0.3	5	618	0.8	0.3
6-23 months	0	243	0.0	-	1	192	0.6	0.6

APPENDIX C. SMI HOUSEHOLD INDICATORS

Table D10.1: Performance of payment indicators

Indicator	Baseline 2013				Second Follow-Up 2017			
	n	N	%	SE	n	N	%	SE
NA Married or partnered women (age 15-49) who received family planning counseling by CHW or at facility	303	702	39.6	4.0	219	649	31.2	3.1
4030 Women (age 15-49) who received postpartum care within 10 days with skilled personnel in their most recent pregnancy in the last two years	309	413	74.1	2.9	308	338	89.4	2.8
5025 Children 12-23 months who received MMR vaccine according to card	138	169	82.5	2.9	117	152	78.3	2.8
5030 Children 18-59 months who received 2 doses of deworming in the last year	209	562	36.9	1.8	202	520	38.2	3.0

* The second follow-up survey included an additional question that asked if women were checked before discharge after delivering in facility. If a women was checked before discharge, she was considered to have passed this indicator. Due to the addition of this question, the baseline and follow-up values are not strictly comparable. Calculation comparable to baseline: 41.1 percent.

Table D10.2: Performance of monitoring indicators

Indicator	Baseline 2013				Second Follow-Up 2017			
	n	N	%	SE	n	N	%	SE
2010 Women (age 15-49) currently using (or whose partner is using) a modern method of family planning	521	599	89.1	1.5	506	581	83.8	2.7
1080 Women (age 15-49) with a live birth in the last year	183	1097	10.5	0.9	112	1045	6.2	0.7
1090 Women (age 15-19) with a live birth in the last year	29	215	8.0	1.7	16	193	4.3	1.0
2020 Women (age 15-49) who did not wish to become pregnant and who were not using/not have access to family planning methods (temporary and permanent)	78	599	10.9	1.5	75	581	16.2	2.7
2030 Women (age 15-49) who report having stopped using a method of family planning during the previous year	22	547	3.8	1.3	14	528	5.0	3.0
4110 Women (age 15-49) with a birth in the last two years who can recognize at least 5 danger signs in newborns	82	318	24.9	2.5	78	269	28.7	5.3
3010 Women (age 15-49) who received at least one antenatal care visit by skilled personnel in their most recent pregnancy in the last two years	398	413	96.2	1.3	317	338	93.9	1.7
3020 Women (age 15-49) who received at least four antenatal care visits by skilled personnel in their most recent pregnancy in the last two years	353	411	84.7	4.1	274	335	81.6	2.9
4101 Children born in the last two years receiving neonatal care by skilled personnel in a health facility within 10 days of birth in the last two years	276	373	72.1	3.6	243	309	78.1	3.1
5050 Children born in the last two years who were breastfed within one hour after birth	340	425	79.6	2.5	262	342	76.4	3.8
4010 Women (age 15-49) who delivered in facility with skilled attendant in their most recent pregnancy in the last two years	388	413	92.8	2.1	315	338	91.6	3.4
4030 Women (age 15-49) who received postpartum care within 7 days with skilled personnel in their most recent pregnancy in the last two years*	275	413	66.3	2.5	159	335	46.8	3.7
NA Women (age 15-49) who used a maternal waiting home during their most recent pregnancy in the last two years	58	413	14.5	3.7	63	338	20.9	4.1
5060 Children 0-59 months who received ORS and zinc in the last episode of diarrhea in the past two weeks	6	104	6.0	2.3	8	77	9.7	3.8

(continued)

Indicator		Baseline 2013				Second Follow-Up 2017			
		n	N	%	SE	n	N	%	SE
NA	Children 0-59 months fully vaccinated for age, according to vaccine card	458	795	56.8	2.9	438	733	60.7	2.9
5040	Children 0-5 months who were exclusively breastfed on the previous day	33	81	42.7	6.2	25	68	37.8	8.5
1060	Children 6-23 months with hemoglobin <110g/L	124	243	50.2	5.9	85	192	46.8	4.8
NA	Children 0-59 months with hemoglobin <110g/L	290	705	41.2	4.1	221	618	36.7	2.9
1070	Children 0-59 months with height <-2 SD of the mean of the reference population for age	121	797	16.4	2.0	110	706	15.4	2.6

APPENDIX E. INTERVENTION AND COMPARISON AREAS

E1 CHAPTER 1

E1.1 Report structure

The chapters in the main body of the report present characteristics of the surveyed SMI-Nicaragua sample in intervention areas only. Each table is presented for comparison areas only in Appendix D, and pooled intervention and comparison areas in Appendix E. Most tables take one of three types. Tabulations of select-only-one question types are mutually exclusive, so the proportions sum to 100%. Counts are shown for non-response (“Don’t know” or “Decline to respond” recorded), but these cases are always excluded from the denominator.

Tabulations of select-all-that-apply question types do not have mutually-exclusive categories, as respondents can report more than one option, and thus proportions do not sum to 100%. The table shows affirmative cases (n) and non-missing cases (N). Non-response is the difference between non-missing cases (N) and the total sample eligible for that section of the questionnaire, indicated at the start of the chapter. Where statistics are reported for subpopulations, the size of the subpopulation is reported in the same table or the preceding table for straightforward comparison.

Tabulations of continuous variables, where respondents were requested to provide a numeric response, present the range and quartiles (25th percentile, median, 75th percentile) in order to illustrate the distribution of responses across the sample. Counts of non-response are listed in the table and excluded from the count of non-missing cases (N).

E2 CHAPTER 2: CHARACTERISTICS OF HOUSEHOLDS

This chapter provides a descriptive summary of the basic demographic, socioeconomic, and environmental characteristics of the households sampled for the SMI-Nicaragua Baseline and Second Follow-up Household Survey.

E2.1 Characteristics of Participating Households

A total of 2,625 households in the Nicaragua second follow-up completed the household characteristics questionnaire. In the baseline, 2,057 completed the survey. The remainder of this chapter is dedicated to a summary of the basic demographic, socioeconomic, and environmental characteristics of the households completing the household characteristics questionnaire.

E2.2 Age and Sex Composition, SMI Census

The unweighted distribution of the de facto household population in the surveyed households in the SMI-Nicaragua household census by five-year age groups and by sex is shown for baseline (Figure E2.1) and second follow-up (Figure E2.2). Nicaragua has a larger proportion of its population in the younger age groups than in the older age groups. Figure E2.2 indicates that in the second follow-up, just under 34 % of the population in the Second Follow-up is under age 15 years, more than half (61%) of the population is in the economically productive age range (15-64), and the remaining 5% is age 65 and above.

Figure E2.1: Age and sex of census sample, unweighted percent distribution of de facto household population by five-year age groups, baseline survey

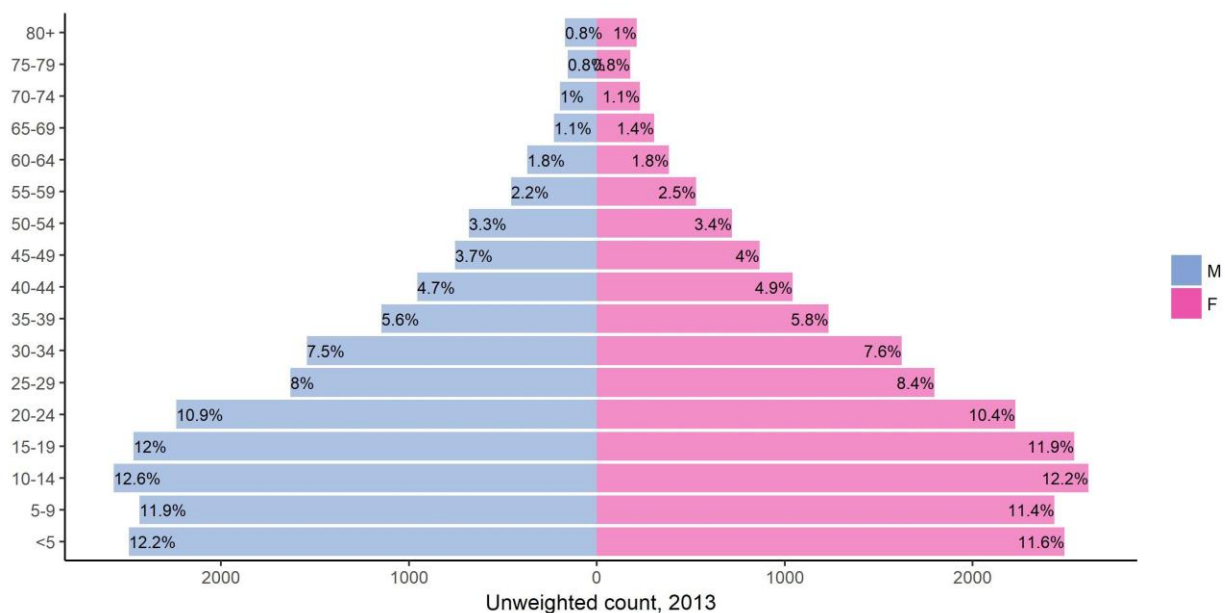
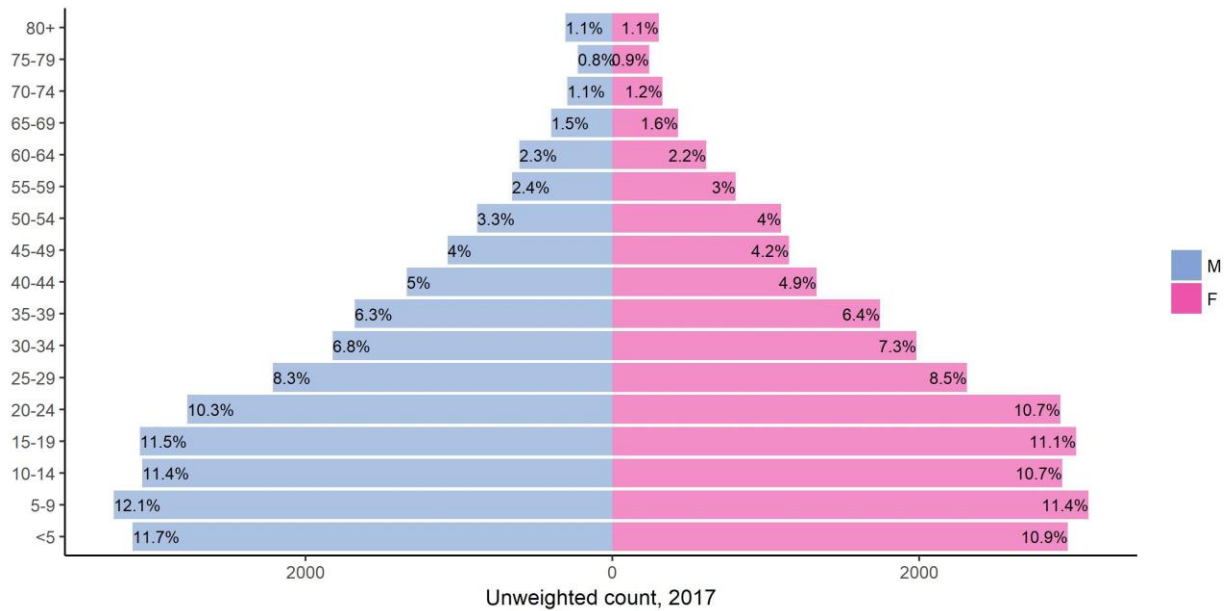


Figure E2.2: Age and sex of census sample, unweighted percent distribution of de facto household population by five-year age groups, follow-up survey



E2.3 Household Characteristics, SMI Household Survey

The number of households, women, and children in the sample are displayed in Table E2.1; and the percent distribution of households by head of household, number of usual members, and marital status are shown in Table E2.2.

Seventy six percent of households in Nicaragua identify as dual-headed in the second follow-up. Males are the head of the household in 3.9% of surveyed households in Nicaragua, with females as the head of household in the remaining 20%. The median household size in Nicaragua is four members, with another 15% of households having six or more members.

Table E2.1: SMI household survey sample sizes: number of total households, women 15-49 years of age, and children 0-59 months

	Baseline 2013	Second Follow-Up 2017
Households	2057	2625
Women	2823	3370
Children	2225	2558

Table E2.2: Household characteristics, SMI household sample

	Baseline 2013			Second Follow-Up 2017		
	n	%	SE	n	%	SE
Head of household						
Dual-headed household	1496	71.5	2.0	2012	76.1	1.7
Single head, female	440	22.9	1.7	518	20.0	1.6
Single head, male	121	5.6	0.8	95	3.9	0.6

Dual-headed households are those where (a) two individuals were identified as "head" by the respondent or (b) both the person identified as "head" and his or her spouse or partner are household members

	N	DK/DTR	Min	p25	Median	p75	Max
Baseline 2013							
Number of usual household members	2057	0	1	4	5	6	19
Second Follow-Up 2017							
Number of usual household members	2625	0	1	3	4	6	19

E2.4 Drinking Water Access and Treatment

E2.4.1 Sanitation facilities and waste disposal

A household's source of drinking water is an important determinant of the health status of household members. Contaminated drinking water can spread waterborne diseases, such as diarrhea or dysentery. Piped water, protected wells, and protected springs are expected to be relatively free of these diseases; whereas other sources like unprotected wells, rainwater, or surface water are more likely to carry disease-causing agents.

The percent distribution of households by source of drinking water, location of water source, and information about sanitation facilities is shown in Table E2.3. The majority of surveyed households (47.9%) have water piped to dwelling, and 52.1% of households have to go outside their home or yard to a water source.

Many households (67.5%) use a pit latrine and 17.5% of households use a flush toilet. Ten percent of households report having no toilet compared to 10.1% at baseline.

Table E2.3: Household water source and sanitation facilities

	Baseline 2013			Second Follow-Up 2017		
	n	%	SE	n	%	SE
Household water source						
Piped to dwelling	1044	49.3	4.2	1297	47.9	3.9
Protected dug well	234	12.6	2.4	312	12.9	2.1
Unprotected dug well	153	7.1	1.2	245	9.0	1.5
Piped to yard/plot	300	15.2	2.2	216	8.9	1.1
Tubewell/borehole	65	3.4	0.9	115	4.5	0.7
Surface water	30	1.3	0.4	121	4.5	1.0
Unprotected spring	55	2.3	0.6	114	4.4	1.1
Protected spring	72	3.4	0.7	56	2.3	0.5
Rainwater collection	19	1.3	0.8	34	1.5	0.8
Public tap/standpipe	37	2.0	0.6	34	1.3	0.4
Bottled water	13	0.9	0.5	13	0.4	0.3
Water jug	7	0.3	0.1	10	0.4	0.2
Tanker truck	0	0.0	-	1	0.0	-
Cart with small tank/drum	0	0.0	-	0	0.0	-
Other	28	1.0	0.2	55	2.0	0.5
Don't know	0	-	-	2	-	-
Decline to respond	0	-	-	0	-	-
Time to retrieve water						
Water on premises	1620	81.6	2.2	2019	79.0	2.4
Less than 30 minutes	380	16.1	2.0	524	19.2	2.2
30 minutes or longer	47	2.3	0.5	51	1.8	0.4
Don't know	10	-	-	30	-	-
Decline to respond	0	-	-	1	-	-
Sanitation facilities						
Pit latrine	1429	71.4	2.6	1726	67.5	2.6
Flush toilet	334	16.1	2.6	508	17.5	2.5
No toilet	239	10.1	1.6	261	9.9	1.6
Pour flush toilet	41	1.7	0.3	56	2.4	0.6
Dry toilet	6	0.3	0.1	32	1.2	0.4
Other	8	0.5	0.2	42	1.5	0.4
Don't know	0	-	-	0	-	-
Decline to respond	0	-	-	0	-	-

	Baseline 2013				Second Follow-Up 2017			
	n	N	%	SE	n	N	%	SE
Shared toilet/facilities	250	1809	15.1	1.4	305	2321	12.2	1.2

E2.4.2 Cooking fuel sources

Cooking fuel source and the location for cooking food are included in Table E2.4. The percentage of households with a separate kitchen is also shown. The two most commonly reported cooking fuel sources

used in households during the second follow-up are wood (77.3%) and gas tank (37.5%). Among those households with non-missing responses as to what cooking fuel sources they use, 74.8% report normally cooking food in the house, 22.8% normally cook food in a separate building, and 2.4% normally cook food outdoors. Sixty six percent of households have a separate kitchen.

Table E2.4: Cooking fuel source and cooking location

	Baseline 2013				Second Follow-Up 2017			
	n	N	%	SE	n	N	%	SE
Wood	1694	2057	79.0	3.9	2005	2625	77.3	3.2
Gas tank	610	2057	34.4	4.9	970	2625	37.5	3.7
Straw/twigs/grass	35	2057	1.8	0.4	57	2625	2.2	0.9
Coal	36	2057	2.9	1.0	44	2625	1.9	0.5
Electricity	37	2057	2.0	0.5	49	2625	1.8	0.4
Agricultural crops	18	2057	1.1	0.3	1	2625	0.0	-
No food cooked at home	2	2057	0.2	0.1	0	2625	0.0	-
Other	1	2057	0.1	0.1	1	2625	0.0	-

*categories not mutually exclusive (select all that apply)

	Baseline 2013			Second Follow-Up 2017		
	n	%	SE	n	%	SE
Location for cooking food, if cooking fuel source reported						
Inside house	1465	70.4	2.0	1938	74.8	1.7
In a separate building	521	26.5	2.0	617	22.8	1.6
Outdoors	66	3.1	0.5	68	2.4	0.5
Other	2	0.0	-	0	0.0	-
Don't know	0	-	-	0	-	-
Decline to respond	0	-	-	0	-	-

	Baseline 2013				Second Follow-Up 2017			
	n	N	%	SE	n	N	%	SE
Separate kitchen, if cooking fuel source reported and food cooked in the home	1105	1464	74.5	1.9	1299	1937	65.5	2.6

E2.4.3 Household wealth

The median number of bedrooms per household is two (Table E2.5). Twenty two percent of households in the second follow-up own agricultural land and 6.7% of households rent agricultural land (Table E2.6).

The availability of durable consumer goods is a good indicator of a household's socioeconomic status. Table E2.6 shows the availability of selected consumer goods by household. The large majority of households (78.9%) have mobile phone, and the most commonly owned items are electricity (75.9%),

television (55.5%), and radio (55%). Many households (19.4%) own a bicycle and 17.2% own a motorcycle/scooter.

Table E2.5: Number of bedrooms per household

	N	DK/DTR	Min	p25	Median	p75	Max
Baseline 2013							
Number of bedrooms	2057	0	0	1	2	2	8
Second Follow-Up 2017							
Number of bedrooms	2622	3	0	1	2	2	6

Table E2.6: Household assets

	Baseline 2013				Second Follow-Up 2017			
	n	N	%	SE	n	N	%	SE
Household assets								
Mobile phone	1411	2056	69.8	2.4	2074	2625	78.9	2.0
Electricity	1542	2056	77.8	3.1	1999	2625	75.9	3.3
Television	1176	2056	59.5	3.1	1497	2625	55.5	2.9
Radio	1390	2056	67.4	1.7	1445	2623	55.0	1.7
Watch	689	2056	34.8	1.3	679	2622	26.9	1.8
Refrigerator	497	2056	25.4	2.4	678	2624	25.8	2.5
Sound system	509	2054	26.7	2.8	585	2621	23.0	2.0
Bank account	123	2054	6.2	1.1	199	2604	7.8	1.1
Computer	139	2056	6.9	1.5	204	2623	7.1	1.4
Washing machine	54	2055	2.3	0.7	152	2624	5.5	1.1
Landline phone	57	2054	2.0	0.7	81	2623	3.4	0.8
Guitar	81	2056	3.7	0.6	83	2624	3.1	0.5
Transportation assets								
Bicycle	556	2056	26.5	2.0	536	2622	19.4	1.6
Motorcycle/scooter	242	2056	10.3	1.0	451	2620	17.2	1.4
Car	90	2056	3.9	0.7	137	2622	4.9	0.9
Animal cart	17	2056	0.7	0.2	19	2624	0.9	0.4
Truck	14	2056	0.5	0.2	21	2623	0.6	0.2
Agricultural assets: Livestock ownership								
Chickens	1167	2056	53.0	3.7	1424	2624	53.7	3.1
Pigs	629	2056	29.0	2.9	972	2625	38.3	2.6
Horses, donkeys, or mules	216	2056	10.1	1.4	310	2623	12.7	1.7
Cattle	199	2056	9.7	1.4	255	2624	10.0	1.4
Sheep or goats	7	2056	0.2	0.1	18	2625	0.6	0.2

	Baseline 2013			Second Follow-Up 2017		
	n	%	SE	n	%	SE
Agricultural assets: Own or rent agricultural land						
No agricultural land	1317	67.4	3.2	1788	69.6	2.6
Owens agricultural land	482	21.2	2.1	607	21.9	2.2
Rents agricultural land	173	7.6	1.1	174	6.7	1.1
Shared/community-held land	80	3.8	0.8	52	1.7	0.7
Don't know	1	-	-	4	-	-
Decline to respond	4	-	-	0	-	-

E2.5 Household expenditure

E2.5.1 Total expenditures by type

Households are surveyed about the amount of money spent over the last month. After reporting total household expenditures, households are then asked how much was spent on specific categories (e.g., food, housing, education, and medical care) over the last four weeks. Table E2.7 shows the itemized monthly expenditure per person living in the household summarized by expenditure quintile. All data are presented in current Córdoba (C), with no adjustment for inflation. Itemized expenditure information was sufficiently complete to report for 2,441 households at the second follow-up. The lowest quintile in the study area spent less than 534 C per person over the last month in the second follow-up.

Table E2.8 shows the budget share, defined as the weighted average expenditure on each category across a quintile divided by the weighted average total itemized household expenditure in the same quintile. Table E2.8 shows that the poorest 20% of households in the study area spend 74.5% of their monthly expenditure on food, on average. In comparison, the wealthiest households spend 55.5% on food. The poorest households spent 1.6% of their expenditure on medical care, while the wealthiest spent 5.5%.

Table E2.7: Total itemized per-capita expenditure quintiles, current Nicaragua Córdoba

	N	DK/DTR	p20	p40	p60	p80
Baseline 2013						
Per capita monthly household expenditure	1953	1	338	547	828	1391
Second Follow-Up 2017						
Per capita monthly household expenditure	2441	11	534	863	1350	2209

*Not adjusted for inflation

Table E2.8: Itemized household expenditure by total household budget share

	Bottom quintile	2nd quintile	3rd quintile	4th quintile	Top quintile
Baseline 2013					
Food	75.7	74.3	68.8	62.5	57.8
Alcoholic beverages and tobacco	2.3	1.5	1.2	0.9	1.9
Education expenses	5.8	4.9	4.3	4.0	3.8
Furniture and domestic appliances	0.1	0.3	0.4	0.8	1.8
Recreation	0.0	0.0	0.0	0.2	0.9
Housing and utilities	6.3	6.9	7.4	8.9	12.3
Clothing and shoes	3.4	3.6	7.8	10.7	7.9
Transportation	2.9	3.2	4.5	3.8	5.1
Communication	1.9	2.4	2.5	2.5	2.1
Out-of-pocket medical expenses	1.5	2.7	2.8	5.1	5.6
Social security premiums	0.0	0.2	0.2	0.7	0.7
Private insurance premiums	0.0	0.0	0.0	0.0	0.0
Other costs to access health care	0.0	0.0	0.0	0.1	0.0
Second Follow-Up 2017					
Food	74.5	69.7	64.8	60.2	55.5
Alcoholic beverages and tobacco	2.0	2.0	1.4	3.0	1.4
Education expenses	4.3	4.4	4.1	3.5	3.4
Furniture and domestic appliances	0.5	0.5	1.4	1.3	2.8
Recreation	0.1	0.2	0.3	0.4	1.2
Housing and utilities	6.8	8.3	8.3	8.7	9.6
Clothing and shoes	3.8	6.5	8.4	9.6	10.1
Transportation	3.1	2.9	4.0	4.9	5.8
Communication	3.0	2.9	2.9	3.2	2.8
Out-of-pocket medical expenses	1.6	2.1	3.8	4.3	5.5
Social security premiums	0.2	0.1	0.5	0.5	1.6
Private insurance premiums	0.0	0.0	0.1	0.5	0.3
Other costs to access health care	0.1	0.2	0.0	0.0	0.0

E2.5.2 Health expenditures

Of the 2,441 households with expenditure data at the second follow-up, 668 reported having health expenditures in the last four weeks. Table E2.9 shows health expenditure by type among households reporting non-zero out-of-pocket health expenditure. Very few households had spending in each category.

Table E2.9: Out-of-pocket medical expenditures by type, last four weeks, current Nicaragua Córdoba

	N	DK/DTR	Min	p25	Median	p75	Max
Baseline 2013							
Diagnostic and laboratory tests, X-rays, blood tests	504	0	0	0	0	0	14400
Medications prescribed by health personnel	504	0	0	0	0	500	10000
Care that required overnight stay in hospital/clinic	503	0	0	0	0	0	8000
Dentists	503	0	0	0	0	0	8000
Care or non-prescription medications from pharmacist	501	0	0	0	0	100	7000
Other health care products or services	504	0	0	0	0	0	7000
Health products (glasses, hearing aids, prosthetics, etc.)	504	0	0	0	0	0	3000
Care by health professionals not requiring overnight stay	504	0	0	0	0	0	2400
Other costs associated with overnight stay in hospital/clinic	504	0	0	0	0	0	1500
Care by traditional/alternative healers/birth attendants	504	0	0	0	0	0	150
Second Follow-Up 2017							
Diagnostic and laboratory tests, X-rays, blood tests	668	0	0	0	0	0	4500
Medications prescribed by health personnel	668	0	0	0	0	500	15000
Care that required overnight stay in hospital/clinic	668	0	0	0	0	0	3000
Dentists	668	0	0	0	0	0	12000
Care or non-prescription medications from pharmacist	667	0	0	0	0	150	5000
Other health care products or services	668	0	0	0	0	0	3000
Health products (glasses, hearing aids, prosthetics, etc.)	668	0	0	0	0	0	7000
Care by health professionals not requiring overnight stay	668	0	0	0	0	0	10000
Other costs associated with overnight stay in hospital/clinic	668	0	0	0	0	0	30000
Care by traditional/alternative healers/birth attendants	668	0	0	0	0	0	3000

*Not adjusted for inflation

E2.5.3 Source of health expenditure financing

Of the 2,441 households with expenditure data at the second follow-up, 232 reported that members of the household went to a hospital and stayed overnight at least once during the last 12 months and paid for expenses associated with the overnight stays. The maximum paid for a hospital stay was 3,000 C.

Table E2.10 shows the source and amount of financing for medical expenditures for overnight hospital stays. The most common source of health care financing was current income from any household member (median amount 353.8 C).

Table E2.10: Health care financing by source, last 12 months, current Nicaragua Córdoba

	N	DK/DTR	Min	p25	Median	p75	Max
Baseline 2013							
Remittances from family or friends abroad	224	0	0	0	0	0	351360
Property sold	224	0	0	0	0	0	150000
Savings	224	0	0	0	0	0	1e+05
Items sold	224	0	0	0	0	0	70000
Any household member's current income	224	0	0	0	200	1000	60000
Loan from a source other than family or friends	224	0	0	0	0	0	60000
Reducing other household spending	224	0	0	0	0	0	14000
Money from relatives or friends outside the household	224	0	0	0	0	0	11500
Other source	224	0	0	0	0	0	4000
Political donations or grants	224	0	0	0	0	0	3000
Social security payments	223	1	0	0	0	0	1000
Health insurance plan payment/reimbursement	224	0	0	0	0	0	0
Conditional cash transfer programs	224	0	0	0	0	0	0
Second Follow-Up 2017							
Remittances from family or friends abroad	232	1	0	0	0	0	7000
Property sold	232	1	0	0	0	0	1
Savings	231	2	0	0	0	0	15000
Items sold	232	1	0	0	0	0	30000
Any household member's current income	231	2	0	0	353.8	1506.6	50000
Loan from a source other than family or friends	232	1	0	0	0	0	50000
Reducing other household spending	232	1	0	0	0	0	5000
Money from relatives or friends outside the household	232	1	0	0	0	0	25000
Other source	232	1	0	0	0	0	40000
Political donations or grants	232	1	0	0	0	0	1000
Social security payments	232	1	0	0	0	0	7800
Health insurance plan payment/reimbursement	232	1	0	0	0	0	1
Conditional cash transfer programs	232	1	0	0	0	0	3000

*Not adjusted for inflation

E3 CHAPTER 3: GENERAL CHARACTERISTICS OF RESPONDENTS

This chapter summarizes the demographic characteristics, socioeconomic status, and health status of women of reproductive age (15-49 years) participating in the SMI-Nicaragua second follow-up household survey.

E3.1 Demographic Characteristics

E3.1.1 Age, marital status, relation to head of household

The age distribution of the de facto population of women of reproductive age participating in the women’s health or pregnancy interviews in Nicaragua is shown in Figure E3.1 by five-year age groups. About 61% of all women participating in the second follow-up SMI-Nicaragua household survey were younger than 30 years of age, 26% were between the ages of 30 and 39, and 13% were between the ages of 40 and 49. While 29% of women reported being married and 39% being partnered, 19% indicated they were never married. Thirty two percent of women were reported at the SMI-Nicaragua census to be the head of household’s spouse, 25.1% to be the biological child of the head of the household, and 16.4% to be the partner of the head of the household.

Figure E3.1: Age of respondents, unweighted

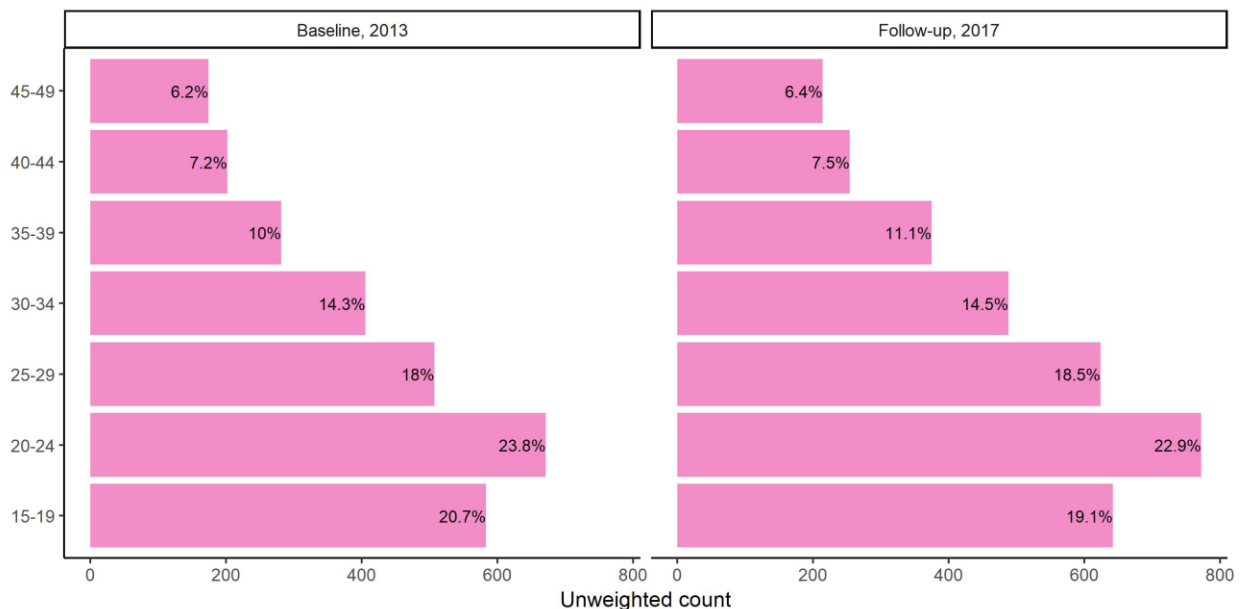


Table E3.1: Demographic characteristics of respondents

	Baseline 2013		Second Follow-Up 2017	
	n	%	n	%
Marital status				
Civil union/partnered	1023	36.2	1291	38.3
Divorced	6	0.2	15	0.4
Married	802	28.4	964	28.6
Separated	94	3.3	392	11.6
Single	874	31.0	687	20.4
Widowed	23	0.8	21	0.6
Other	0	0.0	0	0.0
Don't know	0	0.0	0	0.0
Decline to respond	1	0.0	0	0.0
Respondent's relationship to head of household				
-	4	0.1	12	0.4
Adopted or stepchild	38	1.3	34	1.0
Biological child	740	26.2	846	25.1
Daughter-in-law/son-in-law	207	7.3	146	4.3
Grandchild	67	2.4	79	2.3
Grandparent	0	0.0	0	0.0
Head of household	339	12.0	507	15.0
Mother-in-law/father-in-law	1	0.0	3	0.1
Niece/nephew	33	1.2	25	0.7
Other relative	6	0.2	6	0.2
Parent	5	0.2	3	0.1
Partner	625	22.1	553	16.4
Sibling	44	1.6	35	1.0
Sister-in-law/brother-in-law	20	0.7	15	0.4
Spouse	632	22.4	1073	31.8
Unrelated person	53	1.9	26	0.8
Other	9	0.3	7	0.2
Don't know	0	0.0	0	0.0
Decline to respond	0	0.0	0	0.0

*At baseline, marital status is reported by the respondent in the Census. In the second follow-up, marital status is reported by the woman at the start of the Household Survey

* "0" represents women who were missed in the census and added individually into the household survey, so relationship to the head of household was not registered.

E3.2 Education Attainment and Literacy

Eighty seven percent of second follow-up survey participants had some formal education (Table E3.2). For 45.3% of these women, the highest level of education completed was primary schooling. Literacy was assessed by asking respondents to read from a card the following sentence: "La salud del niño es muy importante para su desarrollo en la vida." Seventy four percent of women surveyed were able to read the whole sentence. Twelve percent of women could not read the sentence at all.

Table E3.2: Education attainment and literacy

	Baseline 2013				Second Follow-Up 2017			
	n	N	%	SE	n	N	%	SE
Ever attended school	2458	2808	86.2	1.5	2961	3362	87.3	1.0
Attended literacy course	283	2810	10.1	1.0	508	3359	15.6	1.5

	Baseline 2013			Second Follow-Up 2017		
	n	%	SE	n	%	SE
Educational attainment and literacy						
Primary	1196	46.6	3.3	1331	45.3	2.6
Secondary	833	35.5	1.7	1108	38.5	1.8
High school	54	2.1	0.4	115	4.4	1.1
University	306	13.1	2.1	353	10.6	1.7
Technical school	67	2.6	0.6	46	1.3	0.3
Don't know	2	-	-	7	-	-
Decline to respond	0	-	-	1	-	-
Literacy						
Cannot read at all	299	10.8	1.3	403	12.4	0.9
Can read parts	369	13.2	1.2	435	13.8	1.0
Can read entire sentence	2121	75.4	1.9	2509	73.6	1.7
Visually impaired	15	0.6	0.2	8	0.2	0.1
Don't know	4	-	-	7	-	-
Decline to respond	2	-	-	2	-	-

E3.3 Employment

As summarized in Table E3.3, the majority of respondents in the second follow-up were homemakers (65.9%). Of the 412 women who reported being employed and working at the time of the interview, most (93.8%) identified "Employee" as their occupational role.

Table E3.3: Employment

	Baseline 2013			Second Follow-Up 2017		
	n	%	SE	n	%	SE
Employment status						
Homemaker	2025	68.5	2.5	2360	65.9	2.2
Student	272	12.3	1.4	321	12.4	1.1
Employed/paid for work	360	13.3	1.3	412	12.0	1.3
Self-employed	116	4.6	0.9	224	8.2	1.2
Unable to work due to disability	9	0.4	0.2	16	0.7	0.2
Employed by a family member without pay	9	0.3	0.1	13	0.5	0.2
Employed, but did not work in last week	7	0.3	0.2	7	0.2	0.1
Retired	2	0.0	-	1	0.0	-
Employed in a cooperative	9	0.2	0.1	1	0.0	-
Don't know	0	-	-	5	-	-
Decline to respond	1	-	-	4	-	-
Occupational role, among women employed and being paid for work						
Employee	344	94.8	1.9	387	93.8	1.9
Proprietor	2	0.5	0.4	14	3.7	1.7
Independent contractor	8	2.8	1.4	9	1.7	0.7
Employer	6	1.8	1.0	1	0.8	0.8
Don't know	0	-	-	1	-	-
Decline to respond	0	-	-	0	-	-

* Self-employed option was not included in the baseline survey

E3.4 Exposure to Mass Media

Respondents were asked about their exposure to newspapers, radio, and television. As displayed in Table E3.4, among women who demonstrated full or partial literacy in the second follow-up, 30.8% had weekly exposure to newspapers. Fifty six percent of all women had weekly exposure to radio, and 58% had weekly exposure to television.

Table E3.4: Exposure to mass media

	Baseline 2013			Second Follow-Up 2017		
	n	%	SE	n	%	SE
Newspapers, among literate women						
Never	977	38.5	2.1	1600	54.0	2.7
At least once a week	1153	47.9	2.3	877	30.8	2.6
Less than once a week	353	13.6	1.2	458	15.2	1.2
Don't know	4	-	-	5	-	-
Decline to respond	0	-	-	1	-	-
Not applicable	3	-	-	3	-	-
Radio						
At least once a week	2076	74.5	1.8	1876	55.5	2.2
Never	465	17.4	1.7	1050	31.5	2.1
Less than once a week	243	8.1	1.0	415	13.0	1.0
Don't know	1	-	-	2	-	-
Decline to respond	0	-	-	1	-	-
Not applicable	25	-	-	20	-	-
Television						
At least once a week	1718	67.1	2.7	1927	58.0	2.8
Never	814	25.8	2.7	1063	32.3	2.8
Less than once a week	188	7.0	0.9	286	9.7	1.0
Don't know	5	-	-	6	-	-
Decline to respond	3	-	-	0	-	-
Not applicable	82	-	-	82	-	-

E3.5 Access to Health Services

E3.5.1 Proximity to health care facilities

Table E3.5 - Table 3.7 display the responses to several survey questions that were used to assess access to health care facilities. Respondents were asked to estimate proximity to health care facilities in terms of distance (kilometers) and travel time. Not surprisingly, respondents typically had more difficulty estimating distance to health care facilities. As shown in the tables below, “Don’t know” responses to the distance questions were exceedingly common.

Excluding the 983 women who were unable to estimate the distance to the closest health facility in the second follow-up, 75% of women reported living 3 kilometers or less from a health facility (Table E3.5). Three-quarters of the sample indicated that it took less than 45 minutes to reach this facility by the usual means of transportation. One-quarter estimated the travel time from their household to the closest health facility to be 45 minutes or more.

Women were also asked for the travel distance and time to their usual health facility, if they had a usual health facility. Excluding the 873 women who did not know the distance to the facility in the second follow-up, three-quarters of the women reported traveling up to 3 kilometers, and three-quarters of the women could travel to the closest facility in less than 60 minutes (Table E3.6).

Of the 2,201 women who reported a recent health facility visit for themselves or for family members in the second follow-up, three-quarters traveled less than 3 kilometers for care. Twenty-five percent of women traveled 3 to 730 kilometers for care. Half of women traveled for less than 20 minutes, and one-quarter spent 45 minutes or more traveling for care. The longest travel time reported for a recent illness was approximately 72 hours.

Table E3.5: Proximity to health care facilities: nearest health facility

	N	DK/DTR	Min	25th Percentile	Median	75th Percentile	Max
Baseline 2013							
Distance, km	2529	281	0	1	2	5	600
Travel time, min	2706	16	1	10	20	60	2700
Second Follow-Up 2017							
Distance, km	2381	983	0	0.5	1	3	100
Travel time, min	3067	136	1	10	20	45	3000

Table E3.6: Proximity to health care facilities: usual health facility

	N	DK/DTR	Min	25th Percentile	Median	75th Percentile	Max
Baseline 2013							
Distance, km	2386	266	0	1	2	6	600
Travel time, min	2640	6	1	15	30	60	2700
Second Follow-Up 2017							
Distance, km	2212	873	0	0.5	1	3	580
Travel time, min	2939	76	1	10	20	60	1800

Table E3.7: Proximity to health care facilities: health facility for recent illness

	N	DK/DTR	Min	25th Percentile	Median	75th Percentile	Max
Baseline 2013							
Distance, km	2264	279	0	1	2	6	600
Travel time, min	2528	7	1	15	30	60	2400
Second Follow-Up 2017							
Distance, km	1602	554	0	0.5	1	3	730
Travel time, min	2099	16	1	10	20	45	4320

E3.6 Health Status

E3.6.1 Current health status

Table E3.8 shows the self-rated current health status of all women participating in the survey. When asked to evaluate their current health status relative to the past year, 52.7% reported that their health was “about the same” in the second follow-up. While 37% reported that their health had improved, 10.3% reported worse health on the day of the interview, compared to last year. Eighty two percent could “easily” perform their daily activities (e.g., work, housework, and childcare). About 18% of women reported at least some degree of difficulty performing these tasks that was related to their health status.

Table E3.8: Current health status

	Baseline 2013			Second Follow-Up 2017		
	n	%	SE	n	%	SE
Current health relative to last year						
Better	1106	42.4	1.4	1223	37.0	1.6
Worse	324	9.8	0.7	340	10.3	0.8
About the same	1376	47.8	1.3	1792	52.7	1.8
Don't know	4	-	-	6	-	-
Decline to respond	0	-	-	3	-	-
Ability to perform daily activities						
Easily	2317	83.6	1.1	2773	81.7	1.3
With some difficulty	437	14.8	0.9	486	14.8	1.1
With much difficulty	50	1.5	0.4	93	3.4	0.5
Unable to do	5	0.1	0.1	7	0.2	0.1
Don't know	0	-	-	1	-	-
Decline to respond	1	-	-	4	-	-

	Baseline 2013			Second Follow-Up 2017		
	n	%	SE	n	%	SE
Days in the last month that physical health was not good						
No days	1878	68.0	1.4	2255	69.1	1.8
1 to 3 days	292	11.6	1.0	321	8.8	0.9
4 to 7 days	634	20.4	1.5	780	22.1	1.2
7 to 29 days	0	0.0	-	0	0.0	-
All month	0	0.0	-	0	0.0	-
Don't know	6	-	-	8	-	-
Decline to respond	0	-	-	0	-	-
Days in the last month that mental health was not good						
No days	2206	78.3	1.6	2572	77.2	1.7
1 to 3 days	197	7.0	0.8	210	6.3	0.7
4 to 7 days	402	14.7	1.3	571	16.6	1.3
7 to 29 days	0	0.0	-	0	0.0	-
All month	0	0.0	-	0	0.0	-
Don't know	5	-	-	11	-	-
Decline to respond	0	-	-	0	-	-

E3.6.2 Recent illness

Women were asked a series of questions about any illnesses or health problems they had in the two weeks preceding the interview. Out of the women in the second follow-up, 21.2% reported being sick during that time (Table E3.9). Of the 741 women who reported a recent illness, headache (19.7%), fever (10.5%), cough (10.3), and abdominal pain (6.7%) were the most commonly elicited specific complaints. Thirty three percent of women specified a different health problem not listed in the questionnaire.

Table E3.9: Recent illness (in the last two weeks)

	Baseline 2013				Second Follow-Up 2017			
	n	N	%	SE	n	N	%	SE
Respondent was sick during the past two weeks	742	2808	24.7	1.6	741	3363	21.2	1.2

	Baseline 2013			Second Follow-Up 2017		
	n	%	SE	n	%	SE
Type of illness, among those sick in the past two weeks						
Headache	174	23.6	2.4	139	19.7	2.6
Fever	71	10.1	1.9	90	10.5	1.3
Cough	0	0.0	-	79	10.3	1.5
Abdominal pain	66	9.3	1.9	50	6.7	1.1
Gynecologic problem	24	3.1	0.9	33	4.5	1.0
Hypertension	18	5.0	1.7	21	3.3	1.0
Skin rash/infection	5	0.4	0.2	10	2.4	1.5
Swelling in legs, ankles, or feet	0	0.0	-	10	2.1	0.9
Vomiting	4	1.3	0.9	8	2.0	0.9
Toothache	17	1.4	0.4	6	1.3	0.7
Diabetes	2	1.3	1.0	2	1.2	0.8
Asthma	9	1.7	0.9	3	0.7	0.5
Diarrhea without blood	3	0.3	0.2	5	0.7	0.4
Eye/ear infection	7	0.8	0.3	4	0.5	0.3
Paralysis	1	0.1	0.1	2	0.5	0.5
Bronchitis	2	0.2	0.2	3	0.3	0.2
Anemia	0	0.0	-	2	0.2	0.2
Chest infection	0	0.0	-	2	0.2	0.1
Obstetric problem	1	0.1	0.1	1	0.1	0.1
Poisoning	0	0.0	-	1	0.1	0.1
Malaria	1	0.1	0.1	0	0.0	-
Cough/chest infection	57	5.8	1.1	0	0.0	-
Tuberculosis	0	0.0	-	0	0.0	-
Pneumonia	1	0.1	0.1	0	0.0	-
Diarrhea with blood	1	0.1	0.1	0	0.0	-
Diarrhea with vomiting	2	0.3	0.2	0	0.0	-
Measles	0	0.0	-	0	0.0	-
Jaundice	1	0.1	0.1	0	0.0	-
Stroke	0	0.0	-	0	0.0	-
HIV/AIDS	0	0.0	-	0	0.0	-
Blood in urine	0	0.0	-	0	0.0	-
Other	274	34.7	2.9	267	32.7	2.3
Don't know	0	-	-	1	-	-
Decline to respond	1	-	-	2	-	-

* Options for "Swelling in legs, ankles, or feet", "Blood in urine", "Poisoning", "Chest infection" and "Cough" were only available only in the follow-up survey. Option "Cough/Chest infection" was only available at the baseline.

E3.6.3 Utilization of health services

Table E3.10 summarizes data regarding the utilization of health services among the 741 women who reported an illness in the two weeks preceding the second follow-up interview. Three hundred twenty one (45.5%) of these women sought care at a health care facility. Many of these women attended a Public health post health unit (42.2%); another 24.6% attended a Public health center/clinic. Only fifteen women were hospitalized for their recent illness (5% of those who sought care).

Table E3.10: Utilization of health services for illness in the last two weeks

	Baseline 2013				Second Follow-Up 2017			
	n	N	%	SE	n	N	%	SE
Sought care for recent illness	305	742	43.8	3.2	321	740	45.5	3.3
Admitted to hospital for care*	17	299	7.2	3.0	15	315	5.0	1.8

Among women who sought care at a public or private hospital, health center/clinic, mobile clinic, or other health facility; public health unit; private office; or pharmacy.

	Baseline 2013			Second Follow-Up 2017		
	n	%	SE	n	%	SE
Type of facility where care was sought						
Public health post	0	0.0	-	136	42.2	6.4
Public health center/clinic	80	27.6	4.8	75	24.6	4.4
Public hospital	85	32.3	5.8	46	13.9	3.5
Private health clinic	13	3.3	1.3	20	7.3	2.9
Private doctor's office	14	4.9	2.5	21	4.8	1.3
Casa base	0	0.0	-	12	2.8	1.6
Private hospital	1	0.4	0.4	3	1.6	1.4
Pharmacy	2	0.5	0.4	4	1.5	1.0
Other public health facility	0	0.0	-	2	1.1	1.1
Public mobile clinic	1	0.4	0.4	0	0.0	-
Private mobile clinic	0	0.0	-	0	0.0	-
Other private health facility	2	0.4	0.3	0	0.0	-
Community health worker	0	0.0	-	0	0.0	-
Traditional healer	0	0.0	-	0	0.0	-
Home of a community health worker	0	0.0	-	0	0.0	-
School	0	0.0	-	0	0.0	-
Public health unit	101	27.3	4.1	0	0.0	-
Other	6	2.9	2.1	1	0.1	0.1
Don't know	0	-	-	0	-	-
Decline to respond	0	-	-	1	-	-

* A casa base is an ambulatory health unit that provides services in remote communities on specified days and times, and may depend on mobile medical professionals that serve multiple units.

* Options for "Public health center", "Public health post", "Home of a traditional healer", "School", and "Casa base" were not available at baseline. Options for "Public health unit and "Public health clinic/center" were not available at follow-up.

E3.6.4 Insurance coverage

About 7% of women reported being covered by any type of health insurance in the second follow-up (Table E3.11).

Table E3.11: Insurance coverage

	Baseline 2013			Second Follow-Up 2017		
	n	%	SE	n	%	SE
No insurance	2651	93.4	1.3	3119	93.2	1.0
INSS	147	6.2	1.1	219	6.2	0.9
Government/Armed forces	3	0.1	0.0	4	0.2	0.1
Private insurance	4	0.3	0.2	8	0.1	0.1
Other	2	0.0	-	7	0.3	0.2
Don't know	2	-	-	6	-	-
Decline to respond	1	-	-	1	-	-

E3.6.5 Other barriers to health care access

There are many other barriers to accessing health care. Women who reported that they sometimes or never sought care when they felt sick were asked what reasons prevented them from receiving health care when it was needed. Interviewers were instructed to ask in an open-ended manner for all applicable reasons, and to mark the appropriate response options in the questionnaire based on the woman's response. Table E3.12 summarizes the responses to this section. The most commonly cited factors influencing health care access in the second follow-up were the preference for treatment at home (36.6%) and the belief that the health center does not have sufficient medicines (20.7%). Twelve percent of women did not believe they were ill enough to seek treatment. Access and quality of care were also important barriers: 9.3% of women said the health center was too far away, 3.5% said care was too expensive, and 7.1% said the health center personnel were too difficult to deal with.

Table E3.12: Other barriers to health care utilization, women 15-49 years of age who were sick in the last two weeks but did not seek care

	Baseline 2013				Second Follow-Up 2017			
	n	N	%	SE	n	N	%	SE
Treated self at home	150	437	42.2	4.1	155	415	36.6	3.6
Health center does not have sufficient medicines	97	437	16.9	2.1	92	415	20.7	3.3
Not sick enough to seek treatment	57	437	16.0	3.0	54	415	11.6	2.3
Health center is not well-equipped	16	437	2.8	0.8	28	415	9.8	2.5
Health center is too far away	21	437	5.7	2.2	39	415	9.3	2.3
Too busy with work, children, or other commitments	43	437	8.8	2.1	41	415	9.0	2.2
It is difficult to deal with health center personnel	23	437	5.9	1.9	29	415	7.1	1.7
Was previously mistreated	14	437	2.6	0.8	19	415	5.4	2.0
Do not trust the personnel	9	437	3.3	1.7	18	415	4.5	1.5
Health center personnel not knowledgeable	6	437	0.9	0.3	14	415	4.4	1.6
Care is too expensive	25	437	4.0	0.9	11	415	3.5	1.6
Could not afford transportation	45	437	8.5	2.3	12	415	2.5	0.9
Health center infrastructure is poor	5	437	1.1	0.6	5	415	2.1	1.3
Did not want to go alone	5	437	0.8	0.4	7	415	1.8	0.8
Tried, but was refused care	14	437	3.5	1.2	10	415	1.7	0.6
Tried, but no staff was at the center	5	437	0.6	0.3	8	415	1.7	0.8
Could not get permission to go to the doctor	3	437	0.4	0.3	2	415	0.3	0.2
Could not find transportation	12	437	1.9	0.5	1	415	0.1	0.1
Did not know where to go	0	437	0.0	-	0	415	0.0	-
Religious or cultural beliefs	3	437	0.5	0.3	0	415	0.0	-
Other	51	437	8.1	1.6	74	415	18.9	3.0

*categories not mutually exclusive (select all that apply)

E4 CHAPTER 4: EXPOSURE TO HEALTH SYSTEM INTERVENTIONS

This chapter summarizes the exposure of women to four health system interventions: community health worker interventions, breastfeeding interventions, child nutrition interventions, and child health interventions.

E4.1 Exposure to Community Health Workers

Respondents were asked about their exposure to community health workers. Three percent of women reported meeting with a community health worker in the month preceding the second follow-up interview (Table E4.1). Two percent met only once, and 1.4% met two or more times.

Table E4.1: Exposure to community health workers, women 15-49 years

	Baseline 2013			Second Follow-Up 2017		
	n	%	SE	n	%	SE
Did not meet	2745	98.0	0.4	3226	96.6	0.5
One time	44	1.1	0.3	86	2.1	0.4
Two times	15	0.7	0.3	29	1.0	0.3
Three times	2	0.1	0.1	10	0.3	0.1
Four or more times	2	0.1	0.1	3	0.1	0.0
Don't know	1	-	-	8	-	-
Decline to respond	1	-	-	0	-	-

Referral and advice services provided by community health workers are summarized in Table E4.2. Among women who met with a community health worker in the last month during the second follow-up, family planning methods or counseling was the most common service provided (74.4%). Advice about vaccination for children (64.9%) and referral for voluntary hiv/syphilis counseling and testing* (54.8%) was also frequently reported.

Table E4.2: Services provided by community health workers, women 15-49 years

	Baseline 2013				Second Follow-Up 2017			
	n	N	%	SE	n	N	%	SE
Family planning methods or counseling	47	70	65.9	9.1	99	136	74.4	5.4
Vaccination for children	44	70	50.5	9.6	91	136	64.9	6.5
Referral for voluntary HIV/syphilis counseling and testing*	22	70	29.4	7.2	71	136	54.8	6.7
Child nutrition counseling	40	70	57.5	8.8	67	136	50.1	6.8
Referral for antenatal care	26	70	33.9	7.5	60	136	47.3	6.7
Referral for in-facility delivery	16	70	19.3	5.6	50	136	36.6	5.6
Information, education, and communication sessions (IEC)	29	70	48.5	8.5	40	136	24.8	5.4

* For the prevention of HIV/syphilis transmission from mother to child

	Second Follow-Up 2017			
	n	N	%	SE
Deworming	87	136	62.6	6.7
Diarrhea treatment with ORS and zinc	67	136	50.8	6.0
Micronutrients	64	136	48.5	6.4
Referral for postnatal care	54	136	41.9	6.5
Other	22	136	15.4	3.8

Questions about these topics were not asked at baseline. They were added to the second follow-up survey to track exposure to SMI interventions.

E4.2 Satisfaction with Community Health Workers

Women who met with a community health worker in the month preceding the interview were asked to assess their satisfaction with the following: number of visits, information provided by community health workers, and respectfulness of community health workers. Results are displayed in Table E4.3.

Table E4.3: Satisfaction with community health workers, women 15-49 years of age who met with community health workers in the last month

	Baseline 2013			Second Follow-Up 2017		
	n	%	SE	n	%	SE
Satisfaction with number of visits from community health workers						
Very dissatisfied	7	5.3	2.6	11	8.4	3.5
Dissatisfied	4	4.0	2.2	14	10.3	3.0
Satisfied	43	81.7	5.4	97	74.3	6.2
Very satisfied	8	9.0	3.6	8	7.0	3.4
Don't know	1	-	-	1	-	-
Decline to respond	0	-	-	1	-	-
Satisfaction of knowledge and training of community health workers						
Very dissatisfied	8	6.0	2.8	9	7.4	3.3
Dissatisfied	3	3.5	2.1	12	9.4	2.9
Satisfied	43	83.7	4.9	97	70.2	6.7
Very satisfied	6	6.8	3.0	12	13.0	5.0
Don't know	2	-	-	1	-	-
Decline to respond	1	-	-	1	-	-
Satisfaction with information provided by community health workers						
Very dissatisfied	9	8.5	3.6	10	7.8	3.4
Dissatisfied	2	2.6	1.8	12	9.2	3.0
Satisfied	41	76.6	6.1	96	69.8	6.6
Very satisfied	9	12.2	4.7	12	13.2	5.0
Don't know	2	-	-	1	-	-
Decline to respond	0	-	-	1	-	-
Satisfaction with respectfulness shown by community health workers						
Very dissatisfied	10	8.6	3.5	8	6.8	3.3
Dissatisfied	2	2.3	1.7	11	11.6	4.6
Satisfied	42	81.8	5.4	101	73.3	6.8
Very satisfied	7	7.3	3.1	10	8.4	3.5
Don't know	2	-	-	1	-	-
Decline to respond	0	-	-	1	-	-

E4.3 Counseling provided in health facilities

Respondents who had visited a health facility in the last 12 months (1,982 women at the second follow-up) were asked whether they were given counseling about certain topics by health center personnel. Approximately 17.8% of women in the second follow-up reported receiving guidance or advice about breastfeeding in the 12 months preceding the interview (Table E4.4). Approximately 18.7% of women in the second follow-up reported receiving guidance or advice about child nutrition in the 12 months preceding the interview (Table E4.4). Approximately 24.3% of women in the second follow-up reported receiving guidance or advice about danger signs for children's health in the 12 months preceding the interview (Table E4.4).

Table E4.4: Exposure to breastfeeding, child nutrition, and child health interventions, women 15-49 years

	Baseline 2013				Second Follow-Up 2017			
	n	N	%	SE	n	N	%	SE
Breastfeeding	606	1867	29.8	1.8	440	1979	17.8	1.5
Child nutrition	588	1868	29.1	1.7	450	1979	18.7	1.5
Danger signs for children's health	603	1867	30.1	1.7	566	1977	24.3	1.6

E4.4 Counseling provided in health facilities to women with children

In the follow-up survey, respondents who had visited a health facility in the last 12 months and who had children (1,750 women at the second follow-up) were asked whether they were given counseling about certain topics by health center personnel.

Table E4.5: Counseling provided in health facilities to women with children

	Second Follow-Up 2017			
	n	N	%	SE
Provided deworming treatment	428	1743	22.3	1.8
Provided diarrhea treatment with ORS and zinc	384	1745	19.6	1.5
Provided micronutrients	287	1744	14.9	1.4

Questions about these topics were not asked at baseline. They were added to the second follow-up survey to track exposure to SMI interventions.

E5 CHAPTER 5: FAMILY PLANNING

This chapter summarizes key indicators related to the knowledge of, access to, need for, and use of family planning methods among women of reproductive age (15-49 years) participating in the SMI-Nicaragua second follow-up household survey.

Family planning questions were asked only to women of reproductive age who were married or partnered. During the SMI-Nicaragua baseline household survey, family planning questions were asked to women whose marital status was reported as “married” or “partnered” by the SMI-Nicaragua household census respondent. During the second follow-up, the family planning section was instead conditioned on a question about marital status asked to the respondent herself at the start of the woman’s health interview. This captured participants who had a change in marital status between the census and household survey and participants whose marital status was incorrectly recorded in the census. At the baseline, 1,817 women qualified for the family planning questions, and at the second follow-up, 2,250 women qualified.

E5.1 Knowledge of the Fertile Period

The successful use of family planning methods depends on an understanding of when during the menstrual cycle a woman is most likely to conceive. This is especially true for traditional methods such as the rhythm method (i.e., periodic abstinence) and the withdrawal method. To assess knowledge of the fertile period, women were asked if there are certain days when a woman is more likely to become pregnant, and when during the menstrual cycle those days occur. Responses to these questions are summarized in Table E5.1. In the second follow-up, 87.3% of women indicated that there were certain days when a woman is more likely to become pregnant, and of these women, only 9.9% identified the correct timing of the fertile period (halfway between two periods).

Table E5.1: Knowledge of the fertile period, women 15-49 years of age who are married or partnered

	Baseline 2013				Second Follow-Up 2017			
	n	N	%	SE	n	N	%	SE
Are there certain days when a woman is more likely to become pregnant?	1346	1662	80.2	1.8	1747	1981	87.3	1.4

	Baseline 2013			Second Follow-Up 2017		
	n	%	SE	n	%	SE
Time of a woman’s fertile period						
Just before period	284	22.4	2.3	247	13.7	1.6
During period	59	5.2	1.0	49	3.0	0.6
Just after period	714	52.4	3.0	1219	72.8	2.1
Halfway between periods	237	18.7	2.1	157	9.9	1.2
Other	18	1.3	0.4	10	0.6	0.3
Don’t know	31	-	-	61	-	-
Decline to respond	3	-	-	4	-	-

E5.2 Use of Family Planning Methods

E5.2.1 Current use

The coverage of contraceptive methods is one of the indicators most frequently used to assess the success of family planning program activities. It is also widely used as a determinant of fertility. Women who said they had heard of a family planning method were asked if they were currently using that method. Table E5.2 displays the percentage of all women using at least one family planning method, as well as the percentage of women reporting use of more than one family planning method at the time of the interview. Seventy one percent of all survey respondents in the second follow-up reported current use of at least one family planning method.

Women considered “in need” of family planning methods are those who are married or partnered, excluding those who report the following characteristics: does not have sexual relations, virgin, menopausal, infertile, pregnant, or wants to become pregnant. Even women not considered “in need” of contraception may use a method. Table E5.3 shows the uptake of modern family planning methods among all married and partnered women (70.7%), and among women considered “in need” of contraception (81.2%).

Table E5.2: Current use of family planning methods, women 15-49 years of age who are married or partnered

	Baseline 2013				Second Follow-Up 2017			
	n	N	%	SE	n	N	%	SE
Currently in need of contraception	1557	1817	80.5	1.7	1950	2251	82.6	1.4
Current use of any method, among all women	1379	1817	70.5	1.7	1679	2251	70.7	1.8

Table E5.3: Current use of modern family planning methods, women 15-49 years of age who are married or partnered and in need of contraception

	Baseline 2013				Second Follow-Up 2017			
	n	N	%	SE	n	N	%	SE
Current use of any method	1352	1557	85.5	1.3	1623	1950	81.2	1.6
Current use of modern method	1334	1557	84.8	1.3	1598	1950	80.2	1.7

	Baseline 2013			Second Follow-Up 2017		
	n	%	SE	n	%	SE
Number of methods the respondent is currently using						
Not using any family planning methods	214	15.2	1.4	337	19.5	1.6
Using 1 family planning method	1330	84.1	1.4	1586	78.9	1.7
Using 2 family planning methods	13	0.8	0.4	27	1.6	0.6

Table E5.4 displays the percentage of all women using specific family planning methods. The methods most commonly in use during the second follow-up are injectables (39.8%) and female sterilization (16.6%).

Table E5.4: Current use of family planning methods, by type of method, for women 15-49 years of age who are married or partnered

	Baseline 2013				Second Follow-Up 2017			
	n	N	%	SE	n	N	%	SE
Injectable	783	1817	38.7	1.7	985	2243	39.8	1.8
Female sterilization	308	1815	18.3	1.4	363	2241	16.6	1.2
Oral contraceptive	166	1815	7.7	1.0	170	2240	7.9	0.9
Intrauterine device (IUD)	49	1816	2.9	0.7	76	2243	3.1	0.5
Male condom	51	1816	2.3	0.5	64	2244	2.8	0.6
Implant	1	1816	0.0	-	8	2241	0.5	0.3
Withdrawal	6	1814	0.2	0.1	11	2245	0.4	0.2
Rhythm	10	1816	0.3	0.1	9	2243	0.3	0.1
Lactational amenorrhea	8	1816	0.2	0.1	7	2243	0.2	0.1
Emergency contraception (Plan B)	0	1814	0.0	-	1	2239	0.2	0.2
Male sterilization	1	1816	0.0	-	0	2241	0.0	-
Female condom	0	1815	0.0	-	0	2244	0.0	-
Diaphragm	0	1815	0.0	-	0	2246	0.0	-
Sponge	0	1816	0.0	-	0	2240	0.0	-
Other modern method	0	1814	0.0	-	1	2236	0.0	-
Other traditional method	1	1813	0.1	0.1	1	2241	0.0	-

* categories not mutually exclusive (select all that apply)

E5.3 Sources of Family Planning Methods

Information on where women obtain contraceptive methods is important for family planning program managers. The places where the currently-used family planning methods were acquired are summarized in Table E5.5.

The public sector is the source most commonly reported by users of most modern family planning methods, including female sterilization. Pharmacies are important sources for injectables, the pill, and male condoms. Women report learning about traditional methods in the public sector, from friends or relatives, or at church (Table E5.6).

Table E5.5: Source of modern family planning methods, women 15-49 years of age who are married or partnered

	Baseline 2013			Second Follow-Up 2017		
	n	%	SE	n	%	SE
Injectable						
Public hospital	185	24.0	3.1	191	17.5	2.5
Public health center/clinic	150	18.6	2.2	214	20.4	2.7
Public health post	0	0.0	-	362	36.8	3.5
Public mobile clinic	0	0.0	-	0	0.0	-
Other public health facility	4	0.3	0.2	1	0.0	-
Private hospital	1	0.1	0.1	3	0.6	0.5
Private health clinic	8	1.3	0.7	11	1.1	0.6
Private doctor's office	4	0.8	0.4	1	0.1	0.1
Private mobile clinic	1	0.1	0.1	0	0.0	-
Other private health facility	2	0.2	0.1	1	0.1	0.1
Pharmacy	88	13.4	2.6	133	14.6	2.1
Community health worker	42	4.5	1.1	10	2.1	0.9
Traditional healer	0	0.0	-	0	0.0	-
Store	1	0.1	0.1	1	0.1	0.1
Market	0	0.0	-	0	0.0	-
Church	0	0.0	-	0	0.0	-
Friend/relative	3	0.3	0.2	3	0.8	0.6
Home of a community health worker	0	0.0	-	7	0.8	0.4
School	0	0.0	-	0	0.0	-
Casa base	0	0.0	-	40	4.5	1.4
Casa materna	0	0.0	-	0	0.0	-
Public health unit	289	35.8	3.1	0	0.0	-
Other	5	0.5	0.2	5	0.5	0.3
Don't know	0	-	-	1	-	-
Decline to respond	0	-	-	2	-	-
Female sterilization						
Public hospital	262	84.4	3.0	328	93.2	2.0
Public health center/clinic	8	2.6	1.2	7	2.2	1.2
Public health post	0	0.0	-	4	0.5	0.3
Public mobile clinic	0	0.0	-	1	0.4	0.4
Other public health facility	0	0.0	-	0	0.0	-
Private hospital	1	0.1	0.1	2	0.2	0.1
Private health clinic	12	4.6	1.7	15	2.8	1.1
Private doctor's office	2	1.7	1.5	1	0.1	0.1
Private mobile clinic	1	0.2	0.2	1	0.1	0.1
Other private health facility	0	0.0	-	0	0.0	-
Pharmacy	0	0.0	-	1	0.1	0.1
Community health worker	0	0.0	-	0	0.0	-
Traditional healer	0	0.0	-	0	0.0	-
Store	0	0.0	-	0	0.0	-
Market	0	0.0	-	0	0.0	-
Church	0	0.0	-	0	0.0	-
Friend/relative	0	0.0	-	0	0.0	-
Home of a community health worker	0	0.0	-	0	0.0	-
School	0	0.0	-	0	0.0	-
Casa base	0	0.0	-	1	0.1	0.1
Casa materna	0	0.0	-	0	0.0	-
Public health unit	18	5.4	2.0	0	0.0	-

(continued)

	n	%	SE	n	%	SE
Other	4	0.9	0.6	1	0.1	0.1
Don't know	0	-	-	0	-	-
Decline to respond	0	-	-	1	-	-
Oral contraceptive						
Public hospital	23	10.4	3.0	16	12.3	4.4
Public health center/clinic	36	19.6	4.1	38	28.2	5.9
Public health post	0	0.0	-	67	31.1	6.0
Public mobile clinic	0	0.0	-	0	0.0	-
Other public health facility	1	0.4	0.5	0	0.0	-
Private hospital	0	0.0	-	2	0.5	0.4
Private health clinic	2	1.2	1.0	0	0.0	-
Private doctor's office	1	0.2	0.3	1	0.1	0.1
Private mobile clinic	0	0.0	-	0	0.0	-
Other private health facility	0	0.0	-	0	0.0	-
Pharmacy	35	31.6	7.4	34	19.7	5.1
Community health worker	4	2.3	1.1	0	0.0	-
Traditional healer	0	0.0	-	0	0.0	-
Store	0	0.0	-	0	0.0	-
Market	0	0.0	-	0	0.0	-
Church	0	0.0	-	0	0.0	-
Friend/relative	0	0.0	-	2	2.2	1.5
Home of a community health worker	0	0.0	-	2	0.9	0.9
School	0	0.0	-	0	0.0	-
Casa base	0	0.0	-	9	4.9	2.9
Casa materna	0	0.0	-	0	0.0	-
Public health unit	63	33.9	6.3	0	0.0	-
Other	1	0.4	0.4	0	0.0	-
Don't know	0	-	-	0	-	-
Decline to respond	0	-	-	1	-	-
Intrauterine device (IUD)						
Public hospital	28	49.7	12.6	43	53.1	8.9
Public health center/clinic	4	4.3	2.5	13	17.6	6.0
Public health post	0	0.0	-	7	8.8	5.2
Public mobile clinic	0	0.0	-	0	0.0	-
Other public health facility	0	0.0	-	1	5.1	5.0
Private hospital	0	0.0	-	1	0.3	0.3
Private health clinic	3	14.4	11.6	8	10.8	4.2
Private doctor's office	1	0.6	0.7	4	4.2	2.5
Private mobile clinic	0	0.0	-	0	0.0	-
Other private health facility	0	0.0	-	0	0.0	-
Pharmacy	0	0.0	-	0	0.0	-
Community health worker	0	0.0	-	0	0.0	-
Traditional healer	0	0.0	-	0	0.0	-
Store	0	0.0	-	0	0.0	-
Market	0	0.0	-	0	0.0	-
Church	0	0.0	-	0	0.0	-
Friend/relative	0	0.0	-	0	0.0	-
Home of a community health worker	0	0.0	-	0	0.0	-
School	0	0.0	-	0	0.0	-
Casa base	0	0.0	-	0	0.0	-

(continued)

	n	%	SE	n	%	SE
Casa materna	0	0.0	-	0	0.0	-
Public health unit	11	28.8	11.5	0	0.0	-
Other	2	2.1	1.5	0	0.0	-
Don't know	0	-	-	0	-	-
Decline to respond	0	-	-	0	-	-
Public hospital	1	69.2	30.1	0	0.0	-
Public health center/clinic	0	0.0	-	1	48.1	27.4
Public health post	0	0.0	-	2	9.8	8.2
Public mobile clinic	0	0.0	-	0	0.0	-
Other public health facility	0	0.0	-	0	0.0	-
Private hospital	0	0.0	-	0	0.0	-
Private health clinic	1	30.8	30.1	2	7.3	6.2
Private doctor's office	0	0.0	-	2	22.8	19.1
Private mobile clinic	0	0.0	-	0	0.0	-
Other private health facility	0	0.0	-	0	0.0	-
Pharmacy	0	0.0	-	0	0.0	-
Community health worker	0	0.0	-	0	0.0	-
Traditional healer	0	0.0	-	0	0.0	-
Store	0	0.0	-	0	0.0	-
Market	0	0.0	-	0	0.0	-
Church	0	0.0	-	0	0.0	-
Friend/relative	0	0.0	-	0	0.0	-
Home of a community health worker	0	0.0	-	0	0.0	-
School	0	0.0	-	0	0.0	-
Casa base	0	0.0	-	1	5.9	6.5
Casa materna	0	0.0	-	0	0.0	-
Public health unit	0	0.0	-	0	0.0	-
Other	0	0.0	-	1	6.0	6.5
Don't know	0	-	-	0	-	-
Decline to respond	1	-	-	0	-	-
Male condom						
Public hospital	6	21.2	9.0	12	21.8	10.2
Public health center/clinic	10	19.7	7.1	15	24.3	8.1
Public health post	0	0.0	-	9	17.1	6.0
Public mobile clinic	0	0.0	-	0	0.0	-
Other public health facility	0	0.0	-	0	0.0	-
Private hospital	1	2.2	2.2	0	0.0	-
Private health clinic	0	0.0	-	1	0.9	0.9
Private doctor's office	0	0.0	-	0	0.0	-
Private mobile clinic	0	0.0	-	0	0.0	-
Other private health facility	0	0.0	-	0	0.0	-
Pharmacy	21	28.2	7.1	26	35.4	7.8
Community health worker	0	0.0	-	0	0.0	-
Traditional healer	0	0.0	-	0	0.0	-
Store	0	0.0	-	0	0.0	-
Market	0	0.0	-	0	0.0	-
Church	0	0.0	-	0	0.0	-
Friend/relative	1	1.0	1.0	0	0.0	-
Home of a community health worker	0	0.0	-	1	0.5	0.5

(continued)

	n	%	SE	n	%	SE
School	0	0.0	-	0	0.0	-
Casa base	0	0.0	-	0	0.0	-
Casa materna	0	0.0	-	0	0.0	-
Public health unit	11	27.1	9.3	0	0.0	-
Other	1	0.7	0.7	0	0.0	-
Don't know	0	-	-	0	-	-
Decline to respond	0	-	-	0	-	-

* "Female condom", "Sponge", and "Diaphragm" were omitted from table because no women reported receiving them in baseline or follow-up.

* Options for "Public health center", "Public health post", "Home of a traditional healer", "School", and "Casa base" were not available at baseline.

Options for "Public health unit" and "Public health center/clinic" were not available at follow-up. "Public health center" responses from follow-up are grouped within "Public health center/clinic".

Table E5.6: Source of knowledge about traditional family planning methods, women 15-49 years of age who are married or partnered

	Baseline 2013			Second Follow-Up 2017		
	n	%	SE	n	%	SE
Lactational amenorrhea						
Public hospital	3	51.6	20.7	1	10.5	10.3
Public health center/clinic	2	24.5	16.3	2	32.7	18.8
Public health post	0	0.0	-	2	33.6	19.1
Public mobile clinic	0	0.0	-	0	0.0	-
Other public health facility	0	0.0	-	0	0.0	-
Private hospital	0	0.0	-	0	0.0	-
Private health clinic	0	0.0	-	0	0.0	-
Private doctor's office	0	0.0	-	0	0.0	-
Private mobile clinic	0	0.0	-	0	0.0	-
Other private health facility	0	0.0	-	0	0.0	-
Pharmacy	0	0.0	-	0	0.0	-
Community health worker	1	10.7	10.6	0	0.0	-
Traditional healer	0	0.0	-	0	0.0	-
Store	0	0.0	-	0	0.0	-
Market	0	0.0	-	0	0.0	-
Church	0	0.0	-	0	0.0	-
Friend/relative	0	0.0	-	2	23.2	15.8
Home of a community health worker	0	0.0	-	0	0.0	-
School	0	0.0	-	0	0.0	-
Casa base	0	0.0	-	0	0.0	-
Casa materna	0	0.0	-	0	0.0	-
Public health unit	1	13.3	12.9	0	0.0	-
Other	0	0.0	-	0	0.0	-
Don't know	2	-	-	0	-	-
Decline to respond	0	-	-	0	-	-
Rhythm						
Public hospital	0	0.0	-	0	0.0	-

Public health center/clinic	0	0.0	-	2	14.2	10.5
Public health post	0	0.0	-	1	13.7	13.1
Public mobile clinic	0	0.0	-	0	0.0	-
Other public health facility	0	0.0	-	0	0.0	-
Private hospital	0	0.0	-	0	0.0	-
Private health clinic	0	0.0	-	0	0.0	-
Private doctor's office	0	0.0	-	0	0.0	-
Private mobile clinic	0	0.0	-	0	0.0	-
Other private health facility	0	0.0	-	0	0.0	-
Pharmacy	0	0.0	-	0	0.0	-
Community health worker	1	8.3	7.7	0	0.0	-
Traditional healer	0	0.0	-	0	0.0	-
Store	0	0.0	-	0	0.0	-
Market	0	0.0	-	0	0.0	-
Church	3	26.2	15.8	0	0.0	-
Friend/relative	3	42.3	21.5	3	47.3	21.9
Home of a community health worker	0	0.0	-	1	8.1	8.3
School	0	0.0	-	0	0.0	-
Casa base	0	0.0	-	0	0.0	-
Casa materna	0	0.0	-	0	0.0	-
Public health unit	0	0.0	-	0	0.0	-
Other	3	23.2	14.4	2	16.6	12.1
Don't know	0	-	-	0	-	-
Decline to respond	0	-	-	0	-	-
Withdrawal						
Public hospital	0	0.0	-	0	0.0	-
Public health center/clinic	0	0.0	-	2	42.0	23.7
Public health post	0	0.0	-	0	0.0	-
Public mobile clinic	0	0.0	-	0	0.0	-
Other public health facility	0	0.0	-	0	0.0	-
Private hospital	0	0.0	-	0	0.0	-
Private health clinic	0	0.0	-	0	0.0	-
Private doctor's office	1	23.6	20.2	0	0.0	-
Private mobile clinic	0	0.0	-	0	0.0	-
Other private health facility	0	0.0	-	0	0.0	-
Pharmacy	0	0.0	-	0	0.0	-
Community health worker	0	0.0	-	0	0.0	-
Traditional healer	0	0.0	-	0	0.0	-
Store	0	0.0	-	0	0.0	-
Market	0	0.0	-	0	0.0	-
Church	0	0.0	-	0	0.0	-
Friend/relative	0	0.0	-	8	51.8	22.3
Home of a community health worker	0	0.0	-	0	0.0	-
School	0	0.0	-	0	0.0	-
Casa base	0	0.0	-	0	0.0	-
Casa materna	0	0.0	-	0	0.0	-
Public health unit	2	29.4	20.2	0	0.0	-
Other	3	47.0	21.8	1	6.1	6.4
Don't know	0	-	-	0	-	-
Decline to respond	0	-	-	0	-	-

* Options for "Public health center", "Public health post", "Home of a traditional healer", "School", and "Casa base" were not available at baseline.

Options for "Public health unit" and "Public health center/clinic" were not available at follow-up. "Public health center" responses from follow-up are grouped within "Public health center/clinic".

E5.4 Non-Use and Interruption of Use of Family Planning Methods

Non-use and interruption of use of family planning methods are major concerns for family planning program managers.

E5.4.1 Prevalence of interruption

The prevalence of interruption and non-use of family planning methods is summarized in Table E5.7. Of women participating in the second follow-up survey, 82.6% are considered "in need" of contraception (i.e., they did not report any of the following: does not have sexual relations, virgin, menopausal, infertile, hysterectomy, pregnant, or wants to become pregnant). Among these women in need, 2.7% reported any interruption in the use of family planning methods in the previous year.

Table E5.7: Interruption and non-use of family planning methods, among women 15-49 years of age who are married or partnered and in need of contraception

	Baseline 2013				Second Follow-Up 2017			
	n	N	%	SE	n	N	%	SE
Discontinuation rate*	54	1557	3.5	0.7	50	1950	2.7	0.7

* any interruption in use during the last year, among women in need of contraception

	Baseline 2013			Second Follow-Up 2017		
	n	%	SE	n	%	SE
Number of interruptions in use during the last year						
none	1503	96.5	0.7	1900	97.3	0.7
once	47	3.2	0.6	50	2.7	0.7
2-6 times per year	7	0.3	0.2	0	0.0	-
7-12 times per year	0	0.0	-	0	0.0	-
>12 times per year	0	0.0	-	0	0.0	-

E5.4.2 Reasons for non-use

Women who indicated they were not using any method on the day of the interview were asked to specify all reasons why they did not use a method. The interviewer matched responses provided by the respondent to a list of reasons in the questionnaire (Table E5.8). The most commonly cited reasons for non-use at the time of the second follow-up interview were, do not like to use contraception (14.4%), respondent is trying to become pregnant (12.4%), and respondent is other reason (10.2%).

Table E5.8: Reasons for non-use of family planning methods, women 15-49 years of age who are married or partnered and who are not currently using family planning methods

	Baseline 2013				Second Follow-Up 2017			
	n	N	%	SE	n	N	%	SE
Do not like to use contraception	98	379	25.8	3.8	82	560	14.4	2.7
Trying to become pregnant	63	379	22.9	3.9	61	560	12.4	2.2
Other reason	37	379	7.1	1.5	71	560	10.2	1.6
Not sexually active	43	379	10.0	2.4	49	560	8.9	1.9
Menopausal	26	379	8.9	2.7	28	560	7.1	1.7
Using contraception interferes with normal body processes	25	379	4.6	1.1	40	560	7.1	1.4
Infrequently sexually active	41	379	9.2	2.4	41	560	6.4	1.5
Spouse or partner opposed to use	10	379	1.9	0.7	38	560	6.1	1.3
Currently pregnant	25	379	7.5	2.1	35	560	5.9	1.7
Married	39	379	8.5	2.7	27	560	5.8	1.8
Opposed to use	13	379	1.9	0.6	30	560	4.4	1.2
Infertile	20	379	7.0	2.2	17	560	3.9	1.2
Concerned about side effects	26	379	4.1	1.2	27	560	3.8	0.9
Using contraception is uncomfortable	3	379	0.3	0.2	19	560	3.4	1.1
Unmarried	17	379	3.9	1.7	11	560	2.9	1.0
Against religious beliefs	4	379	3.9	2.1	11	560	2.3	0.9
Have undergone hysterectomy	10	379	2.4	1.1	10	560	2.1	0.9
Others opposed to use	1	379	0.1	0.1	9	560	1.4	0.6
Knows no method	8	379	1.1	0.5	6	560	1.4	0.7
The health facility is too far away	4	379	0.9	0.5	8	560	1.4	0.6
Mistrust health center staff	6	379	0.5	0.2	6	560	1.3	0.7
No menstrual period since giving birth	15	379	2.3	0.8	12	560	1.1	0.4
Breastfeeding	20	379	2.7	0.6	8	560	0.9	0.3
Virgin	1	379	0.1	0.1	1	560	0.5	0.5
No method was available	4	379	0.3	0.2	1	560	0.5	0.5
Preferred method was not available	4	379	1.4	1.0	2	560	0.2	0.2
Knows no source for methods	6	379	0.5	0.2	1	560	0.1	0.1
Could not find transportation to a health facility	1	379	0.1	0.1	1	560	0.1	0.1
Health facility staff difficult to deal with	6	379	0.8	0.3	1	560	0.1	0.1
Could not afford transportation	5	379	0.9	0.4	0	560	0.0	-
The method is too expensive	2	379	0.4	0.4	0	560	0.0	-

* "Using contraception affects health" was an option offered in the second follow-up, but was not available at baseline.

86 women selected this as a reason for not using family planning at the second follow-up.

* categories not mutually exclusive (select all that apply)

E5.5 Family Planning Intentions and Decision-Making

E5.5.1 Participation in family planning decision

In this setting in the second follow-up, 74.6% of women report that decisions about family planning methods are jointly made by the respondent and her partner. In only 3.9% of cases, the decision to use family planning methods is up to the respondent's partner alone.

Table E5.9: Participation in family planning decision-making, women 15-49 years of age who are married or partnered and are currently using family planning methods

	Baseline 2013			Second Follow-Up 2017		
	n	%	SE	n	%	SE
Joint decision	1227	74.4	1.6	1455	74.6	1.8
Mostly the respondent	295	18.3	1.4	400	21.2	1.6
Mostly respondent's spouse/partner	134	6.6	0.9	69	3.9	0.8
Not applicable - not partnered	4	0.2	0.1	0	0.0	-
Other	8	0.4	0.2	7	0.3	0.1
Don't know	2	-	-	5	-	-
Decline to respond	0	-	-	4	-	-

E5.5.2 Informed choice

With respect to use of family planning methods, “informed choice” refers to whether or not health care workers described other options for family planning methods, possible side effects associated with the method of choice, and how to respond to side effects if they occur. This information can be used to help women select an appropriate contraceptive method, and to assist users in coping with side effects (thus decreasing discontinuation rates for non-permanent methods).

Table E5.10 shows the percent of women currently using family planning methods who were told about other options for contraception (52.2% of women in the second follow-up).

Table E5.10: Family planning decision-making, informed choice, women 15-49 years of age who are married or partnered and who are currently using family planning methods

	Baseline 2013				Second Follow-Up 2017			
	n	N	%	SE	n	N	%	SE
Informed about other family planning options by a doctor, nurse, or community health worker	1112	1668	65.4	2.2	1038	1935	52.2	2.3

E5.6 Exposure to Family Planning Information

E5.6.1 Family planning messages delivered by health care providers

Respondents were asked about their exposure to family planning messages delivered by health care providers (Table E5.11). Thirty percent of women in the second follow-up reported being advised about family planning at the health care facility they attend during the past 12 months. Twenty one percent of all respondents indicated that they had been visited by a health promoter who provided information about family planning in the last 12 months. Just 7.3% of respondents who had not attended a health

facility in the last 12 months were visited by a health promoter who provided information about family planning.

Table E5.11: Family planning messages delivered by health care providers in the last 12 months, women 15-49 years of age who are married or partnered

	Baseline 2013				Second Follow-Up 2017			
	n	N	%	SE	n	N	%	SE
Discussion about family planning methods with staff member at a health facility	697	1202	58.7	2.6	677	2246	29.6	1.9
Discussion about family planning methods during health promoter visit	153	1809	7.5	0.8	489	2242	21.0	1.5
Visit by promotor, among women who had not visited a health facility	42	611	5.9	1.2	92	1377	7.3	1.5

Figure E5.1: Family planning information received from health facility or community health workers in the last 12 months by municipality, women 15-49 years of age who are married or partnered, second follow-up survey

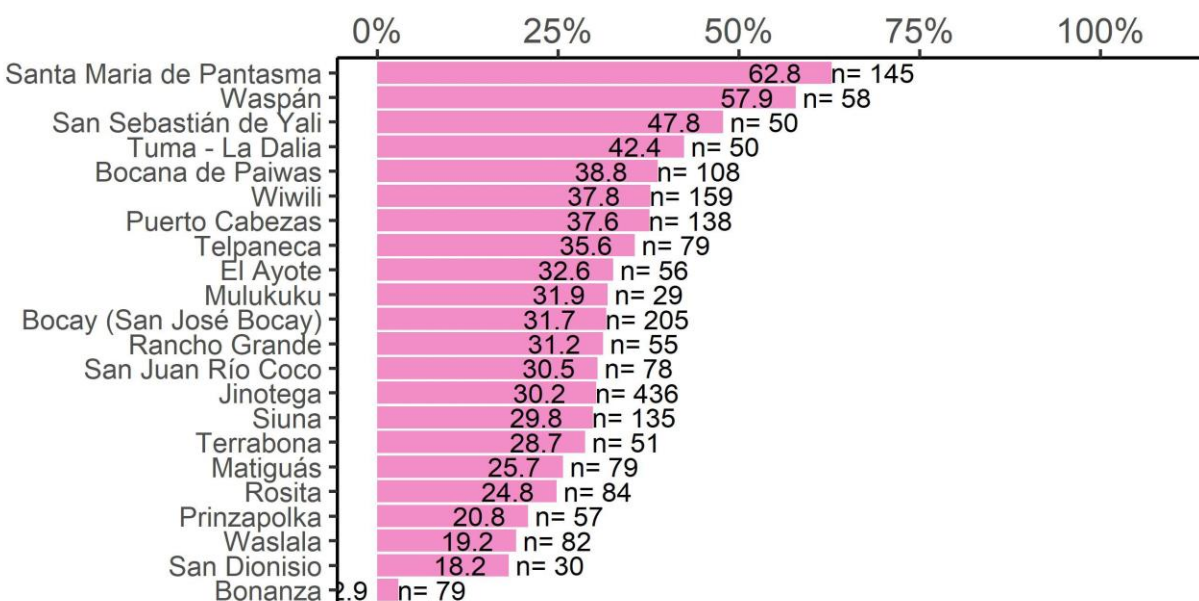
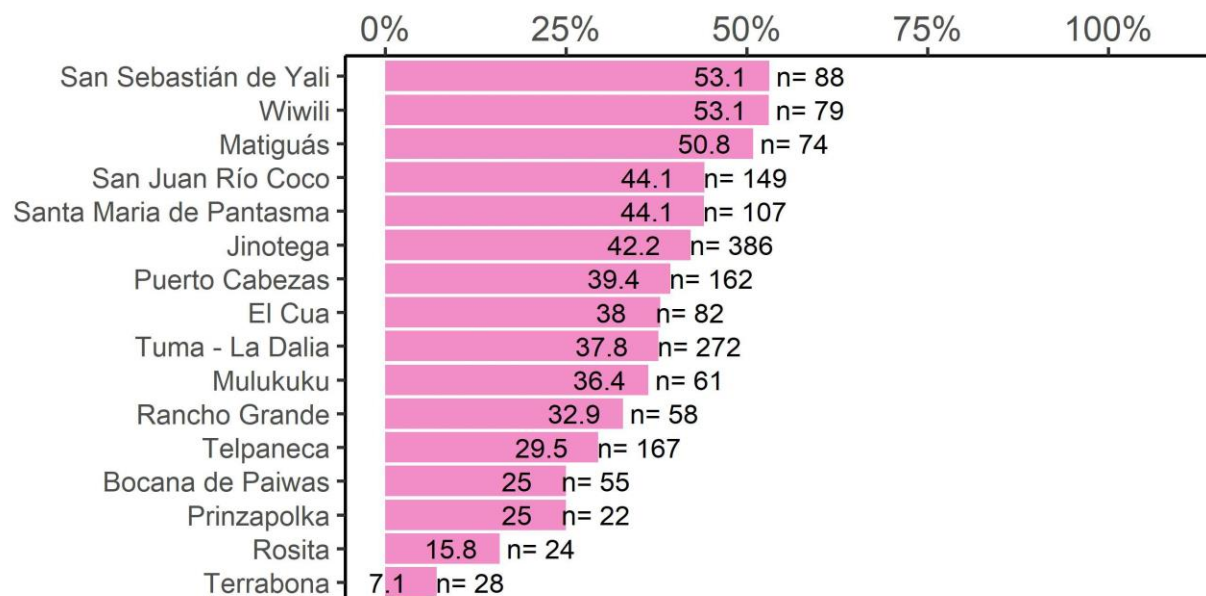


Figure E5.2: Family planning information received from health facility or community health workers in the last 12 months by municipality, women 15-49 years of age who are married or partnered, baseline survey



E5.7 Age at First Birth

E5.7.1 Age at first birth

Seventy four percent of respondents in the second follow-up had ever given birth (Table E5.12). Of these women, the median age of the women when their first child was born was 18 years old. Only a quarter of women were 20 years old or older when their first child was born. Eight percent of women reported a history of stillbirth, miscarriage, and/or abortion.

Table E5.12: Parity and age at first birth, women 15-49 years of age

	Baseline 2013				Second Follow-Up 2017			
	n	N	%	SE	n	N	%	SE
Ever given birth	2290	2810	74.4	1.3	2760	3358	73.7	1.3
Ever had a stillbirth, miscarriage, or abortion	261	2809	9.0	1.0	250	3356	7.7	0.7

	N	DK/DTR	Min	25th Percentile	Median	75th Percentile	Max
Baseline 2013							
Age at first birth, among parous women	2284	0	12	16	18	20	38
Second follow-up 2017							
Age at first birth, among parous women	2740	0	11	16	18	20	43

E6 CHAPTER 6: MATERNAL HEALTH CARE

This chapter summarizes key indicators pertaining to antenatal care, delivery care, and postpartum care for the most recent live birth in the last two years as reported by women of reproductive age (15-49 years) participating in the SMI-Nicaragua second follow-up household survey. Participating women were interviewed about all live births in the last five years, but to reduce the impact of recall bias, results reported here are for each woman's most recent birth in the last two years. At the baseline, 2071 women were interviewed about at least one birth in the last two years. At the second follow-up, 2389 women were interviewed about births in the last two years.

E6.1 Antenatal Care

To reduce recall bias, data pertaining to antenatal care are summarized for a woman's most recent birth in the last two years.

E6.1.1 Antenatal care coverage

Early and regular checkups by trained medical providers are important in assessing the physical status of women during pregnancy and provide an opportunity to intervene in a timely manner if any problems are detected. The Maternal and Child Health Questionnaire captured information from women on both overall coverage of antenatal care and the content of care received. To obtain information on source of antenatal care, interviewers recorded all persons a woman consulted for care. Timing of antenatal care was assessed by asking women how many weeks or months pregnant they were when they attended their first antenatal care visit. The same details were recorded for up to eight antenatal care visits.

The percentage of women with a birth in the last two years who attended at least one antenatal care visit for the most recent birth, and the percent distribution of timing of care among those who received any antenatal care are presented in Table E6.1. Definition of "most recent birth" changed between baseline and second follow-up. The type of facility where antenatal care was sought is detailed in Table E6.2.

Among women with a child under the age of 2 in the second follow-up, 91.8% attended at least one antenatal care visit and 88.8% of women had at least one antenatal care visit with a doctor or professional nurse. At the second follow-up, 47.1% of women had an antenatal care visit during the first trimester (first 12 weeks) with a doctor or professional nurse, compared to 46.2% at the baseline. The median age of gestation at the first antenatal care visit during the second follow-up was 2 months.

Table E6.1: Antenatal care coverage for the most recent birth in the last two years, women 15-49 years of age

	Baseline 2013				Second Follow-Up 2017			
	n	N	%	SE	n	N	%	SE
Attended at least one antenatal care visit	1983	2071	95.8	0.6	2203	2388	91.8	1.3
Attended at least one antenatal care visit with doctor or professional nurse	1980	2071	95.7	0.6	2130	2388	88.8	1.4
Antenatal care visit with doctor or professional nurse in the first trimester (12 weeks)	967	2060	46.2	1.6	1131	2358	47.1	1.6

* Definition of most recent birth changed between baseline and second follow-up

	N	DK/DTR	Min	25th Percentile	Median	75th Percentile	Max
Baseline 2013							
Month of gestation of first ANC visit	1972	9	0.2	2	3	4	9
Second follow-up 2017							
Month of gestation of first ANC visit	2173	28	0.2	1	2	4	9

Regarding the type of facility where antenatal care was usually sought during the second follow-up (Table E6.2), most women who attended antenatal care for their most recent delivery in the last two years sought care in a Public health post (38.2%) or Public health center/clinic (34.6%). Only 16.4% of women sought antenatal care in a public hospital.

Table E6.2: Usual antenatal care location, women 15-49 years of age who attended at least one antenatal care visit for most recent birth in the last two years

	Baseline 2013			Second Follow-Up 2017		
	n	%	SE	n	%	SE
Public health post	0	0.0	-	784	38.2	3.6
Public health center/clinic	524	26.5	2.5	785	34.6	3.1
Public hospital	423	23.6	3.3	362	16.4	2.9
Private health clinic	64	3.0	0.6	93	3.8	0.6
Casa base	0	0.0	-	58	2.3	0.6
Private doctor's office	45	1.7	0.3	53	2.1	0.4
Private hospital	6	0.4	0.2	14	0.5	0.2
Home of a community health worker	0	0.0	-	9	0.3	0.2
Other public health facility	15	0.5	0.2	4	0.2	0.1
Private mobile clinic	3	0.2	0.1	2	0.1	0.1
Community health worker	2	0.1	0.1	2	0.1	0.1
Public mobile clinic	1	0.1	0.1	1	0.0	-
Other private health facility	1	0.0	-	0	0.0	-
Pharmacy	0	0.0	-	0	0.0	-
Traditional healer	2	0.1	0.1	0	0.0	-
School	0	0.0	-	0	0.0	-
Casa materna	0	0.0	-	1	0.0	-
Public health unit	885	43.4	3.1	0	0.0	-
Other	11	0.4	0.1	32	1.4	0.3
Don't know	1	-	-	3	-	-
Decline to respond	0	-	-	0	-	-

* Options for "Public health center", "Public health post", "Home of a traditional healer", "School", and "Casa base" were not available at baseline.

Options for "Public health unit" and "Public health center/clinic" were not available at follow-up. "Public health center" responses from follow-up are grouped within "Public health center/clinic".

E6.1.2 Frequency of antenatal care visits

Antenatal care can be more effective in avoiding adverse pregnancy outcomes when it is sought early in the pregnancy and continues until delivery. According to the national norm in Nicaragua, it is recommended that women receive a minimum of four antenatal care visits. The frequency of antenatal care visits is summarized in Table E6.3. Table E6.4 shows the percentage of women with four or more visits with skilled providers and according to best practices.

In the second follow-up, 78.9% of women reported having four or more antenatal care visits during their most recent pregnancy in the last two years. Forty percent of women reported having seven or more antenatal care visits during their most recent pregnancy.

The content of antenatal care is as crucial as the frequency of visits. As shown in Table E6.4, 41.2 percent of all women in the second follow-up survey had four or more antenatal care visits with a doctor or professional nurse, and with each of 9 defined best practices performed at least once during pregnancy (measurement of blood type, test for anemia, test for syphilis, test for HIV, test of blood

glucose, measurement of maternal blood pressure, measurement of maternal weight, measurement of fundal height, and measurement of fetal heartbeat).

Table E6.3: Frequency of antenatal care visits for the most recent birth in the last two years, women 15-49 years of age

	Baseline 2013			Second Follow-Up 2017		
	n	%	SE	n	%	SE
None	88	4.2	0.6	185	8.3	1.3
1-3 visits	255	12.8	1.0	290	12.8	1.3
4-6 visits	862	42.6	1.4	888	38.4	1.8
7-9 visits	842	39.9	1.7	967	40.0	1.9
10+ visits	12	0.4	0.2	13	0.5	0.2
Don't know	11	-	-	45	-	-
Decline to respond	0	-	-	0	-	-

Table E6.4: Frequency of antenatal care visits with skilled provider for the most recent birth in the last two years, women 15-49 years of age

	Baseline 2013				Second Follow-Up 2017			
	n	N	%	SE	n	N	%	SE
At least four antenatal care visits with doctor or professional nurse	1713	2060	82.9	1.3	1769	2343	74.8	1.9
At least four antenatal care visits with doctor or professional nurse according to best practices*	769	2060	39.6	2.2	991	2343	41.2	2.3

*measuring blood type, anemia, syphilis, HIV, glucose, blood pressure, weight, fundal height, and fetal heartbeat.

E6.1.3 Content of antenatal care

The content of antenatal care is an important indicator of quality of care. The coverage of key procedures was assessed among women who received any antenatal care for a birth in the last two years (Table E6.5 and Table E6.6). It is important to remember that the validity of these data hinge on the respondent's understanding of the question and her ability to recall events that may have occurred several years prior to the interview.

There was variation in performance of the 9 "best practice" procedures during the second follow-up: measured maternal weight (98.2%), measured maternal blood pressure (97.7%), measured fundal height (97%), measured fetal heartbeat (95.2%), measured blood type (90.5%), tested for anemia (89.5%), tested for HIV (81.4%), measured blood glucose (78.1%), and tested for syphilis (71.8%). Women were unfamiliar with several tests, as evidenced by the high number of missing responses for syphilis.

Table E6.5: Content of antenatal care visits - best practices, among women 15-49 years who attended at least one antenatal care visit for most recent birth in the last two years

	Baseline 2013				Second Follow-Up 2017			
	n	N	%	SE	n	N	%	SE
Measured maternal weight	1961	1982	99.0	0.3	2158	2198	98.2	0.4
Measured maternal blood pressure	1960	1980	99.0	0.3	2144	2197	97.7	0.5
Measured fundal height	1863	1970	94.3	0.7	2132	2198	97.0	0.7
Measured fetal heartbeat	1852	1981	93.7	0.9	2099	2199	95.2	0.8
Measured blood type	1524	1770	86.9	1.4	1865	2061	90.5	0.9
Tested for anemia	1554	1767	89.6	1.0	1841	2061	89.5	1.1
Tested for HIV	1464	1961	74.2	2.1	1746	2120	81.4	1.4
Measured blood glucose	1218	1757	71.5	1.8	1604	2029	78.1	1.8
Tested for syphilis	1134	1733	68.1	2.5	1434	1969	71.8	1.9

Most women in the second follow-up had a collected urine specimen (96.8%) and a collected blood specimen (95.7%) collected during their antenatal care visits for the most recent birth during the past two years.

Table E6.6: Content of antenatal care visits - other services provided, among women 15-49 years who attended at least one antenatal care visit for most recent birth in the last two years

	Baseline 2013				Second Follow-Up 2017			
	n	N	%	SE	n	N	%	SE
Collected urine specimen	1838	1981	92.4	0.9	2127	2199	96.8	0.5
Collected blood specimen	1804	1979	90.3	1.0	2108	2199	95.7	0.7
Performed an ultrasound	1497	1982	75.4	1.5	1991	2200	89.7	1.4
Offered an HIV test	1570	1966	79.3	2.0	1841	2129	85.8	1.2
Tested for diabetes	915	1215	76.8	1.6	1289	1595	79.9	1.4

E6.1.4 Coverage of tetanus toxoid vaccinations during pregnancy

Tetanus toxoid injections are given during pregnancy for the prevention of neonatal tetanus. To prevent transmission of this potentially fatal infection, all women should be vaccinated with tetanus toxoid when they become pregnant. A baby is considered protected if the mother receives two doses of tetanus toxoid during pregnancy, with the second at least two weeks before delivery. However, if a woman was vaccinated previously, she only requires one dose during the current pregnancy. Five doses are considered adequate to confer lifetime immunity. To assess the coverage of tetanus toxoid vaccination, women who reported receiving any antenatal care during their most recent pregnancy were asked if they received tetanus toxoid injections.

As shown in Table E6.7, the coverage of sufficient tetanus toxoid vaccination during pregnancy was 60.9% among women who received antenatal care during the second follow-up. Fifty five percent of women

received one vaccination during the pregnancy and 35.8% received two or more. Among women with antenatal care, 35% had never been vaccinated before and 29.1% had received a vaccine in the last 10 years. Among women who were not vaccinated during prenatal care visits, 4.8% had never been vaccinated.

Table E6.7: Coverage of tetanus toxoid vaccinations during pregnancy, among women 15-49 years who attended at least one antenatal care visit for most recent birth in the last two years

	Baseline 2013			Second Follow-Up 2017		
	n	%	SE	n	%	SE
Two or more injections during pregnancy	446	29.6	1.7	518	35.8	2.2
One injection during pregnancy, one <10 years before	442	27.6	1.3	389	25.1	1.6
One injection during pregnancy, none <10 years before	515	36.0	1.8	444	30.2	1.9
No injections during pregnancy, one or more <10 years before	56	3.3	0.6	53	4.0	0.9
No injections during pregnancy nor during the 10 years prior	57	3.5	0.6	69	4.8	0.6
Don't know	467	-	-	723	-	-
Decline to respond	0	-	-	7	-	-

E6.1.5 Exposure to safe pregnancy messages

Women who received antenatal care were asked about a series of topics for which they might have received counseling or advice during their pregnancy. Table E6.8 shows the percentage of women in the second follow-up who were exposed to the following messages: counseled about pregnancy (92.6%); counseled about danger signs during pregnancy (90.6%); advised to deliver in a facility (89.6%); counseled about breastfeeding (86.8%); given information about in-facility delivery (86.3%); counseled about nutrition during pregnancy (84.5%); counseled about childcare (84.2%).

Exposure to safe pregnancy practices increased from baseline to second follow-up for all counseling categories. In the second follow-up, 79.3% of women were counseled about contraception after delivery compared to 83.8% at baseline. 43.9% of women in the second follow-up, compared to 39.9% at baseline, were advised to have a Cesarean section. Compared to 24.2% of women at baseline, 38.9% of women in the second follow-up were counseled about making a transportation plan for delivery.

Table E6.8: Exposure to safe pregnancy practices, women 15-49 years of age who attended at least one antenatal care visit for most recent birth in the last two years

	Baseline 2013				Second Follow-Up 2017			
	n	N	%	SE	n	N	%	SE
Counseled about pregnancy	1852	1981	93.8	0.8	2036	2198	92.6	0.9
Counseled about danger signs during pregnancy	1836	1980	92.7	0.8	1995	2191	90.6	0.9
Advised to deliver in a facility	1744	1981	88.8	1.1	1970	2198	89.6	1.1
Counseled about breastfeeding	1714	1975	86.5	1.3	1917	2200	86.8	1.1
Given information about in-facility delivery	1721	1979	87.6	1.3	1895	2196	86.3	1.1
Counseled about nutrition during pregnancy	1741	1972	88.5	0.9	1837	2187	84.5	1.2
Counseled about childcare	1504	1979	77.3	1.7	1853	2200	84.2	1.1
Counseled about contraception after delivery	1645	1982	83.8	1.3	1743	2196	79.3	1.5
Advised to have a Cesarean section	770	1982	39.9	2.4	941	2186	43.9	2.3
Counseled about making a transportation plan for delivery	470	1981	24.2	1.7	848	2188	38.9	1.6

E6.2 Delivery Care

Proper medical attention and hygienic conditions during delivery can reduce the risk of complications, infections, and even death for the mother and newborn baby. Characteristics of the delivery, including place of delivery and assistance at delivery were captured for all births in the five years preceding the survey. To reduce recall bias, only data from the most recent delivery within the last two years are summarized.

E6.2.1 Place of delivery

The location of the most recent birth and the means of transportation used to get to the facility are shown in Table E6.9. The majority of births occurred in public hospitals (72.5%). Deliveries in private-sector facilities were rare (2.8%). Among women who delivered in a facility, 29.5% indicated that they used a private vehicle for transport (Table E6.10).

Table E6.9: Place of delivery for most recent birth in the last two years, women 15-49 years of age

	Baseline 2013			Second Follow-Up 2017		
	n	%	SE	n	%	SE
Public hospital	1555	75.0	2.1	1765	72.5	1.8
Own home	214	11.0	1.7	302	13.3	1.6
Public health center/clinic	204	9.2	1.3	195	9.4	1.4
Private health center/clinic	31	1.7	0.4	45	1.9	0.4
Other public health facility	20	0.8	0.3	26	1.0	0.2
Private hospital	12	0.6	0.2	23	0.8	0.2
Other house	21	1.0	0.3	12	0.5	0.2
Home of a community health worker	0	0.0	-	5	0.2	0.1
Other private health facility	1	0.1	0.1	2	0.1	0.1
Casa base	0	0.0	-	4	0.1	0.1
Public health ward	0	0.0	-	1	0.0	-
Private health ward	0	0.0	-	0	0.0	-
School	0	0.0	-	0	0.0	-
Casa materna	0	0.0	-	1	0.0	-
Other	13	0.6	0.2	6	0.2	0.1
Don't know	0	-	-	1	-	-
Decline to respond	0	-	-	1	-	-

* Options for "Home of a traditional healer", "School", "Casa base", and "Casa materna" were not available at baseline.

Table E6.10: Transportation to place of delivery for most recent birth in the last two years, among women 15-49 years of age who delivered in a facility

	Baseline 2013				Second Follow-Up 2017			
	n	N	%	SE	n	N	%	SE
Private vehicle	390	1822	21.3	1.6	663	2062	29.5	2.3
Other public transit	761	1822	44.6	2.6	614	2062	29.3	2.2
Ambulance	498	1822	24.4	2.3	503	2062	24.5	2.7
On foot	231	1822	13.3	2.0	212	2062	10.9	1.3

*categories not mutually exclusive (select all that apply)

Women were asked about the proximity to the health facility used to deliver. Of the 2065 women from the second follow-up who delivered in a facility, 1121 were able to estimate the distance to the facility (Table E6.11). The median number of women reported travelling less than 8 km. Fifty percent of women traveled more than one hours to the facility to deliver.

Table E6.11: Proximity to health care facilities: health facility for delivery

	N	DK/DTR	Min	25th Percentile	Median	75th Percentile	Max
Baseline 2013							
Distance, km	1389	434	0	2	10	40	100
Travel time, min	1795	28	1	20	60	120	2700
Second follow-up 2017							
Distance, km	1121	944	0	1.6	8	40	163
Travel time, min	1845	220	1	15	60	120	12000

E6.2.2 Assistance at delivery

The assistance a woman receives during childbirth has important health consequences for both mother and child. For women who did not deliver alone in the last two years (98.4% of all births in the second follow-up), the percentage by type of delivery attendant is detailed in Table E6.12. Among women who did not report being alone for delivery, several categories of personnel may have been in attendance. As can be seen in Table E6.12, most in-facility deliveries during the second follow-up were accompanied by a medical doctor (81.2%) and/or a professional nurse (64.4%). For 28.3% of the deliveries an auxiliary nurse was in attendance. For 22% a relative was in attendance.

Table E6.12: Types of attendants: assistance at delivery for most recent birth in the last two years, women 15-49 years of age

	Baseline 2013				Second Follow-Up 2017			
	n	N	%	SE	n	N	%	SE
Medical doctor	1772	2070	85.0	1.9	1964	2386	81.2	1.6
Professional nurse	1638	2064	79.2	1.6	1498	2296	64.4	1.8
Auxiliary nurse	385	2039	18.5	1.5	628	2236	28.3	2.1
Relative	252	2064	11.8	1.0	494	2355	22.0	1.4
Midwife/comadrona	168	2040	8.4	1.3	239	2331	10.8	1.5
Laboratory technician	48	2020	2.6	0.6	86	2274	3.6	0.7
Community health worker	6	2060	0.3	0.1	13	2336	0.5	0.1
Traditional healer	3	2061	0.1	0.1	9	2345	0.4	0.1
Pharmacist	7	2057	0.4	0.2	6	2341	0.2	0.1
Other	23	2058	1.4	0.5	52	2351	2.2	0.4

* Option "Nurse (title unknown)" was added for the follow-up, but was not available at baseline

Twenty four percent of women in the second follow-up delivered with one attendant, 39.4% with two attendants, and 26.7% with three attendants (Table E6.13). For women's most recent live birth in the past two years, 87% of deliveries had a skilled attendant present and 85.4% delivered with a skilled attendant in a health facility (Table E6.14).

Table E6.13: Number of attendants: assistance at delivery for most recent birth in the last two years, women 15-49 years of age

	Baseline 2013			Second Follow-Up 2017		
	n	%	SE	n	%	SE
None	14	0.7	0.3	35	1.6	0.3
One	373	18.1	1.6	556	23.8	1.9
Two	1227	59.9	1.6	976	39.4	1.8
Three	372	17.0	1.3	630	26.7	1.5
Four or more	85	4.3	0.7	192	8.5	1.3
Don't know	0	-	-	0	-	-
Decline to respond	0	-	-	0	-	-

Table E6.14: In-facility delivery with skilled birth attendant: assistance at delivery for most recent birth in the last two years, women 15-49 years of age

	Baseline 2013				Second Follow-Up 2017			
	n	N	%	SE	n	N	%	SE
Delivery with a skilled birth attendant	1834	2070	87.8	1.7	2090	2386	87.0	1.5
Delivery with a skilled birth attendant in any health facility*	1817	2070	87.1	1.7	2050	2384	85.4	1.7

* In-facility deliveries include deliveries at public and private hospitals, health centers/clinics, health wards, other health facilities, and casas base

E6.2.3 Complications

Pregnancy complications are an important source of maternal and child morbidity and mortality. The type of delivery (vaginal or Caesarian section) among women with births in the last two years is detailed in Table E6.15 along with the percentage of planned in-facility deliveries. Table E6.16 displays the percentage of women with specific complications.

As previously described, the vast majority of births occurred in institutional settings. In 46.2% of these cases during the second follow-up, women indicated that they attended the facility for emergency care. Few women reported seizures prior to delivery (2.7%). Approximately 8.9% of infants were transferred to an intensive care unit after delivery, and 16.7% of women reported excessive bleeding after delivery (more than 1 cup over a two-day period of time).

Table E6.15: Mode of delivery for most recent birth in the last two years, women 15-49 years of age

	Baseline 2013			Second Follow-Up 2017		
	n	%	SE	n	%	SE
Mode of delivery						
Vaginal	1636	80.6	1.4	1816	77.9	1.6
Emergency c-section	286	12.8	1.1	324	12.7	1.2
Planned c-section	149	6.7	0.6	244	9.4	0.8
Don't know	0	-	-	1	-	-
Decline to respond	0	-	-	1	-	-
Reason for seeking delivery care, among in-facility births						
According to birth plan	721	38.3	1.9	1058	53.1	2.1
Because of emergency	1093	61.3	1.9	987	46.2	2.1
Other reason	9	0.4	0.1	15	0.7	0.2
Don't know	0	-	-	3	-	-
Decline to respond	0	-	-	2	-	-

Table E6.16: Delivery complications for most recent birth in the last two years, women 15-49 years of age

	Baseline 2013				Second Follow-Up 2017			
	n	N	%	SE	n	N	%	SE
Respondent experienced excessive bleeding in the first day after delivery	452	2066	19.3	1.5	386	2378	16.7	1.2
Child entered neonatal intensive care unit after delivery	216	2069	9.2	0.8	212	2387	8.9	0.8
Respondent experienced seizures prior to delivery	54	2065	2.5	0.3	57	2388	2.7	0.4

E6.2.4 Birth size and weight

Birth weight is a major determinant of infant and child health and mortality. Birth weight of less than 2.5 kilograms is considered low. For all births during the five-year period preceding the survey, mothers were asked about their perception of the child's size at birth: very large, larger than average, smaller than average, or very small. They were then asked to report the actual weight in kilograms if the child had been weighed after delivery. To reduce recall bias, only data from the most recent birth within the last two years are summarized below (Table E6.17).

In the second follow-up, many women perceived their infant to be average in size (87.9%). With most births occurring in institutional settings, it is not surprising that 87.1% of newborns were weighed at birth. Among those who were weighed, 11.9% weighed less than 2.5 kilograms according to the mother's recall (low birth weight).

Table E6.17: Birth size and weight for most recent live birth in the past two years, women 15-49 years of age

	Baseline 2013			Second Follow-Up 2017		
	n	%	SE	n	%	SE
Very large	49	2.7	0.6	47	2.2	0.4
Larger than average	165	7.9	0.7	102	4.3	0.5
Average	1656	80.9	1.2	2079	87.9	1.0
Smaller than average	120	6.3	0.8	85	3.5	0.5
Very small	43	2.1	0.4	42	2.2	0.4
Don't know	37	-	-	32	-	-
Decline to respond	1	-	-	1	-	-

	Baseline 2013				Second Follow-Up 2017			
	n	N	%	SE	n	N	%	SE
Child was weighed at birth	1829	2041	89.0	1.6	1974	2254	87.1	1.8
Low birth weight (<2.5kg), among those weighed	209	1707	12.9	1.2	192	1626	11.9	0.9

E6.3 Early initiation of breastfeeding

Coverage of early initiation of breastfeeding is defined as the percentage of women who had a live birth in the past two years and put the child to the breast with one hour of birth. Table E6.18 shows that 79.8% of women initiated breastfeeding within one hour of birth.

Table E6.18: Early initiation of breastfeeding for most recent live birth in the past two years, women 15-49 years of age

	Baseline 2013				Second Follow-Up 2017			
	n	N	%	SE	n	N	%	SE
Early initiation of breastfeeding among children <24 months	1673	2067	81.9	1.2	1890	2376	79.8	1.7

E6.4 Postnatal Care

Postnatal care is important both for the mother and the child to treat complications arising from the delivery, as well as to provide the mother with important information on how to care for herself and her child. The postnatal period is defined as the time between the delivery of the placenta and 42 days (six weeks) following the delivery. The timing of postnatal care is important: the first two days after delivery are critical, because most maternal and neonatal deaths occur during this period.

Characteristics of postnatal care, including timing, location, and personnel providing care were captured for all births in the five years preceding the survey. To reduce recall bias, only data from the most recent delivery in the last two years are summarized in the tables below.

E6.4.1 Postnatal checkup for the mother

Data on postnatal care for the mother are summarized in Table E6.19. Table E6.19 shows the percentage of women with a birth in the last two years who were checked at any time after delivery and within 10 days after delivery; and percentage by timing of the check for women with an in-facility delivery.

Only 52.6% of women recalled being checked after delivery during the second follow-up, and numeric(0)% reported being checked one week after delivery by a health care provider. Only 47% of women with an institutional birth recalled being checked every 15 minutes for the first hour post-partum.

Table E6.20 shows the percent distribution of women who were checked at any time after delivery by type of personnel. Among women with postnatal care visits in the second follow-up, most received care from a doctor (78.6%) or professional nurse (14.1%).

Table E6.19: Postnatal checkup for the mother for most recent live birth in the past two years, women 15-49 years of age

	Baseline 2013				Second Follow-Up 2017			
	n	N	%	SE	n	N	%	SE
Any checkup after delivery	759	1070	66.8	2.5	659	1203	52.6	2.3
Checked every 15 minutes during the first hour after delivery, among in-facility births	297	725	39.9	2.5	275	611	47.0	2.6
Checked within 10 days after delivery by a skilled provider*	718	1070	63.5	2.4	1024	1212	83.9	1.9

* The second follow-up survey included an additional question that asked if women were checked before discharge after delivering in facility. If a women was checked before discharge, she was considered to have passed this indicator. Due to the addition of this question, the baseline and follow-up values are not strictly comparable.

Figure E6.1: Postnatal check for mother with skilled attendant within 10 days for most recent live birth in the past two years by municipality, women 15-49 years of age, second follow-up survey

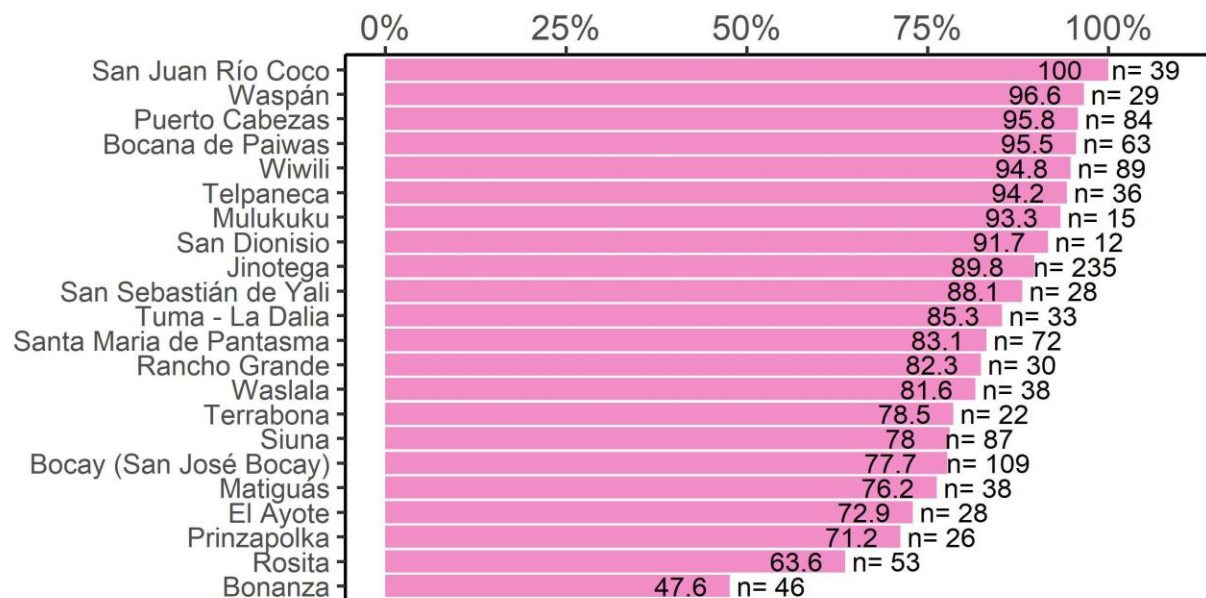


Table E6.20: Provider of care at first postnatal checkup for the mother, most recent live birth in the past two years, among women who attended at least one postnatal care visit

	Baseline 2013			Second Follow-Up 2017		
	n	%	SE	n	%	SE
Doctor	1192	79.9	1.6	1020	78.6	1.8
Professional nurse	270	18.2	1.6	182	14.1	1.4
Auxiliary nurse	14	0.9	0.3	45	3.4	1.0
Nurse (title unknown)	0	0.0	-	24	2.0	0.5
Midwife/comadrona	9	0.5	0.2	14	1.4	0.7
Laboratory technician	1	0.1	0.1	1	0.1	0.1
Pharmacy assistant	0	0.0	-	1	0.1	0.1
Relative	3	0.3	0.2	1	0.1	0.1
Community health worker	1	0.1	0.1	0	0.0	-
Traditional healer	0	0.0	-	0	0.0	-
Other	1	0.0	-	2	0.2	0.2
Don't know	4	-	-	2	-	-
Decline to respond	1	-	-	1	-	-

* Option "Nurse (title unknown)" was added for the follow-up, but was not available at baseline

E6.4.2 Postnatal checkup for the infant

The results regarding postnatal care for the neonate are shown in Table E6.21: percentage of women with a birth in the last two years whose infants were checked after delivery; percent distributions of infants who were checked by skilled personnel within 24 hours of delivery; and percent distributions of infants who were checked by skilled personnel within one week of delivery.

Approximately 79% of women in the second follow-up reported that their infant was checked at any time after delivery. Among all deliveries, 29.5% of women reported that a qualified medical professional checked on their infant within 24 hours of delivery. Table E6.22 shows the attendants for neonatal postnatal care. Most women indicated that a doctor performed a checkup (81.9%). Professional nurse and auxiliary nurse were also reported, though much less frequently.

Table E6.21: Postnatal checkup for neonate for woman's most recent live birth in the past two years, women 15-49 years of age

	Baseline 2013				Second Follow-Up 2017			
	n	N	%	SE	n	N	%	SE
Any checkup after delivery	1745	2066	84.4	1.5	1895	2372	79.0	2.0
Checked within 24 hours after delivery by a skilled provider	696	1851	36.8	1.8	617	2164	29.5	1.9
Checked within 10 days after delivery by a skilled provider	1442	1851	78.0	1.9	1451	2164	66.1	2.2

Table E6.22: Provider of care at first postnatal checkup for the infant, woman's most recent live birth in the past two years, among women whose child attended at least one postnatal care visit

	Baseline 2013			Second Follow-Up 2017		
	n	%	SE	n	%	SE
Doctor	1444	82.8	1.3	1573	81.9	1.6
Professional nurse	264	15.5	1.3	221	13.3	1.4
Auxiliary nurse	20	1.1	0.3	49	2.7	0.6
Nurse (title unknown)	0	0.0	-	28	1.7	0.5
Midwife/comadrona	1	0.1	0.1	8	0.5	0.3
Laboratory technician	0	0.0	-	0	0.0	-
Community health worker	4	0.3	0.1	0	0.0	-
Pharmacy assistant	0	0.0	-	0	0.0	-
Traditional healer	1	0.1	0.1	0	0.0	-
Relative	1	0.1	0.1	0	0.0	-
Other	1	0.1	0.1	1	0.0	-
Don't know	8	-	-	15	-	-
Decline to respond	1	-	-	0	-	-

* Option "Nurse (title unknown)" was added for the follow-up, but was not available at baseline

E6.5 Vouchers, Incentives, and Maternal Waiting Homes

To increase use of their services, some facilities and waiting homes offer vouchers and incentives to women to attend care. Table E6.23 displays the percentage of women in the second follow-up who gave birth the past two years and received a voucher at a health facility. Four percent of women received a voucher or financial assistance to attend antenatal care, 2.2% received a voucher or financial assistance for delivery at a health facility, and 0.4% received a voucher or financial assistance for postpartum or postnatal care at a health facility.

Table E6.23: Voucher incentives for care-seeking for most recent live birth in the past two years, women 15-49 years of age

	Baseline 2013				Second Follow-Up 2017			
	n	N	%	SE	n	N	%	SE
Received a voucher or other form of financial assistance to attend antenatal care at a health facility	10	1982	0.4	0.2	75	2201	3.5	0.7
Received a voucher or other form of financial assistance to deliver at a health facility	26	1821	1.3	0.3	45	2063	2.2	0.6

	Baseline 2013			Second Follow-Up 2017		
	n	%	SE	n	%	SE
No voucher	1821	99.9	0	2046	99.6	0.1
Yes, for infant's care	1	0.0	-	5	0.2	0.1
Yes, for woman's care	0	0.0	-	2	0.1	0.1
Yes, for both woman and infant	1	0.0	-	2	0.1	0.1
Don't know	0	-	-	1	-	-
Decline to respond	0	-	-	0	-	-

Some facilities that attend deliveries have a *casa materna* or maternal waiting home nearby to provide women who live far away a place to stay while they await delivery or while they recover and prepare to travel home with their infant. Table E6.24 displays how women have commonly used maternal waiting homes during their most recent pregnancy in the past two years. 22.3% of women in the second follow-up report using a maternal waiting home before giving birth and 77.9% of these women report receiving counseling while staying at a maternal waiting home. On average, women stayed at a maternal waiting home for eleven days and spent 0 Córdoba.

Table E6.24: Use of maternal waiting homes for most recent live birth in the past two years, women 15-49 years of age

	Baseline 2013				Second Follow-Up 2017			
	n	N	%	SE	n	N	%	SE
Used a maternal waiting home before giving birth	269	2071	11.8	1.4	502	2387	22.3	2.4
Among women who used maternal waiting homes								
Received counseling on health and parenting topics while at waiting home	269	269	100.0	-	374	480	77.9	3.1

	N	DK/DTR	Min	25th Percentile	Median	75th Percentile	Max
Second Follow-Up 2017							
Days spent in maternal home	500	0	1	5	11	20	100
Out-of-pocket cost to use maternal home, Córdoba	502	0	0	0	0	0	7000

E7 Chapter 7: CHILD HEALTH

This chapter summarizes the health status of children aged 0-59 months whose caregivers participated in the SMI-Nicaragua Second Follow-up Household Survey. All data summarized in this chapter are based on the caregiver's report.

E7.1 Health status

The age and sex distribution of the de facto population of children aged 0-59 months participating in the caregiver interview module or the anthropometric measures in Nicaragua for the second follow-up is shown in Figure E7.2 by six- or 12-month age groups.

Twenty one percent of children surveyed at baseline and 19% of children surveyed at the second follow-up were under 1 year old at the time of the interview. The age distributions of female and male children are similar.

Figure E7.1: Age and sex of children aged 0-59 months in child health survey or anthropometric measures of the de facto population by six- to twelve-month age groups, baseline survey unweighted

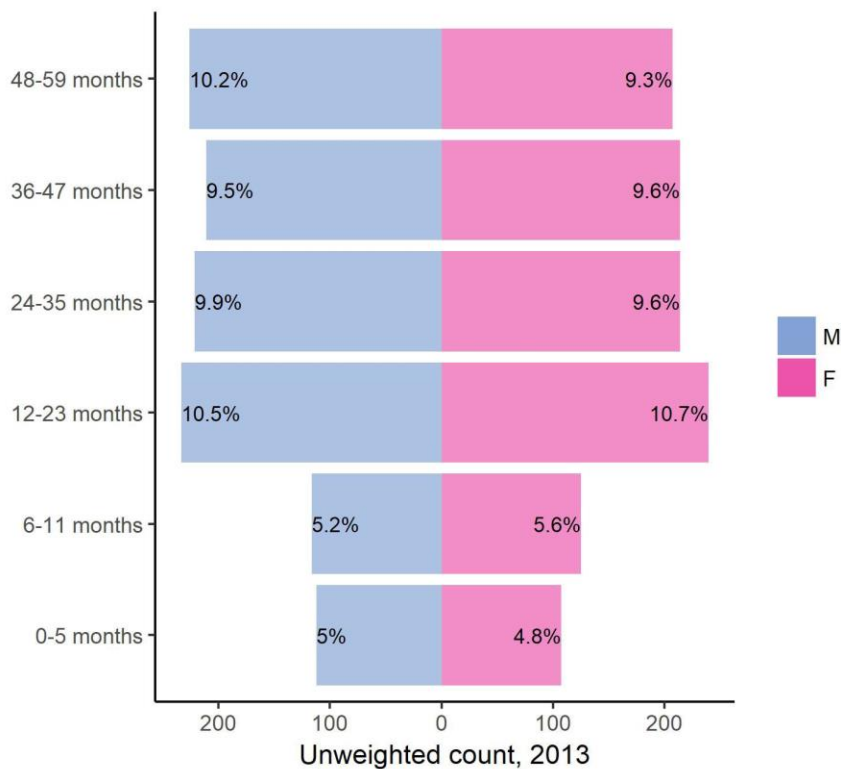
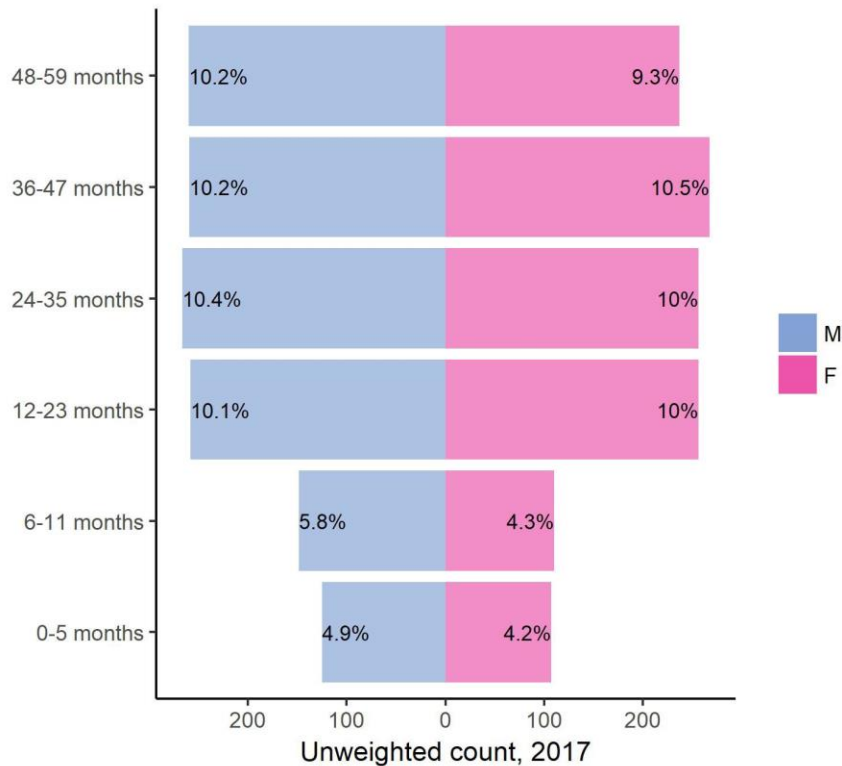


Figure E7.2: Age and sex of children aged 0-59 months in child health survey or anthropometric measures of the de facto population by six- to twelve-month age groups, follow-up survey unweighted



E7.1.1 Current health status

Table E7.1 shows the current health status of all children aged 0-59 months, as reported by their caregivers. The table includes the caregiver’s evaluation of current health relative to health the previous year and the percentage of children who can easily perform daily activities. In the second follow-up, approximately 71.7% of children’s health was considered by their caregiver to be “good,” “very good,” or “excellent,” compared to 72.1% at baseline.

Relative to the past year, caregivers in the second follow-up evaluation reported that 43.1% of children’s health was “about the same” in the second follow-up. While 49.3% of children’s health had improved, 7.7% of children experienced reportedly worse health on the day of the interview, compared to last year. Ninety three percent of children could “easily” perform their daily activities (e.g., playing and going to school) according to their caregivers. Six percent of children had some degree of difficulty performing these activities, 0.9% of children had a significant degree of difficulty performing these activities, and 0.6% of children were unable to complete daily activities, according to their caregivers.

Table E7.1: Current health status, among children aged 0-59 months

	Baseline 2013			Second Follow-Up 2017		
	n	%	SE	n	%	SE
Current health status						
Excellent	383	17.2	1.5	466	18.1	1.0
Very good	531	23.3	1.5	392	14.5	1.1
Good	684	31.6	1.4	991	39.1	1.0
Fair	528	24.2	1.5	586	23.5	1.3
Poor	81	3.6	0.5	117	4.8	0.5
Don't know	0	-	-	0	-	-
Decline to respond	1	-	-	0	-	-
Health status relative to a year ago						
Better	950	55.7	1.7	954	49.3	1.2
Worse	87	5.6	0.8	142	7.7	1.0
About the same	657	38.6	1.6	889	43.1	1.4
Don't know	2	-	-	2	-	-
Decline to respond	0	-	-	0	-	-
Ability to perform daily activities						
Easily	2065	93.0	0.9	2374	93.0	0.9
With some difficulty	94	4.6	0.6	133	5.5	0.8
With much difficulty	7	0.4	0.2	22	0.9	0.2
Unable to do	38	1.9	0.3	14	0.6	0.2
Don't know	4	-	-	8	-	-
Decline to respond	0	-	-	1	-	-

E7.1.2 Recent illness

Caregivers were asked a series of questions about any illnesses or health problems that their children had in the two weeks preceding the interview. In the second follow-up survey, approximately 34% of children were reported as sick during that time (Table E7.2). Of the 856 children who were recently ill, fever (37.4%), cough (27.1%), and diarrhea without blood (8.7%) were the most commonly specified complaints.

Table E7.2: Recent illness, among children aged 0-59 months

	Baseline 2013				Second Follow-Up 2017			
	n	N	%	SE	n	N	%	SE
Child was sick in the last two weeks	719	2208	32.5	1.6	856	2552	34.4	1.9

	Baseline 2013			Second Follow-Up 2017		
	n	%	SE	n	%	SE
Recent illness among children ill in the last 2 weeks						
Fever	178	26.0	1.8	300	37.4	2.3
Malaria	0	0.0	-	0	0.0	-
Cough/Chest Infection	209	27.9	2.0	0	0.0	-
Tuberculosis	0	0.0	-	0	0.0	-
Asthma	10	1.8	0.7	14	1.8	0.6
Bronchitis	3	0.5	0.3	4	0.5	0.2
Pneumonia	18	3.0	0.8	16	2.1	0.7
Diarrhea without blood	134	19.2	1.6	74	8.7	0.9
Diarrhea with blood	10	1.2	0.4	11	1.6	0.5
Vomiting	11	1.2	0.4	6	0.6	0.2
Abdominal pain	2	0.2	0.2	7	0.9	0.4
Anemia	1	0.2	0.2	0	0.0	-
Skin rash/infection	15	2.2	0.6	24	2.8	0.6
Eye/ear infection	6	0.7	0.3	5	0.6	0.3
Measles	1	0.3	0.3	1	0.2	0.2
Jaundice	0	0.0	-	0	0.0	-
Headache	3	0.4	0.2	2	0.3	0.2
Stroke	0	0.0	-	0	0.0	-
Diabetes	0	0.0	-	0	0.0	-
HIV/AIDS	0	0.0	-	0	0.0	-
Paralysis	0	0.0	-	0	0.0	-
Blood in urine	0	0.0	-	1	0.0	-
Difficulty urinating	0	0.0	-	0	0.0	-
Swelling in legs, ankles, or feet	0	0.0	-	1	0.2	0.2
Cough	0	0.0	-	248	27.1	2.1
Chest infection	0	0.0	-	1	0.2	0.2
Other	118	15.2	1.5	141	15.0	1.9
Don't know	0	-	-	0	-	-
Decline to respond	0	-	-	0	-	-

* Options for "Swelling in legs, ankles, or feet", "Blood in urine", "Poisoning", "Chest infection" and "Cough" were only available only in the follow-up survey. Option "Cough/Chest infection" was only available at the baseline.

E7.1.3 Utilization of health services for recent illness

Table E7.3 summarizes data regarding the utilization of health services among the 856 children who were sick in the two weeks preceding the interview. The table shows the percentage of children 0-59 months who were sick in the last two weeks for whom care was sought for recent illness and among these, the percent distribution by type of medical facility where care was sought and whether the child was hospitalized.

In the second follow-up survey, care was sought for 62.8% of these cases. Care was typically sought at Public hospital (9.9%) or Public health center/clinic (18.3%) facilities; some attended public health posts (44%). Only thirty three children were hospitalized for their recent illness.

Table E7.3: Utilization of health services for recent illness in the last two weeks, among children 0-59 months

	Baseline 2013				Second Follow-Up 2017			
	n	N	%	SE	n	N	%	SE
Sought care for recent illness	420	719	56.3	2.7	530	856	62.8	2.4
Child was hospitalized for recent illness	21	230	10.6	2.5	33	272	11.1	2.0

	Baseline 2013			Second Follow-Up 2017		
	n	%	SE	n	%	SE
Type of medical facility where care was sought						
Public hospital	87	23.5	3.8	55	9.9	2.5
Public health center/clinic	98	24.7	3.0	102	18.3	2.5
Public health post	0	0.0	-	210	44.0	4.4
Public mobile clinic	0	0.0	-	0	0.0	-
Other public facility	2	0.3	0.2	0	0.0	-
Private hospital	4	0.8	0.4	4	0.6	0.3
Private health center/clinic	13	2.5	1.0	43	6.7	1.3
Private practice	32	7.1	1.2	22	3.4	0.9
Private mobile clinic	0	0.0	-	0	0.0	-
Other private facility	0	0.0	-	0	0.0	-
Pharmacy	47	10.8	2.1	48	8.1	1.6
Community health worker	3	0.5	0.3	0	0.0	-
Traditional healer	2	0.5	0.4	0	0.0	-
Home of a community health worker	0	0.0	-	0	0.0	-
School	0	0.0	-	0	0.0	-
Casa base	0	0.0	-	19	3.6	1.3
Public health unit	113	25.1	2.6	0	0.0	-
Other	19	4.1	1.2	26	5.3	1.4
Don't know	0	-	-	0	-	-
Decline to respond	0	-	-	1	-	-

* Options for "Public health center", "Public health post", "Home of a traditional healer", "School", and "Casa base" were not available at baseline.

Options for "Public health unit" and "Public health center/clinic" were not available at follow-up. "Public health center" responses from follow-up are grouped within "Public health center/clinic".

E7.2 Acute respiratory infection

Acute respiratory infection is a leading cause of morbidity and mortality among children. Early diagnosis and treatment with antibiotics can prevent deaths resulting from pneumonia, a common acute respiratory disease. The prevalence of acute respiratory infection was estimated by asking caregivers whether their children aged 0-59 months had been ill with a cough accompanied by short, rapid breathing in the two weeks preceding the interview. If the child had symptoms of an acute respiratory infection, the caregiver was asked about what was done to treat the symptoms and feeding practices during the illness.

E7.2.1 Prevalence of acute respiratory infection and fever

The prevalence of cough, suspected acute respiratory infection, and fever among children aged 0-59 months, as reported by their caregivers, is displayed in Table E7.4. In the second follow-up, 30% of children experienced cough, 19.4% had symptoms of an acute respiratory infection (cough with difficulty breathing), and 25.2% had a fever in the two weeks preceding the interview.

Table E7.4: Prevalence of suspected acute respiratory infection and fever in the last two weeks, among children 0-59 months

	Baseline 2013			Second Follow-Up 2017		
	n	%	SE	n	%	SE
Child had cough in the last two weeks, by type						
No cough	1701	78.6	1.4	1800	70.0	1.6
Cough without difficulty breathing	237	10.3	0.8	270	10.6	0.8
With difficulty breathing due to congested/runny nose	113	4.4	0.5	179	7.2	0.6
With difficulty breathing due to chest problem	79	3.4	0.5	166	6.8	0.9
With difficulty breathing due to chest problem and congested/runny nose	72	3.4	0.5	127	5.2	0.5
With difficulty breathing due to other reason	1	0.0	-	4	0.2	0.1
Don't know	4	-	-	6	-	-
Decline to respond	1	-	-	0	-	-

	Baseline 2013				Second Follow-Up 2017			
	n	N	%	SE	n	N	%	SE
Symptoms of acute respiratory infection in the last two weeks	266	2204	11.1	0.9	478	2548	19.4	1.4
Fever in last two weeks	397	2207	18.1	1.1	608	2552	25.2	1.6

E7.2.2 Utilization of health services for suspected acute respiratory infection

Fifty nine percent of children with symptoms of acute respiratory infection were taken for evaluation and/or treatment of their condition at the second follow-up (Table E7.5).

Table E7.5: Utilization of health services for suspected acute respiratory infection in the last two weeks, among children 0-59 months

	Baseline 2013				Second Follow-Up 2017			
	n	N	%	SE	n	N	%	SE
Sought care for suspected acute respiratory infection	340	649	50.7	2.7	525	903	59	2.5

	Baseline 2013			Second Follow-Up 2017		
	n	%	SE	n	%	SE
Type of medical facility where care was sought						
Public hospital	62	19.3	3.7	48	9.0	2.5
Public health center/clinic	83	25.5	3.3	95	17.2	2.6
Public health post	0	0.0	-	210	44.7	4.8
Public mobile clinic	0	0.0	-	0	0.0	-
Other public facility	1	0.2	0.2	0	0.0	-
Private hospital	3	0.6	0.4	4	0.4	0.2
Private health center/clinic	8	2.1	1.1	46	7.1	1.3
Private practice	25	6.4	1.3	20	3.1	0.9
Private mobile clinic	0	0.0	-	1	0.1	0.1
Other private facility	0	0.0	-	0	0.0	-
Pharmacy	47	13.5	2.4	53	9.6	1.9
Community health worker	3	0.6	0.4	2	0.3	0.2
Traditional healer	1	0.5	0.6	0	0.0	-
Home of a community health worker	0	0.0	-	0	0.0	-
School	0	0.0	-	0	0.0	-
Casa base	0	0.0	-	21	3.8	1.3
Public health unit	89	26.2	3.1	0	0.0	-
Other	18	5.1	1.4	23	4.5	1.1
Don't know	0	-	-	0	-	-
Decline to respond	0	-	-	2	-	-

* Options for "Public health center", "Public health post", "Home of a traditional healer", "School", and "Casa base" were not available at baseline. Options for "Public health unit" and "Public health center/clinic" were not available at follow-up. "Public health center" responses from follow-up are grouped within "Public health center/clinic".

E7.2.3 Utilization of medications for suspected acute respiratory infection

Eighty seven percent of children with symptoms of acute respiratory infection were given some type of medication for their condition during the second follow-up (Table E7.6). Fifty eight percent of children were administered antibiotic syrups for a suspected acute respiratory infection. Acetaminophen (71%) and ibuprofen (7%) were also commonly administered. Twenty percent of children received a treatment other than those listed.

Table E7.6: Utilization of medications for suspected acute respiratory infection in the last two weeks, among children 0-59 months

	Baseline 2013				Second Follow-Up 2017			
	n	N	%	SE	n	N	%	SE
Any treatment	542	649	81.7	1.4	784	903	86.6	1.5
Antibiotic injection	13	541	2.5	0.8	33	782	4.8	1.1
Antibiotic pill	45	541	7.7	1.6	86	782	10.5	1.4
Antibiotic syrup	246	541	42.4	2.5	457	781	58.2	2.3
Aspirin	13	541	2.4	0.8	19	782	2.3	0.6
Acetaminophen	340	541	63.2	2.5	548	784	71.0	2.0
Ibuprofen	26	541	4.2	0.9	60	782	7.0	0.9
Oral rehydration therapy	27	541	4.6	1.0	45	783	5.0	0.9
Other	83	540	15.5	1.7	158	781	19.5	1.7

E7.2.4 Feeding practices during suspected acute respiratory infection

Data on feeding practices during the recent episode of suspected acute respiratory infection are summarized in Table E7.7. The table shows the volume of fluids and the volume of solids given during the illness. At the second follow-up, only 4.8% of children were given more fluids than usual. In total, 62% of children were offered less fluid than usual (or none at all). Twenty nine percent of children were offered the same volume of solid food as usual during their illness. Approximately 70% of children were given less than the usual amount of solid food (or none at all).

Table E7.7: Feeding practices during suspected acute respiratory infection in the last two weeks, among children 0-59 months

	Baseline 2013			Second Follow-Up 2017		
	n	%	SE	n	%	SE
Volume of fluids (including breastmilk) given during illness						
No fluids	10	1.6	0.6	32	3.8	0.7
Much less	89	13.1	1.4	104	12.2	1.2
Somewhat less	254	42.0	2.6	411	45.9	2.2
About the same	281	41.4	2.7	311	33.3	2.5
More	13	1.8	0.6	42	4.8	1.0
Don't know	2	-	-	3	-	-
Decline to respond	0	-	-	0	-	-
Volume of solid foods given during illness						
No solids	17	2.2	0.6	41	4.8	0.9
Much less	85	12.5	1.5	116	13.0	1.6
Somewhat less	292	47.5	2.9	464	52.5	2.0
About the same	248	36.9	2.6	267	28.8	2.2
More	5	0.9	0.4	7	1.0	0.4
Don't know	2	-	-	5	-	-
Decline to respond	0	-	-	3	-	-

E7.3 Diarrhea

Dehydration caused by severe diarrhea in a major cause of morbidity and mortality among children. Exposure to diarrheal disease-causing agents is frequently a result of use of contaminated water and unhygienic practices related to food preparation and disposal of feces. The prevalence of diarrhea was estimated by asking caregivers whether their children aged 0-59 months had had diarrhea in the two weeks preceding the interview. If the child had had diarrhea, the caregiver was asked about treatment and feeding practices during the diarrheal episode.

E7.3.1 Prevalence

Table E7.8 shows the proportion of children aged 0-59 months with diarrhea in the two weeks preceding the interview, as reported by their caregivers (13.8% at the second follow-up). Two percent of children had bloody diarrhea.

Table E7.8: Prevalence of diarrhea in the last two weeks, among children aged 0-59 months

	Baseline 2013			Second Follow-Up 2017		
	n	%	SE	n	%	SE
No diarrhea	1888	85.8	1.1	2214	86.2	1.3
Diarrhea without blood	277	13.2	1.1	281	11.8	1.0
Diarrhea with blood	24	1.0	0.2	43	2.0	0.5
Don't know	17	-	-	14	-	-
Decline to respond	2	-	-	0	-	-

E7.3.2 Utilization of health services for diarrhea

Nearly half of children with diarrhea were taken for evaluation and/or treatment of their condition (Table E7.9). Care for these children was often sought in the public sector, although private health centers were visited by 8% of these cases at the second follow-up.

Table E7.9: Utilization of health services for diarrhea in the last two weeks, among children aged 0-59 months

	Baseline 2013				Second Follow-Up 2017			
	n	N	%	SE	n	N	%	SE
Sought care for diarrhea	155	301	50.8	3.8	192	324	60.3	4.5

	Baseline 2013			Second Follow-Up 2017		
	n	%	SE	n	%	SE
Type of medical facility where care was sought						
Public hospital	34	25.8	5.1	11	4.7	2.0
Public health center/clinic	43	29.2	4.2	31	15.8	3.7
Public health post	0	0.0	-	85	50.0	6.6
Public mobile clinic	0	0.0	-	0	0.0	-
Other public facility	1	0.5	0.5	0	0.0	-
Private hospital	0	0.0	-	2	0.5	0.3
Private health center/clinic	6	2.9	1.3	12	4.3	1.7
Private practice	14	9.0	2.2	9	3.8	1.5
Private mobile clinic	0	0.0	-	0	0.0	-
Other private facility	0	0.0	-	0	0.0	-
Pharmacy	20	12.1	3.2	25	12.0	2.9
Community health worker	1	0.6	0.6	0	0.0	-
Traditional healer	1	0.3	0.3	0	0.0	-
Home of a community health worker	0	0.0	-	0	0.0	-
School	0	0.0	-	0	0.0	-
Casa base	0	0.0	-	5	2.3	1.1
Public health unit	23	12.4	2.9	0	0.0	-
Other	12	7.4	2.6	11	6.7	2.1
Don't know	0	-	-	0	-	-
Decline to respond	0	-	-	1	-	-

* Options for "Public health center", "Public health post", "Home of a traditional healer", "School", and "Casa base" were not available at baseline. Options for "Public health unit" and "Public health center/clinic" were not available at follow-up. "Public health center" responses from follow-up are grouped within "Public health center/clinic".

E7.3.3 Utilization of treatments for diarrhea

A simple and effective response to dehydration caused by diarrhea is a prompt increase in the child's fluid intake through some form of oral rehydration therapy. Oral rehydration therapy may include the use of a solution prepared from commercially produced packets of powdered oral rehydration salts, commercially-produced bottled oral serums, or homemade fluids usually prepared from sugar, salt, and water. Other treatments, including zinc, may be administered as well.

Although care was sought in only 60.3% of diarrhea cases, 85.3% of cases were given some form of treatment at the second follow-up. Fluid made with powdered oral rehydration salts was the most common form oral rehydration therapy (43%). Thirteen percent of cases were treated with zinc syrup or pills. Sixteen percent of cases were treated with an antibiotic pill.

Table E7.10: Utilization of treatments for diarrhea during the last two weeks, among children aged 0-59 months

	Baseline 2013				Second Follow-Up 2017			
	n	N	%	SE	n	N	%	SE
Any treatment	251	301	82.6	2.2	277	324	85.3	2.7
Fluids								
Fluid made with powdered oral rehydration salts	135	301	44.2	3.3	140	324	43.0	4.2
Bottled oral rehydration serum	27	301	9.8	2.2	60	324	16.6	2.2
Homemade fluid recommended by health authorities	22	300	7.1	2.1	45	324	12.7	2.2
Medications								
Antibiotic pill	36	301	12.0	2.5	55	322	15.6	2.3
Antidiarrheal pill	22	301	7.8	1.9	43	321	14.5	2.6
Zinc pill	7	301	1.6	0.7	17	321	5.2	1.4
Other type of pill	15	301	5.5	1.3	13	321	3.9	1.2
Unknown pill	36	300	12.2	2.1	7	321	1.9	0.9
Antibiotic injection	2	301	0.6	0.4	9	321	2.7	0.9
Non-antibiotic injection	0	300	0.0	-	0	321	0.0	-
Unknown injection	1	300	0.4	0.4	2	320	0.7	0.5
Intravenous therapy	2	300	0.6	0.4	1	321	0.5	0.5
Home remedy/herbal medicine	50	300	15.9	2.5	36	320	9.9	2.0
Antibiotic syrup	73	300	23.8	3.4	95	321	30.2	3.4
Antidiarrheal syrup	19	298	5.2	1.1	41	322	13.4	2.4
Zinc syrup	7	301	2.6	0.9	24	321	7.4	1.5
Other syrup	16	301	5.1	1.1	15	320	5.1	1.2
Unknown syrup	4	301	1.4	0.8	7	320	2.0	0.8

*We did not have a category for "other" diarrhea treatment besides pills, injections, or syrups in Nicaragua.

E7.3.4 Feeding practices during diarrhea

Caregivers are encouraged to continue feeding children normally when they suffer from diarrheal diseases and to increase the fluids they are given. These practices help to prevent dehydration and minimize the adverse consequences of diarrhea on the child's nutritional status.

Data on feeding practices during the recent diarrheal episode are summarized in Table E7.11. The table shows the volume of fluids and the volume of solids given during the illness. Only 8.8% of children were given more fluids than usual in the second follow-up survey. Approximately 59% of children were offered less fluid than usual (or none at all). Twenty five percent of children were offered the same volume of solid food as usual during their illness. Approximately 72% of children were given less than the usual amount of solid food (or none at all).

Table E7.11: Feeding practices among children aged 0-59 months who had diarrhea in the last two weeks

	Baseline 2013			Second Follow-Up 2017		
	n	%	SE	n	%	SE
Volume of fluids (including breastmilk) given during illness						
No fluids	6	2.3	1.0	8	2.1	0.7
Much less	47	16.1	2.2	34	10.4	1.6
Somewhat less	134	47.3	2.3	152	46.6	3.8
About the same	100	30.7	2.3	104	32.0	3.4
More	14	3.6	1.0	24	8.8	2.8
Don't know	0	-	-	2	-	-
Decline to respond	0	-	-	0	-	-
Volume of solid foods given during illness						
No solids	15	5.0	1.3	23	6.7	1.3
Much less	46	15.2	2.4	45	14.7	2.6
Somewhat less	131	46.2	2.5	160	50.7	3.1
About the same	104	32.5	2.4	87	25.4	2.8
More	4	1.1	0.6	6	2.5	1.0
Don't know	1	-	-	3	-	-
Decline to respond	0	-	-	0	-	-

E7.4 Immunization against common childhood illnesses

Information on immunization coverage was collected for all children aged 0-59 months whose caregivers participated in the survey. Both caregiver's report and review of vaccination card (if available) were used to determine coverage. A vaccination card was available for review for 1,810 children at the second follow-up (71% of the sample, unweighted). In Table E7.12, coverage is estimated by vaccine type to include all children with full compliance for age as specified in the national immunization scheme at the time of the survey, according to either an affirmative response from the caregiver that the immunization was received, or a mark that the immunization was received on the vaccination card (for children with a vaccination card available for review at the time of the interview). Children too young to have received a specific vaccine are counted as covered in order to maintain a comparable all-ages sample across vaccine types.

Table E7.12: Immunization against common childhood illnesses, children aged 0-59 months, according to caretaker recall and vaccination card

	Baseline 2013				Second Follow-Up 2017			
	n	N	%	SE	n	N	%	SE
BCG vaccine (tuberculosis)	2104	2149	97.6	0.5	2337	2382	97.9	0.4
Polio vaccine	1844	2146	84.9	1.6	2072	2363	87.0	1.0
Pentavalent vaccine (DPT, HepB, HiB)	1840	2147	84.7	1.5	2120	2361	89.5	1.0
Rotavirus vaccine	1685	2135	77.3	1.9	1999	2330	85.3	1.3
Pneumococcal conjugate vaccine	2072	2182	94.4	0.7	1985	2316	84.9	1.3
Measles, mumps, and rubella (MMR) vaccine	2011	2145	92.9	0.9	2245	2333	95.8	0.7
Diphtheria, tetanus, and pertussis (DPT) vaccine	1816	2154	83.5	1.3	2112	2362	89.2	1.0

*Pneumococcal vaccine was added to national vaccine scheme during 2012, so children born before 2012 are compliant without receiving the vaccine.

*In November 2014, Nicaragua switched from 3-dose rotavirus vaccine to 2-dose (at 2 and 4 months). Supplies of 3-dose vaccine were to be applied until used up. Therefore, children born after September 2014 are considered compliant with two doses.

* MMR compliance is defined consistent with the indicator manual as one dose at 12 months, and does not take into account the second dose required by the national scheme at 18 months.

In Table E7.13, coverage estimates based on recall are summarized for the full sample, and coverage estimates based on vaccination card data are summarized among the subset with a vaccination card available for review. When considering only caregivers' recall, only 59.5% of children aged 0-59 months were fully immunized for age at the second follow-up survey, reflecting many "Don't know" or "Decline" responses that call into question the reliability and validity of the caregiver recall data. Caregivers were able to definitively answer the entire vaccine recall section for only 1845 children at the second follow-up. Immunization coverage for children 0-59 months based only upon the vaccine card is 48.9%, and when combined with recall-based information, the estimate of full vaccination for age among children 0-59 months is 73.3%.

Table E7.13: Full immunization compliance for age, children aged 0-59 months

	Baseline 2013				Second Follow-Up 2017			
	n	N	%	SE	n	N	%	SE
According to recall + card	1483	2115	68.3	2.3	1682	2254	73.3	1.7
According to caregiver's recall	1139	1892	59.3	2.1	1124	1845	59.5	2.0
According to vaccine card	1164	2193	49.9	2.6	1274	2535	48.9	2.0

E7.5 Deworming treatment

Administration of deworming treatment every six months has been shown to reduce the prevalence of anemia in children. Only 32.5% of children aged 12-59 months received at least two doses of deworming treatment in the year preceding the second follow-up interview (Table E7.14).

Table E7.14: Deworming treatment among children aged 12-59 months

	Baseline 2013			Second Follow-Up 2017		
	n	%	SE	n	%	SE
No deworming	586	36.4	1.4	685	34.8	1.7
One dose	542	30.9	1.2	639	32.7	1.3
Two or more doses	565	32.6	1.1	655	32.5	1.6
Don't know	3	-	-	7	-	-
Decline to respond	0	-	-	0	-	-

Figure E7.3: Children 18-59 months of age who received 2 doses of deworming treatment in the past year by municipality, second follow-up survey

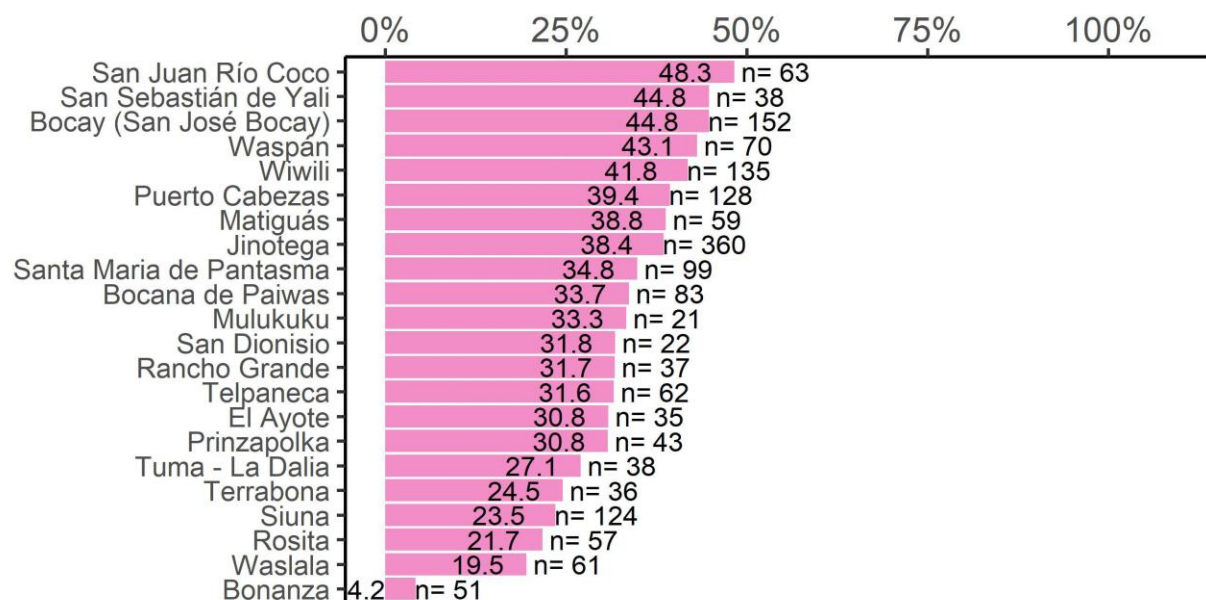
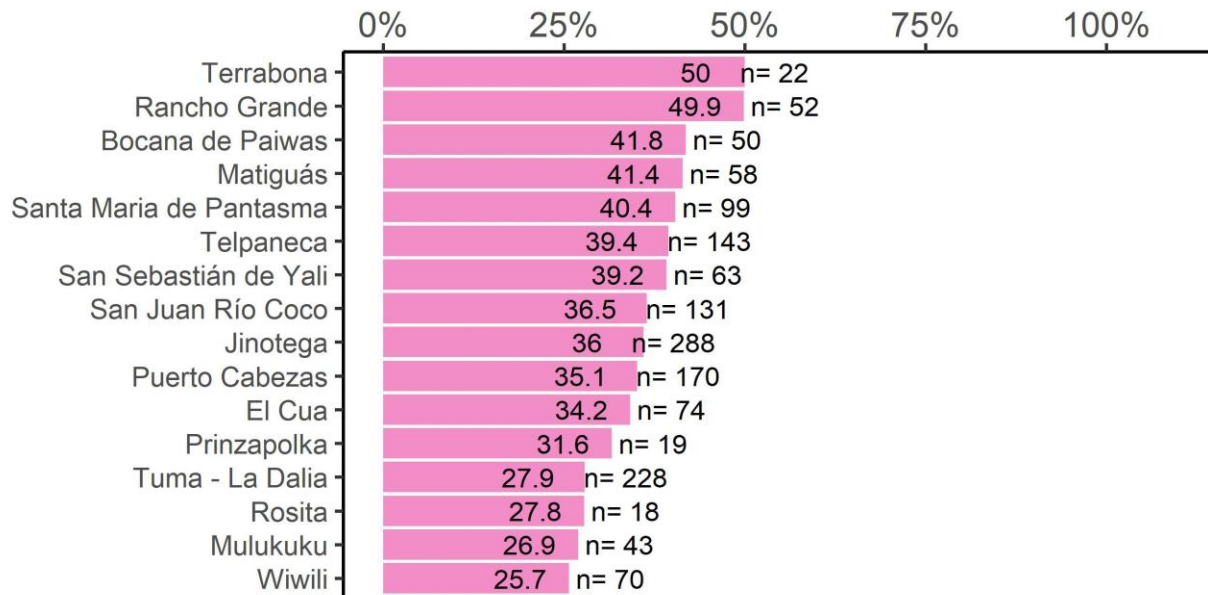


Figure E7.4: Children 18-59 months of age who received 2 doses of deworming treatment in the past year by municipality, baseline survey



E8 Chapter 8: INFANT AND YOUNG CHILDREN FEEDING PRACTICES

This chapter summarizes the feeding practices of infants and children aged 0-59 months whose caregivers participated in the SMI-Nicaragua Household Survey. All data summarized in this chapter are based on the caregiver's report.

E8.1 Breastfeeding

E8.1.1 Exclusive breastfeeding

Coverage of exclusive breastfeeding is defined as the percentage of infants born in the six months prior to the survey who received only breast milk during the previous day. This information is obtained through a 24-hour dietary recall in which the caregiver indicates what the child consumed during the previous day and night. In Nicaragua during the second follow-up, the sample includes 235 children who are under 6 months of age, and 91 of those children have sufficiently complete dietary recall information to determine whether they are exclusively breastfed. Table E8.1 shows that 39.8% of children under 6 months of age are exclusively breastfed.

E8.1.2 Continued breastfeeding at 1 year

Coverage of continued breastfeeding at 1 year is defined as the percentage of children 12-15 months old who received breast milk during the previous day according to caregiver's dietary recall. In Nicaragua during the second follow-up, the sample includes 203 children who are between 12 and 15 months of age, and 127 of those children have adequate responses to determine their breastfeeding status. Table E8.1 shows that 63.7% of children continue to receive breast milk at 1 year.

Table E8.1: Breastfeeding among children

	Baseline 2013				Second Follow-Up 2017			
	n	N	%	SE	n	N	%	SE
Exclusive breastfeeding among children <6 months	111	215	55.6	4.5	91	233	39.8	3.6
Continued breastfeeding at one year among children 12-15 months	89	150	56.4	5.1	127	201	63.7	3.8

E8.2 Acceptable diet

E8.2.1 Introduction of solid, semi-solid, or soft foods

Coverage of appropriate introduction of solid foods is measured as the percentage of infants 6-8 months of age who received solid or semi-soft foods during the previous day according to caregiver's dietary recall. In Nicaragua during the second follow-up, the sample includes 126 children who are 6-8 months of age,

and 101 of those children have sufficiently complete dietary recall information. Table E8.2 shows that 77.6% of children consumed solid or semi-soft foods.

E8.2.2 Dietary diversity

Coverage of minimum dietary diversity is measured as the percentage of children 6-23 months of age who received foods from at least four food groups during the previous day according to caregiver's dietary recall. In Nicaragua during the second follow-up, the sample includes 771 children who are 6-23 months of age, and 380 of those children have sufficiently complete dietary recall information to determine dietary diversity. Table E8.2 shows that 47.5% of children achieved the minimum dietary diversity during the previous day.

E8.2.3 Meal frequency

Coverage of minimum meal frequency is measured as the percentage of children 6-23 months of age who received solid foods at least the minimum number of times the previous day, based on age and breastfeeding status. For breastfed children, the minimum is two times for children 6-8 months of age and three times for children 9-23 months of age. For non-breastfed children, the minimum number is four times for all children 6-23 months of age. This information is obtained through caregiver's dietary recall. In Nicaragua during the second follow-up, the sample includes 771 children who are 6-23 months of age, and 396 of those children have sufficiently complete dietary recall information to determine meal frequency. Table E8.2 shows that 51.1% of children achieved the minimum meal frequency during the previous day.

E8.2.4 Minimum acceptable diet

Coverage of minimum acceptable diet is measured for children 6-23 months of age. For breastfed children to meet the minimum acceptable diet they must have had at least the minimum dietary diversity and the minimum meal frequency during the previous day. For non-breastfed children to meet the minimum acceptable diet they must have had at least two milk feedings, as well as at least the minimum dietary diversity (not including milk feedings) and the minimum meal frequency during the previous day. This information is obtained through caregiver's dietary recall. In Nicaragua during the second follow-up, the sample includes 771 children who are 6-23 months of age, and 224 of those children have sufficiently complete dietary recall information to determine minimum acceptable diet. Table E8.2 shows that 28% of children achieved the minimum acceptable diet during the previous day.

E8.2.5 Consumption of iron-rich or iron-fortified foods

Consumption of iron-rich foods is measured as the percentage of children 6-23 months of age who receive an iron-rich food (e.g., liver, beef, or fish), an iron supplement, or a fortified food that is specially designed for infants and young children, or a food fortified in the home with a product that included iron during the previous day. This information is obtained through caregiver's dietary recall. In Nicaragua during the

second follow-up, the sample includes 771 children who are 6-23 months of age and 436 of those children have sufficiently complete dietary recall information to determine iron consumption. Table E8.2 shows that 56.6% of children consumed an iron-rich food during the previous day.

Table E8.2: Acceptable diet among children 6-23 months

	Baseline 2013				Second Follow-Up 2017			
	n	N	%	SE	n	N	%	SE
Introduction of solid foods among children 6-8 months	87	104	81.5	4.7	101	126	77.6	5.0
Consumption of iron-rich foods among children 6-23 months	262	707	35.9	2.6	436	771	56.6	2.5
Minimum meal frequency among children 6-23 months	343	653	50.1	2.4	396	746	51.1	2.6
Minimum dietary diversity among children 6-23 months	337	707	44.9	2.6	380	771	47.5	2.1
Minimum acceptable diet among children 6-23 months	162	697	21.9	2.0	224	764	28.0	2.2

E8.3 Micronutrient supplementation

E8.3.1 Vitamin A

Interviewers asked the caregiver if their child received a dose of vitamin A in the last six months. Table E8.3 shows that of the 2,550 sampled children 0-59 months of age in the second follow-up, 58.2% received a dose of vitamin A in the last six months.

E8.3.2 Iron

Interviewers showed the caregiver photos of common types of bottles, powders, or syrups and asked if their child received iron pills, powder, or syrup in the last day. Table E8.3 shows that of the 2,550 children 0-59 months of age in the second follow-up sample, 11.9% received a dose of iron in the last day.

Table E8.3: Vitamin A and Iron consumption among children 0-59 months

	Baseline 2013				Second Follow-Up 2017			
	n	N	%	SE	n	N	%	SE
Vitamin A in the last six months	918	2191	39.6	1.9	1407	2401	58.2	2.0
Iron supplement the previous day	131	2202	5.7	0.7	290	2537	11.9	0.8

E8.3.3 Packets of micronutrients

Interviewers showed the caregiver a card with packets of micronutrients and asked how many packets their child received from a health facility and consumed in the last six months. Children are intended

to take 60 consecutive daily doses of micronutrient powder in each of three rounds, beginning at age 6, 12, and 18 months, with an adequate consumption considered to be 50 packets. Table E8.4 shows that among children 6-23 months of age sampled in the second follow-up, 96.8% received no packets of micronutrients from a health facility in the last six months.

Table E8.4: Micronutrient powders among children 6-23 months

	Baseline 2013				Second Follow-Up 2017			
	n	N	%	SE	n	N	%	SE
Received any micronutrient packets from health facility in the last six months	7	697	0.8	0.4	23	757	3.2	0.7
Consumed any micronutrient packets	7	697	0.8	0.4	21	757	2.8	0.8
Consumed adequate dose (≥ 50 packets) of micronutrient powders	4	697	0.4	0.3	2	757	0.2	0.2

* Identical questions were asked in baseline and second follow-up surveys, but the second follow-up interview included photos of the micronutrient products. The baseline survey predated the intervention, so it is possible that questions about receipt and consumption were interpreted by caregivers to include different types of micronutrient supplements at baseline.

E9 CHAPTER 9: NUTRITIONAL STATUS IN CHILDREN

The nutritional status of children aged 0-59 months is an important outcome measure of children's health. The SMI-Nicaragua Second Follow-up Household Survey collected data on the nutritional status of children by measuring the height and weight of all children aged 0-59 months residing in surveyed households, using standard procedures. Hemoglobin levels of these children were also assessed in the field, using a portable HemoCue™ machine, and these data were used to estimate anemia prevalence. As described in Chapter 1, medically trained personnel who were specifically trained to standardize the anthropometric and hemoglobin measurements conducted the testing. This evaluation allows identification of subgroups of the child population that are at increased risk of malnutrition. The parents of anemic children (hemoglobin level <11.0 g/dL, with altitude adjustment) were informed of this result in real-time and were referred for treatment to the appropriate health service.

Three indicators were calculated using the weight and height data – weight-for-age, height-for-age, and weight-for-height. For this report, indicators of the children's nutritional status were calculated using growth standards published by the World Health Organization (WHO) in 2006. The growth standards were generated using data collected in the WHO Multicenter Growth Reference Study. The findings of the study, whose sample included children in six countries (Brazil, Ghana, India, Norway, Oman, and the United States), describe how children should grow under optimal conditions. As such, the WHO Child Growth Standards can be used to assess children all over the world, regardless of ethnicity, social and economic influences, and feeding practices. The three indicators are expressed in standard deviation units from the median in the Multicenter Growth Reference Study.

A total of 2,441 children aged 0-59 months participated in the SMI-Nicaragua second follow-up. In practice, 2,441 of these children underwent the physical measurement module. Height and weight data are presented for 2,418 of these children (99.1%, unweighted). Two thousand two hundred fourteen children 6-59 months of age were eligible for the anemia test. Hemoglobin was measured in 2,086 children (94.2%, unweighted, of children 6-59 months of age). Parental consent was refused for 108 children, three were not measured because anthropometrists could not obtain a sufficient capillary blood sample or any sample at all, and nine cases were not tested for other reasons (for example, because the child did not cooperate). The age and sex distribution of children participating in the physical measurement module in the second follow-up is displayed in Figure E9.2 and Figure E9.4.

Figure E9.1: Height and weight measured: Age and sex of sample, unweighted percent distribution of the de facto population, baseline survey

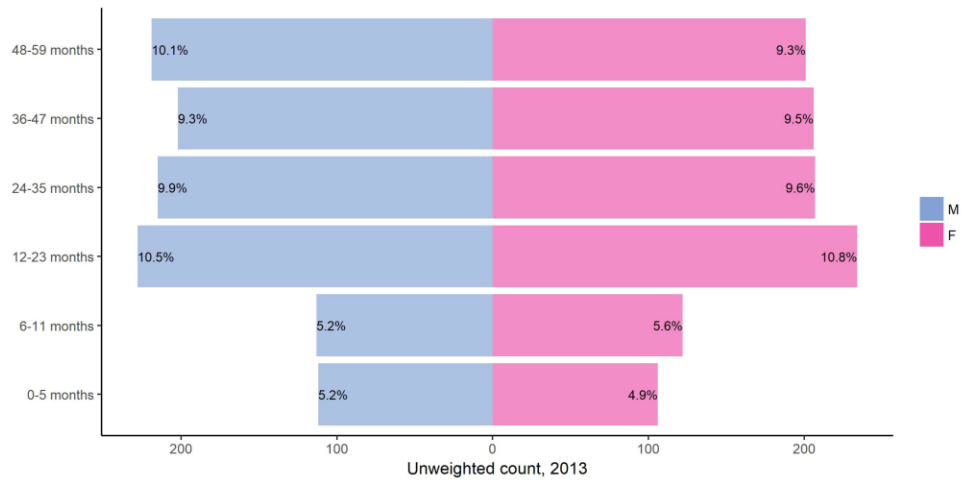


Figure E9.2: Height and weight measured: Age and sex of sample, unweighted percent distribution of the de facto population, follow-up survey

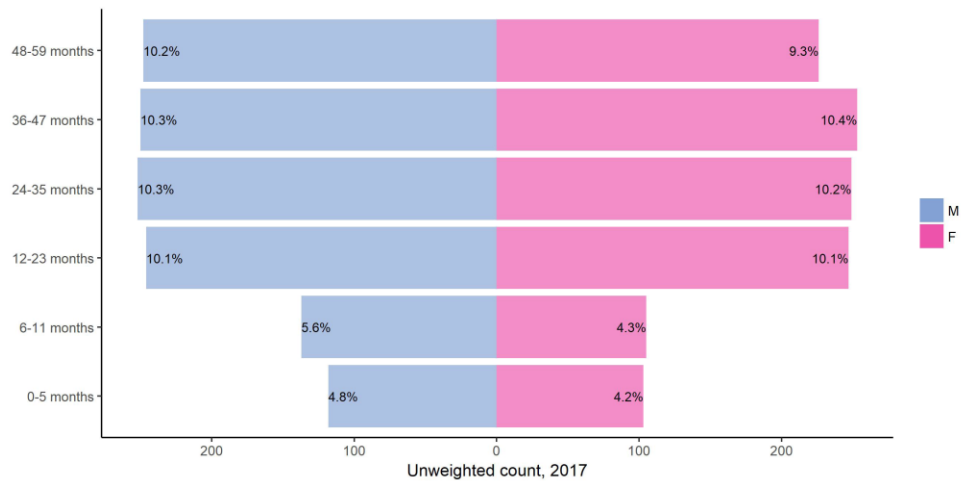


Figure E9.3: Hemoglobin measured: Age and sex of sample, unweighted percent distribution of the de facto population, baseline survey

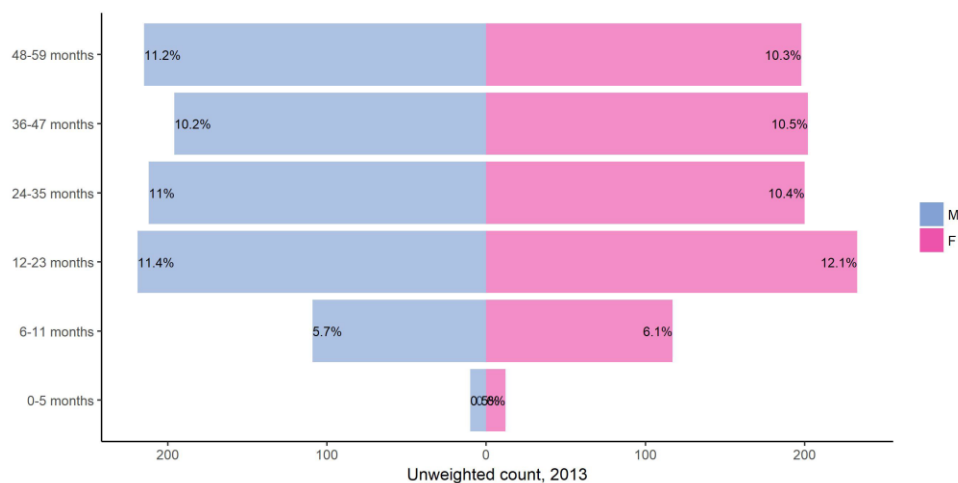
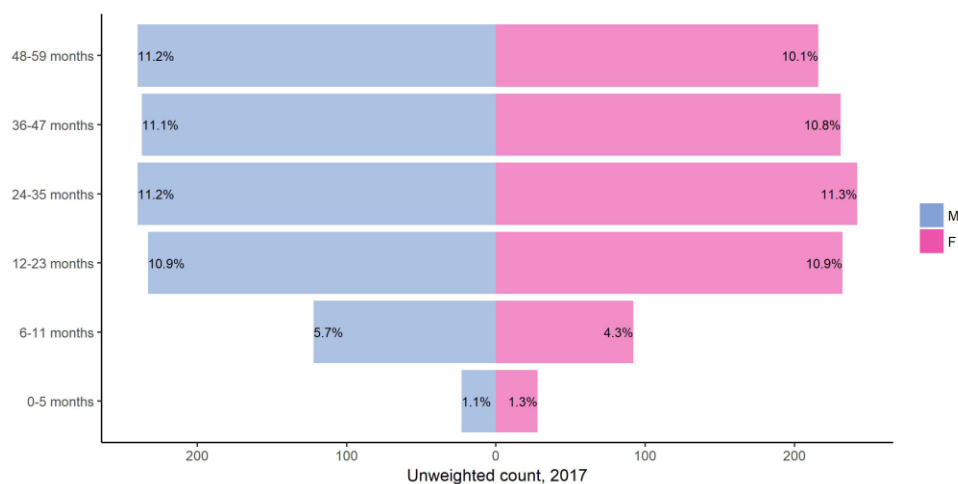


Figure E9.4: Hemoglobin measured: Age and sex of sample, unweighted percent distribution of the de facto population, follow-up survey



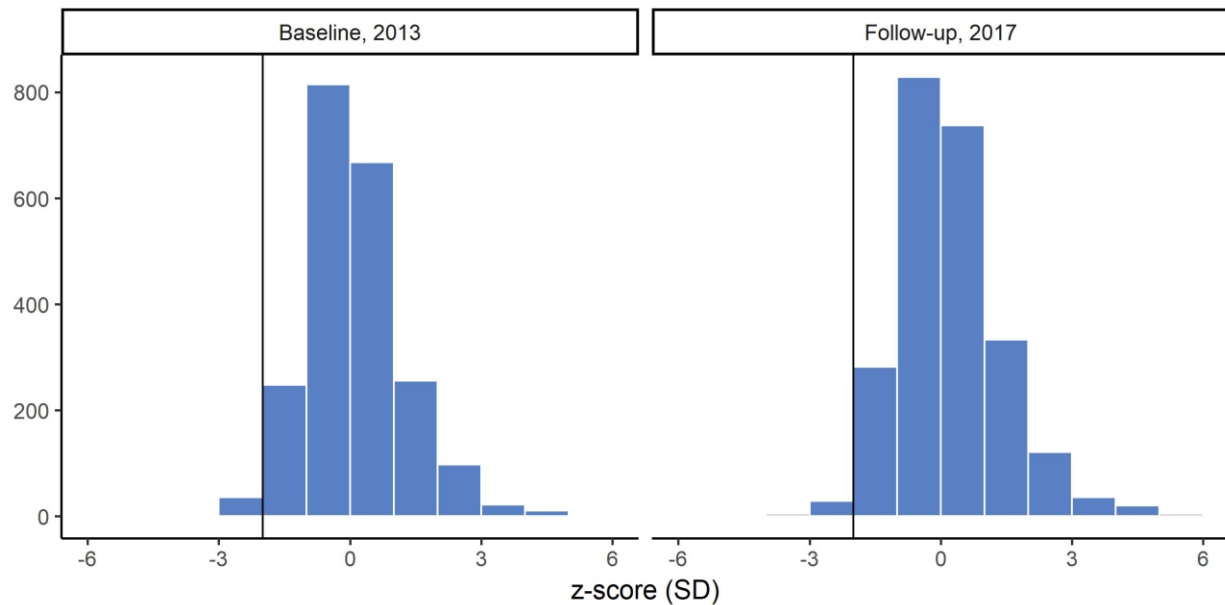
E9.1 Weight-for-Age

Weight-for-age is a good overall indicator of a population's general health, as it reflects the effects of both acute and chronic undernutrition. The weight-for-age indicator does not distinguish between chronic malnutrition (stunting) and acute malnutrition (wasting); a child can be underweight because of stunting, wasting, or both. Children with weight-for-age below minus two standard deviations (-2 SD) are classified as underweight. Children with weight-for-age below minus three standard deviations (-3 SD) are considered severely underweight.

E9.1.1 Unweighted distribution of weight-for-age z-scores

Figure E9.5 shows the distribution of weight-for-age z-scores among all children aged 0-59 months whose measurements were taken. The vertical black lines in the figure denote minus two standard deviations – children to the left of the line are classified as underweight.

Figure E9.5: Distribution of weight-for-age z-scores among children 0-59 months, unweighted



E9.1.2 Prevalence of underweight

As shown in Table E9.1, 3.8% of children aged 0-59 months in the second follow-up are underweight (have low weight-for-age) and 1.1% are severely underweight. The proportion of underweight children is highest (4.4%) in the age groups 24 to 59 months and lowest (2.6%) among those under 6 months. Female children (3.3%) are less likely to be underweight than male children (4.1%).

Table E9.1: Prevalence of underweight in children aged 0-59 months

	Baseline 2013				Second Follow-Up 2017			
	n	N	%	SE	n	N	%	SE
Prevalence of underweight in children 0-59 months, by sex and age (< -2 SD)								
Male	39	1088	3.7	0.6	48	1244	4.1	0.8
Female	45	1076	5.0	0.9	34	1177	3.3	0.6
0-5 months	5	218	2.5	1.2	6	224	2.6	1.2
6-11 months	2	235	1.2	0.9	9	242	4.5	1.5
12-23 months	8	462	2.1	0.8	11	487	2.2	0.7
24-59 months	69	1249	6.1	1.0	59	1471	4.4	0.6
0-59 months	84	2164	4.3	0.7	85	2424	3.8	0.5
6-23 months	10	697	1.8	0.6	20	729	3.0	0.7
Prevalence of severe underweight in children 0-59 months, by sex and age (< -3 SD)								
Male	8	1088	0.8	0.3	12	1244	1.0	0.3
Female	11	1076	1.3	0.5	11	1177	0.9	0.3
0-5 months	2	218	1.3	1.0	4	224	1.2	0.7
6-11 months	1	235	0.9	0.9	1	242	0.3	0.3
12-23 months	1	462	0.1	0.1	7	487	1.6	0.6
24-59 months	15	1249	1.4	0.5	14	1471	1.0	0.3
0-59 months	19	2164	1.1	0.4	26	2424	1.1	0.2
6-23 months	2	697	0.4	0.3	8	729	1.1	0.4
Prevalence of high weight for age in children 0-59 months, by sex and age (> 2 SD)								
Male	68	1088	5.2	0.7	88	1244	7.0	0.7
Female	48	1076	4.3	0.7	78	1177	6.6	0.7
0-5 months	39	218	14.3	2.3	68	224	30.1	3.2
6-11 months	20	235	8.4	2.1	19	242	8.0	1.8
12-23 months	28	462	5.8	1.1	38	487	7.9	1.3
24-59 months	29	1249	2.0	0.5	41	1471	2.7	0.4
0-59 months	116	2164	4.7	0.5	166	2424	6.8	0.5
6-23 months	48	697	6.7	1.0	57	729	7.9	0.9

E9.2 Height-for-Age

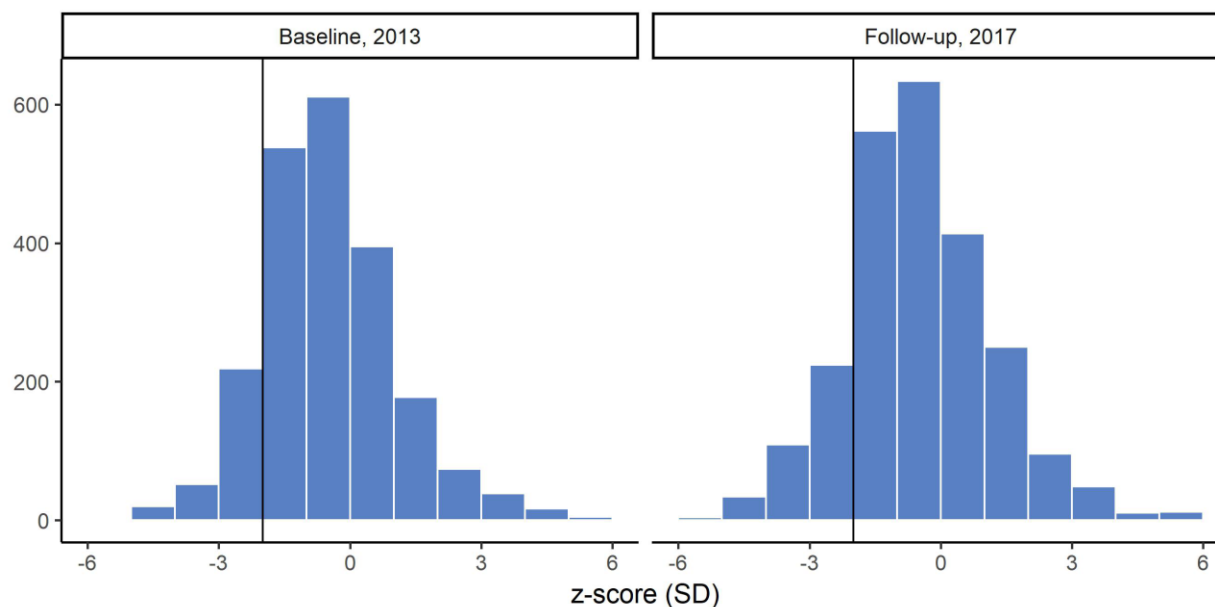
Height-for-age is an indicator of linear growth retardation and cumulative growth deficits in children. Children whose height-for-age z-score is below minus two standard deviations (-2 SD) from the median of the WHO reference population are considered short for their age (stunted) or chronically malnourished. Children who are below minus three standard deviations (-3 SD) are considered severely stunted. Stunting reflects failure to receive adequate nutrition over a long period of time and is affected by recurrent and chronic illness. Height-for-age, therefore, represents the long-term effects of malnutrition in a population and is not sensitive to recent, short-term changes in dietary intake.

E9.2.1 Distribution of height-for-age z-scores

Figure E9.6 presents the distribution of height-for-age z-scores among all children aged 0-59 months whose measurements were taken. The vertical black lines in the figure denote minus two standard

deviations – children to the left of the line are classified as stunted.

Figure E9.6: Distribution of height-for-age z-scores among children 0-59 months, unweighted



E9.2.2 Prevalence of stunting

Table E9.2 presents the prevalence of stunting in children aged 0-59 months as measured by height-for-age. In the second follow-up, 15.5% of children under age 5 are stunted and 6.5% are severely stunted. Analysis of the indicator by age group shows that stunting is highest (18.8%) in children 24-59 months and lowest (4.3%) in children aged 0-5 months. Children 12-23 months old have the highest proportion of severely stunted children (6.8%) while the youngest age group (0-5 months) has the lowest proportion (1.8%). A higher proportion (14.6%) of male children is stunted compared with the proportion of female children (16.4%).

Table E9.2: Prevalence of stunting in children aged 0-59 months

	Baseline 2013				Second Follow-Up 2017			
	n	N	%	SE	n	N	%	SE
Prevalence of stunting in children 0-59 months, by sex and age (< -2 SD)								
Male	158	1087	15.3	1.6	185	1248	14.6	1.4
Female	136	1076	12.6	1.2	195	1176	16.4	1.5
0-5 months	3	218	0.9	0.5	10	225	4.3	1.4
6-11 months	10	235	4.3	1.6	22	241	8.8	2.2
12-23 months	46	462	11.5	1.5	70	489	14.3	1.7
24-59 months	235	1248	19.0	1.8	281	1472	18.8	1.7
0-59 months	294	2163	14.0	1.1	383	2427	15.5	1.2
6-23 months	56	697	9.0	1.1	92	730	12.4	1.4
Prevalence of severe stunting in children 0-59 months, by sex and age (< -3 SD)								
Male	48	1087	5.1	0.9	73	1248	5.9	0.9
Female	30	1076	2.9	0.7	81	1176	7.0	0.9
0-5 months	0	218	0.0	-	5	225	1.8	0.9
6-11 months	2	235	1.1	0.9	11	241	4.5	1.6
12-23 months	11	462	2.5	1.0	30	489	6.8	1.3
24-59 months	65	1248	5.8	1.0	111	1472	7.5	0.8
0-59 months	78	2163	4.0	0.6	157	2427	6.5	0.7
6-23 months	13	697	2.0	0.7	41	730	6.0	1.1

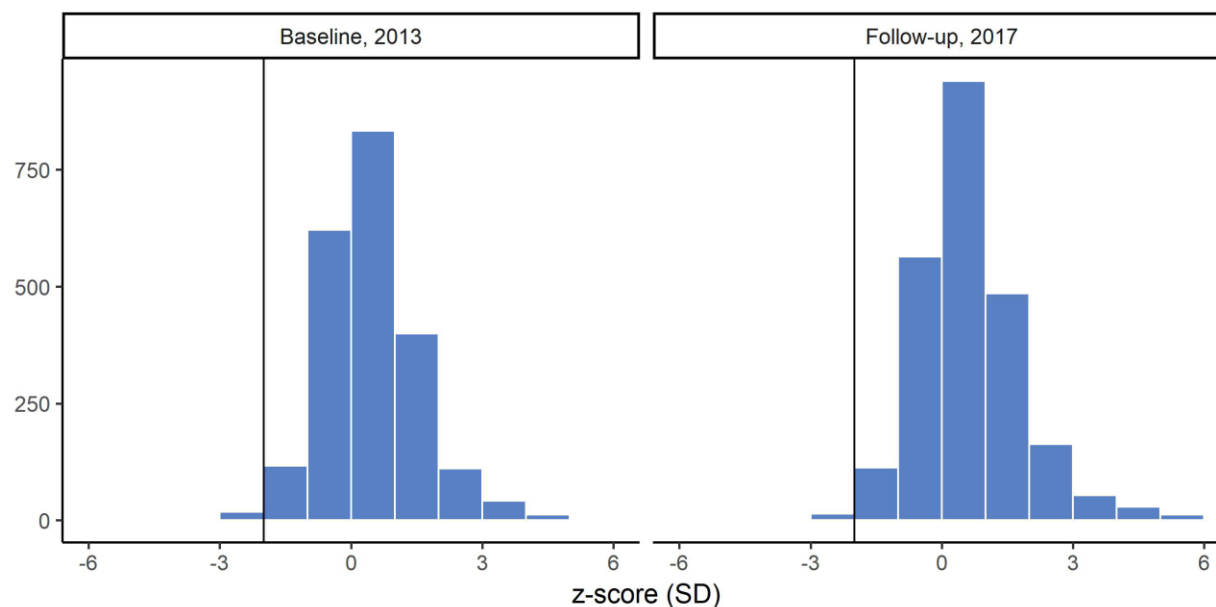
E9.3 Weight-for-Height

The weight-for-height indicator measures body mass in relation to body height or length and describes current nutritional status. Children with z-scores below minus two standard deviations (-2 SD) are considered thin (wasted) or acutely malnourished. Wasting represents the failure to receive adequate nutrition in the period immediately preceding the survey and may be the result of inadequate food intake or a recent episode of illness causing loss of weight and the onset of malnutrition. Children with a weight-for-height index below minus three standard deviations (-3 SD) are considered severely wasted. This weight-for-height indicator also provides data on over-weight and obesity. Children more than two standard deviations (+2 SD) above the median weight-for-height are considered overweight or obese.

E9.3.1 Distribution of weight-for-height z-scores

Figure E9.7 shows the distribution of weight-for-height z-scores among all children aged 0-59 months whose measurements were taken. The vertical black lines in the figure denote minus two standard deviations – children to the left of the line are classified as wasted.

Figure E9.7: Distribution of weight-for-height z-scores among children 0-59 months, unweighted



E9.4 Prevalence of Wasting

Table E9.3 shows the breakdown of nutritional status of children aged 0-59 months as measured by weight-for-height by age groups and sex. In the second follow-up, 2% of children are wasted and 0.7% of children are severely wasted. Analysis of the indicator by age group shows that wasting is highest (1.4%) in children 12-23 months old and lowest (4.7%) in children aged 6-11 months. Male children are more likely to be wasted than female children (2.6% to 1.2%). Male children are slightly more likely to be severely wasted (0.9%) than females (0.4%).

Overweight and obesity affect a greater proportion of children in SMI areas Nicaragua than wasting. In this sample, 10% of children are overweight or obese (weight-for-height more than +2 SD). The coexistence of both growth retardation and obesity reveals the burden of malnutrition in Nicaragua.

Table E9.3: Prevalence of underweight in children aged 0-59 months

	Baseline 2013				Second Follow-Up 2017			
	n	N	%	SE	n	N	%	SE
Prevalence of wasting in children 0-59 months, by sex and age (< -2 SD)								
Male	14	1086	1.4	0.4	30	1246	2.6	0.6
Female	19	1075	1.7	0.5	14	1173	1.2	0.3
0-5 months	8	218	4.0	1.5	8	221	4.5	1.6
6-11 months	1	235	0.4	0.4	10	240	4.7	1.8
12-23 months	7	462	1.4	0.5	6	488	1.4	0.6
24-59 months	17	1246	1.4	0.4	20	1468	1.3	0.3
0-59 months	33	2161	1.5	0.3	44	2417	2.0	0.4
6-23 months	8	697	1.1	0.4	16	728	2.6	0.8
Prevalence of severe wasting in children 0-59 months, by sex and age (< -3 SD)								
Male	4	1086	0.4	0.2	11	1246	0.9	0.4
Female	7	1075	0.8	0.4	5	1173	0.4	0.2
0-5 months	4	218	2.2	1.2	2	221	0.8	0.8
6-11 months	0	235	0.0	-	5	240	2.3	1.1
12-23 months	1	462	0.2	0.2	3	488	0.7	0.4
24-59 months	6	1246	0.6	0.3	6	1468	0.3	0.1
0-59 months	11	2161	0.6	0.2	16	2417	0.7	0.2
6-23 months	1	697	0.1	0.1	8	728	1.3	0.5
Prevalence of overweight in children 0-59 months, by sex and age (> 2 SD)								
Male	83	1086	7.7	1.5	132	1246	10.1	0.9
Female	66	1075	5.8	1.0	128	1173	9.8	1.0
0-5 months	14	218	6.3	2.2	36	221	17.0	2.9
6-11 months	23	235	10.0	2.6	27	240	11.6	2.2
12-23 months	35	462	7.6	1.4	62	488	12.8	1.6
24-59 months	77	1246	5.9	1.2	135	1468	7.7	0.8
0-59 months	149	2161	6.8	1.1	260	2417	10.0	0.7
6-23 months	58	697	8.4	1.3	89	728	12.4	1.4

E9.5 Anemia

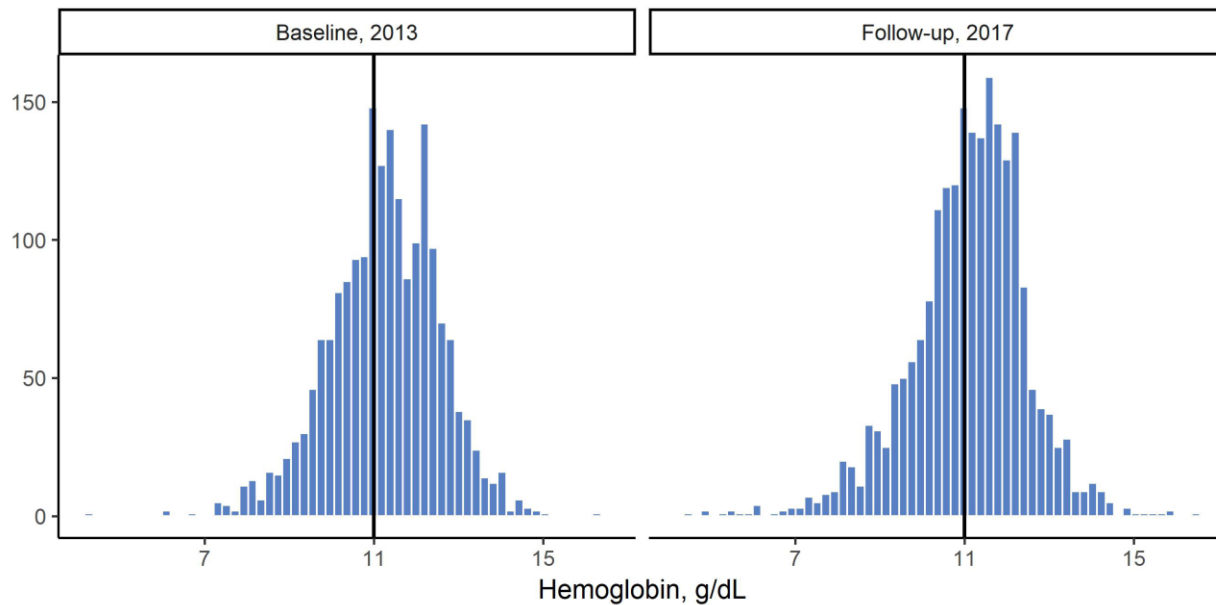
Anemia is a condition characterized by low concentration of hemoglobin in the blood. Hemoglobin is necessary for transporting oxygen to tissues and organs in the body. The reduction in oxygen available to organs and tissues when hemoglobin levels are low is responsible for most of the symptoms experienced by anemic persons. The consequences of anemia include general body weakness, frequent tiredness, and lowered resistance to disease. It is of concern in children because anemia is associated with impaired mental and motor development. Overall, morbidity and mortality risks increase for individuals suffering from anemia.

Common causes of anemia include inadequate intake of iron, folate, vitamin B12, or other nutrients. This form of anemia is commonly referred to as iron-deficiency anemia and is the most widespread form of anemia in the world. Anemia can also be the result of thalassemia, sickle cell disease, malaria, or intestinal worm infestation.

E9.5.1 Distribution of hemoglobin values

Figure E9.8 shows the distribution of hemoglobin values (in g/dL) among children 0-59 months of age. The vertical black lines in the figure denote a hemoglobin concentration of 11.0 g/dL – children to the left of the line are classified as anemic.

Figure E9.8: Distribution of altitude-adjusted hemoglobin values among children 0-59 months, unweighted



E9.5.2 Prevalence of anemia

Levels of anemia were classified as severe (<7.0 g/dL) and any (<11.0 g/dL) based on the hemoglobin concentration in the blood. The cutpoints for anemia are adjusted (raised) in settings where altitude is more than 1,000 meters above sea level, to account for lower oxygen partial pressure, a reduction in oxygen saturation of blood, and an increase in red blood cell production. Although some regions of Nicaragua are mountainous and well above 1,000 meters, the majority of the population resides at lower levels. The highest elevation of a surveyed household at the second follow-up was 1,384 meters above sea level; 15% of children (unweighted) lived above 1,000 meters. Correction for elevation was applied to anemia diagnosis where data collectors measured altitude over 1,000m (using a handheld GPS device).

Children whose hemoglobin levels are below 11 g/dL are considered anemic, and children who have hemoglobin levels below 7 g/dL are considered severely anemic. Table E9.4 indicates that 43.1% of children under age 5 in Nicaragua are anemic. Overall, the anemia prevalence is mostly mild to moderate (42.3%), with only 0.8% of children under 5 years presenting as severely anemic. Anemia prevalence is highest among children aged 0-5 months (63.3%) compared with the other children. More than 50.6% of all children aged 6-23 months, our targeted population for anemia intervention, were found to be anemic.

Table E9.4: Prevalence of anemia, children aged 0-59 months

	Baseline 2013				Second Follow-Up 2017			
	n	N	%	SE	n	N	%	SE
Prevalence of anemia in children 0-59 months, by sex and age								
Male	388	961	39.5	2.1	461	1097	43.3	2.2
Female	381	962	39.2	2.1	428	1041	43.0	2.4
0-5 months	13	22	62.4	8.1	30	51	63.3	7.4
6-11 months	150	226	65.8	3.9	114	214	54.0	3.8
12-23 months	210	452	46.8	3.0	222	465	48.9	3.2
24-59 months	396	1223	31.2	1.9	522	1407	38.8	2.0
0-59 months	769	1923	39.3	1.8	888	2137	43.1	2.0
6-23 months	360	678	53.1	2.6	336	679	50.6	2.8
Prevalence of severe anemia in children 0-59 months, by sex and age								
Male	3	961	0.3	0.2	9	1097	0.8	0.3
Female	1	962	0.1	0.1	8	1041	0.8	0.3
0-5 months	1	22	3.3	3.4	0	51	0.0	-
6-11 months	1	226	0.5	0.5	3	214	1.4	1.2
12-23 months	1	452	0.3	0.3	4	465	1.0	0.5
24-59 months	1	1223	0.1	0.1	10	1407	0.7	0.2
0-59 months	4	1923	0.2	0.1	17	2137	0.8	0.2
6-23 months	2	678	0.3	0.2	7	679	1.1	0.6

APPENDIX C. SMI HOUSEHOLD INDICATORS

Table E10.1: Performance of payment indicators

Indicator	Baseline 2013				Second Follow-Up 2017			
	n	N	%	SE	n	N	%	SE
NA Married or partnered women (age 15-49) who received family planning counseling by CHW or at facility	759	1814	39.3	2.2	769	2243	33.6	2.0
4030 Women (age 15-49) who received postpartum care within 10 days with skilled personnel in their most recent pregnancy in the last two years	718	1070	63.5	2.4	1024	1212	83.9	1.9
5025 Children 12-23 months who received MMR vaccine according to card	351	465	73.5	3.0	379	512	74.6	2.4
5030 Children 18-59 months who received 2 doses of deworming in the last year	544	1528	34.7	1.2	625	1774	34.6	1.7

* The second follow-up survey included an additional question that asked if women were checked before discharge after delivering in facility. If a women was checked before discharge, she was considered to have passed this indicator. Due to the addition of this question, the baseline and follow-up values are not strictly comparable. Calculation comparable to baseline: 41.1 percent.

Table E10.2: Performance of monitoring indicators

Indicator	Baseline 2013				Second Follow-Up 2017			
	n	N	%	SE	n	N	%	SE
2010 Women (age 15-49) currently using (or whose partner is using) a modern method of family planning	1334	1557	84.8	1.3	1598	1950	80.2	1.7
1080 Women (age 15-49) with a live birth in the last year	458	2810	11.6	0.6	437	3364	8.2	0.4
1090 Women (age 15-19) with a live birth in the last year	98	579	12.3	1.5	92	641	8.6	0.9
2020 Women (age 15-49) who did not wish to become pregnant and who were not using/not have access to family planning methods (temporary and permanent)	223	1557	15.2	1.3	352	1950	19.8	1.7
2030 Women (age 15-49) who report having stopped using a method of family planning during the previous year	54	1393	3.9	0.8	50	1679	3.2	0.8
4110 Women (age 15-49) with a birth in the last two years who can recognize at least 5 danger signs in newborns	257	869	31.9	1.9	234	910	24.4	2.6
3010 Women (age 15-49) who received at least one antenatal care visit by skilled personnel in their most recent pregnancy in the last two years	1033	1070	96.8	0.7	1091	1215	90.0	1.6
3020 Women (age 15-49) who received at least four antenatal care visits by skilled personnel in their most recent pregnancy in the last two years	897	1068	83.5	1.5	912	1193	76.5	2.3
4101 Children born in the last two years receiving neonatal care by skilled personnel in a health facility within 10 days of birth in the last two years	784	1008	77.7	2.4	755	1120	66.8	2.6
5050 Children born in the last two years who were breastfed within one hour after birth	900	1106	81.6	1.5	966	1234	77.9	2.0
4010 Women (age 15-49) who delivered in facility with skilled attendant in their most recent pregnancy in the last two years	970	1070	88.9	1.8	1064	1214	87.6	1.8
4030 Women (age 15-49) who received postpartum care within 7 days with skilled personnel in their most recent pregnancy in the last two years*	673	1070	60.0	2.3	450	1203	36.1	2.2
NA Women (age 15-49) who used a maternal waiting home during their most recent pregnancy in the last two years	141	1070	12.1	1.6	289	1214	25.1	3.0
5060 Children 0-59 months who received ORS and zinc in the last episode of diarrhea in the past two weeks	9	301	2.4	0.8	24	323	6.9	1.5

(continued)

Indicator		Baseline 2013				Second Follow-Up 2017			
		n	N	%	SE	n	N	%	SE
NA	Children 0-59 months fully vaccinated for age, according to vaccine card	1164	2193	49.9	2.6	1274	2535	48.9	2.0
5040	Children 0-5 months who were exclusively breastfed on the previous day	111	215	55.6	4.5	91	233	39.8	3.6
1060	Children 6-23 months with hemoglobin <110g/L	360	678	53.1	2.6	336	679	50.6	2.8
NA	Children 0-59 months with hemoglobin <110g/L	769	1923	39.3	1.8	888	2137	43.1	2.0
1070	Children 0-59 months with height <-2 SD of the mean of the reference population for age	294	2163	14.0	1.1	385	2429	15.6	1.2