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SM2015 – NICARAGUA Study Protocol

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Table of Contents

CHAPTER 1: INTRODUCTION	4
1.1 Data Collection	4
1.2 Objectives in Nicaragua	5
1.2.1 Health Issues and Health System Constraints in Nicaragua	5
1.2.2 Targets for Improvement	6
CHAPTER 2: METHODOLOGY	6
2.1 Household Survey Methods	6
2.1.1 Segment Sample Selection	6
2.1.2 Household Census	7
2.1.3 Household Survey	7
2.2 Health Facility Survey Methods	8
CHAPTER 3: INSTRUMENTS	8
3.1 Electronic Data Entry	8
3.2 Household Survey	9
3.2.1 Household Census Instrument	9
3.2.2 Household Characteristics Questionnaire	9
3.2.3 Maternal and Child Health Questionnaire	9
3.2.4 Physical Measurements Module	10
3.3 Health Facility Survey	10
CHAPTER 4: TRAINING AND MONITORING OF DATA	10
4.1 Training of Field Personnel	10
4.1.1 Training for Health Survey	10
4.1.2 Training for Health Facility Survey	11
4.2 Data Monitoring	11
4.2.1 Household Survey	12
4.2.2 Health Facility Survey	12
CHAPTER 5: PLAN FOR ANALYSES	12
CHAPTER 6: REPORTS	13
CHAPTER 7: ETHICAL ISSUES AND CONFIDENTIALITY	13
IHME TEAM	14
APPENDIX A: SM2015-NICARAGUA INDICATORS	15
APPENDIX B: SAMPLE SIZE CALCULATIONS BY INDICATOR	19

This protocol on the SM2015-Nicaragua surveys was produced in agreement with the Inter-American Development Bank (IDB). All analyses and report writing will be performed 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 more knowledgeable decision-making and higher achievements in health. To that end, we strive to build the needed base of objective evidence about what does and does not improve health conditions and health systems 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.

CHAPTER 1: INTRODUCTION

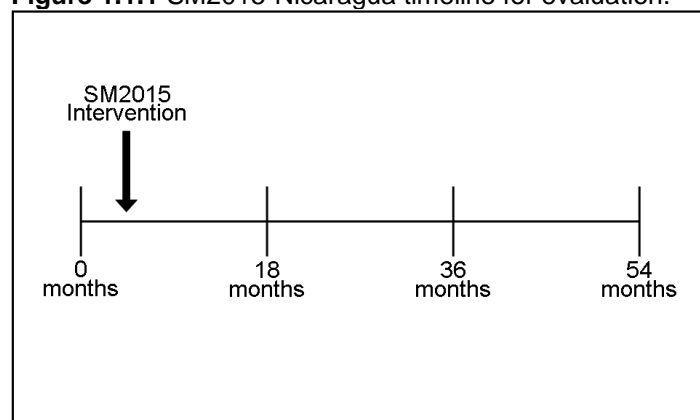
Salud Mesoamérica 2015 (SM2015) is a regional public-private partnership that brings together Mesoamerican countries, private foundations and bilateral and multilateral donors with the purpose of reducing health inequalities affecting the poorest 20 percent of the population in the region. Funding will focus on supply and demand-side interventions, including changes in policy, evidence-based interventions, the expansion of proven and cost-effective healthcare packages, and the delivery of incentives for effective health services. One of its defining features is the application of a results-based financing model (RBF) that relies on serious performance measurement and enhanced transparency in reporting accountability and global impact assessment.

The initiative will focus its resources on integrating key interventions aimed at reducing health inequalities resulting from the lack of access to reproductive, maternal and neonatal health (including immunization and nutrition) for the poorest quintile of the population. A key element of SM2015 is the evaluation. In general, the evaluation will track the progress of the countries to reach a set of goals of the intervention, and will also estimate the impact of specific components of the intervention. The Inter-American Development Bank has contracted IHME to conduct this evaluation. In Nicaragua, El Colegio de la Frontera Sur (ECOSUR) will be the agency in charge of data collection. ECOSUR will coordinate with the National Autonomous University of Nicaragua to conduct local activities.

1.1 Data Collection

In order to monitor efficacy of interventions and the status of indicators, data collection efforts are utilized. The overall data collection method employed in the initiative involves two major components: a health facility survey and a household survey. Twinning of both surveys is a defining and innovative feature designed to capture most accurately prevalence estimates of select key indicators. Indicator goals are established as a cooperative effort between IDB and the Nicaragua Ministry of Health following the collection of baseline information. Periodic waves of data collection will allow for continued monitoring of indicators among the population. These evaluations will occur at 18, 36, and 54 months following baseline surveys (Figure 1.1.1).

Figure 1.1.1 SM2015-Nicaragua timeline for evaluation.



The principal objective of the SM2015-Nicaragua Household Survey is to collect data on household characteristics, household expenditures, and numerous reproductive health, maternal and neonatal health, immunization, and nutrition indicators (including physical measurements) related to the strategic areas of the initiative in Nicaragua. Performance for these indicators will be evaluated after the baseline and each subsequent data collection wave.

In general terms, the objectives of the health facility survey are assessing facility conditions, evaluating service provision and utilization, and measuring quality of care. Equally important, the facility survey will capture changes of interventions at the level of the health services access point, the facility, and predict changes in population health outcomes. The baseline health facility survey, recounted in this report, measured baseline prevalence estimates of various health indicators in aim to monitor future changes in those indicators.

1.2 Objectives in Nicaragua

1.2.1 Health Issues and Health System Constraints in Nicaragua

The departments of Jinotega, Matagalpa, and Región Autónoma del Atlántico Norte (RAAN) in Nicaragua have been selected as targets for SM2015-Nicaragua because of the current health status, health inequalities, and capacity for interventions. The goal of the initiative in this region is to reduce maternal, newborn, and child morbidity and mortality in the poorest municipalities of these jurisdictions. It is expected that there will be an increase in coverage, quality, and use of reproductive, maternal, newborn, and child health services, and an improvement in the health status and nutrition of women of reproductive age and children under 5 years old.

In recent years, there have been some improvements to the health status of Nicaragua. For example, from 2006 to 2010, maternal mortality decreased from 93 deaths per 100,000 live births to 71 deaths per 100,000 live births. Child mortality has also decreased in the last two decades from 58 per 1,000 live births in 1992 to 29 per 1,000 live births in 2006. However, there is still much progress to be done in order to reach Millennium Development Goals for maternal and child health. Neonatal mortality has remained relatively constant since 2001 with a rate of 16 deaths per 1,000 live births.

National epidemiologic data has consistently identified several risk factors for maternal health and child survival to one year of age: high fertility, early fertility and low use of healthcare services (especially prenatal checkups), sparse coverage of labor care in healthcare facilities and by qualified staff, low coverage of postpartum checkups. As of 2008, 20% of all maternal deaths occurred in adolescents. The risk of neonatal death is five times higher among children born from mothers under 18 years and nulliparous women than from mothers between 20 and 34 years of age with birth intervals greater than 18 months.

Inequalities remain evident in health indicators, especially those related to maternal and infant health risk factors and outcomes. The departments of Jinotega, Matagalpa, and RAAN are along the Caribbean coast and Center-North of Nicaragua; this area is the poorest and most disperse of the country, and has the majority of the nation's indigenous and Afrodescendant population. Over 70% of all maternal deaths between 2005 and 2008 occurred in rural areas. In 2009, the wealthiest quintile of the population spent 2% of their household income on health, while households in the poorest quintile spent 14% of their household income on health. There is also unequal access to healthcare services, and deficiencies in infrastructure, equipment and human resources in rural and poor areas.

1.2.2 Targets for Improvement

Goals for maternal, newborn, and child health will be achieved through a network of community interventions, health system improvements, and education. It will involve evidence-based comprehensive public health interventions and alignment of incentives. Interventions for children will incorporate mobile teams providing immunizations, distribution of micronutrient packets, nutritional status assessments and management, vitamin A supplementation, and treatment of parasites, diarrhea, and pneumonia. Community-level education efforts will promote proper breastfeeding and complementary feeding practices, hygiene and waste disposal, danger sign recognition, and care at home during periods of illness. Voucher and payment systems will incentivize the use of health facilities for prenatal care and childbirth. Adequate training of health professionals and midwives is another target, along with strengthening of health system infrastructure, equipment, and information systems.

CHAPTER 2: METHODOLOGY

There are two components of the overall data collection method employed in the initiative: a household survey and a health facility survey. Twinning of both surveys is a defining and innovative feature designed to capture most accurately prevalence estimates of select key indicators.

2.1 Household Survey Methods

2.1.1 Segment Sample Selection

The sample for the SM2015-Nicaragua Household Survey is designed to provide estimates of the coverage of key health interventions and indicators among the lowest wealth quintile of the population and to assess changes over time once the follow-up surveys are collected. Indicators are used to calculate the sample size necessary to provide estimates with sufficient power (80%) and Type I error (0.05). The indicator driving sample size is skilled attendant at birth in institutional setting in the last two years, measured at 36 months from baseline. This requires a total of 1,714 intervention households. Additional indicator sample size calculations can be found in Appendix B.

The primary administrative units in Nicaragua are departments and autonomous regions, each subdivided into municipalities. There are a total of 15 departments and 2 autonomous regions. For SM2015, there will be two phases, the first targeting municipalities with the highest rates of unsatisfied basic needs, and the second targeting municipalities that belong to 3 local health systems or SILAIS. In the departments of Jinotega, Matagalpa, and RAAN, IDB identified 19 municipalities in which the intervention will take place, and a set of 4 control municipalities with similar socio-economic characteristics and ethnic composition (Table 2.1.1) From these 23 municipalities, a random sample of approximately 210 census segments will be selected with probability of selection proportional to size (where size is represented by the number of occupied households within the segment, as captured on the 2005 Nicaragua Population Census). In addition, a set of alternate segments is selected using identical methodology, to be surveyed in the event that any of the selected segments cannot be surveyed and needed to be replaced for any reason (e.g., security concerns or high proportion of absent households). In a second stage, households that contain women and chil-

dren under five years old will be randomly selected to provide an expected sample of 2,464 households (1,714 intervention and 750 control households).

Table 2.1.1 Intervention and control municipalities

Treatment Municipalities		Control Municipalities	
Jinotega	San José Bocay	Madriz	Telpaneca
Jinotega	Wiwilí	Madriz	San Juan de Río Coco
Jinotega	El Cuá	Jinotega	Jinotega
Jinotega	San Sebastián Yalí	RAAS ¹	El Ayote
Jinotega	Santa María Pantasma		
Matagalpa	El Tuma-La Dalia		
Matagalpa	Matiguás		
Matagalpa	Rancho Grande		
Matagalpa	San Dionisio		
Matagalpa	Terrabona		
RAAN	Bocana de Paiwas		
RAAN	Prinzapolka		
RAAN	Rosita		
RAAN	Siuna		
RAAN	Bonanza		
RAAN	Mulukukú		
RAAN	Waspán		
RAAN	Puerto Cabezas		
RAAN	Waslala		

¹ RAAS populations sometimes use health services in the department of Chontales

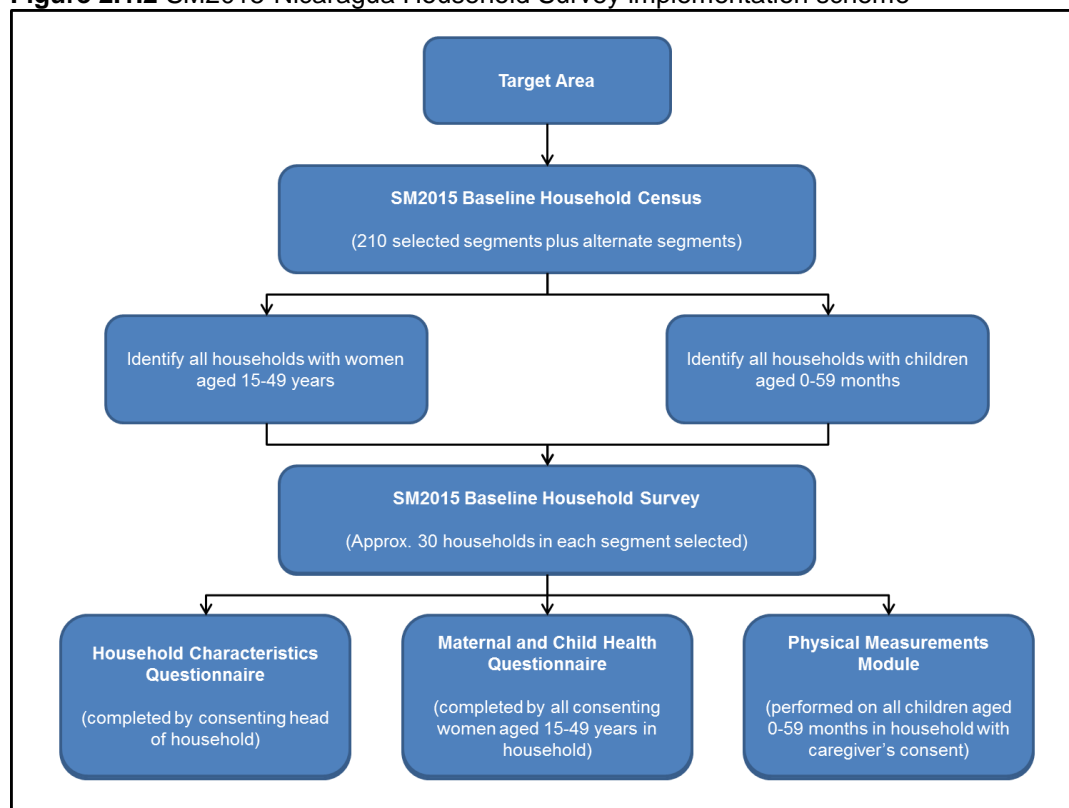
2.1.2 Household Census

In each of the selected segments, the SM2015-Nicaragua Household Census is conducted in order to identify eligible women and children for the survey. Interviewers visit every household in the segment and create a household roster capturing the age and sex distribution of household members. Information from the census is used to sample which households will complete the SM2015-Nicaragua Household Survey.

2.1.3 Household Survey

Using demographic data collected during the household listing exercise, households are then systematically selected for participation in the SM2015-Nicaragua Household Survey (i.e., if age-eligible women and children were listed as residents). All women aged 15-49 years who are residents of the household are eligible to be interviewed, and all children aged 0-59 months who are residents of the household are eligible for the physical measurement module. A schematic diagram of the survey implementation is shown in Figure 2.1.2.

Figure 2.1.2 SM2015-Nicaragua Household Survey implementation scheme



2.2 Health Facility Survey Methods

A total of 90 health facilities present in the intervention segments selected for the household survey are to be sampled, and an additional 30 health facilities in the control segments will be sampled. Health facilities will be selected at random from the network of health facilities of the SILAIS in the study areas. As it will be detailed later, in each facility we will review also an average of 30 medical records.

CHAPTER 3: INSTRUMENTS

The SM2015 Surveys are used to generate a rapid assessment of current coverage rates of health interventions in the strategic areas of the Initiative (reproductive, maternal and neonatal health, immunization, and nutrition). Standardized questionnaires as well as surveys of health facilities and data from the health information systems are used to provide the information needed to establish the current status of these indicators.

3.1 Electronic Data Entry

The SM2015-Nicaragua Surveys are conducted using a computer-assisted personal interview (CAPI). CAPI is programmed using DataStat Illume and installed into computer notebooks which are used by the surveyors at all times of the interview. CAPI supports skip pat-

terns, inter-question answer consistency, and data entry ranges. The aim of introducing CAPI to the field is to reduce survey time by prompting only relevant questions, to maintain a logical answering pattern across different questions, and to decrease data entry errors. The use of CAPI also allows instantaneous data transfer via a secure link to IHME. Data can be continuously monitored, and modifications to the instrument can be updated remotely.

3.2 Household Survey

There are three components to the SM2015-Nicaragua Household Survey (in addition to the SM2015 Household Census): the Household Characteristics Questionnaire, the Maternal and Child Health Questionnaire, and the Physical Measurements Module.

The content of the household questionnaires is developed to measure the coverage of key health interventions and indicators, and many items are adapted from existing Demographic and Health Surveys (DHS). The questionnaires are initially developed in English, then translated to Spanish. To best reflect the issues most relevant to the region under study and the local language, the Spanish-language questionnaires are revised following input from key stakeholders and at the conclusion of the pilot study (described below). The revised Spanish-language surveys are then back-translated to English. Given that study areas include a substantial proportion of indigenous populations, the household survey will be also translated and back-translated to the most common indigenous languages in the study areas, Miskito, Sumo, and Rama.

3.2.1 Household Census Instrument

The SM2015 Household Census is used to capture the age and sex distribution of all of the usual members of all of the households in the selected segments. Basic information including relationship to the head of the household and marital status is also collected. Children aged 0-59 months who had 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. All data for the census is recorded using an electronic data entry program.

As previously mentioned, data from the SM2015 Household Census is then used to systematically select households for the detailed interviews and the physical measurements module (Figure 2.1.1). Selected households are revisited typically within two weeks of the census and these questionnaires are completed during this visit.

3.2.2 Household Characteristics Questionnaire

The Household Characteristics 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.

3.2.3 Maternal and Child Health Questionnaire

The Maternal and Child Health Questionnaire is used to collect information from all women of reproductive age (15-49 years). These women are asked questions on the following topics: background characteristics (including education, occupation, and exposure to media), access to health care, current health status, recent history of illness and associated medical

expenses, birth history (including relevant questions about pregnancies that ended in miscarriage, stillbirth, or abortion), antenatal, delivery, and postpartum care, fertility preferences, knowledge and use of family planning methods (including barriers to use), exposure to health system interventions, and satisfaction with community health workers. Those with children aged 0-5 years are asked detailed questions in reference to each child born in the past five years on topics such as: birth spacing, antenatal care, labor and delivery, postpartum care, breastfeeding and infant feeding practices, 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.

3.2.4 Physical Measurements Module

The Physical Measurements Module captures weight, height/length, and hemoglobin levels of children aged 0-59 months. Portable scales and stadiometers are used for the anthropometric measurements and hemoglobin levels are assessed in the field using a portable HemoCueTM machine. In addition, samples of capillary blood are collected using the dry blood spot (DBS) technique from children 12-23 months. Medically trained personnel (i.e., professional nurses) perform all assessments. DBS samples will be sent to the National Institute of Public Health of Mexico to determine seroconversion to measles antibodies.

3.3 Health Facility Survey

The health facility survey includes three components: an interview questionnaire, an observation checklist, and a medical record review. The questionnaire captures information reported by the facility director or manager about the services provided and the general characteristics of the facility, human resource composition, supply logistics, infection control. The checklist captures objective data observed by the surveyors at the time of the survey about equipment and supplies required for prenatal and postnatal care, delivery care, emergency maternal and neonatal care, family planning and immunizations, depending on the level of the medical facility. Finally, we will conduct a review of medical records of cases of delivery, maternal and neonatal complications, prenatal and child care to collect information about the quality of health care.

CHAPTER 4: TRAINING AND MONITORING OF DATA

4.1 Training of Field Personnel

4.1.1 Training for Health Survey

Individuals are recruited and trained to serve as supervisors, male and female interviewers, and reserves for the household census and survey. Multiple data collection teams, consisting of multiple male and female interviewers are necessary to conduct the SM2015 Household Census. A fewer number of data collection teams are used to conduct the SM2015 Household Survey, each consisting of female interviewers. All field staff are required to have formal education through high school and exhibited sufficient literacy and speaking abilities in the language of the survey, as well as basic arithmetic skills. Personnel in charge of physical measures are required to have previous experience in anthropometry and collection of blood samples.

A multi-day training exercise is to be undertaken consisting of three primary training components. The first component of training is spent briefing and training the supervisors. The next component is devoted to classroom training for all field staff. The final component is devoted to field training. Staff from ECOSUR and invited experts from IHME lead the training, which is conducted mainly in Spanish and includes a variety of lectures, presentations, demonstrations, and role-playing exercises. Nutrition experts lead the training sessions on height and weight measurements and hemoglobin testing for the professional nurses who are hired to perform the physical assessments of children. These personnel are trained to perform standardized anthropometric and hemoglobin measurements using standard techniques.

During the classroom training sessions, supervisors and interviewers are briefed on the Salud Mesoamerica 2015 Initiative (SM2015) and the specific survey instruments developed for the Initiative. Supervisors and interviewers then receive training on survey implementation (including interviewing skills), and fieldwork procedures (including map reading for locating selected households), review the content of the household questionnaires in close detail, and receive basic instruction on the principles of, and strategies for, data quality monitoring, team communication and problem-solving. Household teams engage in role-playing scenarios to practice administering the initial census survey and the full household questionnaire. A specialized team is trained in anthropometry and collection of a blood specimen. Trainers and supervisors provide feedback on the practice interviews. Specific issues noted during observation of the practice interviews are discussed with the whole group.

Field training sessions are initiated in the last days of the training period. Household teams and anthropometry teams spend multiple days in the field collecting data. This field practice provides the interviewers with an opportunity to become aware of any issues with the survey that they did not previously understand. The field training sessions also provide an opportunity to conduct cognitive testing of the survey among target respondents. At the end of each day, the trainers and trainees review the questionnaires and discuss any problems that arise. Minor revisions to the questionnaires may be implemented based on feedback from the field training sessions.

All field staff are evaluated on survey concepts and procedures by means of short, periodic quizzes and tests following completion of the classroom training sessions and field training sessions. In addition to these evaluations, all field staff are observed by the trainers in order to fully assess their ability to administer the questionnaires.

4.1.2 Training for Health Facility Survey

Training sessions and health facility pilot surveys are conducted in Nicaragua over a three-day period. Approximately thirteen surveyors with a medical background undergo training. The training includes an introduction to the initiative, proper conduct of survey, in depth view of the instrument, and hands-on training on the CAPI software. Training is followed by a multi-day pilot at health facilities.

4.2 Data Monitoring

Information that is collected by each survey component is monitored by both field supervisors and analysts at IHME to ensure data quality and adherence to survey protocols. Data files are uploaded to a secure FTP site where they can be accessed by the data analysis team at IHME. After census, household, and health facility data is received, data is rigorous-

ly reviewed for quality with regards to consistency, clarity, and completeness. Prompt evaluation of data quality allows for clarification from data collectors regarding inadequacies and irregularities, and rapid correction of procedural errors.

4.2.1 Household Survey

For quality assurance, the data collected during the SM2015 Census are compared to data from the 2005 Nicaragua Population Census on an ongoing basis. When 20% fewer than expected households or people are captured on the SM2015 Baseline Census, or when more than 5% of households are classified as “absent”, field staff are instructed to return to segments and attempt to capture missing households. In most cases, households considered occupied on the 2005 Census but not captured on the SM2015 Baseline Census are unoccupied because former residents had relocated for work.

To assure completeness of the sample for the SM2015-Nicaragua Household Survey, field staff are instructed to return to selected households up to three times (on different days, and at different times during the day) in an attempt to complete the Household Characteristics Questionnaire, the Maternal and Child Health Questionnaire, and the Physical Measurements Module. Supervisors are responsible for reviewing all questionnaires for quality and consistency prior to departing each segment.

4.2.2 Health Facility Survey

Data collection for facility surveys is done by physicians, given the familiarity required with medical equipment and procedures in the observation checklist and medical record review. Data is collected using computer netbooks equipped with CAPI software. A lead surveyor monitors conduction of the facility survey and reports feedback. Data collection using CAPI allows data to be transferred instantaneously once a survey is completed via a secure link to IHME. IHME monitors collected data on a continuous basis and provides feedback. Suggestions, surveyor feedback, and any modifications are incorporated into the health facility instrument and readily transmitted to the field. The new instrument can be ready for use on the following day of data collection.

CHAPTER 5: PLAN FOR ANALYSES

Analyses done by IHME are tailored to evaluate the collaboratively predetermined indicators. These indicators are detailed in Appendix A. Data collection is designed to cover all the initiative indicators, although special care is taken for the measurement of payment indicators.

In the data analysis, frequencies of indicators and variables of interest will be obtained at baseline. Cross-tabulations with some demographic characteristics (education, age, etc.), as well as in intervention and control areas, will be also calculated for selected variables. Baseline information will be used later to assess changes when comparing against data collected at 18, 36 and 54 months, and estimating the effect of interventions.

All analyses are performed by IHME using STATA Version 11.2 (StataCorp, College Station, Texas), incorporating survey weights developed by IHME and robust standard errors to account for intra-class correlation within clusters (segments).

CHAPTER 6: REPORTS

A report will be published in the middle point and end of baseline, 18 month, 36 month, and 54 month SM2015-Nicaragua survey waves. These reports will highlight the status of the survey, data quality measures, and indicators of interest.

CHAPTER 7: ETHICAL ISSUES AND CONFIDENTIALITY

All SM2015-Nicaragua surveys, protocols, and procedures are reviewed by Institutional Review Boards (IRB). IHME activities are monitored by the IRB of the University of Washington; at the national level, ECOSUR obtains approval from its own institutional IRB and from national instances as required. In addition, authorization from the Ministry of Health has been obtained to collect information from medical units. Previous to data collection, authorization to collect data in the community is also obtained from local authorities. This is especially relevant in the SM2015 target regions of Nicaragua, where some indigenous communities rule themselves by uses and traditions. Signed informed consent letters are obtained from informants prior to collecting any information at the household or health facility level.

The confidentiality of study participants' information is of critical importance. Any personal information captured is treated with the paramount concern for the participant's privacy. Assurance of confidentiality can provide more accurate data from respondents who are certain their personal information will remain secure. Interviewers are trained to present the SM2015-Nicaragua confidentiality agreement and address the concerns of the participants. Participation is completely elective, and efforts are made for each individual to be adequately informed when making the decision to participate. All data that is uploaded to IHME from survey sites lack personally identifiable information; there are no names, dates of birth, or addresses of study participants.

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APPENDIX A: SM2015-NICARAGUA INDICATORS

Indicator	Months	Source of Verification
Number of maternal deaths per 100,000 live births	0, 36, 54	Vital Records Independent surveys
Number of deaths during the first 28 days of life per 1,000 live births in a given year or period	0, 36, 54	Vital Records Independent surveys
Number of deaths during the first year of life per 1,000 live births in a given year or period	0, 36, 54	Vital Records Independent surveys
Number of deaths of children under five per 1,000 live births in a given year or period	0, 36, 54	Vital Records Nationals surveys
Children 0-59 months with hemoglobin <110 g / L	0, 36, 54	Household surveys
Children 0-23 months with hemoglobin <110 g / L	0, 36, 54	Household surveys
Children aged 0-59 months with z score of height for age <-2 SD	0, 36, 54	Household surveys
Number of births per 1,000 women aged 15 to 49 years, in a given year	0, 36, 54	Vital Records National surveys
Number of births to women aged 15 to 19 years in a year per 1,000 women	0, 36, 54	Vital Records National surveys
Women of reproductive age (15-49) currently using (or whose partner is using) a modern method of family planning	0, 36, 54	Household surveys
Women of reproductive age (15-49) who did not wish to become pregnant and who were not using / did not have access to family planning methods	0, 36, 54	Household surveys
Women of reproductive age (15-49) who report having stopped using a method of family planning during the previous year	0, 36, 54	Household surveys
Women who were residents of maternal homes in the last 18 months and adopted a family planning method within 40 days of delivery	0, 36, 54	Health facility surveys
Women of reproductive age (15-49) who received at least one prenatal care by a physician or nurse in their most recent pregnancy in the last two years	0, 36, 54	Household surveys
Women of reproductive age (15-49) who received at least four prenatal care sessions by a physician or nurse in their most recent pregnancy in the last two years	0, 36, 54	Household surveys
Women of reproductive age (15-49) who received four prenatal cares following best practices by a physician or nurse in their most recent pregnancy in the last two years	0, 36, 54	Health facility surveys
Women of reproductive age (15-49) who received their first prenatal visit by doctor or nurse before 12 weeks of gestation in their most recent pregnancy in the last two years	0, 36, 54	Health facility surveys

Women of reproductive age (15-49 years) eligible to receive a transportation and accommodation voucher as defined in the Operation Manual, who received at least one prenatal care by skilled personnel in their last pregnancy in the last 2 years	0, 36, 54	Health facility surveys
Women of reproductive age (15-49) whose most recent delivery was performed by qualified personnel in a health unit in the last two years	0, 36, 54	Household surveys
Women of reproductive age (15-49) who received post-partum care by qualified personnel within the first 48 hours in their most recent pregnancy in the last two years	0, 36, 54	Household surveys
Women of reproductive age (15-49) who received post-partum care within 48 hours where physical examination took place, vital signs, etc., by qualified personnel in a health unit in their most recent pregnancy in the last two years	0, 36, 54	Health facility surveys
Women of reproductive age (15-49) who received post-partum care by qualified personnel within 7 days after birth for their most recent birth in the last two years	0, 36, 54	Household surveys
Women of reproductive age (15-49) who received post-partum care by qualified personnel within 10 days after birth for their most recent birth in the last two years	0, 36, 54	Household surveys
Women of reproductive age (15-49) who received post-natal check within 24 hours immediately following the birth, an additional check within 7 days and another check before 42 days by qualified health unit for their most recent delivery in the last two years	0, 36, 54	Household surveys
Institutional postpartum patients of reproductive age, evaluated and recorded in clinical records at least every 15 minutes during the first hour and every 30 minutes to complete the two hours and being discharged from the hospital in her most recent birth in the last two years	0, 36, 54	Health facility surveys
Women correctly referred due to an emergency following the partograph in their most recent delivery in the last 2 years	0, 36, 54	Health facility surveys
Infants who developed a complication managed according to standard (sepsis, low birth weight, asphyxia, prematurity) in the last two years	0, 36, 54	Health facility surveys
Deliveries with obstetric complications (hemorrhage, sepsis and severe pre-eclampsia, eclampsia) managed according to standards in the last two years	0, 36, 54	Health facility surveys
Institutional deliveries with active management of the third period according to the norm valid as of December 2011, in their last pregnancy in the last 2 years	0, 36, 54	Health facility surveys
Neonates who received neonatal care according to standards by skilled personnel in a health unit within the 48 hours following birth in the last 2 years	0, 36, 54	Household surveys

Infants receiving neonatal care by qualified personnel within 10 days of birth in the last 2 years	0, 36, 54	Household surveys
Mothers or caregivers (15-49) that can recognize at least five danger signs in a newborn for most recent birth in the last two years	0, 36, 54	Household surveys
Children 12-23 months with measles vaccine as measure by DBS (positive seroconversion)	0, 36, 54	Household surveys
Children 0-59 months fully immunized identified for age, according to the official scheme of the National Immunization Program (PNI)	0, 36, 54	Household surveys
Children 12-23 months old with vaccine for measles, mumps and rubella (MMR)	0, 36, 54	Household surveys
Children aged 12-59 months who received 2 doses of deworming in the last year	0, 36, 54	Household surveys
Mothers with children 0-5 months who report having given exclusive breastfeeding to their child during the previous day	0, 36, 54	Household surveys
Children born in the last 24 months who were put to breast within the first hour after birth	0, 36, 54	Household surveys
Mothers/care providers who reported administering oral rehydration salts (ORS) and zinc to their children 0-59 months in the most recent diarrhea episode in the last 2 weeks	0, 54	Household surveys
Children 6-23 months whose mothers report that the child consumed at least 50 packets of micronutrient powder in the last 6 months	0, 36, 54	Household surveys
Women of reproductive age (15-49) who report having had any illness in the past two weeks	0, 36, 54	Household surveys
Women of reproductive age (15-49) who report having a sick child (0-59 months) in the past two weeks	0, 36, 54	Household surveys
Women of reproductive age (15-49) who report having a sick child (0-59 months) in the past two weeks but did not seek health care	0, 36, 54	Household surveys
Mean travel time from home to the closest health care center in the last visit	0, 36, 54	Household surveys
Average amount of household spending last month	0, 36, 54	Household surveys
Women 15 to 49 years old that used the maternal home in their most recent pregnancy in the last 2 years	0, 36, 54	Household surveys
Health units (posts, health centers, and primary hospitals) that meet the cold chain regulation existing in December 2011 for the management of vaccines	0, 18, 36, 54	Health facility surveys (direct input verification)
Health units (posts, health centers, and primary hospitals) that have the basic equipment and supplies set out in the standard of care for children under five years existing in December 2011	0, 18, 36, 54	Health facility surveys (direct input verification)
Percentage of units with adequate supply of ORS and zinc	0, 18, 36, 54	Health facility surveys

Posts, health centers, and primary hospitals that meet the basic equipment standards for prenatal and postpartum care	0, 18, 36, 54	Health facility surveys (direct input verification)
Health centers and hospitals authorized by MINSA to provide COE that are equipped with the necessary supplies for such care according to the COE standards existing March 2012	0, 18, 36, 54	Health facility surveys (direct input verification)
Health units (posts, health centers, and primary hospitals) with a supply of modern family planning methods (injectables, condom, oral, IUD, permanent, as appropriate) according to standards	0, 18, 36, 54	Health facility surveys (direct input verification)
Local information system and management tools in use by the local health network	0, 18, 36, 54	Health facility surveys
Localities with Agreement for Health and Social Welfare who met their goals and received seed capital and innovation fund in accordance with the guidelines established in the Operating Regulations	0, 18, 36, 54	Health facility surveys
Establishment of norms and regulations of the nutrition community platform based on evidence at the national level	0, 18, 36, 54	External review of norms, as stated in the operation manual
Municipal health units (Family Health Centers) that sign the Agreement for Health and Social Welfare with community health committees and monitoring reports made according to the same supervision and monitoring guidelines contained in the Operating Regulations	0, 18, 36, 54	Independent health service surveys; Acuerdos Sociales por la Salud y el Bienestar de la Comunidad subscribed on the year of the baseline survey and follow-up surveys
Health centers and posts without a shortage of vaccines, by type	0, 18, 36, 54	Health facility surveys
Traditional Birth Attendants and health workers trained in ECMAC with a certificate issued by the MoH according to the program	0, 18, 36, 54	Independent health services surveys; number of persons with certificate issued by MoH
Pregnant women at maternal homes who had Access to educational materials and training activities reported to the health center according to the guidelines of the Operation Manual in the last year	0, 18, 36, 54	Health facility surveys
Health centers in municipality heads that implement a mechanism for the delivery of vouchers for transportation and accommodation for pregnant women, according to the Operation Manual.	0, 18, 36, 54	Health facility surveys
Auxiliary nurses and community agents trained in community management of sick neonates, with a certificate issued by the MoH according to the program	0, 18, 36, 54	Independent health services surveys; number of persons with certificate issued by MoH
Health centers that have socioculturally designed health services	0, 18, 36, 54	Health facility surveys

APPENDIX B: SAMPLE SIZE CALCULATIONS BY INDICATOR

Indicator	Target time (months)	Baseline (%)	Target (%)	Sample size needed	Relevant age group to determine inclusion	Number of households needed to sample 1 person in this age-sex group	Total households needed
Contraceptive prevalence	36	62	67	1,136	Women 15-49* (4/3)	1	1,515
	54	62	71	341		1	455
Women eligible for vouchers that receive 1+ ANC visit with a skilled attendant	36	14	23	224	Assuming 15 and 20 households required to capture a woman eligible for a voucher	15 or 20	3360 or 4480
	54	14	29	90		15 or 20	1350 or 1800
Skilled attendant at birth in institutional setting	36	50	59	378	Children 0-2 yrs*(4/3)	3.4	1,714
	54	50	65	133		3.4	603
Postnatal care for woman within 10 days of delivery	36	25	34	316	Children 0-2 yrs*(4/3)	3.4	1,433
	54	25	40	120		3.4	544
Postnatal care for neonate within 10 days of delivery	36	25	35	259	Children 0-2 yrs*(4/3)	3.4	1,174
	54	25	40	120		3.4	544
Mothers using maternal waiting homes in the past 18 months who adopt a modern family planning method within 40 days after birth	36	57	67	290	Assuming 15 and 20 households required to capture a woman who used a maternal waiting home in the last 18 months	15 or 20	4350 or 5800
	54	57	72	125		15 or 20	1875 or 2500
Full vaccination for age	36	75	80	861	Children 0-59 months	1.3	1,119
	54	75	85	197		1.3	256
Prevalence of exclusive breastfeeding during first 6 months of life (children 0-5 months)	36	50	55	1,232	Children 0-5 months	13.7	16,878
	54	50	60	305		13.7	4,179
ORS and zinc	54	30	45	128	Children 0-59 months *1/0.145	1.3	1,148
De-worming	36	54	62	469	Children 12-59 months	1.6	750
	54	54	69	129		1.6	206