



---

[saludmesoamerica2015.org](http://saludmesoamerica2015.org)

# **SM2015 – MEXICO**

## **Study Protocol**

---

26 October 2012

## Table of Contents

<b>CHAPTER 1: INTRODUCTION .....</b>	<b>4</b>
1.1 Data Collection .....	4
1.2 Objectives in Mexico .....	5
1.2.1 Health Issues and Health System Constraints in Chiapas .....	5
1.2.2 Targets for Improvement .....	6
<b>CHAPTER 2: METHODOLOGY .....</b>	<b>7</b>
2.1 Household Survey Methods .....	7
2.1.1 Segment Sample Selection .....	7
2.1.2 Household Census .....	8
2.1.3 Household Survey .....	8
2.2 Health Facility Survey Methods .....	9
<b>CHAPTER 3: INSTRUMENTS .....</b>	<b>9</b>
3.1 Electronic Data Entry .....	9
3.2 Household Survey .....	10
3.2.1 Household Census Instrument .....	10
3.2.2 Household Characteristics Questionnaire .....	10
3.2.3 Maternal and Child Health Questionnaire .....	10
3.2.4 Physical Measurements Module .....	11
3.3 Health Facility Survey .....	11
<b>CHAPTER 4: TRAINING AND MONITORING OF DATA .....</b>	<b>11</b>
4.1 Training of Field Personnel .....	11
4.1.1 Training for Health Survey .....	11
4.1.2 Training for Health Facility Survey .....	12
4.2 Data Monitoring .....	12
4.2.1 Household Survey .....	13
4.2.2 Health Facility Survey .....	13
<b>CHAPTER 5: PLAN FOR ANALYSES .....</b>	<b>13</b>
<b>CHAPTER 6: REPORTS .....</b>	<b>14</b>
<b>CHAPTER 7: ETHICAL ISSUES AND CONFIDENTIALITY .....</b>	<b>14</b>
<b>IHME TEAM .....</b>	<b>15</b>
<b>APPENDIX A: SM2015-MEXICO INDICATORS .....</b>	<b>16</b>
<b>APPENDIX B: SAMPLE SIZE CALCULATIONS BY INDICATOR .....</b>	<b>20</b>

This protocol on the SM2015-Mexico 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

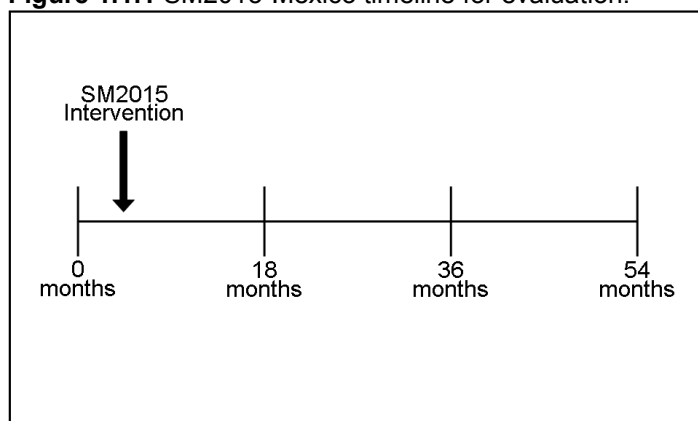
Salud Mesoamérica 2015 (SM2015) is a regional public-private partnership that brings together Mesoamerican countries, private foundations and bilateral and multilateral donors with the purpose of reducing health inequalities affecting the poorest 20 percent of the population in the region. Funding will 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 Mexico, El Colegio de la Frontera Sur (ECOSUR) will be the agency in charge of data collection.

### 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 Mexico 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-Mexico timeline for evaluation.



The principal objective of the SM2015-Mexico 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 Mexico. 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 Mexico

### 1.2.1 Health Issues and Health System Constraints in Chiapas

The state of Chiapas in Mexico has been selected as a target for SM2015-Mexico because of its 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 Chiapas. 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.

The state of Chiapas is located in the south of Mexico, on the border with Guatemala. It is a state with high proportion of people living in poverty and a high proportion of indigenous peoples. Chiapas is the state with the highest chronic malnutrition in Mexico (30% in rural areas). Anemia prevalence is 20.4% in children and 20% in of reproductive age. Maternal and newborn mortality are also major concerns; hemorrhage is the cause of 33% of maternal deaths, and asphyxia and trauma cause 25% of newborn deaths. There is high inequality in Chiapas. 69.7% of the state's deliveries are institutional births, but this statistic is only 42.4% among the indigenous population. Averages are similar for births by a doctor. The state average for prenatal care by a medical professional is 85.9%; among the poorest 20% the average is 86.0%; among the indigenous population the average is 67.8%. Particular supply- and demand-side barriers to sufficient health care are illustrated in Table 1.2.1. Each of these barriers has specific implications with regards to health outcomes.

**Table 1.2.1** Supply-side and demand-side barriers in Chiapas

<p><b>Supply-side barriers</b></p>	<ul style="list-style-type: none"> <li>▶ <b>Institutional:</b> Population segmentation by health provider (SSA-ISECH and IMSS-Op) and program membership (Oportunidades and Seguro Popular)</li> <li>▶ <b>Capacity:</b> Lack of capacity to attend uncomplicated birth at Basic ENOC and obstetric emergencies at Complete ENOC</li> <li>▶ <b>Reference and counter-reference:</b> Barriers for admittance of women with obstetric complications into hospitals</li> <li>▶ <b>Supervision:</b> Superficial and low quality supervision focused on attendance and registration</li> <li>▶ <b>Safety:</b> Personnel feeling unsafe, equipment robberies</li> <li>▶ <b>Infrastructure and inputs:</b> Problems with infrastructure and equipment, and insufficient supplies</li> <li>▶ <b>Human resources:</b> Lack of specialists, high personnel mobility, medical team does not speak native tongues, and lack of incentives for direction roles</li> </ul>
<p><b>Demand-side barriers</b></p>	<ul style="list-style-type: none"> <li>▶ <b>Geographic:</b> high geographic dispersion and lack of road access in some municipalities</li> <li>▶ <b>Economic:</b> Barriers for the population to transport patients</li> <li>▶ <b>Religious:</b> Religious leaders discouraging women checkups, celebrations or prayers during birth discourage institutional birth</li> <li>▶ <b>Cultural:</b> Distrust for medical personnel, high acceptance of traditional birth attendants, home births perceived as more comfortable, language barriers, low literacy</li> <li>▶ <b>Political:</b> Distrust for government programs, political organizations promoting mobilizations due to perceived differences in care</li> <li>▶ <b>Information:</b> lack of information about right of access to health services, NGOs promoting traditional birth and in-house birth</li> </ul>

### 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. A first component is to strengthen the supply, improve equality and increase use of maternal and child health care services. Subcomponents are to promote demand of maternal and child health services, innovate and extend family planning methods and services, and strengthen monitoring of pregnant women and the reference and counter reference system. A second component is to strengthen immunization services and creation of the Electronic Health Card (EHC). The EHC will allow for monitoring of pregnant women and vaccinations in children. A third component is to increase and strengthen preventative nutrition health services. This will involve disbursement of nutritional supplements paired with education

about eating habits and child care. A fourth component is to strengthen and modernize state health information systems. This includes implementation of integrated health information systems that improve monitoring and decision making.

## 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-Mexico Household Survey is designed to provide estimates of the coverage of key health interventions and indicators among the lowest wealth quintile of the population. Indicators are used to calculate the sample size necessary to provide estimates with sufficient power (80%) and Type I error (0.05). The indicator with the highest sample size requirement is the measurement of postpartum care for mother within 7 days of delivery at 36 months. This requires a total of 3,534 intervention households. In addition, there will be 1,200 control households. Additional indicator sample size calculations can be found in Appendix B.

The primary administrative units in Mexico are states and municipalities. Mexico is a federation comprising 31 states and a Federal District, the capital city. In the state of Chiapas, which has 114 municipalities, IDB identified 30 municipalities in which the intervention will take place, and a set of 26 control municipalities with similar socio-economic characteristics and ethnic composition (Table 2.1.1). The baseline SM2015 Household Survey for Mexico will be conducted on a sample extracted from those areas on the basis of their high concentration of residents in the country's lowest wealth quintile. From these 56 municipalities, a random sample of approximately 181 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 2010 Mexico Population Census). 130 of these segments are intervention segments, and 51 are control segments. 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 children under five years old will be randomly selected to provide an expected sample of 4,734 households (3,534 intervention and 1,200 control households).

**Table 2.1.1** Intervention and control municipalities

Treatment Municipalities	Control Municipalities
Aldama	Altamirano
Amatenango del Valle	Benemerito de las Americas
Amatán	Bochil

Chalchihuitán	Chapultenango
Chamula	Coapilla
Chanal	Francisco León
Chenalhó	Ixhuatan
Chilón	Ixtacomitan
El Bosque	Ixtapa
Huitiupán	Ixtapangajoya
Huixtán	Jitotol
Larráinzar	Las Margaritas
Mitontic	Maravilla Tenejapa
Oxchuc	Marqués de Comillas
Pantelhó	Ocosingo
Pueblo Nuevo Solistahuacán	Ocotepec
Sabanilla	Ocozacoautla de Espinosa
Salto de Agua	Palenque
San Andrés Duraznal	Pantepec
San Cristóbal de las Casas	Rayon
San Juan Cancuc	San Lucas
Santiago el Pinar	Solosuchiapa
Simojovel	Soyalo
Sitalá	Tapalapa
Tenejapa	Tecpatan
Teopisca	Venustiano Carranza
Tila	
Tumbalá	
Yajalón	
Zinacantán	

### 2.1.2 Household Census

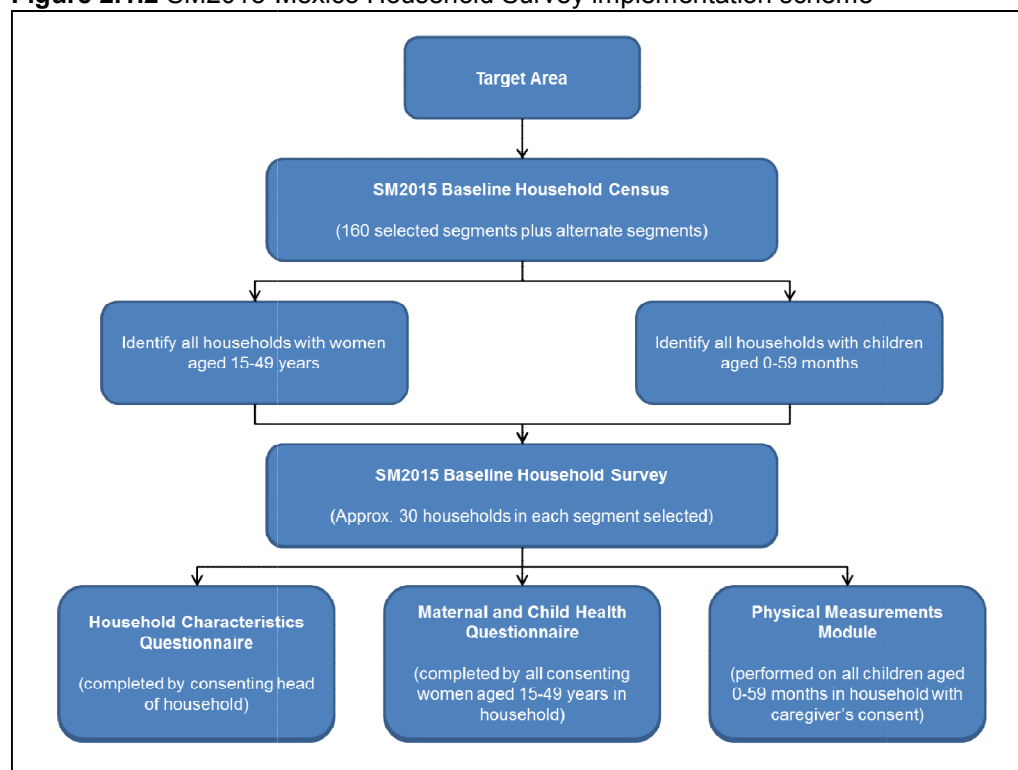
In each of the selected segments, the SM2015-Mexico Household Census is conducted in order to identify eligible women and children for the survey. Interviewers visit every household in the segment and create a household roster capturing the age and sex distribution of household members. Information from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



## 2.2 Health Facility Survey Methods

A total of 90 health facilities present in the intervention segments selected for household survey are to be sampled. Health facilities will be selected at random from the network of health facilities of the Instituto de Salud del estado de Chiapas 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-Mexico Surveys are conducted using a computer-assisted personal interview (CAPI). CAPI is programmed using DataStat Illume and installed into computer netbooks which are used by the surveyors at all times of the interview. CAPI supports skip patterns, 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-Mexico 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: tzental, tzotzil, chol and tojolabal.

### 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 HemoCue™ 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.

## **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 Mexico 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 rigorously 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 2010 Mexican 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 2010 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-Mexico 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 within the intervention group, and making comparisons with the control group to estimate the effect of the intervention.

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-Mexico 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-Mexico 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. 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 State of Chiapas, 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-Mexico 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.

## IHME TEAM

### *Principal Investigators:*

Rafael Lozano, MSc, MD  
Professor, IHME

Ali H. Mokdad, PhD  
Professor, IHME

### *Project Officers:*

Brent Anderson, BA  
Project Officer, IHME

Tasha B. Murphy, PhD  
Senior Project Officer, IHME

### *Team Members:*

Bernardo Hernández Prado, MS, DSc  
Clinical Associate Professor, IHME

Emily Carnahan, BA  
Post-Bachelor Fellow, IHME

K. Ellicott Colson, BA  
Post-Bachelor Fellow, IHME

Marielle Gagnier, BS  
Post-Bachelor Fellow, IHME

Erin Palmisano, BA  
Data Analyst, IHME

Dharani Ranganathan, BA  
Data Analyst, IHME

Gulnoza Usmanova, MPH, MD  
Post-Graduate Fellow, IHME

Catherine M. Wetmore, MPH, PhD  
Senior Fellow, IHME



## APPENDIX A: SM2015-MEXICO 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 Independent surveys
Children aged 0-59 months with hemoglobin <110 g / L	0, 36, 54	Household surveys
Children 6-23 months with hemoglobin <110 g / L	0, 36, 54	Household surveys
Children 0-59 months with height <-2 SD from the mean of the reference population for age-length	0, 36, 54	Household surveys
Number of births per 1,000 women aged 15 to 49 years, in a given year	0, 36, 54	Health surveys Household surveys Vital Records
Number of births to women aged 15 to 19 years in a year per 1,000 women	0, 36, 54	Health surveys Household surveys
Number of maternal deaths in hospitals	0, 36, 54	Hospital records
Number of neonatal deaths in hospitals	0, 36, 54	Hospital records
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 (temporary and permanent)	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 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) in their most recent pregnancy in the last two years received at least	0, 36, 54	Health facility surveys



5 prenatal care performed by doctor, nurse or COCS according to best practices		
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) 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 postpartum 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 of birth in the last 2 years, in which the physical examination included vital signs and information on breastfeeding was provided by skilled attendants in the medical units	0, 36, 54	Health facility surveys
Women of reproductive age (15-49) who received postpartum care by qualified personnel before seven days after birth for their most recent birth in a health unit in the last two years	0, 36, 54	Household surveys
Women of reproductive age (15-49) in their most recent pregnancy in the last two years received postpartum care by qualified personnel between 7 and 42 days after birth	0, 36, 54	Household surveys
Women of reproductive age (15-49) who received postnatal 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
Women with obstetric complications (hemorrhage, sepsis and severe pre-eclampsia, eclampsia) managed according to standards in their most recent birth in the last two years	0, 36, 54	Health facility surveys
Births with active management of the third period (given oxytocin / 10 IU intramuscular carbetocin one	0, 36, 54	Health facility surveys

minute after birth, uterine massage and traction cord strain relief) and late cord clamping in the most recent birth in the last two years		
Neonates who received neonatal care by skilled personnel in a health unit within the 48 hours following birth in the last 2 years, and in which postnatal care was provided according to the norms	0, 36, 54	Health facility 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
Caesarean sections as a proportion of all births in the last two years	0, 36, 54	Health facility surveys
Children diagnosed with diarrhea treated at the health unit tested, classified and treated according to the degree of dehydration in the past two years	0, 36, 54	Health facility surveys
Children aged 0-59 months diagnosed with pneumonia in health unit who attended follow-up appointment within two days in the primary care level in the last two years	0, 36, 54	Health facility surveys
Children 12 to 23 months of age with measles vaccine as measured by DBS (positive seroconversion)	0, 36, 54	Household surveys
Children 0-59 months fully immunized identified for age	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
Children 0-5 months who were fed exclusively on breast milk during the previous day	0, 36, 54	Household surveys
Mothers of children 0-23 months who reported having given their children exclusively breast milk for the first 6 months of life	0, 36, 54	
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 ORS to their children 0-59 months in the most recent diarrhea episode in the last 2 weeks	0, 36, 54	Household surveys
Mothers reported that their children between 6-23 months consumed micronutrients in adequate doses in the last two weeks	0, 36, 54	Household surveys
Children 12 to 15 months who were breastfed during the previous day	0, 36, 54	Household surveys
Children 6 to 8 months who received solid or semisolid food the previous day	0, 36, 54	Household surveys
Children 6 to 23 months who received food from 4 or more food groups during the previous day	0, 36, 54	Household surveys
Breastfed or with complimentary feeding children 6 to 23 months who received solid, semisolid and soft foods (including maternal milk substitutes) in the minimal amount twice per day	0, 36, 54	Household surveys
Children 6 to 23 months who received a minimum acceptable diet (apart from breast milk) during the	0, 36, 54	Household surveys

previous day		
Children 6 to 23 months who received iron-rich foods or iron-fortified foods during the previous day	0, 36, 54	Household surveys
Midwives or community personnel who receive incentives linked to prenatal, delivery, postnatal and / or care RN (pending preliminary analysis)	0, 36, 54	Health facility surveys
Women of reproductive age (15-49) who report having had any illness in the last 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 had a child (0-59 months) sick in the last 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
Mean out of pocket family payment for health services in the previous month	0, 36, 54	Household surveys
Average amount of household spending last month	0, 36, 54	Household surveys
Units (micro region) with cold chain according to standards	0, 18, 36, 54	Health facility surveys
Health services with continuous availability of supplies and equipment necessary for the health care of children, immunization and nutrition	0, 18, 36, 54	Health facility surveys
Health services with continuous availability of supplies and equipment needed for prenatal and postpartum	0, 18, 36, 54	Health facility surveys
Health services with continuous availability of supplies and equipment for emergency obstetric and neonatal	0, 18, 36, 54	Health facility surveys
Health services with continuous availability of supplies and equipment necessary for the delivery and care of newborn	0, 18, 36, 54	Health facility surveys
Health services that include supply of modern family planning methods (oral, injectable, barrier, IUD) according to the schedule (population under responsibility, time of year, rotation)	0, 18, 36, 54	Health facility surveys
Maternal deaths by selected causes reported and investigated according to rules of mortality surveillance (at the jurisdictional level) in the last year	0, 18, 36, 54	Health facility surveys
Neonatal deaths by selected causes reported and investigated according to rules of mortality surveillance (at the jurisdictional level) in the last year	0, 18, 36, 54	Health facility surveys
Children 6 to 23 months who received micronutrients in health units in the recommended doses	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
Unmet need for contraception	36	50	43	627	Women 15-49 *(4/3)	1	836
	54	50	40	305		1	407
Birth with SBA in an institution	36	42.4	50.4	479	Children 0-2 years *(4/3)	3.1	1,980
	54	42.4	54.4	213		3.1	880
Post-partum care for mother within 7 days of delivery	36	50	56	855	Children 0-2 years *(4/3)	3.1	3,534
	54	50	60	305		3.1	1,261
Exclusive breastfeeding during first 6 months of life (children 0-23 months)	54	11.1	15.1	879	Children 0-23 months	3.1	2,725
Micronutrients	36	50	80	30	Children 6-23 months	4.3	129
ORS	36	19	34	106	Children 0-59 months *1/0.145	1.6	1,170
	54	19	44	42		1.6	463
Anemia 6-23 months	54	50	40	305	Children 6-23 months	4.3	1,312