USAID
FROM THE AMERICAN PEOPLE

EXTENDING SOCIAL INSURANCE TO INFORMAL SECTOR WORKERS IN NICARAGUA VIA MICROFINANCE INSTITUTIONS:

RESULTS FROM A RANDOMIZED EVALUATION

GDN
GLOBAL DEVELOPMENT NETWORK

PSP-*One*
PRIVATE SECTOR PARTNERSHIPS FOR BETTER HEALTH

October 2009

This publication was produced for review by the United States Agency for International Development. It was prepared by Laurel Hatt, PSP-*One* Project, Abt Associates Inc., Rebecca Thornton, University of Michigan, Barbara Magnoni, EA Consultants, and Mursaleena Islam, PSP-*One* Project, Abt Associates Inc.

Country Report

Country Report Series: PSP-*One* Country Reports were developed to inform specific PSP-*One* country program operations, but they also contain results that may be of interest to a wider audience. All papers in the series were reviewed by PSP-*One* technical staff in the field and in Washington, DC, as well as by relevant PSP-*One* program management staff.

Recommended Citation: Hatt, Laurel, Rebecca Thornton, Barbara Magnoni, and Musaleena Islam. October 2009. *Extending Social Insurance to Informal Sector Workers in Nicaragua via Microfinance Institutions: Results from a Randomized Evaluation.* Bethesda, MD: Private Sector Partnerships-*One* project, Abt Associates Inc.

Download: Download copies of PSP-*One* publications at: www.psp-one.com

Contract/Project No.: GPO-I-00-04-00007-00

Submitted to: Patricia Mengech, CTO
Bureau of Global Health
Global Health/Population and Reproductive Health/Service Delivery Improvement
Center for Population, Health and Nutrition
Bureau for Global Programs, Field Support and Research
United States Agency for International Development

Abt Associates Inc. ■ 4550 Montgomery Ave, Suite 800 North ■
Bethesda, Maryland 20814 ■ Tel: 301/913-0500 ■ Fax: 301/913-9061
■ www.psp-one.com ■ www.abtassoc.com

In collaboration with:
Banyan Global ■ Dillon Allman and Partners ■ Family Health International ■ Forum One Communications ■ IntraHealth International ■ O'Hanlon Health Consulting ■ Population Services International ■ Tulane University's School of Public Health and Tropical Medicine

EXTENDING SOCIAL INSURANCE TO INFORMAL SECTOR WORKERS IN NICARAGUA VIA MICROFINANCE INSTITUTIONS:

RESULTS FROM A RANDOMIZED EVALUATION

CONTENTS

List of Tables

List of Figures

ACRONYMS

ACODEP	*Asociación de Consultores para el Desarrollo de la Pequeña, Mediana y Microempresa* (local MFI)
ANC	Antenatal Care
ATC	Anatomical, Therapeutic, Chemical drug classification system
EMP	Social Security health clinics for the insured, *Clínicas de los Asegurados* (formerly *Empresas Médicas Previsionales)*
ENDESA	Nicaragua Demographic and Health Survey *(Encuesta Nicaragüense de Demografia y Salud)*
FP	Family Planning
GDN	Global Development Network
HIV/AIDS	Human Immunodeficiency Virus/Acquired Immune Deficiency Syndrome
INIDE	National Institute of Development Information, *Instituto Nacional de Información de Desarrollo*
INSS	Nicaraguan Social Security Institute, *Instituto Nicaragüense de Seguridad Social*
MCH	Maternal and Child Health
MDG	Millennium Development Goals
MFI	Microfinance Institution
MINSA	Nicaraguan Ministry of Health, *Ministerio de Salud*
NGO	Nongovernmental Organization
OOP	Out-of-Pocket
PSP-*One*	Private Sector Partnerships-*One*
RH	Reproductive Health
USAID	United States Agency for International Development

ACKNOWLEDGMENTS

This evaluation project brings together an international research team funded by USAID's Private Sector Partnerships-*One* project (PSP-*One*) and the Global Development Network (GDN). Lead researchers responsible for preparation of this final report include Dr. Laurel Hatt (PSP-*One,* Abt Associates), Dr. Rebecca Thornton (University of Michigan), Ms. Barbara Magnoni (EA Consultants), and Dr. Mursaleena Islam (PSP-*One*, Abt Associates). Dr. Tania Dmytraczenko (formerly PSP-*One*, Abt Associates) contributed substantially to the original evaluation design. The excellent contributions from our Nicaraguan survey research counterparts at ALVA Consultores (including Dr. Freddy Solís, Dr. Ana Rojas, Ms. Rosario Duarte, and the whole survey team) and qualitative data collection provided by consultant Ms. Imelda Torrez have been essential to the success of this research. We wish to thank Dr. Erica Field (Harvard University) for her guidance and technical reviews throughout this project. We are grateful for helpful comments and suggestions from Robert Lalonde, Jeff Smith, and other GDN mentors and participants as well as participants at Harvard School of Public Health, the World Bank Research Group, and the Population Association of America seminars. Ms. Barbara O'Hanlon's (PSP-*One*, O'Hanlon Health Consulting LLC) and Dr. Kathryn Banke's (PSP-*On*e, Abt Associates) review of the document, Ms. Anne Fitzpatrick's (University of Michigan) assistance with the literature review and Ms. Erica James' (PSP-*One,* Abt Associates) analysis of focus group discussion transcripts are greatly appreciated.

ABSTRACT

This report presents results from a one-year randomized evaluation of a program that extended voluntary health insurance to informal sector workers in Nicaragua. In January 2007, the government of Nicaragua made its Social Security health insurance program available for a monthly fee to informal sector workers, using private microfinance institutions (MFIs) as intermediaries. Subsidies for this insurance were randomly allocated to market vendors in several large open-air markets in Managua and we also randomly assigned different locations for enrolling in the insurance: either at the central Social Security (INSS) office, or at the participating MFIs. The results showed that costs were crucial determinants of signing up for health insurance—both monetary costs as represented by the subsidies offered and time and convenience costs associated with the enrollment process. Allowing individuals to enroll at MFIs did not increase uptake of the insurance.

In a follow-up survey conducted one year after individuals were offered the insurance, PSP-*One* found that insured individuals switched from using services at private and Ministry of Health (MoH) facilities to visiting covered health facilities contracted by INSS. However, overall utilization of services did not increase. Having insurance had little impact on individuals' use of reproductive health (RH) services, including family planning (FP), most likely because this population has a very low unmet need. Total out-of-pocket expenditures were reduced among insured individuals and their family members, but the average out-of-pocket savings were lower than the equivalent unsubsidized insurance premiums. The findings also revealed very low retention rates after the subsidies expired, with less than 10 percent still enrolled in the insurance program after one year. In addition to the empirical results, the report discusses the institutional challenges and limitations of this project that are essential to consider for other similar programs and makes several key policy recommendations.

EXECUTIVE SUMMARY

In January 2007, the government of Nicaragua initiated a demonstration project that extended the Nicaraguan Social Security Institute's (INSS') health insurance program to informal sector workers using microfinance institutions (MFIs) as delivery channels. To evaluate the impact of the program on health care utilization (including family planning (FP) and reproductive health (RH) services) and out-of-pocket expenditures, we randomly allocated informational brochures, monetary subsidies for the insurance, and convenience subsidies for the enrollment process to a sample of market vendors in Managua. To test the effectiveness of MFIs as a delivery agent, individuals were also randomly assigned to sign up for the insurance at different locations: either at the INSS central office, or at the branch offices of three participating MFIs. A baseline survey with 4,002 vendors was conducted in the spring of 2007, at which point respondents were randomly assigned to the treatment groups.

In the spring of 2008, we conducted a follow-up survey with 2,608 of these respondents, measuring their uptake of the insurance product, as well as changes in their socioeconomic status, health care utilization, out-of-pocket health expenditures, and health status. To analyze the panel survey data, we used two-stage least squares (instrumental variables) regression analysis to identify the impact of insurance enrollment on utilization and expenditures, instrumenting enrollment with the respondent's randomization outcome. This approach addressed the classic measurement limitation that voluntary insurance enrollment is subject to selection bias and allowed the authors to make causal interpretations regarding the impact of the insurance. We also conducted a series of focus group discussions to investigate uptake of the insurance program and use of health services from a qualitative perspective. Finally, we conducted a review of participants' medical records at 13 INSS-contracted health facilities.

Results showed that costs are crucial to signing up for health insurance, both monetary costs, as represented by the health insurance premium subsidies offered, and time and convenience costs that were reduced for a subset of individuals by allowing them to enroll at their place of work. We also found that insured individuals switched from using services at private and Ministry of Health (MoH) facilities to visiting covered, INSS-contracted health facilities as expected. However, insurance did not increase their overall utilization of health services. Being insured had little impact on an individual's use of FP and RH services, for example, most likely because this population has a very low unmet need. Total out-of-pocket expenditures fell significantly when individuals were insured, but average out-of-pocket savings were lower than the equivalent unsubsidized insurance premiums. Finally, we found very low retention rates after expiration of the premium subsidy, with less than 10 percent still enrolled and paying for the insurance program after one year. The fact that insurance may be perceived as a net gain only for those who are the most ill or who experience a catastrophic health problem may explain overall low enrollment rates in insurance programs in developing countries where individuals have lower levels of discretionary income. Experience has shown worldwide that it is challenging to design affordable and accessible health insurance plans for the poor, particularly with premiums that are low relative to incomes and average health expenditures, which is what the poor are often forced to consider.

In this evaluation, MFIs were not more effective than the INSS as a health insurance delivery agent. Take-up and retention of insurance was not higher when individuals were assigned to sign up at an MFI

rather than at the INSS. Focus group discussions shed some light on this finding, with many informal sector workers suggesting that the participating MFIs had limited knowledge of health insurance, added bureaucracy to an already bureaucratic process, and were perceived to have increased the cost of the product by functioning as an intermediary. Nevertheless, some workers pointed to the convenience of MFI locations as well as easy payments as advantages of having MFIs involved in the process, and MFIs that made a greater effort to learn about the insurance and market it to their clients performed better in terms of uptake. Participants who were MFI clients at baseline were slightly more likely to enroll in the insurance. Insurers seeking to increase enrollment can consider MFIs as attractive potential delivery channels. However, this evaluation points to a number of obstacles in public-private partnerships (PPPs) between governments and MFIs that must be addressed, including political will and administrative challenges and those related to promotion and marketing, before MFIs can be a viable alternative and before high enrollment and retention rates are achieved.

1. INTRODUCTION

Interest is growing among policymakers and academics in the establishment of insurance programs for poor and vulnerable populations throughout the world as a way of increasing access to priority health services and protecting families from catastrophic health care costs. Evidence exists, however, that uptake of voluntary health insurance among informal and low-income workers is typically low. Moreover, collecting premium payments from this population is challenging (Abel-Smith 1992), and insurers are concerned that insuring the poor will attract those who are less healthy. Existing synergies between the delivery of financial and health services to clients in the informal sector have led policymakers to believe that microfinance institutions (MFIs) may be a promising and innovative delivery agent to extend health insurance to low-income and other vulnerable groups. In particular, there may be economies of scale for collection of payments in settings where MFI penetration is high.

Nicaragua provided a good opportunity to explore this model, given its large informal sector and well-organized MFI presence. In January 2007, the government of Nicaragua initiated a demonstration project that extended the Nicaraguan Social Security Institute's (INSS') formal sector health insurance program to informal sector workers using MFIs as delivery channels. By extending the INSS' basic package of services and medications to the informal sector, the program aimed to positively impact health outcomes, including reproductive health and family planning (RH/FP), as well as move towards achieving health Millennium Development Goals related to the reduction of child mortality rates, improved maternal health, and reduced incidence of HIV/AIDS and malaria.

This report presents findings of a randomized evaluation of that pilot project. The evaluation activity, implemented in 2007 and 2008, was cofunded by the USAID-funded Private Sector Partnerships-*One* (PSP-*One*) project and the Global Development Network.

1.1 NICARAGUAN CONTEXT AND MOTIVATION FOR THE EVALUATION

In Nicaragua, workers engaged in the informal sector, which is composed of microentrepreneurs, vendors, independent professionals, and contractors, number around 1.2 million. For these workers, as for informal workers in many parts of the developing world, the vulnerability of household and business cash flows to a family health crisis is extreme. Workers often must divert resources from essential consumption, savings, and investment to meet immediate health care needs, and these tradeoffs can negatively impact both current and future household income flows as well as future business growth. Health insurance can serve a vital risk protection function for families and small businesses, as well as increase access to priority health services.

A census of independent business owners and informal sector workers in urban Managua conducted in 2006 (Thornton et al. 2007), however, showed that a significant majority (93 percent) lacked health insurance coverage and thus did not have an available mechanism to manage health and associated financial risks. Although informal sector workers are eligible for free care at the Nicaraguan Ministry of Health (MINSA) clinics or can pay out of pocket for services from private providers, available MINSA facilities are under-resourced and lack the infrastructure, staff, and medications needed to respond

adequately to the population's health needs. Focus groups with informal sector workers conducted in 2006 (Magnoni et al. 2005) revealed that they perceived MINSA facilities as offering a lower quality of care than INSS-contracted facilities and other private health providers. Many reported preferring to go directly to pharmacies for their basic care rather than waiting in long lines at MINSA facilities. Potentially more costly alternatives included paying private doctors or avoiding care altogether, thereby incurring the risk of requiring more extensive and costly health care services down the line.

Although the arguments for improving access and financial protection exist for extending health insurance coverage to informal workers, significant challenges are associated with doing so. Low-income and informal workers possess many characteristics associated with low insurance take-up rates: an inability to pay high premiums due to income and credit constraints (Behrman and Knowles 1999), existing informal social networks that develop in the absence of formal risk-sharing channels (Jowett 2003; Morduch 1999), and lack of familiarity with insurance products, risk pooling and associated low willingness to pay for insurance (Chankova et al. 2008; Gine et al. 2007). Additionally, Alderman and Paxson (1994) and Fafchamps (1998) find that the poor use savings and credit as a substitute for insurance.

Moreover, the transaction costs of collecting premiums from informal sector workers can be high. By definition, informal workers operate outside official tax collection and business registration systems. They do not receive regular salaries or income flows from which premiums could easily be deducted, and often they do not have bank accounts. Their cash income may be highly seasonal or entirely unpredictable.

Several authors, including Matin, Hulme, and Rutherford (2002), discuss mechanisms by which to extend formal sector financial or insurance products to the working poor. The community-based health insurance movement, particularly prevalent in West Africa, has resulted in the establishment of many small grassroots-level risk pooling schemes that are based in traditional social networks and depend heavily on community solidarity for their financial sustainability and functioning (Atim 1999; Jakab and Krishnan 2001; Carrin et al. 2005; Chankova et al. 2008). Tying premium collection with annual harvests and linking community savings and credit schemes with premium payments are two approaches that show promise in these communities (Ahuja and Jütting 2004).

In communities where they are active, MFIs appear to be an increasingly promising mechanism for extending health insurance to low-income groups while streamlining administrative costs for premium collection (Churchill 2003; Churchill and Cohen 2006). Strong linkages exist between the delivery of financial and health services—namely, client demand for both services and an institutional ability by MFIs to easily integrate health savings or insurance products into their menu of financial services. MFIs are increasingly adding these products to respond to client demand, maintain client loyalty, and improve clients' ability to repay loans by improving their well-being and access to health care (Dror and Preker 2002). In Bolivia, for example, one of the country's largest and most stable MFIs offers a variety of insurance products including life, health, and accident insurance. Pro Mujer, an MFI operating in Argentina, Bolivia, Mexico, Nicaragua, and Peru, offers health training, primary care, and linkages to providers in various countries in which they operate. Savings and insurance services are particularly important in meeting the needs of women microentrepreneurs who manage the finances, health, and education of their households.

Unfortunately, rigorous evidence is limited on the effectiveness of different schemes that provide health insurance to the informal sector, specifically on the potential role of MFIs in marketing and delivering the insurance products and the schemes' ability to reduce out-of-pocket (OOP) expenditures and increase utilization of quality health services. One of the main reasons for this lack of evidence is the difficulty in making causal inferences from cross-sectional studies. Typically, those who are more likely to be sick or utilize health services will also be more likely to enroll in voluntary health insurance programs. Thus comparing outcomes for those with health insurance to those without health insurance is likely to confound these other factors that are correlated with the choice to purchase insurance and give biased results.

1.2 SUMMARY OF EVALUATION APPROACH AND RESEARCH QUESTIONS

The main goals of this evaluation were to assess the effectiveness of offering health insurance to the informal sector, both with and without the assistance of MFIs, and to measure the impact of insurance on access to affordable health care, including RH/FP, for this population. The study introduced an experimental component in which individuals were allocated health insurance subsidies of varying amounts by a "lottery," thereby reducing the effects of selection bias by disproportionately encouraging enrollment among a randomly chosen subset. Individuals were also randomly assigned to sign up for the insurance either at the main INSS office or at one of three participating MFIs. Our evaluation enables evidenced-based recommendations with respect to expanding the program within Nicaragua and to adapting the model to other countries that wish to extend health insurance to the informal sector.

The following are several key research questions for this project:

- What are the determinants of health insurance enrollment among informal sector workers in Nicaragua?
    - Does simply providing information about insurance encourage enrollment?
    - How does reducing the cost of insurance premiums affect enrollment?
    - How does increasing the convenience of the enrollment process affect enrollment?
    - To what extent is adverse selection observed?
    - To what extent does using MFIs as insurance intermediaries affect enrollment?
- What is the impact of health insurance on utilization (especially of maternal and child health services [MCH] and RH/FP) and expenditures within this population?
- What are the determinants of retention in the insurance program?
    - How does MFI status affect retention?

1.3 ORGANIZATION OF REPORT

The report continues in section 2 with a brief overview of the Nicaraguan context, background on the INSS program and pilot demonstration project, and information about implementation challenges that may affect interpretation of results. Section 3 describes both quantitative and qualitative methods used for the evaluation. Section 4 details findings, while section 5 interprets these findings and provides recommendations. Section 6 presents conclusions from this evaluation.

2. BACKGROUND AND CONTEXT

This section provides background information on the INSS insurance program and the characteristics of the demonstration project, as well as contextual factors that affected project implementation and may affect interpretation of evaluation results.

2.1 THE INSS HEALTH CARE SYSTEM IN NICARAGUA

Health insurance provided through the INSS extends quality care to its formal sector subscribers and is based on mandatory payroll and employer contributions. Prior to January 2007, only formal sector workers and government employees in Nicaragua—representing 18.5 percent of the economically active population—were eligible for INSS health insurance. Individuals working in the informal sector, the self-employed, and the unemployed were not eligible.

INSS contracts with for-profit, not-for-profit, and public sector health facilities called Clinics for the Insured (formerly *Empresas Médicas Previsionales* and referred to in this paper as EMPs). INSS purchases services from these facilities on a capitated basis. The INSS insurance provides all beneficiaries with a comprehensive package of preventive, diagnostic, and curative health services, including primary and specialist care, medication and laboratory exams, hospitalization, 24-hour emergency care, prenatal care, childbirth and post-natal care, infant care and vaccinations, child wellness visits through age 5, voluntary FP counseling and contraception, breast and cervical cancer screenings, HIV and sexually transmitted disease counseling, and prevention and treatment of dengue fever and malaria. An INSS subscriber's dependent children up to the age of 12 are covered. During pregnancy and the postpartum period, the subscriber's wife is also eligible for maternity services, including delivery care.

2.2 VOLUNTARY INSS INSURANCE FOR INFORMAL WORKERS AND THE MFI DEMONSTRATION PROJECT

In 2007, the INSS health insurance package was made available for purchase by informal sector workers through a voluntary program known as *Seguro Facultativo de Salud*. In this program, insured individuals and eligible dependents pay a flat monthly premium for covered services. The monthly fee is higher in the first two months, at approximately US$17[1] per month, and falls to approximately US$15 per month thereafter. If a subscriber desires to disenroll, he or she continues to be covered during a three-month grace period after he or she has stopped paying for the insurance, before the affiliation is cancelled. No copays are charged at the time of service.

As a means of increasing enrollment in the voluntary insurance program, Nicaraguan policymakers at INSS hypothesized that it would be convenient for informal sector workers to make health insurance payments at the same time as making payments on loans at MFIs. About one-third of small business owners in Managua have a loan with an MFI (Thornton et al. 2008). The government initiated a demonstration project, allowing MFIs to market the insurance, register subscribers, and collect premiums. Three MFIs in Managua that had expressed interest and whose administrative systems were sufficiently developed were selected to participate: Asociación de Consultores para el Desarrollo de la Pequeña, Mediana y Microempresa (ACODEP), Banco ProCredit, and Findesa. The MFIs signed a

[1] Based on July 2007 exchange rates.

one-year contract with INSS in October 2006 for registering subscribers and collecting payments, and they received a small fee from INSS for each enrolled worker. In the fall of 2006, the PSP-*One* project provided technical assistance to each MFI on management information systems, operations, and marketing, and provided training to familiarize them with the process of signing up informal workers for health insurance. Beginning in January 2007, individuals could sign up for the insurance at any branch of these participating MFIs, which would send all paperwork to INSS. Monthly payments could also be paid at any participating MFI as well as through most banks in the country.

2.3 CONTEXTUAL FACTORS AFFECTING IMPLEMENTATION OF THE DEMONSTRATION PROJECT

Several external factors affected the rollout and ongoing management of the INSS demonstration project, and these must be considered when interpreting evaluation results presented in this report. Perhaps most important was a change in Nicaragua's political administration in January 2007, which delayed project start-up. Government-wide budget cuts also kept the INSS from committing any additional resources to the project, including funds for communications materials to support the MFIs' direct marketing of the voluntary INSS insurance.

In October 2007, the three MFIs participating in this demonstration project did not have their contracts for registering subscribers and collecting payments renewed by INSS. This in essence cut short the demonstration project by several months, although registered participants were able to remain in the program. The political transition likely affected both enrollment and retention since the program was not marketed as planned, and no innovative approaches were taken to address issues of concern such as convenient registration procedures and options or locations for payment.

3. METHODS

This section summarizes the data collection and analysis methods used to evaluate the INSS informal sector insurance program. The project team's research integrated multiple quantitative and qualitative approaches, providing a comprehensive and rich understanding of the program and its impacts. In order to measure the determinants of insurance enrollment as well as the causal effects of having insurance, we implemented a randomized evaluation that varied the costs (financial, informational, and convenience) of signing up for health insurance. Data collection involved a baseline survey and subsidy lottery, collection of insurance affiliation data, a follow-up survey, key informant interviews, focus group discussions, and a medical records review. Each is described in detail below. All research activities were approved by the Abt Associates Institutional Review Board, and all respondents gave informed consent.

3.1 DATA COLLECTION METHODS

3.1.1 BASELINE SURVEY AND RANDOMIZATION OF INFORMAL SECTOR WORKERS

Between March and July 2007, a few months following the rollout of the insurance program to informal sector workers, a baseline survey was administered to a representative sample of 4,002 vendors in the seven open-air markets in central Managua. The markets that were chosen were the main markets in central Managua that had more than approximately 500 vendors. We chose to conduct our study among this subpopulation because it was likely to contain a large population of uninsured informal sector workers who were MFI clients. The survey collected information on demographic characteristics, prior and current health services utilization, socioeconomic characteristics, and health care expenditures. Government ID numbers were collected in order to match respondents to health insurance enrollment data that the government would later provide. The baseline survey was held in two rounds, in March/April 2007 and June/July 2007, respectively. The first round was conducted in 48 blocks of the Mercado Oriental, Managua's largest marketplace, while the second round was conducted in 25 blocks of the Mercado Oriental and in all blocks of six smaller markets (Huembes, Iván Montenegro, Virgen de la Candelaría, Mayoreo, San Judas, and Israel Lewites).

Prior to the first round of the baseline survey, a census of each booth of the Mercado Oriental was conducted to define the sampling frame of possible respondents. Participants deemed eligible through the census were selected randomly and administered the full survey. Eligibility depended on being a certain age (18 to 54), being the owner of the booth, having a government ID, and lacking current health insurance coverage. Table 1 presents the completion rates of the baseline survey. During the first round, 1,193 market vendors were approached and 61 percent, or 728 market vendors, completed the survey. During the second round of the baseline survey, we broadened the scope of the study to include six additional large markets in the city and approached all booths, rather than randomly select respondents from a sampling frame. Of the 6,192 market vendors approached in the second round, 53 percent, or 3,274 vendors, completed the survey.

TABLE 1: COMPLETION RATES OF BASELINE SURVEY

		Number	Percent
Round 1	Away	225	19%
	Refused	114	10%
	Not eligible	124	10%
	Other	2	0.2%
	Completed	728	61%
Round 2	Away	1732	28%
	Refused	21	0.3%
	Not eligible	1065	17%
	Other	38	1%
	Completed	3274	53%

Refusal rates, eligibility, or availability of respondents may affect the external validity of the study. However, because the program design involves randomly allocating subsidies for health insurance, our estimates of the causal determinants of health insurance enrollment and effects of having insurance are internally valid.

Upon completing the baseline survey interview, participants were invited to choose a lottery ticket randomly out of a stack of unmarked, presealed envelopes. The distribution of the lottery tickets is presented in Table 2. In the first round, several lottery prizes were offered: a blank lottery ticket (pure control group), an INSS brochure on the insurance product, a two-month insurance subsidy with instructions to sign up at the INSS office, a two-month insurance subsidy with instructions to sign up at an MFI, a six-month insurance subsidy with instructions to sign up at the INSS office, or a six-month insurance subsidy with instructions to sign up at an MFI office. All subsidies were provided in the form of a voucher, and participants were told that insurance premium payments would be made on their behalf directly to the INSS.

Because of low rates of enrollment in the insurance after the first round of the survey and concerns about sample size, the pure control group and the two-month subsidy groups were eliminated in the second round of the baseline survey. In the second round, only three prizes were offered: an INSS brochure, a six-month insurance subsidy with instructions to sign up at INSS office, and a six-month subsidy with instructions to sign up at an MFI.

Finally, near the end of the second round of the baseline survey, a random sample of 112 respondents who had been offered a six-month subsidy and 63 respondents who had been offered no subsidy—none of whom had yet subscribed—were offered the opportunity to sign up for the health insurance on the spot at their market booth. Surveyors were trained to fill out the registration forms on-site and were accompanied by a photographer who took required photos. On-the-spot enrollment eliminated respondents' travel costs and reduced the time costs related to taking photographs and making copies of their ID cards. In addition, it minimized potential psychological influences on enrollment such as procrastination or imperfect recall, and addressed constraints imposed by uncertainty regarding the enrollment process.

TABLE 2: RANDOM ASSIGNMENT (ROUND 1 AND ROUND 2 OF BASELINE SURVEY)

	Number	Percent
Pure control	125	3%
Informational brochure only	1211	30%
2 month subsidy, enroll at INSS	123	3%
2 month subsidy, enroll at MFI	123	3%
6 month subsidy, enroll at INSS	1137	28%
6 month subsidy, enroll at MFI	1107	28%
6 month subsidy, on-the-spot enrollment	112	3%
Informational brochure only, on-the-spot enrollment	63	2%
Total	**4001**	

Note: One individual had missing data on subsidy/prize.

3.1.2 COLLECTION OF INSS ADMINISTRATIVE DATA REGARDING TAKE-UP

To determine who had signed up for the insurance, the INSS provided access to data indicating which respondents signed up for insurance, government ID numbers for registered respondents and their beneficiaries, and their place of affiliation (INSS or a participating MFI). These data could be linked to the survey data via government ID numbers, which individuals provided during the survey and when enrolling in the insurance. Confidentiality of respondent and beneficiary information was maintained at all times.

3.1.3 KEY INFORMANT INTERVIEWS

Individual interviews provided contextual information that enriched our understanding of the quantitative survey results as well as elucidated problems with program implementation. In July 2007, individual interviews were conducted with 40 randomly selected subsidy winners in the Huembes market who had not signed up for INSS insurance. These interviews functioned as audits to monitor the quality of local surveyors. They also contributed to a deeper understanding of reasons for nonenrollment and provided information on whether EMPs participating in the program were perceived to be meeting the standards necessary to attract and retain subscribers from the informal sector. In September 2007, researchers interviewed a subsequent sample of 20 survey participants who had registered for insurance to understand whether these participants were utilizing health services and to investigate their experiences with the program.

3.1.4 FOLLOW-UP SURVEY

Between March and June 2008, a follow-up survey was conducted among a subset of the original survey respondents—those who had booths in the largest markets (Oriental, Huembes, and Iván Montenegro). Respondents who had randomly been allocated two-month subsidies were not approached to be interviewed at the follow-up survey due to the relatively low rate of insurance enrollment among this group. Since the group was randomly selected at baseline, excluding this entire treatment arm does not compromise the validity of our experimental design. A total of 2,806 baseline respondents were

approached for the follow-up survey. Out of these, 2,608, or 93 percent, completed the follow-up survey. The reasons for attrition are found in Table 3, with the attrition rates by randomization group in Table 4. There is almost no difference in the completion rates among each of the treatment groups, supporting the external and internal validity of the study implementation.

TABLE 3: FOLLOW-UP SURVEY PARTICIPATION

	Number	Percent
Moved/temporarily away	26	1%
Hospitalized	8	0.3%
Deceased, refused, other	164	6%
Completed	2608	93%
Total	**2806**	**100%**

TABLE 4: FOLLOW-UP SURVEY COMPLETION BY RANDOMIZATION GROUP

	Number	Percent
Nothing	119	93%
Information	1138	93%
6 month subsidy, enroll at INSS	702	94%
6 month subsidy, enroll at MFI	673	93%
6 month subsidy, on-the-spot enrollment	112	92%
Informational brochure only, on-the-spot enrollment	62	98%
Total	**2806**	**93%**

3.1.5 FOCUS GROUP DISCUSSIONS

In September and October 2008, the research team conducted 9 focus group discussions with market vendors that had participated in both the baseline and follow-up quantitative surveys. Topics covered during the discussions included the following:

- Awareness of the INSS insurance program for informal sector workers
- Health care-seeking behaviors
- Reasons for enrollment or nonenrollment
- Experiences with the enrollment process
- Perceptions of the role and effectiveness of MFIs as insurance intermediaries
- Trust in the INSS and MFIs
- Satisfaction with the insurance, MFIs, and EMPs
- Willingness to pay for health insurance
- Recommendations

Five strata of participants were defined, according to MFI client status, receipt of a subsidy, and enrollment in the insurance, as shown in table 5.

TABLE 5: FOCUS GROUP DISCUSSION STRATA

	Won subsidy		No subsidy
	Enrolled	**Did not enroll**	**Did not enroll**
MFI client	Stratum 1	Stratum 3	Stratum 5
Non-MFI client	Stratum 2	Stratum 4	

Researchers aimed to recruit between 8 and 10 respondents per group. Respondents that had provided telephone numbers during the follow-up survey were selected randomly within each stratum. Researchers first contacted potential participants via telephone and followed up with an in-person visit to the market stall to administer an informed consent protocol to those who agreed to participate. The discussion protocol was pilot tested in the Oriental market and minor revisions were made. With the exception of stratum 5, two focus group discussions were organized for each stratum, one each with vendors from the Oriental and Huembes markets. Only one discussion was held with stratum 5 participants from Huembes, since only 2 out of 30 recruited participants in the Oriental market showed up as planned. In total, 73 market vendors participated in the nine discussions.

Discussions were held at quiet locations near each market. A professional facilitator recruited the participants and moderated each discussion. All participants were paid a transportation stipend of approximately US $5, and all discussions were tape recorded and transcribed.

3.1.6 REVIEW OF MEDICAL RECORDS AT EMPs

Finally, to enhance our understanding of health care utilization patterns among insurance enrollees, we conducted a review of enrollees' medical records at 13 EMPs. Medical files were reviewed for those survey participants that signed up for the INSS health insurance after January 1, 2007, and who provided oral consent for the review. Records for insured children were also reviewed in those instances where consent was provided by the beneficiary parent. The PSP-*One* project also obtained permission from INSS and the individual EMP clinics visited for the review. A total of 423 records were reviewed, covering 1,354 visits.

A simple template for extracting information from the medical records was developed, capturing the following:

- Patient birth date and gender
- Dates of all medical visits from January 2007 through November 2008
- Type of visit (outpatient, emergency, inpatient admission)
- Reason for visit or initial complaint
- Diagnoses
- Services prescribed (medicines, laboratory tests, imaging, and surgeries)

All diagnoses were coded using the ICD-10 coding system, and medications were coded using the Anatomical, Therapeutic, Chemical (ATC) classification system. Raw and coded data were input into Excel and analyzed using Stata version 10 (StataCorp, College Station, TX).

3.2 ANALYSIS METHODS

3.2.1 QUANTITATIVE ANALYSES

Most cross-sectional or panel studies that examine the impact of health insurance coverage suffer from potential omitted variable bias, in which an individual's unobservable propensity to purchase insurance is related to his or her underlying health profile or risk preferences. This makes causal inference of the impact of health insurance on health and related outcomes difficult— typically, those who need the insurance due to greater risk of illness are more likely to sign up, and because they are more likely to be sick, the observed impact of having insurance is biased. A randomized study design such as that utilized in this evaluation reduces biases in analysis due to possible selection effects by guaranteeing that, in expectation, comparison groups are composed of the same underlying types. Indeed, Table 6 provides evidence to suggest balanced randomization on observable baseline characteristics. Some differences exist between insurance subsidy and control groups; however, these differences are small in magnitude. The results are similar across MFI clients and non-MFI clients (results not shown).

TABLE 6: BASELINE CHARACTERISTICS BY TREATMENT STATUS

	Control (1)	Info only (2)	6-Month INSS (3)	6-Month MFI (4)	Enroll on-the-spot (5)
Age	38.45	37.30	38.21	37.74	38.56
Male	0.38	0.34	0.36	0.35	0.34
Years of education	8.56	9.32	9.15	9.25	9.86
Married	0.78	0.71	0.69	0.68	0.69
Number of children	2.16	2.00	2.15	2.04	1.77
Smokes	0.18	0.16	0.14	0.15	0.16
Income (US$)	287.02	255.49	297.95	263.49	324.88
MFI client	0.50	0.39	0.37	0.38	0.37
Observations	111	1051	659	623	164

Note: This table presents baseline statistics by randomized treatment status for the 2,608 respondents who participated in both baseline and follow-up surveys.

To measure the determinants of signing up for insurance, including the amount of subsidy received and the assigned location for enrollment, we estimated the following regression equation:

(1) $Insurance_i = \alpha + \beta_1 Information_i + \beta_2 6Months(INSS)_i + \beta_3 6Months(MFI)_i + \beta_4 OnSite_i + \beta_5 6Months*OnSite_i + X'_i\mu + \varepsilon_i$

where "Insurance" is an indicator if respondent '*i*' signed up for health insurance. "Information," "6Months (INSS)," "6Months (MFI)," "OnSite," and "6Months*OnSite" are indicators of the randomized

lottery received, thus the pure control group is the omitted category. For this analysis, we did not examine those receiving two-month subsidies as this group was not interviewed in the follow-up survey. A vector of controls was included such as age, age squared, gender, years of education, an indicator if married, and market fixed effects. Robust standard errors were estimated. In some specifications we also controlled for baseline health expenditures and health status indicators. Data from round 1 and round 2 baseline surveys were pooled and fixed effects were included for each round. To measure how MFI clients might have responded differentially to the random assignment of affiliation, we also estimated equation (1) separately by MFI client status.

To estimate the determinants of retention, we re-estimated equation (1), with the dependent variable indicating whether the respondent was still paying for health insurance at the follow-up survey, and only included the 530 individuals who had enrolled in the health insurance program. We examined both the impact of receiving an insurance subsidy and the potential differential effects of being an MFI client. Because of small sample sizes of enrolled individuals who were in the control or information-only treatment arms, for several specifications, we compared only the six-month subsidy groups to study differential effects of signing up at an MFI on retention. Unlike the specification in equation (1), this is not an experimental estimate since MFI client status was not randomly assigned.

We also evaluated the effects of health insurance on health care utilization and expenditures. The equation predicting health insurance enrollment (specification (1) above) becomes the first stage in an instrumental variables (two-stage least squares) estimate of the effects of insurance. In the second stage we estimated the following:

(2) $Y_i = \alpha + \beta_1 Insurance_i + X'_i\mu + \varepsilon_i$

where "Y" is the outcome variable of interest (any health care utilization at follow-up, number of health care visits at follow-up, and health expenditures at follow-up) and "Insurance" enrollment is instrumented with the vector of randomization indicators (whether the respondent received any of the four incentives to enroll). The F-statistic of the excluded instruments was large, at 147.4, implying that the first stage is strong and the subsidy amounts are good predictors of insurance enrollment. This is important for the instrumental variables strategy.

The review of medical records at EMPs was also analyzed quantitatively. Local consultants in Nicaragua with clinical expertise coded the raw data on reasons for the visit, diagnoses, and tests and medications prescribed. Data were entered into Excel and converted into Stata format. Descriptive tables were produced to summarize patterns of patient utilization, morbidity, and care provided.

3.2.2 QUALITATIVE ANALYSIS

The research team received full written transcripts in Spanish for each focus group discussion, along with recordings on cassette tape. To analyze the transcripts, we began by developing an *a priori* list of thematic codes. We then quickly scanned the full set of transcripts and added additional codes as appropriate. The qualitative analysis software NVivo version 7 (QSR International, Cambridge, MA) was used for the full coding process, in which each section of the transcripts was uploaded in electronic format and reviewed in detail. The coding process allowed for calculating frequencies of key words and identifying recurring themes, and the software facilitated organization by stratum. Indicative quotations were highlighted to capture key themes in the participants' own words.

4. FINDINGS

This section begins by summarizing descriptive results from the baseline and follow-up surveys. Results are then organized thematically, according to the key research questions addressed in the study. Qualitative findings are integrated throughout the section according to the relevant themes.

4.1 SAMPLE CHARACTERISTICS AT BASELINE AND FOLLOW-UP

For the analysis of the determinants of health insurance enrollment and the effect of having health insurance, we included in our analysis the 2,608 respondents who completed interviews at both baseline and follow-up. In addition to presenting average baseline and follow-up demographic characteristics of the entire sample, we also present the average baseline statistics separately for MFI clients and non-MFI clients in Annex A. This allows for understanding the potential effectiveness of targeting MFI clients for insurance products.

Table 7 presents some key demographic characteristics of the sample [mean and standard deviation (SD) are shown]. The average age was 38 years at baseline with 35 percent of respondents being male. These individuals averaged approximately 9.3 years of education, and 70 percent were married or had a common-law spouse. This is higher than the 2006 countrywide figure of 56 percent (INIDE and MINSA 2007). On average, respondents had two children, while two-thirds had at least one child under age 12—the maximum age for coverage of dependents by the INSS health insurance. Only 3 percent of the sample was pregnant or had a spouse who was pregnant, either at baseline or follow-up.

TABLE 7: DEMOGRAPHIC CHARACTERISTICS OF SAMPLE

Variable	Baseline		Follow-up		Significance of change
	Mean	SD	Mean	SD	(where appropriate)
Age	37.8	9.4	38.8	9.4	*(NA)*
Male	35%	0.48	*		*(NA)*
Years of education	9.3	4.2	*	5	*(NA)*
Married	70%	0.46	72%	0.45	*<0.0001*
Number of children	2.04	1.52	*		*(NA)*
Has children under 12	66%	0.47	66%	0.47	
Pregnant	3%	0.18	3%	0.17	*0.812*
Smokes	15%	0.36	14%	0.35	*0.007*

*Question not repeated at follow-up

There were some differences in basic demographic characteristics between MFI clients and non-MFI clients (see Annex A, Panel A). In particular, MFI clients were a little more than two years older on average and were more likely to be female; only 28 percent of the MFI clients were male as opposed to almost 40 percent of the non-MFI clients. In addition, MFI clients had slightly more children. There were no differences in years of education or in the likelihood of being married or pregnant.

Table 8 presents economic characteristics of the sample at baseline and follow-up. Dollar figures were converted from Nicaraguan Cordobas at an exchange rate of US$1= 18.7 Cordobas in 2007 and US$1 = 19.5 Cordobas in 2008, to adjust for inflation. Respondents had an average monthly income of US$274 at baseline, which reportedly increased to US$422 at follow-up. The reported increase in income should be treated with caution as other measures of financial well-being do not support this apparent improvement in socioeconomic status, and we have reason to believe that the survey interviewers asked the question differently at baseline and follow-up. Both figures are significantly higher than the reported national average household income of approximately US$129 per month, according to survey data reported from the Central Bank of Nicaragua (2008). Average monthly disposable income after business and household expenses was reported at US$25 at baseline and US$19 at endline, with an average current savings balance of US$146 at baseline and US$129 at endline. However, only 29 percent of the sample declared having disposable income at month end in 2007, and this declined to 22 percent of the sample in 2008. More than half of the sample at both surveys had an outstanding loan, while 38 percent of the sample surveyed had a loan with an MFI.

TABLE 8: ECONOMIC CHARACTERISTICS OF SAMPLE

Variable	Baseline		Follow-up		Significance of change
	Mean	SD	Mean	SD	p-value
Monthly income (US$)	273.8	380.2	422.2	1159.0	*<0.0001*
Proportion with savings	29%	0.46	22%	0.42	*<0.0001*
Monthly savings (US$)	25.1	158.5	18.9	139.0	*0.133*
Current savings balance* (US$)	145.7	574.8	129.0	778.0	*0.657*
Proportion receiving remittances	14%	0.35	12%	0.33	*0.011*
Proportion sending remittances	18%	0.39	24%	0.43	*0.216*
Proportion MFI clients	38%	0.48	38%	0.49	*0.373*
Proportion with any loan	58%	0.49	56%	0.50	*0.143*

*Phrasing of this question changed slightly between 2007 and 2008 surveys.

On average, total expenses for health over the prior year for the respondent and children under 12 were quite substantial at US$85 in 2007 and US$83 in 2008 (Table 9). For the respondent only, the amount was approximately US$47 in 2007 and increased to US$53 in 2008.

TABLE 9: HEALTH EXPENDITURES OF SAMPLE IN U.S. DOLLARS (US$)

Variable	Baseline		Follow-up		Significance of change
	Mean	SD	Mean	SD	p-value
Total household health care costs	84.5	171.62	83.0	186.20	*0.699*
Total health care costs for respondent	46.5	114.44	52.7	155.50	*0.088*
Last visit cost for respondent	17.8	59.98	18.58	115.56	*0.815*

There were some socioeconomic differences between MFI clients and non-MFI clients at baseline (see Annex A, Panel B). MFI clients reported higher monthly income (by approximately US$38), and they were more likely to own their home (80 percent vs. 74 percent, respectively). MFI clients were no more likely to have savings and there was no statistically significant difference in the savings balance, consistent with a lower need for precautionary savings among individuals with access to credit. MFI clients spent about US$7 more on their total health care costs for themselves.

Information on self-reported health status is presented in Table 10. Of those surveyed, 80 percent reported being sick in the past year at baseline, with a mean value of 2.6 days and a maximum value of 72 days. Both the likelihood of illness and the duration increased significantly between baseline and follow-on. The most common self-reported illness was the flu (60 percent); fever, cough, vomiting, and diarrhea were also frequently reported. Many respondents reported chronic conditions such as vision or hearing problems, kidney problems, back pain, hypertension, psychological problems, allergies, or respiratory problems. A little more than one-third of respondents or their partners received a Pap smear at baseline or follow-up. One in 10 received an HIV test.

On average respondents who were ill waited slightly more than four days before visiting a provider, although many (45 percent) visited a provider after one day of being sick. There was no change in provider waiting times between 2007 and 2008.

TABLE 10: SELF-REPORTED HEALTH CHARACTERISTICS AND CARE-SEEKING BEHAVIOR OF SAMPLE

Variable	Baseline		Follow-up		Significance of change
	Mean	SD	Mean	SD	p-value
Ever sick in previous year	80.0%	*0.40*	91.4%	*0.28*	*<0.0001*
Times sick in previous year	2.57	*3.51*	3.89	*12.88*	*<0.0001*
Days waited to see doctor	4.32	*16.58*	4.93	*20.85*	*0.180*
Diabetes	5.6%	*0.23*	6.2%	*0.24*	*0.103*
Hypertension	18.7%	*0.39*	21.6%	*0.41*	*0.001*
Heart problems	5.5%	*0.23*	7.2%	*0.26*	*0.004*
Respiratory problems	13.6%	*0.34*	9.3%	*0.29*	*<0.0001*
Physical disability	1.2%	*0.11*	0.8%	*0.09*	*0.078*
Sight/hearing limitations	25.3%	*0.43*	20.8%	*0.41*	*<0.0001*
Psychological problems	15.1%	*0.36*	9.5%	*0.29*	*<0.0001*
Kidney problems	25.4%	*0.44*	29.0%	*0.45*	*0.0003*
Cancers	0.6%	*0.08*	0.8%	*0.09*	*0.304*
Headaches	40.0%	*0.49*	38.8%	*0.49*	*0.303*
Skin problems	8.0%	*0.27*	6.4%	*0.24*	*0.019*
Allergies	14.8%	*0.36*	10.6%	*0.31*	*<0.0001*
Flu	60.2%	*0.49*	63.4%	*0.48*	*0.013*
Fever	32.1%	*0.47*	26.4%	*0.44*	*<0.0001*
Vomiting	8.4%	*0.28*	7.6%	*0.27*	*0.255*
Diarrhea	9.5%	*0.29*	12.7%	*0.33*	*0.0001*
Cough	18.9%	*0.39*	18.0%	*0.38*	*0.387*
Chest pains	14.7%	*0.35*	13.3%	*0.34*	*0.109*
Back pains	26.3%	*0.44*	30.1%	*0.46*	*0.001*
Dizziness	16.7%	*0.37*	14.7%	*0.35*	*0.026*
Had Pap smear	35.4%	*0.48*	36.3%	*0.48*	*0.331*
Had mammogram	11.7%	*0.32*	8.6%	*0.28*	*<0.0001*
Had prostate exam	4.8%	*0.21*	3.4%	*0.18*	*0.033*
Had HIV test	11.7%	*0.32*	10.0%	*0.30*	*0.026*

Most respondents who were sick in the past year did not miss work for their last illness (57 percent at baseline, 64 percent at follow-up). Only 11 percent at baseline and 8 percent at follow-up missed more than one week of work due to their last illness.

Comparing MFI with non-MFI clients at baseline, 80% of both groups experienced illness and there was no statistically significant difference between the number of times they were sick (see Annex B, Panel A). Some differences in health characteristics were exhibited between MFI clients and non-MFI clients at baseline (see Annex B). MFI clients were slightly more likely to have diabetes, suffer stress, and

suffer from hypertension. On the other hand, they were less likely to report smoking. Although these differences existed, few other baseline differences occurred between MFI clients and non-MFI clients that are either large in magnitude or statistically significant. In addition, no significant differences existed between MFI clients and non-MFI clients in terms of last illness experienced (see Annex B, Panel B). The data, therefore, do not point to any significant advantage in targeting MFI clients for micro-insurance programs because they are healthier, nor do the data raise substantial concern about adverse selection associated with MFI client status.

4.2 KNOWLEDGE OF INSURANCE

The INSS rolled out the *Seguro Facultativo* voluntary insurance for informal sector workers in January 2007, at which point MFIs were to begin publicizing the product. However, as indicated in the background section of this report, various implementation and political challenges limited the extent to which either INSS or the MFIs marketed the insurance. As of the baseline survey conducted between March and June 2007, only 12 percent of informal sector respondents in the sample were aware of any insurance product available to them, including INSS insurance or private insurance.

By the time the follow-on survey was conducted in 2008, approximately 22 percent of the sample was aware of some type of health insurance for which they were eligible. This was a statistically significant increase from baseline ($p<0.001$). However, among those who had indicated awareness of such insurance at baseline, only one-third (35 percent) still indicated awareness at follow-up. The decrease may reflect confusion about whether the INSS insurance was still available, given the new government administration and INSS' cancellation of contracts with MFIs. Among those respondents with no knowledge at baseline, awareness had increased to 21 percent at follow-up.

In comparing MFI clients and non-MFI clients at baseline ($p=0.30$) and at follow-on ($p=0.22$), we found no statistically significant difference in their awareness of available insurance. This provides further evidence that MFIs were not actively promoting the INSS insurance at either time. Knowledge of insurance at follow-on, however, was significantly ($p<0.001$) correlated with randomization status in our evaluation (Table 11). Receiving the informational brochure alone did not increase respondents' awareness of insurance availability significantly more than receiving no information at all ($p=0.25$), but receiving a six-month insurance subsidy was highly significantly associated with increased awareness compared to receiving nothing ($p=0.001$).

TABLE 11: AWARENESS OF INSURANCE FOR INFORMAL WORKERS AT BASELINE AND FOLLOW-UP, BY RANDOMIZATION STATUS

	Percent aware of any insurance available to them:	
Randomization outcome	**2007**	**2008**
Nothing *(n=111)*	10%	13%
Informational brochure *(n=1,112)*	11%	17%
6-month subsidy, enroll at INSS *(n=711)*	12%	28%
6-month subsidy, enroll at MFI *(n=674)*	14%	28%
Total	**12%**	**22%**

Respondents in the follow-on survey were asked a series of more specific questions related to their knowledge of eligibility, cost, and benefits of the INSS insurance. Table 12 displays a selection of these results, according to MFI client status and randomization status in the survey. Respondents were most likely to know that children under 12 would be covered by the insurance. However, those who received an insurance brochure or subsidy as part of the evaluation were significantly more likely than those who received nothing to know that children under 12 are covered and that the insurance does not cover brand-name medications. The majority knew that the insurance covers the pregnant spouse of a beneficiary from the first month of pregnancy and that it does not cover brand-name medications. Between two-thirds and three-quarters of the sample knew that the insurance provides coverage for FP methods and counseling. Their knowledge was much more limited regarding coverage of kidney dialysis and nonprovision of emergency transportation benefits. There were no significant differences between MFI clients and non-MFI clients in their knowledge in these areas.

Less than two-fifths of the sample reported knowing where to make payments for the INSS insurance (e.g., at a bank or participating MFI). Again, this did not differ according to MFI client status, but did vary significantly according to receipt of a subsidy or brochure in the evaluation. Three-fifths of the sample reported knowing where the main INSS office was located. In this regard, MFI clients were significantly more likely to know the location than non-MFI clients. The study indicated significant differences according to randomization status, with those assigned to sign up at INSS most likely to know where the office was.

TABLE 12: KNOWLEDGE OF BENEFITS COVERAGE AND PAYMENT OPTIONS, BY MFI AND RANDOMIZATION STATUS

Benefits coverage: Percentage of respondents reporting correct knowledge of INSS	Overall %	MFI clients	Non-MFI clients	No subsidy	Brochure	6-month INSS	6-month MFI
Covers children under 12 of beneficiary	91%	92%	91%	77%	93%	91%	92%*
Covers pregnant spouse in first month of pregnancy	61%	62%	61%	53%	61%	60%	63%
Does not cover brand-name medications	74%	76%	73%	63%	76%	76%	72%*
Covers FP methods	76%	77%	75%	68%	76%	77%	76%
Covers FP counseling	67%	69%	67%	58%	68%	68%	67%
Covers dialysis	21%	22%	20%	21%	20%	24%	20%
Does not cover ambulance services	26%	27%	25%	18%	26%	26%	26%

Payment: Percentage of respondents reporting knowledge regarding INSS	Overall %	MFI clients	Non-MFI clients	No subsidy	Brochure	6-month INSS	6-month MFI
Where to make payments for INSS insurance	38%	39%	37%	26%	34%	42%	41%*
Where the INSS office is located	60%	63%	58%*	49%	58%	66%	59%*

*significant difference at the $p<0.05$ level, compared to no subsidy group

Respondents in the follow-up sample had limited knowledge of what the unsubsidized INSS insurance premium actually costs (Table 13). Overall, 11 percent could identify correctly that the insurance costs 300 Cordobas (approximately US$17) per month during the first two months, and 4 percent identified that the price decreases to 270 Cordobas (approximately US$15) per month thereafter. Between 39 and 45 percent indicated that they did not know what the premium price was. Perhaps of greater concern is the fact that 40 percent believed the initial premium was cheaper than it actually is. Respondents were also more likely to report that the premium *increases* after the first two months than that it decreases. Again, in some cases, significant (although small) differences did exist according to randomization status in our evaluation. MFI clients and non-MFI clients did not significantly differ in their knowledge of premium amounts, confirming that the MFIs did not raise awareness of the insurance product among their clients. Those who received a subsidy or brochure were more likely to report the correct amount, and those who received a subsidy were less likely to report "Don't know," than those who received no subsidy.

In sum, it appears that this evaluation—and specifically provision of an informational brochure and/or an insurance subsidy—was a leading source of information about the INSS insurance program. Merely being an MFI client did not increase respondents' knowledge about the insurance program, implying again that MFIs were not actively marketing the insurance to their clients.

TABLE 13: KNOWLEDGE OF INSURANCE PRICING DURING AND AFTER THE FIRST 2 MONTHS, BY MFI AND RANDOMIZATION STATUS

Panel A: Estimated price of insurance during first two months: Distribution of responses

	Overall %	MFI clients	Non-MFI clients	No subsidy	Brochure	6-month INSS	6-month MFI
200 Cordobas or less	30%	30%	31%	39%	32%	29%	29%
201-299 Cordobas	10%	9%	10%	7%	6%	13%	12%
300 Cordobas (correct)	11%	11%	11%	6%	11%	13%	11%
301 Cordobas or more	10%	10%	10%	7%	10%	13%	9%
Don't know/NR	39%	39%	38%	41%	42%	33%	39%

Panel B: Estimated price of insurance after first two months: Distribution of responses

	Overall %	MFI clients	Non-MFI clients	No subsidy	Brochure	6-month INSS	6-month MFI
200 Cordobas or less	22%	22%	23%	29%	24%	20%	21%
201-269 Cordobas	6%	6%	6%	6%	5%	7%	6%
270 Cordobas (correct)	4%	4%	4%	3%	2%	6%	6%
271 Cordobas or more	22%	23%	22%	17%	21%	26%	22%
Don't know/NR	45%	44%	46%	45%	48%	40%	45%

We also probed the topic of information and awareness during our focus group discussions with market vendors. Findings generally aligned with the quantitative survey results. Few participants in focus group discussions had heard of the INSS insurance program for informal workers prior to the baseline survey. They were confused about what benefits the insurance covered; specifically, some participants thought the insurance provided benefits during old age, perhaps confusing the product with INSS' pension services. Participants noted difficulties in obtaining clear information about the program, particularly from the MFIs. Several MFI clients noted that they had never received any information about the program from their MFI. A few were skeptical of the program and its legitimacy, and worried that they might get "trapped" into paying for the insurance after the subsidy expired. One individual commented, "The majority of Nicaraguans…don't have the level of confidence that other countries have in their Social Security system." Among the key recommendations participants suggested were better provision of information about what benefits were covered, how to enroll, what fees would be charged, and how to make payments.

> *"I think that is the reason that most people don't pay into the insurance; we don't know where to do it or with whom to do it. I think there needs to be more publicity…"*
>
> –MFI client who won a subsidy but did not enroll [Huembes market]

Eight participants reported that they never received any proof of their insurance enrollment from INSS. This led to confusion about whether the program was "real," whether they were indeed covered, and when they could start using services.[2]

> *"I was told that… they would notify me when I could use the insurance—a thing that never happened. After a week passed, then two weeks, I said that it was a real joke because they never notified me. Then eight months later, a statement arrived that I owed two months of insurance payments."*
>
> – Non-MFI client that enrolled [Oriental market]

4.3 DETERMINANTS OF INSURANCE ENROLLMENT

A key research question in this study addressed the extent to which providing information on insurance programs, offering premium subsidies, or increasing the convenience of enrollment would affect rates of enrollment in the INSS voluntary insurance by informal sector workers. This section details researchers' findings related to the determinants of enrollment.

Overall, out of those who were interviewed in both the baseline and the follow-up, we found that 20.3 percent signed up for insurance. Table 14 summarizes enrollment rates according to randomization group. Among those in the sample who could enroll at the INSS office or an MFI (*N*=2,446), 18.2 percent enrolled. Almost none of the "pure controls" in this sample (those who received no information or subsidy) and almost none of those who received only an informational brochure enrolled. Slightly more than one-third of those who received a six-month subsidy enrolled: 32 percent of those randomized to enroll at a participating MFI and 37 percent of those assigned to enroll at the main INSS office. The difference in uptake of insurance between these latter two subsidy groups was marginally statistically significant (p=0.08).

[2] Another potential source of confusion about enrollment derived from the failure of INSS to deliver monthly billing statements. Under the traditional INSS (formal sector) insurance scheme, couriers on motorbikes hand deliver monthly statements to each employer's office; this system was administratively burdensome for the dispersed informal sector workers, and an alternate system was not developed. Although some workers received their statements, this was not always reliable and this may have caused more confusion.

TABLE 14: INSURANCE ENROLLMENT, ACCORDING TO RANDOMIZATION GROUP

Standard enrollment group

Treatment Status	% Enrolled
Nothing	1%
Informational brochure	0%
6-month subsidy, register at INSS	37%
6-month subsidy, register at MFI	32%
Total (N=2,446)	18%

"On-the-spot" enrollment group

Treatment Status	% Enrolled
Informational brochure	23%
6-month subsidy	70%
Total (N=164)	52%

Of those given the opportunity to enroll "on the spot" at their market booth (*N*=164), 52.4 percent enrolled. About 70 percent of six-month subsidy winners in this group enrolled on the spot, and 23 percent of those who received only a brochure enrolled. Thus, six-month premium subsidy winners who received this additional "convenience subsidy" were about twice as likely to enroll as those who did not have the option to enroll at their place of work. This dramatic effect highlights the substantial opportunity costs of time faced by market vendors. Signing up for insurance at either the INSS central office or at an MFI required workers to gather their government identification card, make a photocopy of the card, obtain two passport-size photos of themselves, and gather birth certificates of beneficiaries, as a requirement for registration. In addition, the workers had to complete a form and then travel to the INSS or MFI office and wait in line to register in person. According to our survey, this entire process took about one day's time, a substantial time cost for small business owners who would need to find someone to watch their market booth or forego a day's revenues. The on-site enrollment reduced the opportunity costs involved in going to an office to sign up for the insurance.

Key informant interviews with 40 randomly selected survey winners in the Huembes market who had not signed up for INSS insurance after winning a six-month subsidy confirmed the importance of the cost of time and convenience. The interviews showed that 25 of the 38 who verified having won the subsidy still intended to sign up. Half of these, however, explained they had not had the time to do so. Other reasons given for not signing up included difficulty obtaining all of the required documentation and not fully understanding the registration process.

Table 15 presents the multivariate linear regression results predicting enrollment in the insurance (see methodology described in section 3.2.1). The outcome was binary (0/1), with 1 representing enrollment and 0 representing nonenrollment. Coefficients can be interpreted as the percentage point increase in the rate of insurance enrollment, comparing a variable's category of interest with the reference category. In table 15, columns 1 and 2 compare a basic and an extended model estimated in the full

sample of respondents that completed both baseline and follow-up surveys, column 3 presents results estimated in the sample of MFI clients, and column 4 presents results for non-MFI clients.

There was only a marginal (4 percentage points) difference in enrollment between those receiving an informational brochure and the pure control group (model 1 in table 15). Those receiving a six-month subsidy and assigned to register at the INSS office were 33 percentage points more likely to take up insurance than the control group receiving no information, and those receiving a six-month subsidy and assigned to register at a participating MFI were 28 percentage points more likely to sign up for insurance than the controls. The difference in enrollment between those assigned to enroll at INSS vs. an MFI is statistically significant (*p*-value = 0.002).

TABLE 15: DETERMINANTS OF INSURANCE ENROLLMENT

Dependent variable: Signed up for insurance (0/1)	All		MFI Client	Non-MFI Client
	(1)	(2)	(3)	(4)
Information only (ref=pure control group)	-0.041*	-0.048*	-0.041	-0.086**
Info. & 6-month subsidy, enroll at INSS	0.328***	0.330***	0.379***	0.268***
Info. & 6-month subsidy, enroll at MFI	0.277***	0.274***	0.307***	0.222***
Interaction term: On-the-spot enrollment	0.172***	0.191***	0.170*	0.210***
Interaction term: 6-month subsidy and on-the-spot enrollment	0.139*	0.154**	0.179	0.126
Male	-0.025*	-0.025	-0.012	-0.031
Education (years)	0.001	0.002	0	0.003
Married	0.012	0.022	0.002	0.032
MFI client	0.033**	0.029*	0	0
Number of children	-0.014***	-0.011*	-0.032***	0.003
Has children under 12	0.033**	0.037**	0.108***	-0.011
Log (income)		0.009	0.006	0.01
Has any savings		0.013	0.011	0.008
Smokes		0.009	-0.033	0.032
Any chronic disease		0.044**	0.034	0.054**
Ever sick in past year		-0.009	-0.045	-0.025
Log (costs of health care in past year)		0	-0.012	0.008
Number of visits to provider in past year		0	0	-0.001
Any visit to provider in past year		0.031	0.183*	-0.029
Constant	-0.003	-0.109	-0.433*	0.039
N	2608	2215	867	1348
R-squared	0.24	0.26	0.33	0.24

Note: This table presents multivariate linear regressions results on the likelihood of signing up for health insurance. Each column also included dummy variables for market (location of work for the respondent) and baseline survey round as well as controls for age and age squared. "Any chronic disease" includes diabetes, hypertension, cardiac problems, physical disability, psychological problems, kidney problems, and cancer.
*significant at p=0.10, **significant at p=0.05, ***significant at p=0.01

Near the end of the baseline survey data collection period, the research team returned to a subsample of market vendors (*N*=164 in the final analysis) who had been awarded an informational brochure or six-month subsidy, but had not yet signed up for the insurance. These respondents were offered the opportunity to sign up for the insurance "on the spot," right from their market booth. Providing this convenience had a significant impact on enrollment rates in these adjusted models. For instance, providing on-site enrollment to those who had been offered the informational brochure alone increased their enrollment rates by an additional 17 percentage points. Providing on-site enrollment to those who had been awarded a six-month subsidy and information increased their enrollment rates by an additional 31 (17.2 + 13.9, respectively) percentage points. In sum, simply reducing the time costs of going to an office to sign up produced about half the increase in rates compared with offering a six-month subsidy worth approximately US$100.

Other demographic and socioeconomic characteristics were less strongly associated with insurance enrollment. Men were slightly less likely to sign up than female respondents. There was no significant difference in take-up between married and unmarried respondents. MFI clients were slightly more likely to enroll than non-MFI clients. Controlling for the total number of children in the family, having children under the age of 12 (the age of eligible dependents) increased the likelihood of enrollment by 3.5 percentage points; however, the total number of children was negatively related to uptake. Other factors that were found not to be statistically significant in explaining insurance take-up included age (not shown) and education.

Surprisingly, baseline health expenditures and utilization of health care (model 2 in table 15) had very little predictive power in determining enrollment. Similarly, income had no statistically significant effect on insurance take-up, controlling for all other factors. This may reflect the high degree of correlation between income and other household characteristics. Having a self-reported chronic or commonly recurring disease, such as diabetes or hypertension, was positively associated with higher rates of uptake, although this is only marginally significant (p-value = 0.10). This finding may indicate some adverse selection in the voluntary insurance program, but the effect is not large in magnitude nor in statistical significance.

Certain markets in Managua were associated with significantly higher enrollment than others. Compared to the Oriental market, those working in Huembes market had higher take-up rates, while those working in Virgen de la Candelaría, Mayoreo, and Israel Lewites markets had lower take-up rates (not shown). These market effects are significant despite controlling for the respondents' own income and may be in part due to some differences in the social characteristics of the markets. Huembes market, for instance, is perceived to be "stable"; vendors tend to stay here for longer periods of time than vendors in some of the other markets in Managua. This is partly due to the better working conditions, greater safety, and a higher income clientele, which includes tourists.

The basic patterns in enrollment were similar between MFI clients and non-MFI clients (models 3 and 4 in Table 15). Premium subsidies and on-the-spot registration were the most important determinants of enrollment. Having children under the age of 12 was a more important determinant among MFI clients than among non-MFI clients. Baseline costs of health care also seem to have opposite relationships with take-up rates between MFI clients and non-MFI clients. However, these differences are small and may be merely a reflection in the small sample size of the two groups rather than differences between these groups.

Overall, individuals adhered to their randomly assigned location for enrollment. Of those who were offered six-month subsidies to sign up at INSS, almost all who signed up (98 percent) did so at the INSS. Similarly, of those who were offered six-month subsidies to sign up at a participating MFI, 99 percent of those who signed up did so at an MFI. Among the 17 who received the informational brochure only and enrolled, 15 signed up at the INSS office (88 percent).

In general, focus group discussions elicited similar themes regarding reasons for enrolling or not enrolling in the insurance, although they also provided additional context and clarification for quantitative results related to the role of MFIs as insurance intermediaries. The main reasons respondents gave for enrolling (in addition to receiving a free subsidy) were to secure medical attention for their children, to have insurance as protection in case of a medical emergency, and to make frequent check-ups more affordable. Reasons against participation in the program varied, although two popular arguments were that the premium was too high and that the insurance wasn't worth it because it did not cover children over the age of 12. Two respondents mentioned that they did not enroll because they feared having to continue to pay after the six-month trial period ended, suggesting a lack of trust in the survey lottery itself.

We explored the finding that respondents assigned to enroll at an MFI were less likely to enroll than those assigned to enroll at INSS. Focus group participants confirmed a preference for enrolling in the insurance directly with INSS, rather than through intermediary MFIs. INSS was reportedly perceived to be a more stable institution, whereas MFIs were potentially vulnerable to bankruptcy and possibly less trustworthy. Respondents noted that health insurance was the regular "business" of INSS, whereas MFIs were not experts in health or health insurance.

> *"INSS knows the benefits, what's not covered, while the MFI is a lending institution and doesn't understand [health]. Health is not its specialty; its thing is money."*
>
> – MFI client that enrolled [Oriental market]

> *"INSS is more flexible because it is part of the government, it is an institution that will never go bankrupt…"*
>
> – Non-MFI client that enrolled [Oriental market]

Several discussants expressed concern that MFIs were liable to charge hidden fees or interest for providing insurance services and that MFIs were only concerned with their own business interests. Many believed that MFIs lacked the stability and transparency that is found in state institutions such as INSS and that at any point they might dissolve.

> *"There are MFIs that are here today and gone tomorrow…they take your savings, it is very complicated and there is no security."*
>
> – Non-MFI client that did not enroll [Oriental market]

However, others expressed a preference to make routine payments at banks and MFIs, noting that there were long waiting lines at the INSS office. Several people commented on the distance to INSS' headquarters office as being too far and as such were not impressed with the program's accessibility. Three participants suggested that INSS should open more branch offices throughout Managua to make it easier to register. Multiple respondents reported never receiving documentation of their insurance enrollment, making it impossible to obtain care from an EMP.

The three participating MFIs in this demonstration project attracted different shares of the survey sample: of those who received a subsidy and signed up at an MFI, 47 percent signed up at the ProCredit MFI, 15 percent signed up at Findesa, and 37 percent signed up at ACODEP. Key informant interviews helped to explain this variation. Respondents indicated that ProCredit has a large and convenient branch located near the Oriental Market where many respondents worked. ProCredit and ACODEP had a similar number of clients in Managua, whereas Findesa had about half as many. Market share also appears to correspond approximately with the level of effort that each MFI committed to participating in the demonstration project, according to key informant interviews and our monitoring of the MFIs' activities related to the program. ProCredit made a substantial effort to train its staff to offer the INSS insurance to its clients and arranged a series of events to market the program. Interviews with Findesa suggest that they made only minimal efforts to market insurance to their clients. Although ACODEP had a marketing effort in place, its branch manager in the Oriental Market was replaced shortly after the baseline survey. The new manager was apparently not informed of the demonstration project or of the MFIs' commitment to sign up survey respondents. As a result, many people were turned away when they tried to sign up.

Finally, individual interviews with 20 selected survey participants who had registered for insurance indicated that a small number of EMP clinics were aggressively encouraging subsidy winners to enroll in the insurance and register with their clinic. Indeed, two small EMPs achieved more than 40 percent of the market share. However, these EMPs had not provided enrollees with sufficient information to understand when they could begin to utilize services, and participants expressed widespread dissatisfaction with clinics' customer service and willingness to serve demonstration project participants. Although no evidence of explicit fraud was found, testimonials suggested that poor customer service had discouraged future utilization at these EMPs.

4.4 HEALTH CARE UTILIZATION

4.4.1 USE OF MATERNAL AND CHILD HEALTH SERVICES

Approximately 31 percent of respondents or their partners in the 2007 survey had been pregnant during the previous five years, while 8 percent of respondents or their partners in the 2008 survey had been pregnant during the previous 12 months. As much as 92 percent of those pregnant received antenatal care (ANC) at baseline; this proportion did not change at endline. There was no significant difference in the likelihood of seeking ANC, comparing those who enrolled in insurance and those who did not (p=0.49). There was, however, a change in where women sought ANC. At baseline, only 7 percent of women received ANC from an EMP (Table 16). At endline, 6 percent of women who did not enroll in insurance received ANC from an EMP, while 28 percent of those who enrolled in the insurance sought ANC from an EMP (p=0.006).

TABLE 16: LOCATION FOR ANC, COMPARING BASELINE AND FOLLOW-UP SURVEYS, ACCORDING TO INSURANCE ENROLLMENT

Type of facility (column %)	Births 2002-2007	Births 2007-2008, uninsured	Births 2007-2008, insured
EMP	7%	7%	28%
Private clinic	25%	31%	26%
Public health center	57%	52%	42%
Public hospital	7%	8%	2%
Private hospital	3%	1%	2%
Other	1%	1%	0%
TOTAL	**100%**	**100%**	**100%**
	N=744	*N=159*	*N=43*

Women's choice of delivery location differed according to insurance enrollment. At baseline, most women chose to deliver in public hospitals (73 percent), while only 7 percent delivered in an EMP (Table 17). At endline, pregnant women who had enrolled in the insurance were much more likely to deliver in an EMP (28 percent) and less likely to deliver in a government hospital (62 percent) (p=0.03). There were no statistically significant differences in rates of surgical delivery between baseline (35 percent) and endline surveys (34 percent) or according to insurance status at endline (p=0.226). These statistics should be viewed with caution given the small sample size of women who were pregnant or who had a birth during the evaluation period.

TABLE 17: LOCATION FOR DELIVERY, COMPARING BASELINE AND FOLLOW-UP SURVEYS, ACCORDING TO INSURANCE ENROLLMENT

Location (column %)	Births 2002-2007	Births 2007-2008, uninsured	Births 2007-2008, insured
EMP	7%	8%	28%
Private clinic	14%	12%	10%
Public hospital	73%	79%	62%
At family or friend's home	1%	0%	0%
At own home	4%	2%	0%
Other	0.4%	0%	0%
TOTAL	**100%**	**100%**	**100%**
	N=791	*N=103*	*N=29*

The likelihood that a newborn was brought to a doctor during his or her first month of life for treatment of a sickness did not change between the baseline (32.5 percent) and endline (32.6 percent) surveys, and was not correlated with the insurance enrollment of the respondent (p=0.84). The likelihood of bringing an infant for a growth and development checkup slightly decreased between 2007 and 2008 (p=0.09); those with insurance were slightly more likely to seek a wellness checkup (93 percent) than those without insurance (81 percent) in 2008, although the difference was not statistically significant (p=0.11).

4.4.2 USE OF RH/FP SERVICES

A key outcome of interest for this evaluation was the association between insurance enrollment and utilization of RH/FP services, especially at INSS-contracted EMP facilities. Respondents were asked a number of questions at baseline and follow-up about their knowledge and use of FP methods, as well as sources for contraception and FP counseling. At baseline, 75 percent of respondents reported that they had been sexually active in the prior six months. This increased to 77 percent at endline, likely due to the increasing age of the sample. As much as 64 percent of the sample was using some form of FP at baseline, increasing to 66 percent at endline (p=0.03). Respondents' likelihood of using an FP method did not differ according to insurance enrollment at endline (p=0.68).

Respondents exhibited no significant differences by insurance status in their awareness of various FP methods in 2008. When asked whether they had heard of each FP method, awareness of the pill was highest (99 percent), followed by condoms (96 percent) and monthly injectables (94 percent). Respondents were least likely to have heard of male sterilization (60 percent), rhythm (46 percent), abstinence (31 percent), or withdrawal (28 percent).

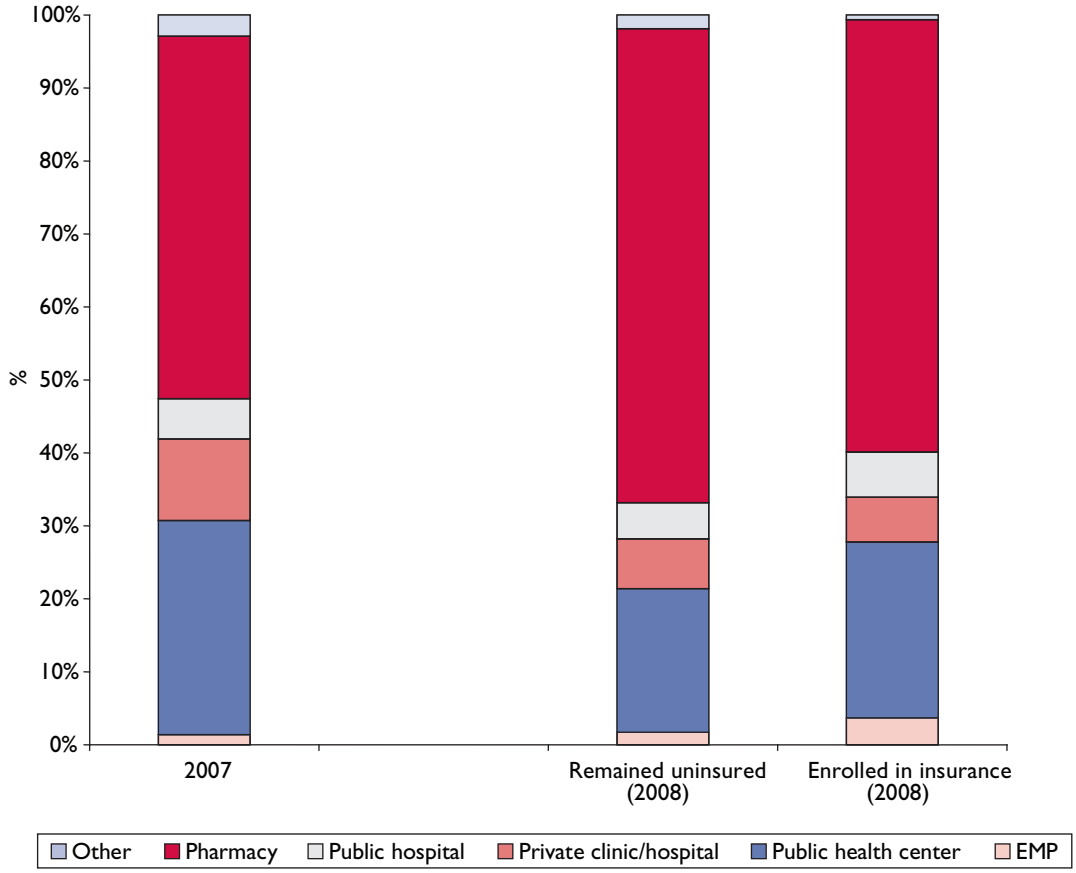
The most common method of FP used by participants in this sample (which includes many middle-aged women) is female sterilization. Slightly more than one-third of respondents or their female partners had been sterilized (Table 18). With one exception, usage rates of various FP methods among women age 18–49 did not change between 2007 and 2008 and did not differ between those who enrolled in the insurance and those who did not. The exception is three-month injectables: insurance enrollees were twice as likely to use three-month injectables (6 percent) as those who did not enroll (3 percent) (p=0.018). Anecdotally, many EMPs stated that they prefer to prescribe injectables over oral contraceptives, since some women may resell free oral contraceptives upon leaving their facilities while injectables are administered onsite.

TABLE 18: CURRENT FAMILY PLANNING METHOD (WOMEN AGE 18–49)

			Insurance status:		
Method	**2007 total**	**2008 total**	**2008 insured**	**2008 not insured**	**p-value**
No method	39%	35%	35%	32%	*0.326*
Female sterilization	33%	35%	35%	35%	*0.909*
Pill	8%	9%	9%	8%	*0.653*
Monthly injectables	6%	7%	7%	7%	*0.924*
IUD	6%	6%	6%	6%	*0.952*
3-month injectables	4%	4%	3%	6%	*0.018*
Condoms	3%	3%	3%	4%	*0.618*
Rhythm	1%	1%	1%	2%	*0.223*
Male sterilization	0%	0%	0%	0%	–
Abstinence	0%	0%	0%	0%	–
Withdrawal	0%	0%	0%	0%	–
N	*1468*	*1404*	*1103*	*301*	

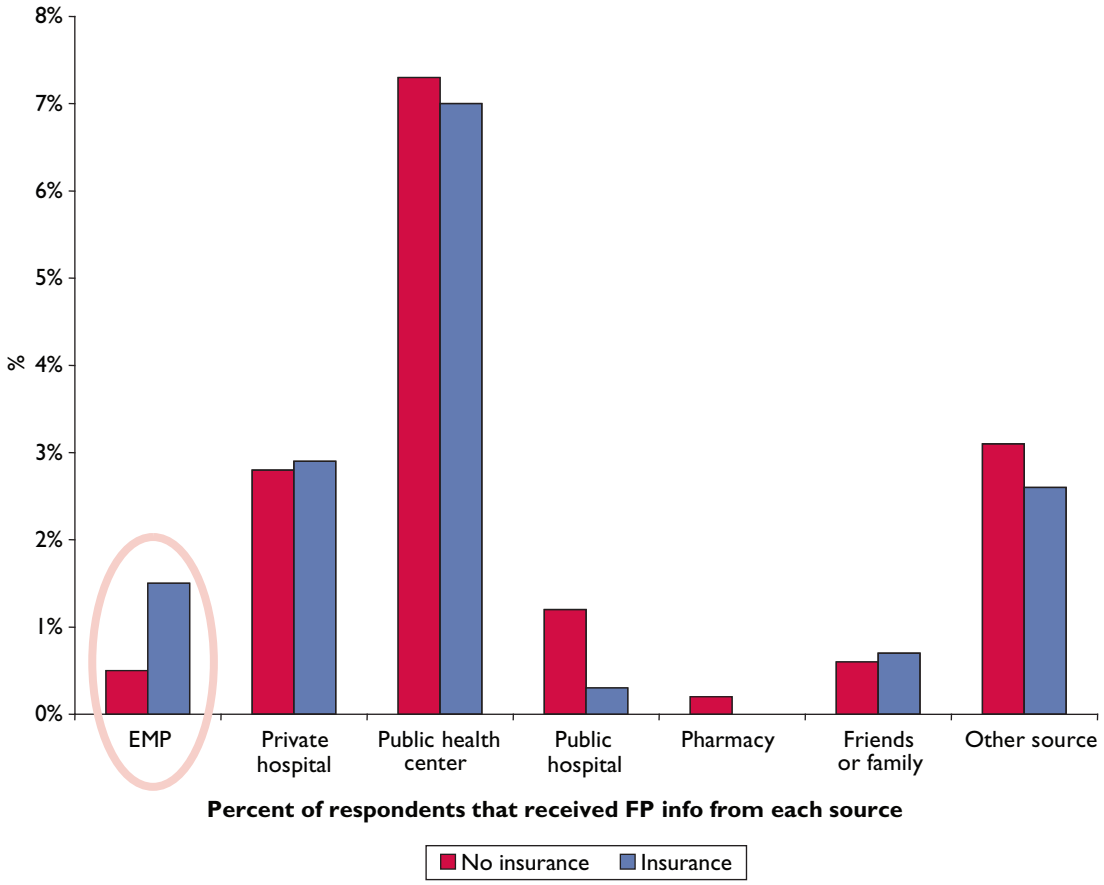
Excluding those who had been sterilized, most respondents reported that they had obtained their most recent FP method from a pharmacy (Figure 1). A greater proportion of respondents indicated pharmacies as their source for FP in 2008 (64 percent) than in 2007 (50 percent). Those who enrolled in the insurance were less likely than those who did not enroll to obtain FP from a pharmacy in 2008 and more likely to obtain FP from an EMP, although these differences are not statistically significant (p=0.31).

FIGURE 1: SOURCE FOR MOST RECENT FAMILY PLANNING METHOD



In the follow-up survey, few respondents reported receiving FP information or counseling from any source. Public health centers were the most commonly indicated source of FP information (Figure 2). Only 0.7 percent of respondents indicated that they received FP information at an EMP, although those who enrolled in insurance were three times as likely to receive FP information from an EMP as those who did not (p=0.023). Interestingly, although pharmacies were listed as the most common source for FP methods, almost no respondents reported receiving FP information from a pharmacy.

FIGURE 2: SOURCE FOR FAMILY PLANNING INFORMATION MENTIONED SPONTANEOUSLY, ACCORDING TO INSURANCE ENROLLMENT (2008 FOLLOW-UP SURVEY ONLY)



Few focus group participants had received FP counseling at EMPs. Local nongovernmental organization (NGO) clinics such as IXCHEN, Pro Mujer, and Profamilia were mentioned as more popular providers of FP services in general, along with MoH facilities.

RH services (as distinct from maternal health or FP services) were defined to include Pap smears, mammograms, prostate exams, and HIV tests. In 2007, 39 percent of respondents had received at least one RH service. This increased to 42 percent of the sample in 2008 (p=0.01). Respondents had no significant difference in the likelihood of their receiving RH services in 2008 according to insurance enrollment (p=0.76). Two-stage least squares regression confirmed this result (results not shown).

Approximately 10 percent of those with RH service use in 2008 had received the service at an EMP. Insured respondents were significantly more likely to utilize an EMP for RH services (12 percent) than those who did not enroll in insurance (2 percent) (p<0.001).

4.4.3 USE OF GENERAL HEALTH SERVICES

Descriptive results

Tables 19 and 20 present descriptive information about informal sector workers' utilization of different health facilities, according to the baseline and follow-up surveys. The surveys found that pharmacies were the most commonly visited of any health facility. At baseline, 73 percent of survey respondents visited a pharmacy on average 3.2 times in the past year, and this increased to 80 percent with 3.6 visits per year at follow-on. Private sector facilities were utilized more than public sector facilities. In the year prior to the 2007 survey, 43 percent visited a private doctor or private clinic/hospital, compared to 24 percent visiting public health centers and public hospitals. Use of private facilities remained about the same in the year prior to the 2008 survey (44 percent) while use of public clinics and hospitals increased to 43 percent of the sample. Only 1 percent of survey respondents reported visiting an INSS clinic (EMP) in the year prior to the baseline survey. This increased significantly to 10 percent of respondents at the follow-up survey. Overall, respondents showed a significant increase in their likelihood of making at least one visit to a health facility between 2007 and 2008. The increase was observed for both those who enrolled in insurance and those who did not.

TABLE 19: PROPORTION OF RESPONDENTS WHO REPORTED VISITING HEALTH FACILITIES IN PRIOR YEAR

Type of facility	2007	2008	Significance	2008 uninsured	2008 insured	Significance
Pharmacy	73%	80%	***	81%	77%	*
Private doctor	29%	14%	***	15%	11%	**
Laboratory	27%	44%	***	44%	43%	
Social Security Health Clinic (EMP)	1%	10%	***	2%	44%	***
Private clinic/hospital	15%	30%	***	31%	23%	***
Public (MINSA) health center	16%	27%	***	27%	25%	
Public (MINSA) hospital	9%	17%	***	18%	12%	**
ANY FACILITY	**78%**	**89%**	***	**89%**	**91%**	

***p<0.001 **p<0.01 *p<0.05

TABLE 20: NUMBER OF VISITS TO HEALTH CARE PROVIDER IN PRIOR YEAR, AMONG THOSE WITH AT LEAST ONE VISIT

Type of facility	2007	2008	2008 uninsured	2008 insured	Significance
Pharmacy	3.21	3.56	3.55	3.58	
Private doctor	2.18	2.20	2.18	2.36	
Laboratory	2.09	2.12	2.13	2.08	
Social Security Health Clinic (EMP)	3.88	3.48	2.92	3.57	
Private clinic/hospital	2.31	2.30	2.41	1.68	**
Public (MINSA) health center	2.80	3.17	3.24	2.87	
Public (MINSA) hospital	2.79	2.43	2.41	2.58	
ANY FACILITY	**5.80**	**7.16**	**7.06**	**7.52**	

***p<0.001 **p<0.01 *p<0.05
Note: Statistical significance tests cannot be performed comparing 2007 to 2008 samples since different individuals sought care in each time period.

The high representation of pharmacy visits is especially notable since public health centers and hospitals provide medication free of charge, yet they reportedly lack inventory on a regular basis. Results from focus group discussions confirmed this finding. Busy market workers often do not bother to attend a free MINSA clinic, where they may wait between 2 and 6 hours to see a doctor, only to risk discovering that their medication is not available. Instead, they frequently prefer to pay for the service of visiting a pharmacy, where a pharmacist might also recommend and provide a medication on the spot.

At follow-up, insurance enrollment was correlated with patterns of health facility use, as can be observed in tables 19 and 20. Insured respondents appeared to substitute care seeking at EMPs for utilization of public and private facilities, since insurance covered EMPs. They were slightly less likely than the uninsured to visit a pharmacy or private doctor, and substantially less likely to visit a private clinic/hospital. They were also less likely to visit a MINSA health clinic or hospital. Most notably, insured respondents were far *more* likely to utilize an EMP than uninsured respondents, as would be expected. Almost no uninsured respondents sought care from an EMP, compared to 44 percent of insured respondents. No significant difference existed, however, between the insured and uninsured in the *overall* likelihood of visiting a health facility.

Although MFI clients and non-MFI clients were broadly similar in terms of health service utilization, a few notable differences became evident (see Annex C). MFI clients were more likely than non-MFI clients to visit a private doctor at baseline. In addition, among those who had at least one visit, the number of visits to pharmacies, private doctors, and private clinics/hospitals was higher for MFI clients. This is possibly related to higher levels of income; MFI clients may be better able to afford more frequent and more costly care provided by private providers and pharmacies. Alternatively, the higher fraction of women and children in the sample of MFI clients may be driving the difference in visits.

Instrumental variables regression results

After obtaining this information, the survey examined the causal effects of being insured on health care utilization and expenditures after one year, using the instrumental variables regression analysis, which

controls for self-selection into the insurance. Specifically, we analyzed the effects of being insured by instrumenting insurance enrollment with the respondent's randomization status, that is, having been randomly offered a six-month subsidy. Table 21 displays the results of these instrumental variables regressions. Each line in the table reflects a separate regression model. The models also controlled for age, age squared, gender, education, marital status, MFI client status, total number of children, a binary indicator for having children under age 12, and market location. For the regressions with "any visit" as the outcome, the displayed coefficient can be interpreted as the percentage point difference in the probability of visiting a given health facility, comparing those with insurance to those without insurance after controlling for selection bias. Likewise, for the regressions with "number of visits" as the outcome, the coefficient can be interpreted as the difference in the average number of visits per year to a given health facility, comparing those with insurance to those without insurance and controlling for selection bias.

TABLE 21: INSTRUMENTAL VARIABLE REGRESSION RESULTS – IMPACT OF HAVING HEALTH INSURANCE ON HEALTH CARE UTILIZATION

	Any visit		Number of Visits	
Type of facility	**Coeff.**	**Std. Err.**	**Coeff.**	**Std. Err.**
Pharmacy	-0.025	[0.044]	0.406	[0.443]
Private doctor	0.022	[0.038]	0.034	[0.121]
Laboratory	-0.076	[0.054]	-0.139	[0.207]
EMP	0.428	[0.027]**	1.546	[0.144] **
Private clinic/hospital	-0.091	[0.050]	-0.483	[0.181] **
Public (MINSA) health center	-0.058	[0.047]	-0.406	[0.245]
Public (MINSA) hospital	-0.119	[0.040]**	-0.175	[0.151]
ANY FACILITY	0.003	[0.034]	1.291	[0.990]

Note: This table presents the impact of having health insurance on having visited each provider and the number of visits to that health provider (unconditional on any visit) at the follow-up survey. Having insurance is instrumented with randomization status. Controls for the baseline visits are also included. Each coefficient is from a separate regression.

* p<0.05 ** p<0.01

Overall, enrolling in health insurance did not lead to an increase in the probability of respondents seeking any health care from a provider. There was, however, fairly substantial substitution away from use of public and private facilities into EMP facilities covered by the INSS insurance. Those who were insured were 42.8 percent more likely to have attended an EMP in the past year, 9.1 percent less likely to have visited a private clinic, and 11.9 percent less likely to have visited a public health center than the uninsured. MFI and non-MFI clients exhibited no difference in this pattern of substitution. Importantly, although pharmaceuticals were covered under the INSS insurance and could be obtained free of charge from EMPs, insured respondents did not significantly reduce their visits to pharmacies.

Having health insurance increased the total number of health care visits by about 1.29 visits per respondent per year, but this result was not statistically significant. The insured also exhibited a similar pattern of substitution away from visits to public and private providers into free EMP visits. The analysis

produced similar results for questions about the type of provider respondents consulted for their last illness (not shown). For MFI and non-MFI clients, the patterns are quite similar: visits to the EMP increased, with a decrease in use of private and public health facilities.

Results from medical records review at EMPs

To obtain more detailed information regarding health services utilization patterns among those who enrolled in the INSS insurance, the evaluation included a review of the medical records of survey respondents who enrolled, utilized an EMP at least once, and provided consent for the records review. Beneficiary children's records were also reviewed with parental consent. A total of 423 patients' records were reviewed, reflecting 1,354 patient visits to 13 EMPs.

On average, insured informal sector patients from the survey sample made 3.2 visits to an EMP between January 2007 and November 2008 when the review was conducted (Table 22). This is similar to self-reported results from the survey. The maximum number of visits per patient was 20. One EMP, which had actively recruited for informal sector enrollees in the markets in this study, accounted for 30 percent of informal sector workers from the survey sample who enrolled, and four EMPs accounted for more than two-thirds of informal sector enrollees.

TABLE 22: PATIENT UTILIZATION STATISTICS, BY EMP

EMP (number)	Number of informal sector patients from evaluation	Share of patients	Average visits per patient	Total number of visits, 2007-2008	Share of total visits	Max number of visits per patient
1	128	30%	2.9	373	28%	8
2	61	14%	2.8	168	12%	18
3	55	13%	3.7	201	15%	20
4	40	9%	3.8	153	11%	12
5	35	8%	2.9	100	7%	14
6	31	7%	3.0	92	7%	7
7	22	5%	4.1	91	7%	15
8	18	4%	2.6	46	3%	7
9	11	3%	5.2	57	4%	19
10	8	2%	2.1	17	1%	3
11	7	2%	3.3	23	2%	6
12	4	1%	5.8	23	2%	11
13	3	1%	3.3	10	1%	8
Total	**423**	**100%**	**3.2**	**1354**	**100%**	**20**

Patient characteristics varied by EMP (Table 23). Overall, 69 percent of patients were female, closely reflecting the gender distribution of the survey sample (65 percent female) and market vendors in Managua in general. One in five patients overall was a child under 12. However, certain EMPs were more likely to be visited by female patients than others—the percentage of women varied from 45 percent to 91 percent—and about 85 percent of children visited only two EMPs. Again, these two EMPs marketed themselves more aggressively than others in the sample areas. Additionally, one of these EMPs offers free primary care to children between 12 and 16 years, which is outside the INSS regular coverage and may have appealed to families with older children.

TABLE 23: PATIENT GENDER AND AGE, BY EMP VISITED

EMP	No. patients	% Female	Mean age	% under 12
1	128	59%	28	36%
2	61	80%	29	30%
3	55	82%	41	2%
4	40	63%	40	0%
5	35	77%	39	3%
6	31	74%	38	3%
7	22	45%	30	23%
8	18	61%	34	0%
9	11	91%	36	0%
10	8	63%	27	25%
11	7	86%	45	0%
12	4	50%	41	0%
13	3	67%	26	33%
TOTAL	**423**	**69%**	**34**	**18%**

The timing of informal sector workers' visits to EMPs clearly parallels the provision of insurance subsidies through our evaluation (Table 24). Workers could begin enrolling in the voluntary insurance as of January 2007. The research team conducted the baseline survey between March and June 2007, at which point the two-month and six-month subsidies were distributed. An individual's subsidized period began once he or she enrolled in the insurance and registered with an EMP. During this period, a clear increase in patient visits occurred, from five patient visits in March 2007 to a peak of 174 visits in November 2007, followed by a decrease to preintervention levels by October 2008. Most visits to EMPs (94 percent) were outpatient consultations; only 3 percent were emergency visits and 1 percent was hospitalizations.

TABLE 24: TIMING OF EMP VISITS

Year	Month	No. Visits	%	Survey and subsidy timing
2007	Jan	18	1%	
	Feb	22	2%	
	Mar	5	0%	Baseline Survey Round 1
	Apr	7	1%	
	May	8	1%	Baseline Survey Round 2
	Jun	32	2%	
	Jul	40	3%	
	Aug	85	6%	
	Sep	151	11%	
	Oct	162	12%	Peak use of services for those with insurance subsidies
	Nov	174	13%	
	Dec	87	6%	
2008	Jan	132	10%	
	Feb	116	9%	
	Mar	61	5%	Pilot follow-on survey
	Apr	59	4%	
	May	51	4%	Main follow-on survey
	Jun	27	2%	
	Jul	37	3%	
	Aug	43	3%	
	Sep	22	2%	
	Oct	7	1%	
	Nov	8	1%	
	Total	1354	100%	

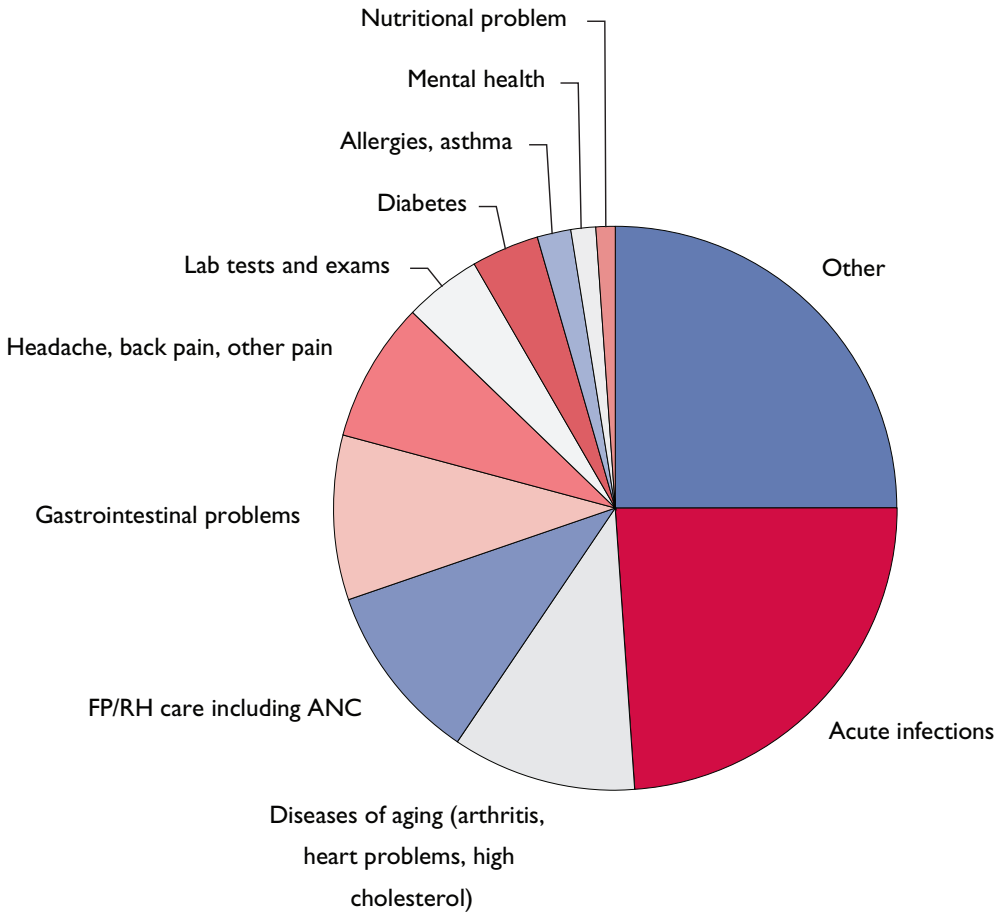
Data collectors coded patient diagnoses recorded in their medical files using ICD-10 codes; the full set of coded diagnoses is included as Annex D. Using categories similar to those in the market vendor survey, the most common diagnoses were for colds and sore throats (11.3 percent of total). Other leading diagnoses were for gastrointestinal problems, gynecological problems, heart or circulatory systems problems, joint pain or arthritis, urinary tract infections, diabetes, headaches, and back pain (combined accounting for 50 percent of diagnoses). RH, FP, and ANC-related diagnoses accounted for about 10 percent of the total. Table 25 lists the leading primary and secondary diagnoses recorded in the reviewed EMP files.

TABLE 25: DIAGNOSES BASED ON MEDICAL RECORDS REVIEW (REPORTED FOR CATEGORIES SIMILAR TO THOSE INCLUDED IN EVALUATION SURVEY)

	Primary Diagnosis	%	Secondary Diagnosis	%	Total	%
Cold symptoms, sore throat	164	12%	13	5%	177	11.3%
Gastrointestinal problem	123	9%	27	11%	150	9.6%
Gynecological problem	74	6%	6	2%	80	5.1%
Heart/circulatory problem	59	4%	22	9%	81	5.2%
Joint pain, arthritis	67	5%	7	3%	74	4.7%
UTI	53	4%	9	4%	62	4.0%
Diabetes	57	4%	0	0%	57	3.6%
Headache	43	3%	12	5%	55	3.5%
Back pain	40	3%	6	2%	46	2.9%
General/specialized examination	42	3%	2	1%	44	2.8%
Diarrhea	30	2%	8	3%	38	2.4%
Lower resp. infection, pneumonia	33	2%	3	1%	36	2.3%
Gyn exam, Pap smear	35	3%	0	0%	35	2.2%
Antenatal care	32	2%	2	1%	34	2.2%
Other pain, fatigue, malaise	31	2%	2	1%	33	2.1%
Skin problem	26	2%	8	3%	34	2.2%
Depression, anxiety	22	2%	2	1%	24	1.5%
Ear or eye infection	22	2%	0	0%	22	1.4%
Allergies	15	1%	3	1%	18	1.2%
Nutritional problem	10	1%	6	2%	16	1.0%
Lab test	15	1%	1	0%	16	1.0%
High cholesterol	8	1%	3	1%	11	0.7%
Asthma	8	1%	2	1%	10	0.6%
Family planning	7	1%	0	0%	7	0.4%
Fever	7	1%	0	0%	7	0.4%
Malaria	5	0%	0	0%	5	0.3%
Other	294	22%	99	41%	393	25.1%
Total	1322		243		1565	

Collapsing these diagnoses even further, Figure 3 graphically displays the distribution of diagnoses for informal sector workers visiting EMPs.

FIGURE 3: DISTRIBUTION OF DIAGNOSES AT EMPs



At 21 percent of EMP visits, a lab test was prescribed to the patient. Table 26 summarizes the basic types of tests prescribed.

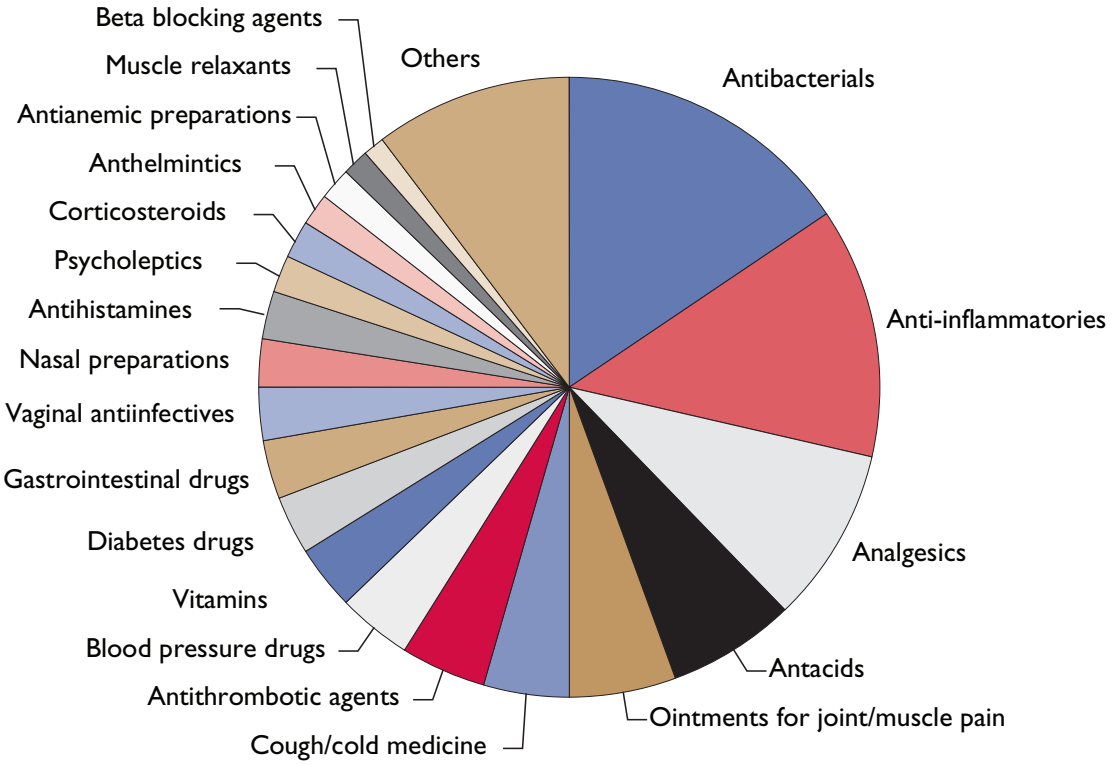
TABLE 26: LAB TESTS PRESCRIBED AT VISIT

Type of lab test	%
Blood test	15%
Urine test	9%
Stool sample	3%
Vaginal culture	5%
Other test	1%

N=1322 visits

Diagnostic imaging, which is covered by the INSS insurance, was prescribed at 9 percent of visits. The most common procedure prescribed was an ultrasound (4.3 percent) followed by x-rays (2.1 percent) and EKGs (0.9 percent). Drugs are also covered by the insurance and were prescribed at 82 percent of EMP visits. The full list of prescribed drugs (coded according to the ATC classification system [http://www.whocc.no/atcddd/]) is included in Annex E. Figure 4 summarizes prescribed drugs, listing the top 20 categories, which account for 90 percent of prescribed drugs. Antibiotics, anti-inflammatories, and analgesics accounted for almost 40 percent of drugs prescribed.

FIGURE 4: DISTRIBUTION OF DRUGS PRESCRIBED



4.5 OUT-OF-POCKET EXPENDITURES

4.5.1 DESCRIPTIVE RESULTS

The baseline and follow-up surveys collected information on both the total OOP health expenditures over the previous 12 months per individual and family and the amount these participants spent on their last illness. Respondents reported OOP expenses in both public and private facilities. For the previous 12 months, total expenses for the respondent and his or her dependent children were US$85 at baseline and decreased slightly to US$83 at follow-up (see Table 9), while expenses for the respondent alone were US$47 at baseline and increased to US$53 at follow-up. These expenditures are substantially higher than OOP family health costs in the general population (US$28), according to the 2003 national *Encuesta Nicaragüense de Demografía y Salud* (ENDESA) survey, even with considering an additional $12 adjustment for inflation over the period.

Respondents' expenses reported at individual facilities also match the utilization findings (see Table 27). Costs were lowest at subsidized public health centers. Respondents spent an average of US$0.26 at public health centers at baseline and nearly nothing at follow-up. The bulk of expenditures were incurred at pharmacies. Of those who visited a pharmacy during the past year, respondents reported spending on average US$43 at a pharmacy in 2007 and US$36 in 2008. Of those visiting a private doctor, respondents reported spending US$17 per year in 2007 and US$18 in 2008. Respondents spent US$24 at private hospitals at baseline, and this increased substantially to US$40 at follow-up. Finally, respondents spent US$2.33 at public hospitals at baseline and almost nothing at follow-up. It is useful to note that the median amounts spent at each facility were substantially lower than the average, indicating that some individuals had rather high expenses.

TABLE 27: AVERAGE OUT-OF-POCKET EXPENDITURES AT HEALTH FACILITIES IN THE PRIOR YEAR, AMONG THOSE WITH AT LEAST ONE VISIT

Expenditures at (US$)	2007	2008	2008 uninsured	2008 insured	Significance
Pharmacy	42.67	36.37	37.31	32.45	
Private doctor	16.97	17.86	17.45	20.22	
Laboratory	25.67	18.20	19.73	12.08	**
Social Security Health Clinic (EMP)	14.88	0.00	0.00	0.00	
Private clinic/hospital	24.04	40.14	43.53	21.70	
Public (MINSA) health center	0.26	0.02	0.02	0.05	
Public (MINSA) hospital	2.33	0.02	0.02	0.05	
ANY FACILITY	**59.27**	**58.98**	**63.78**	**40.69**	**

***p<0.001 **p<0.01 *p<0.05
Note: Statistical significance tests cannot be performed comparing 2007 to 2008 samples since different individuals sought care in each time period.

Expenditure patterns comparing insured and uninsured respondents in 2008 reflect their different patterns of utilization. Insured respondents spent less at pharmacies than the uninsured, although the difference was not statistically significant. They spent significantly less at laboratories than the uninsured, despite a similar likelihood of visiting a laboratory, implying that some of these lab tests were covered by the insurance. Insured respondents reported spending nothing at EMPs, as would be expected, and spent substantially less at private clinics. There were no significant differences in expenditures at public clinics between the insured and uninsured, since care is provided for free.

It is important to note that reported OOP medical expenses for participants and their children under 12 years (US$85) were on average less than the equivalent unsubsidized cost of the INSS' health insurance premiums, which is approximately US$176 per annum. This indicates potentially low willingness to pay for a health insurance plan among this population given that, for many individuals, premiums cost more than their expected OOP expenses. Those who spent more than US$176 per year on themselves and their children under 12 represented only 13 percent of the respondents. This could also be one reason for the low retention in the insurance program reported later in this evaluation.

At baseline, MFI clients reported higher health care expenditures (approximately US$7 more) and laboratory costs were significantly higher among MFI clients. This is likely due to the higher income levels of MFI clients rather than higher levels of sickness, as the difference in health expenditures is eliminated after controlling for income.

4.5.2 INSTRUMENTAL VARIABLE REGRESSION RESULTS

Finally, the research team examined the causal effects that being insured had on the respondent's OOP health expenditures after one year, again using the instrumental variables regression analysis, which controls for self-selection into the insurance. The effects of being insured were instrumented with the respondent's randomization status, and the models were adjusted for baseline OOP expenditures, age, age squared, gender, education, marital status, MFI client status, number of children, children under age 12, and market location (coefficients not shown). We modeled the natural logarithm of expenditures (adjusted for those with zero expenditures by adding 0.01) to account for the highly skewed distribution of spending. The coefficients in Table 28 can thus be interpreted as the *percentage* change in OOP health expenditures at a given facility, comparing those respondents with insurance to those without insurance after controlling for selection bias. Each line in the table reflects a separate regression model.

TABLE 28: INSTRUMENTAL VARIABLE REGRESSION RESULTS – EFFECT OF HAVING INSURANCE ON RESPONDENT'S LOG OOP EXPENDITURES DURING THE PRIOR YEAR

Type of facility	Coeff.	Std. Err.	Significance
Pharmacy	-0.658	[0.330]	*
Private doctor	0.184	[0.244]	
Laboratory	-0.939	[0.346]	**
Private clinic/hospital	-0.734	[0.322]	*
Public (MINSA) health center	0.012	[0.034]	
Public (MINSA) hospital	-0.007	[0.030]	
ANY FACILITY	-0.532	[0.329]	

Note: This table presents the impact of having health insurance on log expenditures at each provider (unconditional on having visited) at the follow-up survey. Having insurance is instrumented with randomization status. Controls for the baseline visits are also included. Each coefficient is from a separate regression.

* p<0.05; **p<0.01

Overall, we were unable to detect a statistically significant decrease in the respondent's own total OOP health expenditures over the prior year due to insurance enrollment. The coefficient on total expenditures is negative (-0.532), but the decrease is not statistically significant (p=0.11). Expenditures at some types of facilities, however, did decrease significantly. Having health insurance reduced respondents' OOP expenditures at pharmacies by 66 percent. This implies that some reported pharmacy use may have been at the pharmacies within EMPs and/or that the types of medications insured respondents purchased at private pharmacies cost less. Health insurance enrollment also resulted in a large and significant decrease in laboratory expenses (which are covered by the insurance) and in expenditures at private health clinics and hospitals. There was no impact on expenses at public sector facilities, where care is typically free.

Results for total health expenditures in the past year for the respondent *and* his or her dependents under age 12 indicated that insurance had a strong and significant impact (not shown) – total health expenditures were estimated to decrease by 52 percent (p=0.08) for those insured.

Finally, insurance had a strong and statistically significant impact on the costs incurred during the respondent's most recent illness (not shown). The coefficient for log OOP expenditures on the most recent illness was -1.17 (p=0.001), implying a near total reduction in expenditures for those with insurance. For the respondent and his or her dependents, expenditures on the most recent illness were estimated to decrease by 73 percent (p=0.03). The fact that statistically significant insurance impacts are found for the most recent illness implies that respondent recall may play a role. It is well documented that the accuracy of recall of expenditure data decreases precipitously with time, and indeed survey respondents tend to report higher expenditures in the most recent time period than in time periods further in the past (Lu et al. 2009). The impact of insurance may have been attenuated when respondents tried to recall expenditures over the previous year.

4.6 SATISFACTION WITH AND RETENTION IN THE INSURANCE PROGRAM

Overall, retention rates in the INSS voluntary insurance program were very low after the six-month subsidy expired. At the follow-up survey, respondents reported whether they were still affiliated with the program and whether or not they were paying for it. Less than 10 percent of those in our sample who had enrolled were still paying for insurance at the time of the follow-up survey. Table 29 presents multivariate linear regressions predicting retention rates among those who had signed up for insurance. As expected, those receiving the largest subsidies to sign up for health insurance were least likely to be retained over time. This makes sense if the subsidy encouraged those with low "willingness to pay" to enroll. Those with no subsidy were significantly more likely to be retained in the insurance program, again reflecting their greater demand for the insurance despite having to pay a premium. Higher education was associated with a slightly higher likelihood of remaining enrolled, but other control variables had no significant impact on the likelihood of still being insured (column 2). There was no difference in retention rates between MFI clients and non-MFI clients.

TABLE 29: DETERMINANTS OF INSURANCE RETENTION, AMONG THOSE WHO ENROLLED

Outcome variable: Still enrolled in insurance program at follow-up (0/1)	All		6-Month Subsidy Winners Only		
	(1)	(2)	All (3)	MFI Client (4)	Non-MFI Client (5)
Information	-0.632*	-0.637*			
6-month subsidy, enroll at INSS	-0.910**	-0.927**			
6-month subsidy, enroll at MFI	-0.895**	-0.924**	0.006	0.058	-0.03
Information only, on-the-spot enrollment	-0.267	-0.282			
6-month subsidy, on-the-spot enrollment	0.193	0.218			
Male	0.001	0.016	0.012	-0.099	0.055
Years of education	0.010**	0.009**	0.007	0.015*	0.001
Married	0.026	0.027	0.031	0.008	0.033
MFI client	0.016	-0.003	-0.007	0	0
Number of children	-0.007	-0.006	-0.006	-0.002	-0.005
Has children under 12	-0.018	0.004	-0.018	0.019	-0.038
Log (income)		-0.003	0.007	0.036	0.004
Has any savings		0.019	0.014	-0.045	0.047
Smokes		-0.035	-0.03	0.101	-0.056
Any chronic disease		-0.032			
Ever sick		0.002			
Log (costs of health care)		0.000			
Number of visits to provider		0.002			
Any visit to provider		0.038			
Constant	1.044	0.922*	0.142	0.369**	0.191
	[0.265]	[0.142]	[0.133]	[0.021]	[0.218]
Observations	530	470	387	157	230
R-squared	0.07	0.11	0.04	0.14	0.05

Note: This table presents multivariate linear regressions on still paying for health insurance at the follow-up survey. Each column also includes market dummy variables and baseline survey round dummy variables as well as controls for age and age squared. "Any chronic disease" includes diabetes, hypertension, cardiac problems, physical disability, psychological problems, kidney problems, and cancer. The sample includes only those respondents who had enrolled in insurance. * significant at p<0.05; ** significant at p<0.01

We found generally the same pattern of determinants of retention in comparing MFI clients and non-MFI clients. Given the small sample size of those who signed up for insurance (especially, for example, among those receiving the informational brochure only), we restricted the sample to those who were offered six-month subsidies (columns 3–5) in order to test whether differences in retention resulted from assignment to enroll at MFIs or at the INSS. MFI clients who signed up at an MFI branch were 5.8

percentage points more likely to retain the insurance program (column 4) than those registering at the INSS, although this difference was not statistically significant. This suggests that the convenience of MFIs as payment channels might have made MFI clients more likely to retain insurance. However, we should note that while place of affiliation was randomized, these estimates are conditional on having signed up for any insurance at all, which is endogenous.

Other portions of the survey and focus group discussions shed light on reasons why insurance enrollees did or did not continue to pay for the insurance. For instance, respondents were asked the maximum amount they would be willing to pay monthly for INSS health insurance that covered themselves and their children under 12 years old. Table 30 summarizes their responses, according to enrollment and retention in the program – this can be compared with the INSS insurance premium of US$17 during months 1 and 2 and US$15 thereafter.

TABLE 30: WILLINGNESS TO PAY FOR INSURANCE, BY ENROLLMENT AND RETENTION STATUS

Enrollment and retention status	Average amount willing to pay per month	*N*
Never enrolled	$10.53	*2078*
Enrolled previously but no longer	$11.04	*482*
Still enrolled and paying premium	$18.12	*48*

Those who enrolled and were still paying premiums at the follow-up survey were willing to pay a significantly ($p<0.001$) higher amount for the INSS insurance than those who never enrolled or who enrolled but dropped out after the subsidy expired. Their average willingness to pay was in fact lower than the actual premium cost per month.

Focus group discussions confirmed this finding. Most focus group participants felt that it was "worth it" to pay for health insurance, but almost all indicated a preference for an insurance product with a lower price tag. Those who enrolled in the demonstration project and had young children indicated that obtaining coverage for their children under 12 was a key motivating factor for enrollment. Other reasons for enrollment were ensuring access to regular medical checkups and getting protection in case of future emergencies or surgeries. Those who received a subsidy but did not enroll cited reasons such as their children were too old to be eligible, they were more likely to visit a pharmacy rather than a doctor for most health care because it was faster and more convenient, the premium was too high to afford after the subsidy expired, and the time costs and inconvenience associated with the enrollment process were deterrents.

Participant experiences at EMP clinics also were associated with retention in the insurance program. According to the follow-up survey, 80 percent of those who signed up for insurance registered with a particular EMP, and of those who registered, 80 percent visited the EMP at least once. In general, those who reported a more "positive" experience at the EMP were more likely to be retained in the insurance program and still paying premiums. Among these indicators, the statistically significant predictors of retention were ease in obtaining medicines and willingness to return to the EMP in the future (Table 31).

TABLE 31: SELECTED INDICATORS OF SATISFACTION WITH EMP CARE, ACCORDING TO RETENTION IN THE INSURANCE PROGRAM

Indicator	% of total	% of those no longer enrolled:	% of those still paying premiums
EMP could locate respondent in computer system	94%	93%	98%
It was easy for respondent to obtain medicine	88%	86%	100% **
Respondent had no problem obtaining service	80%	78%	87%
Doctor explained respondent's condition	77%	77%	78%
Respondent's problem was resolved	76%	74%	84%
Respondent would go back to this EMP in the future	61%	57%	85% ***
EMP reception was "friendly"	61%	62%	58%

**p<0.01 ***p<0.001

Those who were no longer enrolled in the insurance were also asked the main reasons why they were not paying for continued coverage. The reason respondents most commonly reported (Table 32) was the inconvenience of having to go to an external location to make payments (equally likely to be reported both by those assigned to enroll with an MFI and those assigned to enroll with INSS). Expense was also high on the list of reasons. Respondents less commonly reported problems with quality of care at the EMPs as a reason.

TABLE 32: REASONS GIVEN FOR NOT PAYING PREMIUMS FOR INSURANCE

Indicator	%
Too inconvenient to go – time involved	38%
Other	35%
Too expensive	32%
No need for it – don't often get sick	11%
Did not like the administrative staff	8%
Could not get the medicine I needed	7%
Did not like the doctor/nurse	5%
Doctor was rude	3%

Focus group participants indicated mixed attitudes towards EMPs. When asked about the quality of service given at local EMPs, an equal number of participants referenced specific negative experiences and specific positive experiences. The three most heavily enrolled EMPs all received mixed reviews. One individual commented, "I have seen that there are some EMPs where [service] is deficient; as such, we have opted on many occasions to take our children to private clinics because the service is of a better quality."

5. DISCUSSION AND RECOMMENDATIONS

This report presents the one-year findings from a randomized evaluation of a program extending Social Security health insurance to informal sector workers in Managua via MFIs. The study findings provide insights on the delivery and effects of voluntary health insurance for informal sector workers, and the findings have a number of implications for policymakers in Nicaragua and other countries. Although its implementation had flaws, the INSS' demonstration project represents an important first step toward broadening access to health insurance in the informal sector in Nicaragua. This section details some of the main conclusions of this research and highlights recommendations for policymakers both in Nicaragua and elsewhere.

- ***Subsidies brought informal sector workers into the insurance program, but did not contribute to long-term retention.***

This evaluation determined that subsidies (of both price and "convenience") could play an important role in bringing informal sector workers into a voluntary insurance scheme. Once both the time and monetary costs were covered, 70 percent of those approached by our study enrolled in the INSS insurance. Nicaraguan informal sector workers considering signing up for health insurance were concerned with both the monetary and time costs involved, and similar subsidies may be necessary for launching a new health insurance program, both to bring the program to scale and to broaden the risk pool.

Subsidies had no impact, however, on long-term retention (10 percent of enrollees), suggesting that, once a worker was in the program, factors other than the initial subsidy influenced his or her retention. These factors included the worker's overall willingness to pay for insurance (which could be influenced through demand-generation and marketing activities), the inconvenience of making payments (cited by 38 percent of respondents), the pricing of premiums (cited by one-third of respondents), lack of coverage for children over age 12, and the perceived quality and convenience of care at EMPs. Reasons against participation in the program varied, although two popular arguments were that the premium was too high and that the insurance was not worth it because it did not cover children over the age of 12 High premium (relative to income) is a common deterrent against enrolling in any insurance scheme, and needs to be addressed when designing insurance schemes to cover the poor.

To increase enrollment, benefits packages should be designed to balance informal workers' preference for convenience and quality of care with their limited disposable income. Such packages should balance meeting client needs with ensuring broad population coverage in order to keep costs low. Education about the value of insurance may also help increase informal sector workers' willingness to sign up and pay into a program, as they may not fully understand the risk-management benefits of the protection included in insurance against the high cost of rare accidents or severe illnesses. Addressing these considerations would be vital for the success of a program that incorporated subsidies to encourage enrollment.

- ***For informal sector workers, time and convenience costs matter almost as much as monetary costs.***

Time is money to informal sector market vendors, whose income relates directly to the amount of time they spend in their market booths. Simply providing an informational brochure and the ability to enroll on the spot at their market booths impacted informal sector workers' insurance enrollment, with 23 percent registering on the spot. Providing a six-month monetary subsidy without on-the-spot enrollment acquired 34 percent enrollment. Respondents in our focus group discussions repeatedly mentioned time costs as reasons for not enrolling in the insurance. Respondents also mentioned time costs as a key reason for self-treating with drugs from local pharmacies, rather than waiting for care from a free MINSA clinic.

This implies that streamlined, efficient enrollment, registration, and administrative processes are essential for distribution of insurance to informal workers. Our surveys and focus group discussions indicated a strong preference for a transparent and convenient registration process. Participants also criticized slow, ineffective distribution of billing statements. Based on these findings, it may be useful to test automated registration procedures through personal digital assistants and other remote devices, as well as exploring paperless billing through mechanisms such as text messages on cell phones.

- ***Trust issues are paramount.***

Concerns about the trustworthiness of INSS and especially of MFIs were repeatedly voiced during our focus group discussions. Some respondents questioned whether the insurance program for informal workers was "real," others wondered whether the upfront subsidies were a way of "trapping" people into making payments later, and still others were concerned that MFIs would find ways to charge them hidden fees or interest. Many respondents were skeptical that MFIs could function as trustworthy, reliable intermediaries for insurance. The dissemination of only a small amount of publicity concerning the insurance program in advance of our survey evaluation (either by INSS or the MFIs) likely contributed to this lack of trust. Better marketing and public relations campaigns could help overcome this skepticism and contribute to higher enrollment rates.

- ***The INSS insurance only modestly impacted the already high use of RH/FP and MCH services.***

As detailed in this report's introduction, one of the original motivations for expanding insurance coverage to informal sector workers was to increase their utilization of priority health services, particularly RH, FP, and MCH services. The evaluation did not find that having insurance had a substantial impact on the use of these services within the survey population. Insurance enrollment did not increase enrollees' use of FP in general or their awareness of individual FP methods. It is important to recall, however, that the sample population in these markets had an average age of 38, and a high proportion of women (35 percent) had been sterilized. The sample had almost no unmet need for contraception. In fact, among the 75 percent of respondents who reported being sexually active in the past six months, 85 percent were currently using some type of FP, and the remainder reported that they were currently pregnant or trying to get pregnant. In addition, prior to the demonstration project, the sample population already had a very high use of ANC services (92 percent), and almost all women delivered in a health facility (95 percent).

It is noteworthy, however, that few respondents reported receiving any FP counseling from any source. Public health centers were the most commonly indicated source of FP information (mentioned by 7.3 percent of respondents), while only 0.7 percent of respondents indicated that they received FP counseling at an EMP, although those who enrolled in the insurance were significantly more likely to receive FP information from an EMP than those who did not enroll. The low rate of FP counseling corroborates results from a separate evaluation that found modest rates of FP counseling among EMPs, despite targeted training to these providers on FP promotion. Nine of the 13 EMPs in our medical records review participated in these trainings (Chin-Quee et al. 2009).

Overall, the substantial supply of free RH/FP services provided by NGOs and public sector clinics in Nicaragua may have limited women's incentive to switch to EMPs for these services, especially over only a six-month period when most of the survey respondents were enrolled in the insurance program. In addition, the majority of respondents (63 percent) currently using contraception are using long-acting or permanent methods.

For both ANC and delivery care, we observed substantial switching from public and private clinics into EMPs among those with insurance, as expected. Insured respondents were significantly more likely to utilize an EMP for RH services (12 percent) than those who did not enroll in insurance (2 percent).

In sum, these results should not be interpreted to mean that extending insurance to informal workers via MFIs is *not* an effective means of increasing overall uptake of RH/FP and MCH services. Applying this intervention in a different context (e.g., with less availability of alternative providers offering "free" services) and with a different population (e.g., younger and with greater unmet need) would very likely result in more significant impacts.

- ***The main impact of INSS insurance on utilization was it encouraged switching from public and private for-profit providers to INSS-contracted EMPs rather than generated an overall increase in service use.***

Our results on the impact of insurance on overall service utilization were similar to those for utilization of RH/FP and MCH services. The likelihood of the survey sample visiting a health facility or pharmacy at least once in the past year was high (89 percent) and about equal when comparing insured and uninsured respondents at the follow-up survey. In addition, no significant difference in the total number of health care visits existed among those who sought care. This may be because access was relatively high from even before the survey: respondents could access free care from MINSA clinics at any time, albeit with the constraints of these providers (long waits, limited medications and supplies, poor infrastructure). The more relevant impact the demonstration project had was on the type of care sought. Enrolling in insurance clearly induced participants to use *less* of the lower quality care available in public facilities, *less* of the higher cost care provided by private clinics, and *more* of the care provided in EMPs. This switching pattern implies that EMPs offer an acceptable substitute both for high-quality private care and for free public sector care.

Interestingly, however, enrolling in the insurance did not significantly decrease respondents' use of pharmacies. This may be partially due to the research team being unable to identify whether respondents included EMP pharmacies in this category, but it may also reflect the respondents' preference for the perceived convenience of self-medicating.

- ***The INSS insurance did reduce out-of-pocket expenditures for informal sector workers but not by enough to cover the cost of the premium for most individuals.***

Expenditures at pharmacies, laboratories, and private clinics all dropped significantly as a result of insurance enrollment. These three types of facilities, especially pharmacies, were the main contributors to OOP spending for the survey sample at baseline, which makes this a critical finding. At follow-up, total health expenditures in the past year for the respondent and his or her eligible dependents were 52 percent lower (p=0.08) while expenditures related to the respondent and dependents' most recent illness episode were 73 percent lower (p=0.03).

It is important to note, however, that the expected value of the benefits covered by the insurance (e.g., the amount that insured respondents would have spent without insurance) was still less than the equivalent full cost of INSS premiums, for all but 13 percent of sample respondents. This cost recovery structure is generally in line with insurance premium pricing in other contexts, but it likely functioned as a disincentive for respondents to remain enrolled in the insurance once subsidies expired. For informal sector workers, greater market segmentation in premium pricing according to socioeconomic status may be needed to encourage lower income workers to purchase insurance. Even with more low-cost products available, the target population has had limited access to health insurance. Efforts to increase the public's awareness of the value of health insurance for risk-management purposes rather than only as an alternative to OOP expenditures would likely be helpful in the marketing of such products.

- ***Initial hopes that MFIs could increase insurance enrollment and retention were not met, and the potential of MFIs could not be rigorously evaluated through this study.***

In this evaluation, respondents who received a subsidy and were assigned to enroll at an MFI were *less* likely to enroll in the INSS insurance than those who were assigned to enroll at the central INSS office. This finding is in stark contrast to expectations in advance of the study. We hypothesized that MFIs would facilitate higher uptake of insurance, given their ongoing relationship with many market vendors and their convenience to the markets themselves. What occurred instead was that respondents indicated a preference for interacting with INSS directly for enrollment and insurance payments, rather than working through intermediary MFIs. Some expressed doubts about the expertise of MFIs in dealing with health-related issues, and others were suspicious that the MFIs would try to profit from the arrangement.

> *"INSS knows the benefits, what's not covered, while the MFI is a lending institution and doesn't understand [health]. Health is not its specialty; its thing is money."*
>
> – MFI client that enrolled [Oriental market]

> *"INSS is more flexible because it is part of the government, it is an institution that will never go bankrupt …"*
>
> – Non-MFI client that enrolled [Oriental market]

However, a variety of factors limited the extent to which the project team could draw broader conclusions about the potential of MFIs from this study. Specifically, substantial program implementation problems, many of which were linked to the political transition occurring simultaneously in Nicaragua when the program was rolled out, constrained the team's interpretation of results. The change

in administration and the withdrawal of INSS' political support for the pilot project were clearly detrimental to project implementation. The new administration embarked upon a policy of promoting the MINSA free clinic system and substantially deemphasized working with the private sector, including MFIs. Both INSS and MINSA requested to review the results of this evaluation prior to promoting or expanding the pilot program.

- ***Challenges in the public-private partnership between INSS and MFIs contributed to significant program implementation problems.***

Overall, limited coordination existed between INSS and the MFIs, and INSS provided limited administrative support to the MFIs. This in turn discouraged MFIs from promoting the insurance extensively or consistently, and MFIs stopped prioritizing the insurance product as they became aware that it required additional investment in time and resources. Additionally, INSS' lack of willingness to market the product massively and the limited capacity at INSS to implement even smaller marketing efforts proved disappointing to MFIs. As previously described, approximately 10 months into the program, the participating MFIs did not have their contracts with INSS renewed. Once it became clear that the contracts would not be renewed, MFIs halted their efforts to market the voluntary program and discontinued offering premium payment services on behalf of INSS. This change in the process and the accompanying lack of information were likely to have been sources of confusion among participants who had signed up with an MFI, especially when subsidies expired and they needed to pay for insurance.

The challenges of a program fundamentally based on a PPP cannot be underestimated. We highlight two important implications in this report. First, coordinating programs between institutions that have substantial differences in cultures, management styles, and processes can be extremely difficult. These differences can lead to miscommunication and frustration among personnel on both sides. They require significant coordination, transparency, and commitment from senior management. Second, a fundamental lack of trust between government and private actors can taint these partnerships from the outset. INSS suspected that MFIs would unfairly profit from sales of the insurance program, but this suspicion appears to have been unfounded, according to our interviews with MFIs. The MFIs' initial investments in operations, training, and marketing for the program were significant, and low volumes of sales meant that MFIs actually recovered few of their costs. INSS argued that MFIs would gain financially by having healthier clients who then repaid their loans more steadily, but given that MFIs already had strong portfolio quality at the time of the program's launch, in reality, there was little room for improvement in repayment rates.

According to our interviews, MFIs agreed to participate in the program because they saw the INSS insurance as a marketable complement to their existing credit services. Strong competition in the microfinance sector in Nicaragua drives MFIs to seek new products that could give them a competitive advantage. In addition, the MFIs' sense of social mission played a role: MFIs were aware that their clients lacked access to quality health care and saw the INSS product as a cost-effective solution to improve this access. The incentives individual MFI staff members faced in supporting the demonstration project, however, were less clear. Loan officers who were charged with selling the product found that closing a "sale" of insurance could take two visits and last more than one hour. Standard loans were quicker to sell and paid higher commissions.

- ***Conflicting supply-side incentives for enrolling informal sector workers may have affected their long-term retention***.

EMP clinics displayed two major views of the INSS voluntary insurance program for informal workers: on the one hand, informal sector workers were less informed health consumers who would be less likely to utilize services (and easier to deny services to); and, on the other hand, informal sector workers would be sicker than formal sector clients and likely to incur costs that exceeded INSS reimbursements. These two themes played out explicitly in the extent to which EMPs marketed their services to potential informal sector clients. Two mid-sized EMPs were particularly aggressive at enrolling informal workers, perceiving the informal sector as an attractive growth opportunity. These two EMPs actively pursued the winners of the "subsidy lottery" and obtained more than 40 percent of the market share. During qualitative interviews with insurance enrollees, the research team observed a series of complaints about the service at one of these clinics, which seemed to be frequently denying services. There was no evidence of explicit fraud, but dissatisfaction was widespread.

On the other hand, other EMPs were concerned that adverse selection would be a major problem, that INSS capitation rates were too low, and that informal workers tended to be sicker than average. One of these EMPs discouraged some lottery winners from affiliating by requiring a series of expensive blood and urine screening tests upfront. This occurred despite our surveys providing no indication that adverse selection was a substantial problem.

Both of these perspectives highlight the importance of ensuring that appropriate incentives are in place both to recruit high-quality providers and to ensure adherence to quality standards. Such incentives include appropriate educational efforts for providers to inform them about the program requirements, clientele, and adequate reimbursement rates.

- ***The potential may exist for further market segmentation in voluntary insurance for the informal sector.***

The hypothesis that extending the INSS health insurance to informal sector workers would free up MoH resources was not founded, since few informal sector workers voluntarily enrolled and remained in the program. At baseline, informal sector workers in our sample were already more likely to use private sector providers than public providers. Enrolling in INSS health insurance resulted in significant switching of respondents' use of *both* public and private facilities to EMP services. Programs seeking to reduce the burden on public sector resources of public health facilities should consider that informal sector workers in Nicaragua spend significantly more OOP expenditures on health care than the overall population and may not be among those placing the greatest burden on public resources.

Segmentation of the informal sector may identify those lower income brackets most likely to use public sector resources. These lower income workers may not otherwise be able to pay for comprehensive private services, but may be able to pay smaller premiums for complementary insurance or for basic prepaid private service packages in convenient locations. For those workers on the higher end of the income spectrum who are already using private health facilities and pharmacies, insurance programs need to take great care to differentiate themselves in terms of price, convenience, and quality to ensure retention. In addition, trust and procedural transparency appear to be important factors for guaranteeing successful implementation of a micro-health insurance scheme.

6. CONCLUSIONS

Government-run health insurance programs can have many advantages, including broad risk pools, ability to generate confidence and trust in the population, and ability to manage provider costs and quality. Legal and political constraints, however, often make it difficult for public sector health programs to meet the needs of all citizens, including informal sector workers, thus leaving room for private sector actors to take on the role of agent and/or provider. This rigorous evaluation of the INSS voluntary insurance demonstration project was important in understanding the impact of insurance, determinants of enrollment, and behavior of consumers, in this case informal sector workers.

The project team found that both monetary and convenience subsidies effectively increased informal sector workers' enrollment in the voluntary insurance, although allowing them to register at MFIs did not increase their enrollment rates. Insurance did not result in increased overall service utilization, but, as expected, resulted in a switching to EMPs from other facilities not covered by the insurance program. We also found that the subsidized insurance significantly reduced enrollees' out-of-pocket health expenditures (not accounting for the insurance premium) for their most recent health care visit, and we observed indications that it reduced total household health expenditures in the prior year. Once subsidies for the premium expired, however, the insurance program experienced a low retention rate.

Using MFIs as delivery channels may be useful when government programs have limited outreach and infrastructure. In Nicaragua, MFIs saw the INSS insurance as a marketable complement to their existing credit services that helped them achieve their social missions. However, it is important not to underestimate the complexity involved in making this type of public-private partnership work. Suspicion about possible profit-oriented motivations of MFIs in Nicaragua damaged the tone of their working relationship with INSS, while a lack of political support from the government limited MFIs' incentive to market the insurance effectively. Strong strategic leadership and commitment are needed within both sectors to ensure that the operational arrangements are clear and incentives are well aligned. Administrative procedures for both affiliation and payments need to be easy and accessible, regardless of location. In Nicaragua, any formal decision to implement this program on a larger scale will require a very strong commitment from the INSS, MINSA, and perhaps higher political levels to ensure that sufficient resources and political weight support the roll out. In addition, the program design will need to be revisited in light of these evaluation results – particularly premium pricing, ease of registration, and bill payment. Finally, program managers will need to implement marketing and awareness-raising activities to inform the poor about the program and its benefits.

BIBLIOGRAPHY

Abel-Smith, B. 1992.
Health insurance in developing countries: Lessons from experience. *Health Policy and Planning* 7(3): 215-226.

Ahuja, R., and J. Jütting. 2004.
Are the poor too poor to demand health insurance? *Journal of Microfinance* 6:1, 1-20.

Alderman, H., and C.H. Paxson. 1994.
Do the poor insure? A synthesis of the literature on risk and consumption in developing countries. Economics in a changing world: Proceedings of the Tenth World Congress of the International Economic Association, Moscow, Volume 4, Development, Trade and the Environment. E. Bacha, New York: St. Martin's Press; London: Macmillan Press in association with the International Economic Association.

Atim, C. 1999.
Social movements and health insurance: A critical evaluation of voluntary, non-profit insurance schemes with case studies from Ghana and Cameroon. *Social Science and Medicine* 48, 881–896.

Behrman, J., and J. Knowles. 1999.
The demand for health insurance in Vietnam. Mimeo.

Carrin, G., M.P. Waelkens, and B. Criel. 2005.
Community-based health insurance in developing countries: A study of its contribution to the performance of health financing systems. *Tropical Medicine and International Health* 10, 799–811.

Central Bank of Nicaragua. 2008.
Nicaragua en chifras 2007 [Nicaragua in figures 2007]. Available online at http://www.bcn.gob.ni/.

Chankova, S., S. Sulzbach, and F. Diop. 2008.
Impact of mutual health organizations: Evidence from West Africa. *Health Policy and Planning,* 23(4): 264-276.

Chin-Quee, D., E. Keyes, and B. Janowitz. 2009.
Impact of the Banking on Health intervention to increase the provision of family planning services by INSS-contracted private health care providers in Nicaragua: Final report. Bethesda, MD: Private Sector Partnerships-*One* Project (Abt Associates Inc.).

Churchill, C. 2003.
Insurance work for microfinance institutions: A technical guide to developing and delivering microinsurance. InFocus Programme for Small Enterprise Development, International Labor Organization, Geneva.

Churchill, C., and M. Cohen. 2006.
Marketing Microinsurance. Churchill, C. (ed.), *In Protecting the poor: A microinsurance compendium*, International Labor Organization, Geneva.

Dercon, S. (2002).
Income risk, coping strategies and safety nets. *The World Bank Research Observer* 17(2), 141-166.

Dercon, S., M. Kirchberger, J.W. Gunning, and J. Platteau. (2008).
Literature Review on Microinsurance. *European Development Research Network.*

Dror, D., and A. Preker. 2002.
Social Reinsurance: A New Approach to Sustainable Community Health Financing. Washington, DC: The World Bank.

Fafchamps, M. 1998.
Risk sharing, quasi-credit, and the enforcement of informal contracts. Mimeograph, Department of Economics, Stanford University.

Franco, L., F. Diop, C. Burgert, A. Kelley, M. Makinen, and C. Simpara. (2008).
Effects of mutual health organizations on use of priority health-care services in urban and rural Mali: a case-control study. *Bulletin of the World Health Organization* 86(11):830-8.

Gine, X., R.M. Tonsend, and J. Vickery. 2007.
Patterns of Rainfall Insurance Participation in Rural India. Policy Research Working Paper Series 4408, The World Bank.

Gumber, A. and V. Kulkarni. (2000).
Health Insurance for Informal Sector: Case Study of Gujarat. *Economic and Political Weekly,* 30 Sept 2000.

Hatt, L., R. Thornton, B. Magnoni, and M. Islam. (2009).
Extending Social Security Insurance to Informal Sector Workers in Nicaragua via Microfinance Institutions: Results from a Randomized Evaluation. DRAFT Final Report for USAID – June 2009. Bethesda, MD: Private Sector Partnerships-*One* Project (Abt Associates Inc.) and Global Development Network.

Instituto Nacional de Información de Desarrollo (INIDE) and Ministerio de Salud (MINSA). 2007.
Encuesta Nicaragüense de Demografía y Salud (ENDESA) 2006/07, Informe Preliminar [Nicaragua Demographic and Health Survey 2006/07, Preliminary Report]. *http://www.inec.gob.ni/endesa/InformePrel07.pdf.*

Jakab, M., and C. Krishnan. 2001.
Community involvement in health care financing: A survey of the literature on the impacts, strengths and weaknesses. World Bank/CMH Discussion Paper, Washington DC, World Bank.

Jowett, M. 2003.
Do informal risk sharing networks crowd out public voluntary health insurance? Evidence from Vietnam. *Applied Economics* 35: 1153-1161.

Lu, C., B. Chin, G. Li, and C.J. Murray. 2009.
Limitations of methods for measuring out-of-pocket and catastrophic private health expenditures. *Bulletin of the World Health Organization* 87(3):238-244D.

Magnoni, B., N. Natilson, and G. Bolaños. 2005.
Estudio de Factibilidad de la Incorporación del Sector Laboral Independiente en el Seguro Facultativo de Salud del INSS. Original feasibility study submitted by the Banking on Health Project to the INSS in September 28, 2005.

Matin, I., D. Hulme, and S. Rutherford. 2002.
Finance for the poor: From microcredit to microfinancial services. *Journal of Economic Development* 14: 273-294.

McIntyre, D., M. Thiede, G. Dahlgren, and M. Whitehead (2006).
What are the economic consequences for households of illness and of paying for health care in low- and middle-income country contexts? *Social Science and Medicine* 62(4), 858-865

Morduch, J. 1999.
Between the State and the Market: Can Informal Insurance Patch the Safety Net? World Bank Res. Obs., August 1999, 14:187–207.

Morduch, J., & M. Sharmab (2002).
Strengthening Public Safety Nets from the Bottom Up. Washington, DC: The World Bank.

Narayan, D., R. Chambers, M. Shah, and P. Petesch (2000).
Voices of the poor: crying out for change. New York: Oxford University Press.

Preker, A.S., G. Carrin, D.M. Dror, M. Jakab, W. Hsaio, and D. Arhin (2002).
Effectiveness of Community Health Financing in Meeting the Cost of Illness. *Bulletin of the World Health Organization* 80(2): 143-150.

Russell, S. (2004).
The economic burden of illness for households in developing countries: a review of studies focusing on malaria, tuberculosis, and human immunodeficiency virus/acquired immunodeficiency syndrome. *Am J Trop Med Hyg,* 71(Suppl. 2), 147-155.

Smith, K. and S. Sulzbach (2008).
Community-based health insurance and access to maternal health services: evidence from three West African countries. *Social Science and Medicine* 66(12):2460-73.

Thornton, R., M. González Moncada, and M. Islam. 2008.
Randomized Evaluation of a Program Extending Social Security Health Insurance to the Informal Sector via MFIs in Nicaragua, Baseline Report. Bethesda, MD: Private Sector Partnerships-*One* Project (Abt Associates Inc.) and Global Development Network.

WHO Collaborating Centre for Drug Statistics Methodology. *ATC/DDD Index 2009***.**
Available online at *http://www.whocc.no/atcddd/*.

ANNEXES

ANNEX A: BASELINE SAMPLE CHARACTERISTICS, BY MFI CLIENT STATUS

Panel A:	MFI Client (N=1,013)		Non-MFI Client (N=1,595)		Difference
Demographic Characteristics	Mean	SD	Mean	SD	
Age	39.04	8.65	36.95	9.69	2.08***
Male	0.28	0.45	0.39	0.49	-0.11***
Years of education	9.25	4.15	9.27	4.27	-0.02
Married	0.70	0.46	0.70	0.46	0.00
Number of children	2.22	1.52	1.93	1.52	0.29***
With children under age 12	0.66	0.48	0.67	0.47	-0.01
Pregnant	0.03	0.18	0.03	0.17	0.00
Panel B:	MFI Client		Non-MFI Client		Difference
Economic Characteristics	Mean	SD	Mean	SD	
Monthly income	297.20	404.10	258.80	363.50	38.4***
Proportion with savings	0.28	0.45	0.30	0.46	-0.02
Monthly savings	23.40	157.90	26.20	158.90	-2.8
Last year's savings balance	141.50	609.70	148.50	551.90	-7.00
Owns home	0.80	0.40	0.74	0.44	0.06***
Total household health care costs (US$)	88.67	174.38	81.78	169.85	7.10
Total health care costs for respondent (US$)	51.68	128.77	43.20	104.20	6.95*
Cost of respondent's last visit (US$)	20.79	82.05	15.86	39.95	4.9

Note: This table presents sample statistics from 2,608 respondents baseline survey data. The last column presents differences in means of each variable between MFI clients and non-MFI clients.

* significant at 10%; ** significant at 5%; *** significant at 1%

ANNEX B: BASELINE HEALTH CHARACTERISTICS, BY MFI CLIENT STATUS

	MFI Client (N=1,013)	Non-MFI Client (N=1,595)	Difference
	Mean		
Panel A: Health Characteristics			
Ever experienced sickness in 2007	80%	80%	0.01
Number of times sick in 2007	2.59	2.55	0.08
Number of days waited to see doctor	4.75	4.04	0.70
Smokes	14%	16%	-0.03*
Diabetes	7%	5%	0.02**
Hypertension	21%	17%	0.03**
Heart problems	6%	5%	0.01
Respiratory problems	13%	14%	-0.01
Physical limitations	1%	1%	0.00
Sight/hearing limitations	27%	24%	0.03
Stress	17%	14%	0.03**
Kidney problems	27%	24%	0.02
Cancer	1%	1%	0.00
Headaches	40%	40%	0.01
Skin problems	8%	8%	0.00
Allergies	14%	15%	0.00
Flu	60%	60%	0.00
Fever	31%	33%	-0.03
Vomiting	8%	9%	-0.02
Diarrhea	10%	9%	0.00
Cough	18%	19%	-0.02
Chest pains	14%	15%	-0.01
Back pains	28%	26%	0.02
Dizziness	15%	18%	-0.03**
Panel B: Last Illness			
Allergies or Respiratory Illness	46%	50%	-0.04
Renal infection or diabetes	16%	13%	0.03
Circulatory problems	8%	7%	0.01
Diarrhea or Digestive problems	5%	5%	0.00
Arthritis	5%	4%	0.01
Gynecology visit	3%	3%	0.00
Dengue or Malaria	1%	2%	-0.01
Skin infection	1%	2%	-0.00
Other	14%	14%	-0.00

Note: This table presents sample statistics from 2,608 respondents baseline survey data. The last column presents differences in means of each variable between MFI clients and non-MFI clients.

* significant at 10%; ** significant at 5%; *** significant at 1%

ANNEX C: HEALTH FACILITIES VISITED IN THE PAST YEAR AT BASELINE, BY MFI CLIENT STATUS

Panel A:	Visited		Number of Visits		Expenditure		
MFI Clients (N=1,013)	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.	Median
Pharmacy	73%	0.44	3.47	4.78	45.19	89.49	16.04
Private doctor	32%	0.47	2.38	3.52	18.37	57.05	5.35
Laboratory	26%	0.44	2.06	1.89	32.03	85.81	13.37
Social Security Health Clinic (EMP)	1%	0.10	3.80	6.11	24.33	60.98	28.88
Private clinic/hospital	15%	0.36	2.57	2.52	26.11	84.59	7.49
Public (MINSA) health center	14%	0.35	2.58	2.81	0.34	2.38	2.41
Public (MINSA) hospital	9%	0.28	2.45	2.45	3.32	19.24	12.03
Panel B:	Visited		Number of Visits		Expenditure		
Non-MFI Clients (N=1,595)	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.	Median
Pharmacy	72%	0.45	3.03	3.69	41.05	92.31	16.04
Private doctor	26%	0.44	2.03	1.68	15.90	30.83	6.42
Laboratory	27%	0.45	2.10	3.19	21.84	41.02	13.37
Social Security Health Clinic (EMP)	0%	0.07	4.00	4.83	1.38	3.64	28.89
Private clinic/hospital	14%	0.35	2.13	1.88	22.61	65.14	7.49
Public (MINSA) health center	17%	0.37	2.92	3.24	0.21	1.76	2.41
Public (MINSA) hospital	9%	0.28	3.00	6.35	1.70	14.01	12.03

Note: This table presents sample statistics from 2,608 respondents baseline survey data. Presents proportion of the respondents who visited each provider in the past year. Number of respondent total visits and amount the respondent spent includes only those who actually went to that facility. Amount spent is presented in dollars.

ANNEX D: DIAGNOSES RECORDED IN EMP MEDICAL RECORDS REVIEW (ICD-10 CODES)

Code	Description	Diagnosis 1		Diagnosis 2		Combined	
J00-J99	Diseases of the respiratory system	221	*17%*	22	*9%*	245	*15%*
M00-M99	Diseases of the musculoskeletal system and connective tissue	148	*11%*	24	*10%*	172	*11%*
Z00-Z99	Factors influencing health status and contact with health services	157	*12%*	10	*4%*	169	*11%*
A00-B99	Certain infectious and parasitic diseases	112	*8%*	47	*19%*	160	*10%*
N00-N99	Diseases of the genitourinary system	141	*11%*	16	*7%*	160	*10%*
R00-R99	Symptoms, signs, and abnormal clinical and laboratory findings, not elsewhere classified	85	*7%*	24	*10%*	113	*7%*
K00-K93	Diseases of the digestive system	96	*7%*	16	*7%*	112	*7%*
I00-I99	Diseases of the circulatory system	79	*6%*	29	*12%*	108	*7%*
E00-E90	Endocrine, nutritional, and metabolic diseases	80	*6%*	15	*6%*	96	*6%*
L00-L99	Diseases of the skin and subcutaneous tissue	41	*3%*	8	*3%*	50	*3%*
G00-G99	Diseases of the nervous system	35	*3%*	12	*5%*	47	*3%*
S00-T98	Injury, poisoning, and certain other consequences of external causes	31	*2%*	5	*2%*	36	*2%*
F00-F99	Mental and behavioral disorders	25	*2%*	2	*1%*	27	*2%*
H60-H95	Diseases of the ear and mastoid process	22	*2%*	1	*0%*	25	*2%*
C00-D48	Neoplasms	22	*2%*	0	*0%*	22	*1%*
O00-O99	Pregnancy, childbirth and the puerperium	8	*1%*	7	*3%*	15	*1%*
D50-D89	Diseases of the blood and blood-forming organs and certain disorders involving the immune mechanism	6	*0%*	5	*2%*	12	*1%*
H00-H59	Diseases of the eye and adnexa	12	*1%*	0	*0%*	12	*1%*
Q00-Q99	Congenital malformations, deformations, and chromosomal abnormalities	1	*0%*	0	*0%*	1	*0%*
P00-P96	Certain conditions originating in the perinatal period	0	*0%*	0	*0%*	0	*0%*
V01-Y98	External causes of morbidity and mortality	0	*0%*	0	*0%*	0	*0%*
U00-U99	Codes for special purposes	0	*0%*	0	*0%*	0	*0%*
	N	1322	*100%*	243	*100%*	1582	*100%*

Note: For 32 visits, the medical file was opened but the patient did have a consultation. Therefore, a diagnosis code is recorded for only 1,322 out of 1,354 visits.

ANNEX E: DRUGS PRESCRIBED AT EMPs (FULL LIST)

Drug type	Prescription 1	Prescription 2	Prescription 3	Total prescriptions	Column percentage
Antibacterials for systemic use	223	90	20	333	15.7%
Anti-inflammatory and antirheumatic products	140	106	30	276	13.0%
Analgesics	70	101	24	195	9.2%
Drugs for acid related disorders	63	57	20	140	6.6%
Topical products for joint and muscular pain	57	51	9	117	5.5%
Cough and cold preparations	41	41	14	96	4.5%
Antithrombotic agents	22	43	28	93	4.4%
Agents acting on the renin-angiotensin system	43	27	12	82	3.9%
Vitamins	33	27	13	73	3.4%
Drugs used in diabetes	46	16	4	66	3.1%
Drugs for functional gastrointestinal disorders	27	24	14	65	3.1%
Gynecological antiinfectives and antiseptics	35	15	8	58	2.7%
Nasal preparations	28	20	6	54	2.5%
Antihistamines for systemic use	22	18	9	49	2.3%
Psycholeptics (antipsychotics, tranquilizers, sedatives)	14	23	8	45	2.1%
Corticosteroids, dermatological preparations	22	14	5	41	1.9%
Anthelmintics	18	14	5	37	1.7%
Antianemic preparations	25	7	2	34	1.6%
Muscle relaxants	13	13		26	1.2%
Beta blocking agents	10	7	7	24	1.1%
Sex hormones and modulators of the genital system	13	5	3	21	1.0%
Antidiarrheals, intestinal anti-inflammatory/anti-infective agents	7	9	3	19	0.9%
Blood substitutes and perfusion solutions	12	4	3	19	0.9%
Antimycotics for systemic use	12	6		18	0.8%
Mineral supplements	11	5	1	17	0.8%
Calcium channel blockers	9	3	3	15	0.7%
Ophthalmologicals	6	7	1	14	0.7%
Drugs for obstructive airway diseases	3	7	3	13	0.6%
Psychoanaleptics	8	2		10	0.5%
Antiemetics and antinauseants	4	2	2	8	0.4%
Diuretics	2	4	1	7	0.3%
Cardiac therapy	3	1	2	6	0.3%
Corticosteroids for systemic use	3	3		6	0.3%
Anesthetics	4	2		6	0.3%
Antibiotics and chemotherapeutics for dermatological use	3	1	1	5	0.2%
Urologicals	3	1	1	5	0.2%
Laxatives	3	1		4	0.2%
Antifungals for dermatological use	2	1		3	0.1%