

Major Applied
Research 2,
Working Paper 3

**The Use of Capitation
Payment by the Social
Security Institute and
Previsional Medical
Enterprises in
Nicaragua**

June 2000

Prepared by:

Bitrán y Asociados
Gloria Ubilla, M.Sc.
Consuelo Espinosa, M.P.P.
Ricardo Bitrán, Ph.D.

**Instituto Nicaragüense de
Seguridad Social**
Pedro Quintanilla, M.D.
José Ramón Zamora, M.S.



Partnerships
for Health
Reform



Abt Associates Inc. ■ 4800 Montgomery Lane, Suite 600
Bethesda, Maryland 20814 ■ Tel: 301/913-0500 ■ Fax: 301/652-3916

In collaboration with:

Development Associates, Inc. ■ Harvard School of Public Health ■
Howard University International Affairs Center ■ University Research Co., LLC



Funded by:

U.S. Agency for International Development



Partnerships
for Health
Reform

Mission

The Partnerships for Health Reform (PHR) Project seeks to improve people's health in low- and middle-income countries by supporting health sector reforms that ensure equitable access to efficient, sustainable, quality health care services. In partnership with local stakeholders, PHR promotes an integrated approach to health reform and builds capacity in the following key areas:

- > *Better informed and more participatory policy processes in health sector reform;*
- > *More equitable and sustainable health financing systems;*
- > *Improved incentives within health systems to encourage agents to use and deliver efficient and quality health services; and*
- > *Enhanced organization and management of health care systems and institutions to support specific health sector reforms.*

PHR advances knowledge and methodologies to develop, implement, and monitor health reforms and their impact, and promotes the exchange of information on critical health reform issues.

June 2000

Recommended Citation

Ubilla, Gloria, Consuelo Espinosa, and Ricardo Bitrán. 2000. *The Use of Capitation Payments by the Social Security Institute and Provisional Medical Enterprises*. Major Applied Research 2, Working Paper 3. Bethesda, MD: Partnership for Health Reform, Abt Associates, Inc.

For additional copies of this report, contact the PHR Resource Center at PHR-InfoCenter@abtassoc.com or visit our website at www.phrproject.com.

Contract No.: HRN-C-00-95-00024
Project No.: 936-5974.13

Submitted to:

Robert Emrey, COTR
Policy and Sector Reform Division
Office of Health and Nutrition
Center for Population, Health and Nutrition
Bureau for Global Programs, Field Support and Research
United States Agency for International Development

The opinions stated in this document are solely those of the author(s) and do not necessarily reflect the views of USAID.

Abstract

In 1994, Nicaragua externalized the provision of health care from the *Instituto Nicaragüense de Seguridad Social*, introduced competition between public and private health care providers, called *Empresas Médicas Previsionales* (EMP), and created a system of per capita payments in exchange for a basic benefits package. This paper attempts to test whether the effects that the literature predicts for capitation—e.g., growth and relatively more intense utilization of outpatient care, a decrease in hospitalization rates and the average length of hospital stays—are present in the Nicaraguan context. The study also examines the effects of capitation on physicians' working conditions and on market structure. To reach its findings, the study used historical data and information gathered through two *ad-hoc* surveys, one for patients and the other for physicians.

As expected, the EMPs have adopted a mix of services that emphasizes prevention and primary care over higher levels of care. However, because these results are influenced by changes in insurance coverage, technology, and the country's epidemiological situation, it is not possible to attribute them solely to the change in the provider payment mechanism. On the other hand, the study did not find evidence of changes in physicians' working conditions or remuneration basis, although their real average incomes went up with the reform. Finally, the number of EMPs has grown significantly since the implementation of the system, and the market has tended to become less concentrated.

Table of Contents

| | |
|--|-----|
| Acronyms..... | vii |
| Foreword..... | ix |
| Acknowledgments | xi |
| 1. Introduction | 1 |
| 2. Study Objectives | 3 |
| 3. Health Sector Background..... | 5 |
| 4. Theoretical Framework | 9 |
| 5. Methodology..... | 11 |
| 6. Findings..... | 15 |
| 6.1 Effect of Reform on the Output of Health Care Providers..... | 15 |
| 6.1.1 Utilization Rates | 15 |
| 6.1.2 Utilization Rates by EMP Group..... | 17 |
| 6.1.3 Amount and Structure of Health Spending..... | 21 |
| 6.1.4 Physicians' Satisfaction with the Reformed System..... | 24 |
| 6.1.5 User Satisfaction..... | 25 |
| 6.2 Working Conditions and Characteristics of EMP Physicians | 27 |
| 6.3 Effect of the reform on market structure..... | 29 |
| 6.3.1 Market Characterization | 29 |
| 6.3.2 Market segmentation | 31 |
| 7. Conclusions | 33 |
| Annex: Bibliography..... | 35 |

List of Figures

| | |
|--|----|
| Figure 1. INSS Beneficiaries, Nicaragua, 1978-1998..... | 5 |
| Figure 2. Performance Comparisons..... | 12 |
| Figure 3. Per Capita Expenditures INSS-EMP. Nicaragua 1974-78 and 1994-98..... | 22 |
| Figure 4. Percent of Total Expenditures INSS-EMP. Nicaragua 1974-78; 1994-98 | 24 |

List of Tables

| | |
|---|----|
| Table 1. Evolution of Monthly per Capita at INSS | 6 |
| Table 2. Affiliates Average Annual Salary | 7 |
| Table 3. Research Questions, Hypotheses, Comparisons, and Expected Results | 10 |
| Table 4. Outpatient and Emergency Care Indices. Nicaragua 1974-1978; 1994-1998..... | 16 |
| Table 5. Inpatient Care Indices, Nicaragua, 1974-1978 and 1994-1998 | 17 |
| Table 6. Comparative Performance Public and Private EMPs. Nicaragua, 1994-1998. | 18 |
| Table 7. Comparative Performance Large and Small EMPs. Nicaragua, 1994-1998..... | 19 |
| Table 8. Comparative Performance Old and New EMPs. Nicaragua, 1994-1998. | 20 |
| Table 9. Comparative Performance Managua and Other EMPs. Nicaragua, 1994-1998..... | 21 |
| Table 10. Distribution of Expenditures by Types of EMP. Nicaragua, 1998 | 22 |
| Table 11. Quantum per Member by Level of Care at INSS-EMP.23 Nicaragua, 1974-1978; 1994-1998 (US\$1998)..... | 23 |
| Table 12. Physicians' Working Conditions by Type of EMP.25 Nicaragua, 1999 (% of physicians Satisfied or Very Satisfied)..... | 25 |
| Table 13. Physicians' Satisfaction by Type of EMP. Nicaragua, 199925 (% of Physicians Satisfied or Very Satisfied) | 25 |
| Table 14. Patients' Satisfaction by Type of EMP. Nicaragua, 1999 (%)..... | 26 |
| Table 15. Physicians' Average Annual Remuneration by Type of EMP.28 Nicaragua, 1994-1998 (US\$ 1999) | 28 |
| Table 16. Sources of Physicians' Total Income. Nicaragua, 1994-1998 (US\$ 1999) | 28 |
| Table 17. Average Number of Insured by Type of EMP. Nicaragua, 1998 | 30 |
| Table 18. Number of EMPs and Market Concentration Index. Nicaragua 1994-1998..... | 30 |
| Table 19. Member Profile by Type of EMP. Nicaragua, 1999 | 31 |

Acronyms

| | |
|--------------|--|
| C | Cordoba (Nicaraguan currency) |
| EMP | Empresas Médicas Previsionales |
| GP | General Practice |
| INSS | Instituto Nacional de Seguridad Social |
| MOH | Ministry of Health |
| PHR | Partnerships for Health Reform Project |
| USAID | United States Agency for International Development |

Currency Conversion

C 10.7 = US\$1.00

Foreword

Part of the mission of the Partnerships in Health Reform Project (PHR) is to advance “knowledge and methodologies to develop, implement, and monitor health reforms and their impact.” This goal is addressed not only through PHR’s technical assistance work but also through its Applied Research program, designed to complement and support technical assistance activities. The program comprises Major Applied Research studies and Small Applied Research grants.

The Major Applied Research topics that PHR is pursuing are those in which there is substantial interest on the part of policymakers, but only limited hard empirical evidence to guide policymakers and policy implementors. Currently researchers are investigating six main areas:

- > Analysis of the process of health financing reform
- > The impact of alternative provider payment systems
- > Expanded coverage of priority services through the private sector
- > Equity of health sector revenue generation and allocation patterns
- > Impact of health sector reform on public sector health worker motivation
- > Decentralization: local level priority setting and allocation

Each Major Applied Research Area yields working papers and technical papers. Working papers reflect the first phase of the research process. The papers are varied; they include literature reviews, conceptual papers, single country-case studies, and document reviews. None of the papers is a polished final product; rather, they are intended to further the research process—shedding further light on what seemed to be a promising avenue for research or exploring the literature around a particular issue. While they are written primarily to help guide the research team, they are also likely to be of interest to other researchers, or policymakers interested in particular issues or countries.

Ultimately, the working papers will contribute to more final and thorough pieces of research work, such as multi-country studies and reports presenting methodological developments or policy relevant conclusions. These more polished pieces will be published as technical papers.

All reports will be disseminated by the PHR Resource Center and via the PHR website.

Sara Bennett, Ph.D.
Director, Applied Research Program
Partnerships for Health Reform

Acknowledgments

This paper has benefited greatly from comments by Annemarie Wouters, consultant to the Partnerships for Health Reform (PHR) Project, and Sara Bennett, PHR Applied Research Director.

1. Introduction

There is little empirical evidence about the impact of different provider payment mechanisms on the performance and structure of the health industry in developing countries. Nearly all of the available empirical work is based on data and experiences from managed care organizations in the United States. However, while the U.S. health care system has evolved from a situation of excessive consumption to one of greater cost containment, health care in developing countries has always been characterized by a persistent lack of resources and unsatisfied demand. Therefore, the conclusions derived from the empirical studies carried out in industrialized countries are not directly applicable to the developing world. Furthermore little is understood about how provider organizational structure and market structure mediate the effect of different forms of payment, such as capitation. For example, how do provider organizations facing new payment incentives pass these incentives on to individual physicians.

To limit the size of the state and preserve the macroeconomic equilibrium, international development organizations have promoted a health sector reform model involving purchaser–provider split and a greater participation of the private sector in financing and provision. Establishing payment mechanisms that create appropriate incentives is a fundamental part of these reform processes.

Nicaragua has been a pioneer of health sector reform in Latin America. Until 1978, the Nicaraguan Social Security Institute (*Instituto Nicaragüense de Seguridad Social*, INSS) provided generous health care coverage to its members, formal sector workers and their families, and had its own network of providers. From 1979 to 1990, during the Sandinista regime, the Ministry of Health (MOH) gained responsibility for all of INSS's hospitals and health facilities, making the state the only provider of health services in Nicaragua. INSS no longer participated in health care provision during this period, and access to health care for INSS beneficiaries deteriorated. In 1994, the country externalized the provision of health care from INSS, introduced competition between public and private health care providers, and implemented capitation contracting between INSS and providers, who would offer a standard benefits package. This study attempts to draw lessons for Nicaragua and for countries engaged in, or planning to adopt, a similar reform.

This paper is organized as follows. Section 2 presents study objectives. Section 3 contains background information on Nicaragua's health sector. Section 4 offers a theoretical frame about the effects of capitation upon which hypotheses are formulated about the expected results of the reform. Section 5 describes the study methods. Section 6 presents study results. Finally, Section 7 draws study conclusions.

2. Study Objectives

The study had the following three objectives:

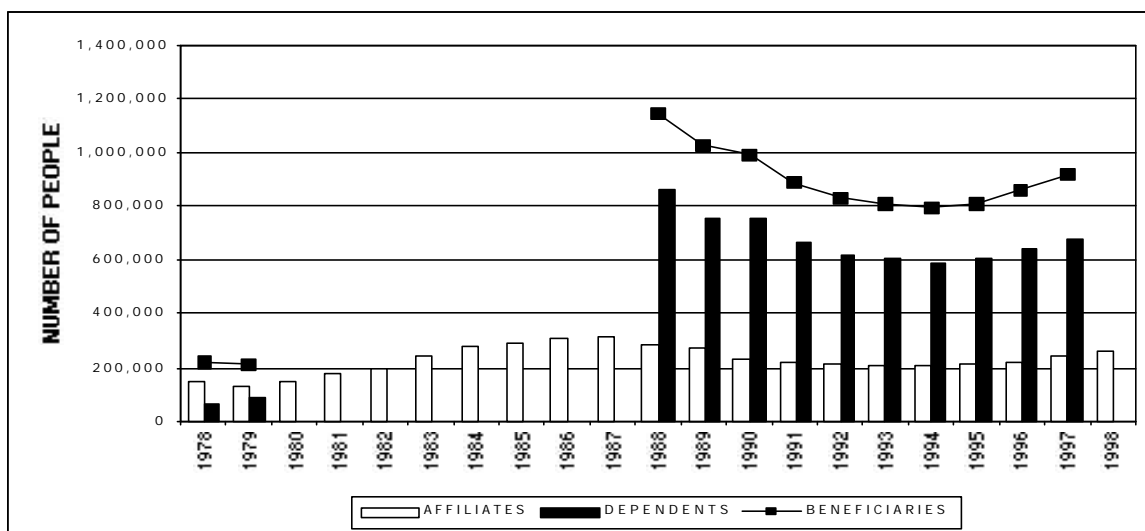
1. Examine how the provider payment reform has affected the output of health care providers. In particular, analyze whether the reform has altered the distribution of public and private resources between primary/preventive care and secondary/tertiary care.
2. Study the effects that capitation has had on the physicians' working conditions.
3. Examine how capitation has affected the structure of the market for health services (e.g., the number and types of providers, market concentration, market segmentation).

3. Health Sector Background

Three clear turning points have occurred in the recent history of the Nicaraguan health care system: the development of social security (1955), the creation of a single, unified health care system (1979), and the implementation of a managed, competitive model (1994).

The first stage began with the creation of INSS, the objective of which was to provide formal sector workers with health care and maternity insurance, pensions, and workers' compensation. Until 1979 (marked by the arrival of the Sandinista government) INSS provided health services through its own network of medical providers, which included three hospitals, one medical specialty polyclinic, and several outpatient facilities, most located in urban areas around the country. By 1979 INSS had a total of 129,517 affiliates (Figure 1) representing 7 percent of the nation's labor force, 84,287 dependents, and a total of 213,804 beneficiaries (about 5 percent of Nicaragua's population). INSS affiliates were for the most part formally employed workers; only a small proportion was made up of independent workers who subscribed to INSS on a voluntary basis.

Figure 1. INSS Beneficiaries, Nicaragua, 1978-1998



Source: PHR research protocol impact of health care provider payment reform in Nicaragua's Social Security Institute

In a second stage, the Marxist Sandinista government created a single, unified national health care system. While INSS did not disappear as an institution, all of its health care facilities and its revenue from insurance premiums were turned over to the MOH. As a consequence, quality and access to care dropped significantly for INSS beneficiaries, causing a decrease in enrollment and an increase in the evasion of contributions.

In the third stage, a new government came to power in 1990 and initiated a reform designed to restore health care benefits for the INSS population. The reform sought to limit the role of the State in health care, supporting reorganization and decentralization of the system, and encouraging private sector participation in delivery. As a result, in 1994 INSS implemented a new system whereby it

would no longer produce health care services but would instead purchase them from external providers through capitated contracts. This meant that INSS would pay a monthly, previously agreed upon sum of money to the contracted provider, per beneficiary, in exchange for an agreed upon set of medical benefits.

Currently, INSS purchases health care services both from public and private providers organized as Previsional Medical Enterprises (*Empresas Médicas Previsionales*, EMP), several of which have been created since 1994. The EMPs must provide INSS beneficiaries with a basic health benefits package, covering common illnesses and maternity, in exchange for the monthly per capita payment. By the end of 1999 INSS paid the selected EMP a monthly capita of \$12.16 per beneficiary. This capita has dropped over time in real terms and also when expressed in U.S. dollars (see Table 1). EMPs cover both primary and secondary care. All EMPs have their own primary care facilities but the majority contracts out the provision of inpatient care and diagnostic services, usually with public hospitals. Nonetheless, the trend in recent years has been to expand and vertically integrate services. EMPs are allowed to provide care to non-INSS patients; however, more than 95 percent of their patients are INSS enrollees.

Table 1. Evolution of Monthly per Capita at INSS

| | 1994 | 1996 | Jan 1999 |
|-------------------------------|--------|--------|----------|
| Nominal per cápita (C\$) | 97 | 113 | 1030.68 |
| Real per cápita (C\$) | 160.32 | 134.77 | 130.68 |
| Per cápita (C\$) | 11.41 | 9.74 | 12.16 |
| Exchange rate (C\$ per 1US\$) | 7.8 | 11.6 | 10.7 |

Sources: Instituto Nicaragüense de Seguridad Social, 1997 and Price Waterhouse Coopers, 1998

At present, INSS covers approximately 6 percent of Nicaragua's population (260,000 beneficiaries), and its affiliates represent 25 percent of the labor force. The insurance covers the affiliated worker, his wife or partner, and his children up to six years of age. Only the insured workers and their children are entitled to the full set of benefits contained in the basic package; an affiliate's wife only has access to obstetric/gynecological care. Additionally, the insured worker has a right to sick leave and maternity leave, while infants less than six months of age receive a subsidy for nursing. INSS pays a fixed amount per household, regardless of its size, age, or risk.

The benefits package is defined through a so-called *negative list* by excluding a series of treatments and procedures, such as CAT scan, electroencephalogram, dialysis, transplants, mental health, radiotherapy and chemotherapy, neurological diseases, and infectious diseases of mandatory reporting (AIDS, tuberculosis, leishmaniasis, leprosy, rabies).

INSS is financed by the contributions made by the employer (12.5 percent of the payroll), the worker (4.0 percent), and the government (0.5 percent). One-half of this total, or 8.5 percentage points, is designated for health insurance. In 1998 the contributor's average annual salary was US\$2,609, and the total amount of contributions collected was US\$41.4 million (see Table 2).¹ This is an important amount of resources in the Nicaraguan context, considering that the MOH's executed budget for the same year was US\$66.6 million. In fact, as shown in a study conducted in 1996, INSS

¹ Equivalent to 443,055 million córdobas, at the exchange rate of 1US\$ = 10.7 córdobas.

managed 10.3 percent of the nation's overall health care expenditure, including household out-of-pocket expense (*Comité Técnico Cuentas Nacionales en Salud*, 1997). The share of INSS expenditure on public sector expense on health care was 15.2 percent.

Table 2. Affiliates Average Annual Salary

| Year | Average Annual Salary (C\$ 1998) | Average Annual Salary (US\$) | Contributions Collection (US\$) |
|-------------|---|---|--|
| 1994 | 31.192 | 2.378 | 26.502.455 |
| 1995 | 29.858 | 1.831 | 21.563.642 |
| 1996 | 28.813 | 1.845 | 23.352.797 |
| 1997 | 28.948 | 2.363 | 32.685.833 |
| 1998 | 31.263 | 2.609 | 41.406.836 |

Source: Authors' estimates using data from Instituto Nicaragüense de Seguridad Social, 1997 and Price Waterhouse Coopers, 1998.

4. Theoretical Framework

Payment mechanisms generate incentives that affect the efficiency of health care production, the quality of care, and the equity of financing and delivery. The effect on each of these factors depends on the payment mechanism selected and the institutional context where it is applied (Robinson, 1993). The main challenge of setting up a payment method is adopting one that promotes desirable behaviors to further the objectives of the health care system while discouraging unwanted actions. Ideally, payments should be made per cured patient or for improvements in health status, but one of the greatest practical difficulties in establishing adequate incentives is measuring the performance of providers in terms of health outcomes (McGuire et al., 1988:242).

In practice, the most commonly used payment mechanisms are fee-for-service and capitation. Nicaragua's INSS chose the latter. Capitation consists of a fixed periodic payment made by the insurer to the provider, per beneficiary covered. Since the payment is independent of whether or not the insured person becomes ill and the quantity of health care services he or she consumes, the risk of a greater-than-expected expense is transferred to the provider. As opposed to fee-for-service, demand induction under capitation only increases costs but not revenues. The provider's profitability depends exclusively on its ability to attract and retain affiliates and its capacity to keep average costs below the capitation rate (Robinson and Cassalino, 1996).

Capitation provides incentives to improve allocative and technical efficiency, since it is in the provider's interest to prioritize the most cost-effective care and to produce at minimum cost.² This also implies a greater emphasis on primary care than on specialty care, on outpatient care than on inpatient care, and an increase in prevention.

But capitation can also have negative consequences on health care quality, particularly in the absence of competition. Capitation may induce risk selection: if capitation is not risk adjusted, providers have an incentive to trim their budgets by eliminating high-cost affiliates (Newhouse, 1996; Robinson, 1993).

For capitation to function adequately the size of the risk pool must be sufficiently large.³ Otherwise the financial risk for individual providers would be unbearable. It is estimated that a primary care physician needs at least 2,000 members to successfully deal with risk (Wouters, 2000). In the United States, prepaid group practices at risk for all health care expenses of the patient enroll tens to thousands of individuals per plan (Phelps, 1992:357).

The capitation contract may include all of the medical services that an individual can demand or only some of them. For example, a capitated contract may only cover primary care, although such an arrangement would confer the provider an incentive to over-refer patients and shift costs to higher levels of care. On the other hand, when the group of services covered is more comprehensive, the

² A firm reaches technical efficiency when it produces the maximum possible output for a given level of inputs. This concept is more restricted than allocative efficiency, where either inputs or outputs are put to their best possible uses in the economy and welfare is maximized (Folland et al., 1997:599).

³ According to the law of large numbers, the variance in expense per member falls with the square root of the number of enrollees (Phelps, 1992: 357).

provider has a greater incentive to efficiently coordinate the continuum of services (from well care to emergency surgery). Therefore, the provider may develop new, more cost-effective care modalities and place a greater emphasis on prevention and health promotion.

Capitation works as long as each physician in the organization responds to the incentives created. The physicians are the individuals who control the largest share of health expenditure (The Governance Committee, 1994:88). Both physicians' groups and hospitals face the problem of motivating the individual physicians. To produce increases in efficiency, the physicians must coordinate their actions, since the effort of each individual physician has a relatively small impact on cost containment (Phelps, 1992:348). If the physicians in a group or hospital are paid with fixed salaries, the incentives diminish enormously, and a bureaucratic culture not directed towards the goal develops. As a response to this problem, hospitals have developed variable compensation systems, such as bonuses, profit sharing, and individual capitation. However, the physicians' motivation depends on non-financial incentives as well, such as strong leadership, utilization controls, medical education, and peer pressure (The Governance Committee, 1995:105).

Table 3. Research Questions, Hypotheses, Comparisons, and Expected Results

| Research Question | Major Hypothesis | Method | Variables Being Compared | Expected Results |
|--|--|--|--|--------------------------------|
| How has capitation affected the performance of health care providers? | Will increase use of primary care and outpatient care? | 1994-1998 data of EMPs compared with 1974-1978 data of INSS | Rate of outpatient visits | + |
| | | | Rate of general practice (GP) visits | + |
| | Will reduce utilization of secondary and tertiary care? | 1994-1998 EMPs compared with 1994-1998 MOH | Rate of specialist visits | - |
| | | | First visit / total visits | + |
| | Will induce lower unit and per capita costs? | 1999 EMPs' Patients Survey | Lab tests/ visit | - |
| | | | Radiology tests / visit | - |
| | | | Prescriptions/ visit | - |
| | | | Rate of emergency visits | - |
| | | 1999 EMPs' Physicians Survey | % Emergency visits/all visits | - |
| | | | Rate of hospital admissions | - |
| | | | ALOS | - |
| | | | % C-sections/ total deliveries | - |
| | | | Sick leave days | - |
| | | | Per capita expenditure | - |
| | | | Primary care expenditure per capita | + |
| | | | Primary care expenditure/Total expenditure | + |
| | | | Patient satisfaction | ? |
| | | | Physicians' satisfaction | ? |
| What effects has capitation had on physicians' working conditions? | Increase in the utilization of GPs in the delivery of care | 1999 EMPs' Physicians Survey | Average annual remuneration | ? |
| | | | Seniority in the profession | - |
| | Individual physicians also bear some risk | | Seniority in the specialty | - |
| | | | Work schedule | ? |
| | | | Bonuses and variable remuneration | Yes |
| How capitation has altered the structure of the market for health care services? | Risk segmentation | 1999 EMPs' Patients Survey | Percentage of female patients | Different between types of EMP |
| | Decreasing market concentration | 1994-1998 INSS Database of EMPs | Average age of patients | Different between types of EMP |
| | | EMPs grouped according to size, years in business, region, and ownership | Number of EMPs Herfindhal index | + - |

5. Methodology

As stated above, the study sought to analyze the effects of capitation on provider output (objective 1), physicians' working conditions (objective 2), and market structure (objective 3). Provider output was assessed through an analysis of utilization rates, case mix, amount and structure of expenditures, sick leave days, and user satisfaction. Physicians' working conditions were analyzed by looking at trends in physicians' income, work schedules, and remuneration mechanisms. The study also looked at the years that physicians employed by the EMPs have practiced the profession and the medical specialty. To detect any changes in market structure, trends in the number of EMPs in the market were examined, as well as EMP enrollment and average size. Market concentration indices were calculated, and an attempt was made at establishing whether or not EMPs engaged in risk selection leading to market segmentation.

The analysis involved two institutions, INSS and the MOH, and encompassed two time periods, before the Sandinista government (1974-78) and after (1994-98). The Sandinista period (1979-90) was left out of the analysis for two reasons: there is no information available on utilization rates and health services costs for that period, and INSS health services disappeared and were integrated with MOH's during that time. The period immediately following the Sandinista government (1990-93) was also excluded from the analysis because INSS's health reform was not implemented until 1994. The pre-reform INSS was a social security agency whose own providers produced the medical services demanded by its beneficiaries. EMPs did not exist at the time. The post-reform INSS, in contrast, was an agency that did not produce any medical care; instead, it purchased it from EMPs.

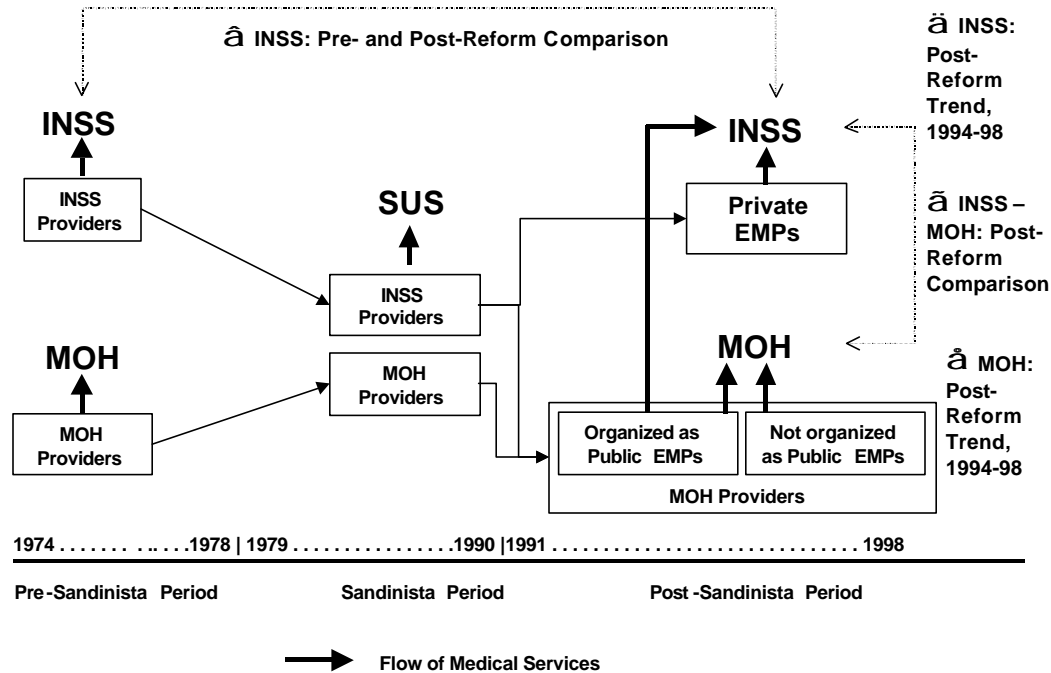
Thus, as shown in Figure 2 the analysis involved four comparisons:

1. INSS's pre- and post-reform performance;
2. Trends in INSS's post-reform performance;
3. INSS–MOH post-reform performance; and
4. Trends in MOH's post-reform performance.

In addition, the study team assessed whether there were any systematic differences in utilization rates and other variables according to the size, years in business, location, and ownership of the EMPs. The criterion to classify the EMPs according to size and years in business was the median for each variable (number of insured and length of time in business measured in months). The cut point was 1998 but data for the same groups in the previous years are presented.

The team carried out two surveys for this study, one on a sample of EMP physicians, to examine working conditions, and another on a sample of EMP users, to assess consumer satisfaction.

Figure 2. Performance Comparisons



Both surveys were applied to a sample of 12 EMPs, selected using the following criteria:

1. The study team made a list of the 49 existing EMPs and gathered information about each one according to the following characteristics: (1) Population enrolled; (2) type of ownership—public or private; (3) whether the enterprise existed before becoming an EMP; (4) years in business; and (5) district to which it belongs.
2. The team then created a subset of EMPs, consisting of the EMPs that were operating as of December 31, 1998, a total of 38.
3. The team selected the final subset according to the following two principles. First, it forced the inclusion of the four largest EMPs and the two public EMPs that were operating in December 1998, a total of six. Second, it stratified the remaining EMPs into six groups of five, according to their size (large or small) and location (Managua or other). It then randomly selected one EMP per group. A total of 12 EMPs was finally selected, or 31 percent of the EMPs that existed as of December 1998. However, because of time constraints it was only possible to conduct surveys in 11 of them.

Among the EMP selected, 20 percent of the physicians, or a minimum of five physicians per EMP, were surveyed. For example, if the staff had 40 physicians, eight were surveyed. An equal number of specialists and primary care physicians was selected. If the EMP had fewer than 25 physicians on its staff, five were surveyed. A total of 46 physicians were finally surveyed.

For each of the above EMPs, the team also surveyed 30 outpatient patients, for a total of 320 observations. This sample is only representative of the members who actually went to the facilities on the day of the survey. The sample is not representative of the total EMP member population, since

that population also includes individuals who do not require medical care or who were admitted to hospitals. The sample was selected in the following way:

1. All persons entering the facility were given a card, which recorded the time that they arrived.
2. As each of these persons left the EMP, they were asked to turn in their card, and the time that they left was also recorded. They were asked three questions and filled out a form to quickly select the sample. The questions were: Are you enrolled in the EMP as an INSS beneficiary? Did you receive medical care or did you carry out some transaction in the EMP? Did you come to the facility today to visit someone? If the answer to the first two questions was “yes” and the answer to the third was “no”, then the survey was applied.
3. The survey was applied to a sample of 30 persons per EMP. All persons who complied with the requirements in point 2 were surveyed, until 30 surveys were completed.

For the period 1974-78, the study team obtained information on INSS’s utilization rates and costs from the institution’s internal records. For 1994-98, the team analyzed magnetic data on use and costs supplied monthly by the EMPs to INSS, and information contained in INSS’s Statistical Yearbooks (*Anuarios Estadísticos*). The MOH supplied utilization statistics from its General Directory of Information Services, but had no data on costs or expenditure.

6. Findings

6.1 Effect of Reform on the Output of Health Care Providers

6.1.1 Utilization Rates

From the above analysis, the introduction of capitated payments into the Nicaraguan health care system should induce a higher utilization rate for primary care and a lower utilization rate for secondary and tertiary care. Additionally, outpatient care should take precedent over inpatient care, and the number of tests, procedures, and medications per visit should drop. Hospitalization rates and the average length of hospital stays should also drop.

Outpatient care. The total number of EMP outpatient visits per beneficiary seems to have dropped in the year following the reform, but then jumped and stabilized at around 4.5 visits per year, a rate very similar to that observed for INSS in the 1970s (Table 4). After the reform, the EMPs exhibited a growing number of general practitioner visits per beneficiary, while the per capita number of specialist visits remained about constant. The specialist visit rates were substantially lower among EMPs relative to the situation at INSS before the reform. Also, the EMPs' share of first to total visits was much higher (albeit declining) after the reform than at INSS in the 1970s, suggesting an increase in efficiency of care since presumably more health problems are solved with just one visit. The number of laboratory tests per visit among EMPs remained more or less stable between 1994 and 1998 and was slightly higher than in the 1970s. As regards radiology tests, the EMPs showed a decreasing trend with the reform. The number of prescriptions per visit was lower in the 1990s than in the 1970s, although there was mild growth after the reform.

In most years following the reform, the EMPs provided nearly twice as many visits per capita as the MOH. The growing trend in the number of visits per beneficiary seen in EMPs also took place in the MOH, although it was greater among the former. In comparison with the MOH, the EMPs have had a much larger share of first to return visits, implying that they may have had a greater ability to solve the patients' medical problems during their first visit. In spite of this, however, in recent years the MOH seems to have increased its efficiency, as seen by its rising ratio of first to repeat visits. There were only few differences between EMPs and MOH with regard to lab tests, while prescription rates at EMPs exceeded those at the MOH.

Emergency room visits. The rate of emergency room visits among EMPs in 1998 was slightly greater than it was at INSS 10 years earlier; however, it quadrupled from 1995 to 1998. In the MOH, the trend has been the opposite: the rate of emergency room visits has actually dropped in recent years. In 1998, the rate of emergency room visits in MOH facilities was nearly half that of EMPs. According to the standards set by the Pan American Health Organization, in a performing health system, emergency room visits should not exceed 10 percent of total visits. Among EMPs, emergency room visits grew, as a percentage of the total, from about 3 percent in 1994 to 8 percent in 1998. In contrast, the MOH fell from 12 percent to slightly more than 8 percent.

Table 4. Outpatient and Emergency Care Indices. Nicaragua 1974-1978; 1994-1998

| | Index | Pre-Reform | | | | | Post-Reform | | | | |
|----------|--|------------|------|------|------|------|-------------|------|------|------|------|
| | | 1974 | 1975 | 1976 | 1977 | 1978 | 1994 | 1995 | 1996 | 1997 | 1998 |
| INSS-EMP | Total visits/beneficiary per year | 4.6 | 5.2 | 5.3 | 5.0 | 4.4 | 1.3 | 3.2 | 3.4 | 5.2 | 4.7 |
| | GP visits/beneficiary per year | 3.9 | 4.4 | 4.5 | 4.1 | 3.6 | 1.1 | 2.8 | 2.8 | 4.5 | 4.1 |
| | Specialist visits/beneficiary per year | 0.7 | 0.8 | 0.9 | 0.9 | 0.8 | 0.2 | 0.4 | 0.5 | 0.7 | 0.5 |
| | % First visits/all visits | 25.4 | 18.9 | 19.0 | 21.1 | 21.8 | 77.3 | 81.4 | 51.4 | 53.5 | 50.7 |
| | Lab tests/visit | 0.2 | 0.2 | 0.3 | 0.4 | 0.5 | 0.6 | 0.6 | 0.5 | 0.5 | 0.5 |
| | Radiology tests/visit | 0,06 | 0,07 | 0,07 | 0,08 | 0,05 | 0,02 | 0,03 | 0,03 | 0,02 | 0,03 |
| | Prescriptions/visit | 2.8 | 3.0 | 3.2 | 3.3 | 3.4 | 1.1 | 1.4 | 1.9 | 1.9 | 2.3 |
| | Emergency visits/beneficiary per year | 0.2 | 0.1 | 0.2 | 0.2 | 0.3 | 0.0 | 0.1 | 0.2 | 0.3 | 0.4 |
| | % Emergency visits/all visits | 3.6 | 2.4 | 3.9 | 4.4 | 6.6 | 2.7 | 3.3 | 4.2 | 6.1 | 8.0 |
| MOH | Total visits/beneficiary per year | NA | NA | NA | NA | NA | 1.7 | 2.0 | 2.0 | 2.0 | 1.9 |
| | GP visits/beneficiary per year | NA | NA | NA | NA | NA | - | - | - | - | - |
| | Specialist visits/beneficiary per year | NA | NA | NA | NA | NA | - | - | - | - | - |
| | % First visits/all visits | NA | NA | NA | NA | NA | 14.1 | 11.5 | 21.3 | - | - |
| | Lab tests/visit | NA | NA | NA | NA | NA | 1.1 | 0.6 | 0.6 | 0.6 | 0.6 |
| | Radiology tests/visit | | | | | | | | | | |
| | Prescriptions/visit | NA | NA | NA | NA | NA | 1.1 | 0.9 | 0.9 | 0.9 | 0.9 |
| | Emergency visits/beneficiary per year | NA | NA | NA | NA | NA | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 |
| | % Emergency visits/all visits | NA | NA | NA | NA | NA | 11.8 | 10.0 | 9.2 | 9.2 | 8.3 |

Source: Authors' estimates using data from INSS 1974-1978 and 1994-1997, database 1998.

Hospitalizations and deliveries. The hospitalization rates per INSS policyholder in 1997 and 1998 were similar to those observed 10 years earlier: around 10 percent including deliveries, and 6 percent excluding them (Table 5). This indicator is relatively high when compared to countries with similar economic development. The rate of cesarean sections in the EMPs was more than 40 percent, while at the MOH it was below 20 percent. The number of cesarean sections increased steadily among EMPs. This is an unexpected finding since the economic incentives of capitation should lead to a decrease in the proportion of cesarean sections. These are more expensive than normal deliveries, so rational agents would perform only those which are strictly recommended on clinical basis. However, one explanation for the observed pattern may be that cesarean sections offers the possibility of scheduling deliveries in advance and hence there may be less need for on-call doctors. The average length of a hospital stay for INSS in the 1990s was significantly shorter than in the 1970s, an effect that is more marked if hospitalizations for deliveries are excluded. Before the reform a patient was hospitalized for an average of around 10 days, while after the reform the average stay was less than three days. A similar contrast is found between the MOH and the EMPs: the average length of stay for MOH patients is more than double that of EMP patients.

Table 5. Inpatient Care Indices, Nicaragua, 1974-1978 and 1994-1998

| Index | | Pre-Reform | | | | | Post-Reform | | | | |
|----------|--|------------|------|------|------|------|-------------|------|------|------|------|
| | | 1974 | 1975 | 1976 | 1977 | 1978 | 1994 | 1995 | 1996 | 1997 | 1998 |
| INSS-EMP | Admissions/1000 beneficiaries per year | 80 | 100 | 120 | 110 | 100 | 16 | 42 | 59 | 99 | 99 |
| | Admissions (not including deliveries)/1000 beneficiaries | 50 | 60 | 70 | 70 | 60 | 8 | 22 | 32 | 59 | 63 |
| | % C-sections/ total deliveries | 11.2 | 11.2 | 13.7 | 14.6 | 16.7 | - | - | 42.4 | 45.6 | 44.2 |
| | Average length of stay (days) | 8.1 | 7.8 | 7.1 | 7.2 | 6.6 | 1.4 | 1.6 | 2.4 | 2.5 | 2.4 |
| | Average length of stay excluding OBGYN | 11.5 | 10.5 | 9.6 | 10.0 | 9.4 | 1.6 | 2.1 | 2.8 | 2.8 | 2.6 |
| | Average length of stay for C-sections | 6.4 | 13.1 | 9.7 | 10.8 | 9.7 | - | - | 2.2 | - | 2.6 |
| | Average length of stay all deliveries | 2.5 | 3.7 | 3.4 | 3.7 | 3.5 | - | - | 1.7 | 2.6 | 1.8 |
| MOH | Admissions/1000 beneficiaries per year | NA | NA | NA | NA | NA | 60 | 70 | 60 | - | - |
| | Admissions (not including deliveries)/1000 beneficiaries | NA | NA | NA | NA | NA | 40 | 40 | 40 | - | - |
| | % C-sections/ total deliveries | NA | NA | NA | NA | NA | 17.5 | 17.9 | 19.4 | - | - |
| | Average length of stay (days) | NA | NA | NA | NA | NA | 4.5 | 4.5 | 4.6 | - | - |
| | Average length of stay excluding OBGYN | NA | NA | NA | NA | NA | 4.9 | 5.7 | 5.2 | - | - |
| | Average length of stay for C-sections | NA | NA | NA | NA | NA | - | - | - | - | - |
| | Average length of stay all deliveries | NA | NA | NA | NA | NA | 2.3 | 2.4 | 2.3 | - | - |

Source: Authors' estimates using data from INSS 1974-1978 and 1994-1997, database 1998

6.1.2 Utilization Rates by EMP Group

Tables 6 through 9 provide information on utilization rates by type of EMP. In practically all years studied, the public EMPs show a higher rate of specialist visits and a lower rate of general practice (GP) visits than the private EMPs. This would imply that the public EMPs respond less strongly than the private enterprises to the capitation incentives, which may be a sign of lower efficiency.

The greatest difference in utilization rates among all categories of services is in the number of prescriptions per visit. The large EMPs prescribe 15 times more medications than their smaller counterparts; the old EMPs nearly six times more than their new counterparts; the EMPs in Managua and the public EMPs around five times more than their rural and private counterparts, respectively. This behavior is repeated for the number of lab tests per visit. In absolute terms, the public EMPs are those with the largest number of prescriptions and tests per visit. They also show the worst resolute capacity, measured as the percentage of first visits over the total. This reinforces the idea that the public EMPs operate less efficiently than the private enterprises.

The public EMPs show a systematically higher hospitalization rate than their private counterparts, both in total admissions and in non-obstetric admissions. It is likely that the public

EMPs face greater rigidities in responding to the capitation incentives. In addition, the public EMPs show a greater percentage of cesarean sections than their private counterparts. The average length of stay is also longer for the state-owned EMPs than for the private enterprises.

There are no significant differences in the average length of stay per delivery among the different EMP categories. The average length of stay for a normal birth is around a day and a half for all categories of EMP, and a cesarean sections requires nearly three days.

Table 6. Comparative Performance Public and Private EMPs. Nicaragua, 1994-1998.

| | Index | Public | | | | | Private | | | | |
|------------|--|--------|------|------|------|------|---------|------|------|------|------|
| | | 1994 | 1995 | 1996 | 1997 | 1998 | 1994 | 1995 | 1996 | 1997 | 1998 |
| OUTPATIENT | GP visits/beneficiary per year | 0.6 | 1.7 | 2.3 | 3.9 | 4.4 | 1.8 | 3.4 | 3.0 | 4.7 | 4.0 |
| | Specialist visits/beneficiary per year | 0.1 | 0.4 | 0.7 | 0.9 | 0.6 | 0.2 | 0.4 | 0.5 | 0.6 | 0.5 |
| | Emergency visits/beneficiary per year | 0.03 | 0.04 | 0.04 | 0.05 | 0.30 | 0.05 | 0.15 | 0.18 | 0.43 | 0.43 |
| | Total outpatient visits/beneficiary per year | 0.7 | 2.1 | 3.1 | 4.8 | 5.4 | 2.0 | 3.9 | 3.7 | 5.7 | 5.0 |
| | % First visits/all visits | | | | | 33 | | | | | 49 |
| | Prescriptions/visit | | | | | 13.7 | | | | | 2.7 |
| | Lab tests/ visit | | | | | 3.2 | | | | | 0.7 |
| | Nº days of sick leave/visit | | | | | 7.8 | | | | | 10.4 |
| INPATIENT | Admissions/1000 beneficiaries per year | 26 | 50 | 61 | 99 | 102 | 1 | 6 | 44 | 85 | 87 |
| | Admissions (not including deliveries)/1000 beneficiaries | 10 | 21 | 32 | 57 | 65 | 0 | 1 | 22 | 51 | 54 |
| | % C-sections/ total deliveries | | | | | 47 | | | | | 42 |
| | Average length of stay OBGYN (days) | | | | | 2.1 | | | | | 2.0 |
| | Average length of stay other admissions | | | | | 2.9 | | | | | 2.6 |
| | Average length of stay for C-sections | | | | | 2.6 | | | | | 2.7 |
| | Average length of stay all deliveries | | | | | 1.8 | | | | | 1.9 |
| | Nº days sick leave/hospital admission | | | | | 17.0 | | | | | 16.8 |

Sources: INSS: 1974-1978 and 1994-1997, database 1998

Table 7. Comparative Performance Large and Small EMPs. Nicaragua, 1994-1998.

| Index | | Large | | | | | Small | | | | |
|------------|--|-------|------|------|------|------|-------|------|------|------|------|
| | | 1994 | 1995 | 1996 | 1997 | 1998 | 1994 | 1995 | 1996 | 1997 | 1998 |
| OUTPATIENT | GP visits/beneficiary per year | 1.1 | 2.7 | 2.8 | 4.5 | 4.1 | 1.4 | 3.8 | 3.0 | 5.4 | 4.0 |
| | Specialist visits/beneficiary per year | 0.1 | 0.4 | 0.5 | 0.7 | 0.5 | 0.1 | 0.5 | 1.4 | 0.6 | 0.4 |
| | Emergency visits/beneficiary per year | 0.0 | 0.1 | 0.2 | 0.3 | 0.4 | 0.0 | 0.1 | 0.1 | 0.2 | 0.1 |
| | Total outpatient visits/beneficiary per year | 1.3 | 3.2 | 3.5 | 5.5 | 5.1 | 1.5 | 4.4 | 4.4 | 6.2 | 4.5 |
| | % First visits/all visits | | | | | 46 | | | | | 42 |
| | Prescriptions/visit | | | | | 5.9 | | | | | 0.4 |
| | Lab tests/ visit | | | | | 1.5 | | | | | 0.1 |
| | Nº days of sick leave/visit | | | | | 10.1 | | | | | 10.5 |
| INPATIENT | Admissions/1000 beneficiaries per year | 12 | 34 | 56 | 96 | 99 | 34 | 37 | 70 | 92 | 87 |
| | Admissions (not including deliveries)/1000 beneficiaries | 4 | 14 | 29 | 56 | 63 | 16 | 15 | 41 | 57 | 59 |
| | % C-sections/ total deliveries | | | | | 41 | | | | | 44 |
| | Average length of stay OBGYN (days) | | | | | 2.0 | | | | | 1.9 |
| | Average length of stay other admissions | | | | | 2.7 | | | | | 2.2 |
| | Average length of stay for C-sections | | | | | 2.7 | | | | | 2.8 |
| | Average length of stay all deliveries | | | | | 1.8 | | | | | 2.0 |
| | Nº days sick leave/hospital admission | | | | | 16.2 | | | | | 17.9 |
| | | | | | | | | | | | |
| | | | | | | | | | | | |

Sources: INSS: 1974-1978 and 1994-1997, database 1998

Table 8. Comparative Performance Old and New EMPs. Nicaragua, 1994-1998.

| | Index | Old | | | | | New | | | | |
|-------------------|--|------|------|------|------|------|------|------|------|------|------|
| | | 1994 | 1995 | 1996 | 1997 | 1998 | 1994 | 1995 | 1996 | 1997 | 1998 |
| OUTPATIENT | GP visits/beneficiary per year | 1.1 | 2.8 | 2.9 | 4.4 | 4.1 | | 2.7 | 1.7 | 5.1 | 4.2 |
| | Specialist visits/beneficiary per year | 0.1 | 0.4 | 0.5 | 0.7 | 0.5 | | 0.1 | 0.3 | 0.8 | 0.5 |
| | Emergency visits/beneficiary per year | 0.0 | 0.1 | 0.1 | 0.3 | 0.4 | | 0.0 | 0.4 | 0.4 | 0.4 |
| | Total outpatient visits/beneficiary per year | 1.3 | 3.3 | 3.6 | 5.5 | 5.1 | | 2.8 | 2.3 | 6.3 | 5.0 |
| | % First visits/all visits | | | | | 48 | | | | | 34 |
| | Prescriptions/visit | | | | | 4.8 | | | | | 0.9 |
| | Lab tests/ visit | | | | | 1.2 | | | | | 0.1 |
| | Nº days of sick leave/visit | | | | | 10.4 | | | | | 9.8 |
| INPATIENT | Admissions/1000 beneficiaries per year | 12 | 34 | 57 | 94 | 100 | 0 | 0 | 43 | 112 | 89 |
| | Admissions (not including deliveries)/1000 beneficiaries | 5 | 14 | 30 | 55 | 64 | 0 | 0 | 25 | 62 | 56 |
| | % C-sections/ total deliveries | | | | | 41 | | | | | 45 |
| | Average length of stay OBGYN (days) | | | | | 2.0 | | | | | 1.9 |
| | Average length of stay other admissions | | | | | 2.7 | | | | | 2.3 |
| | Average length of stay for C-sections | | | | | 2.6 | | | | | 2.9 |
| | Average length of stay all deliveries | | | | | 1.8 | | | | | 2.1 |
| | Nº days sick leave/hospital admission | | | | | 17.3 | | | | | 15.4 |

Sources: INSS: 1974-1978 and 1994-1997, database 1998

Table 9. Comparative Performance Managua and Other EMPs. Nicaragua, 1994-1998.

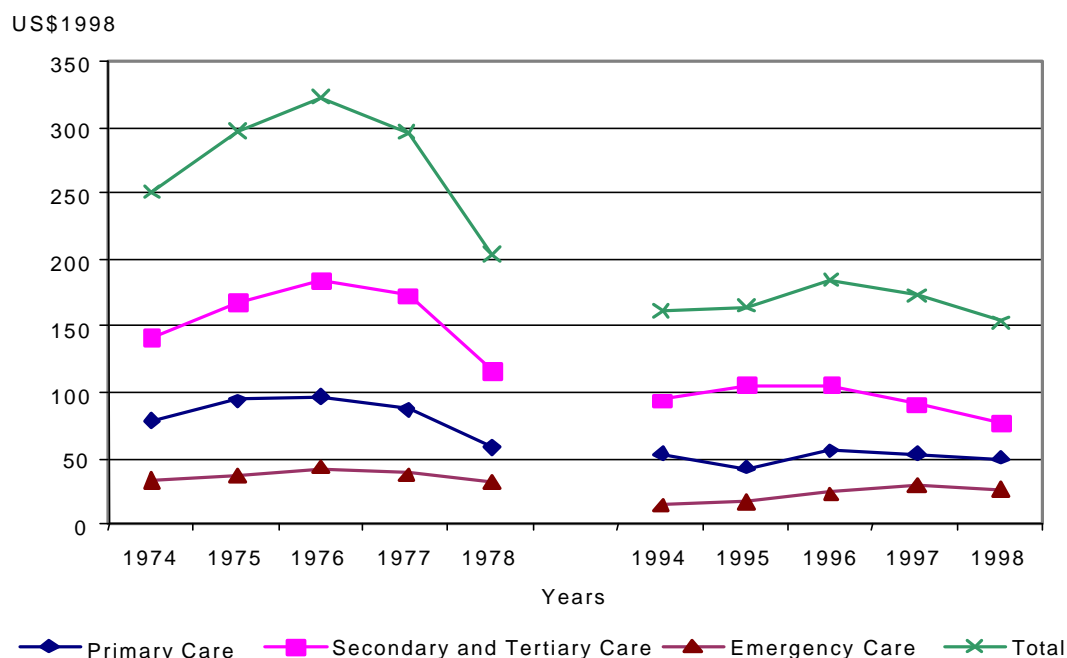
| | Index | Managua | | | | | Other | | | | |
|------------|--|---------|------|------|------|------|-------|------|------|------|------|
| | | 1994 | 1995 | 1996 | 1997 | 1998 | 1994 | 1995 | 1996 | 1997 | 1998 |
| OUTPATIENT | GP visits/beneficiary per year | 1.0 | 2.4 | 2.7 | 4.1 | 3.8 | 2.0 | 4.5 | 3.5 | 5.8 | 5.0 |
| | Specialist visits/beneficiary per year | 0.1 | 0.3 | 0.4 | 0.6 | 0.5 | 0.2 | 0.6 | 0.9 | 0.9 | 0.6 |
| | Emergency visits/beneficiary per year | 0.03 | 0.11 | 0.17 | 0.37 | 0.47 | 0.05 | 0.11 | 0.06 | 0.22 | 0.22 |
| | Total outpatient visits/beneficiary per year | 1.2 | 2.8 | 3.3 | 5.1 | 4.8 | 2.3 | 5.2 | 4.5 | 6.9 | 5.9 |
| | % First visits/all visits | | | | | 44 | | | | | 50 |
| | Prescriptions/visit | | | | | 6.7 | | | | | 1.5 |
| | Lab tests/ visit | | | | | 1.9 | | | | | 0.2 |
| | Nº days of sick leave/visit | | | | | 8.9 | | | | | 11.1 |
| INPATIENT | Admissions/1000 beneficiaries per year | 9 | 30 | 53 | 93 | 95 | 38 | 50 | 73 | 104 | 108 |
| | Admissions (not including deliveries)/1000 beneficiaries | 3 | 13 | 26 | 53 | 59 | 15 | 17 | 42 | 63 | 74 |
| | % C-sections/ total deliveries | | | | | 42 | | | | | 43 |
| | Average length of stay OBGYN (days) | | | | | 2.0 | | | | | 2.0 |
| | Average length of stay other admissions | | | | | 2.8 | | | | | 2.3 |
| | Average length of stay for C-sections | | | | | 2.6 | | | | | 2.8 |
| | Average length of stay all deliveries | | | | | 1.8 | | | | | 2.0 |
| | Nº days sick leave/hospital admission | | | | | 16.8 | | | | | 16.7 |

Sources: INSS: 1974-1978 and 1994-1997, database 1998

6.1.3 Amount and Structure of Health Spending

Between 1994 and 1998 INSS expenditure per policyholder dropped slightly at all levels of care (Figure 3), with the exception of emergency care, which showed an explosive growth starting in 1994. Expenditure on primary care fell 7 percent during the same period, and expenditure on secondary and tertiary care decreased 18 percent. INSS per capita health spending was smaller in the 1990s than in the 1970s for all categories of care, including emergency care. The difference between the periods was particularly dramatic for secondary and tertiary care. The small EMPs, the new EMPs, and the EMPs outside of Managua spend a larger share of their resources on primary care than their counterparts (Table 10) Between the public and private EMPs, however, there are no significant differences.

Figure 3. Per Capita Expenditures INSS-EMP. Nicaragua 1974-78 and 1994-98.



Source: Numerator: 1974-1978 expense report for illness and maternity from the INSS 1974-78; 1994-1998 estimate of expenditure on illness and maternity based on per capita payment minus subsidies. Denominator: 1974-1978 all insured for maternity and illness, 1994-1998 only the insured that are enrolled in EMPs.

Table 10. Distribution of Expenditures by Types of EMP. Nicaragua, 1998

| Type of EMP | Total Expenditure on Primary Care | Total Expenditure on Secondary and Tertiary Care | Total Expenditure on Emergency Care | Average Expenditure Per EMP (Us\$ Mill.)* |
|-------------|-----------------------------------|--|-------------------------------------|---|
| Large | 34.3 | 48.5 | 17.2 | 1.369.836 |
| Small | 37.5 | 50.6 | 11.9 | 126.558 |
| Old | 34.9 | 49.8 | 15.3 | 1.157.783 |
| New | 37.3 | 48.9 | 13.9 | 208.515 |
| Managua | 32.0 | 49.6 | 18.4 | 1.623.039 |
| Other | 37.8 | 49.4 | 12.8 | 352.029 |
| Public | 35.4 | 48.6 | 16.0 | 2.970.555 |
| Private | 35.8 | 49.5 | 14.7 | 674.489 |
| Total | 32.5 | 50.4 | 17.2 | 23.655.132 |

Sources: Own estimates based on INSS: 1974 -1978 and 1994-1997, database 1998

*Average expenditure for each EMP in that category.

INSS health spending may vary over time owing to changes in the types of services delivered to beneficiaries, or in the unit cost of those services, or both. Ideally, one would like to be able to ascertain the independent effects that these two factors may have on total spending. Unfortunately, that is not possible in this case because INSS did not keep information on unit costs of care in the

1970s. To overcome in part the difficulties arising from this gap in information, the study used unit cost data from 1998 to calculate INSS annual health spending before and after the reform. This exercise amounts to determining how changes in utilization over time would affect INSS's total health spending if that institution faced a stable vector of unit costs over time. In particular, since the unit cost of secondary and tertiary care output is higher than that of ambulatory care, relative changes in outpatient and inpatient activity would translate into changes in total spending. Thus, with constant unit costs of services, a greater emphasis on primary and preventive care might result in a drop in total spending.

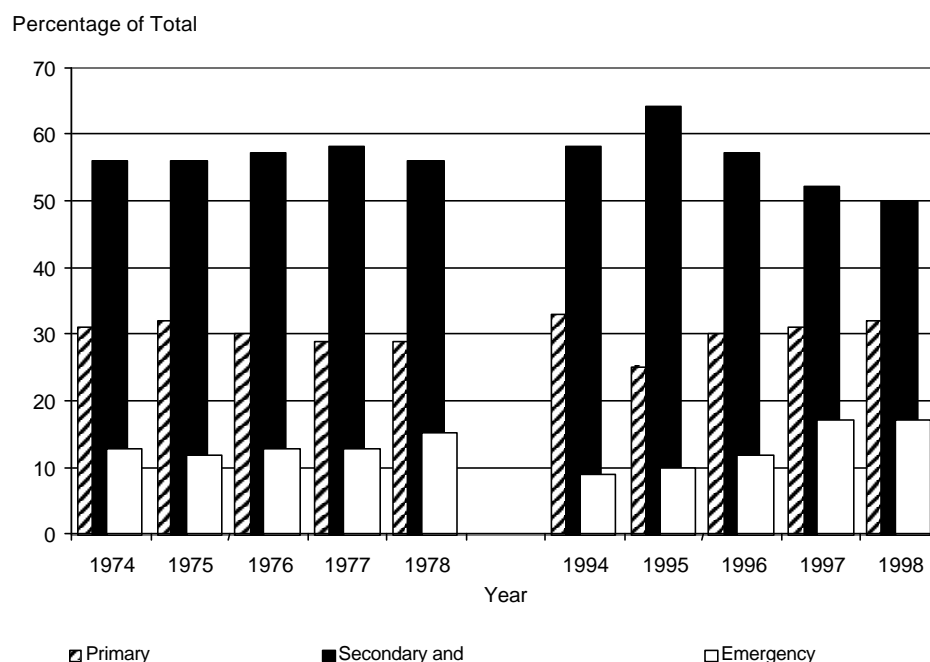
The result of this exercise is presented in Table 11. The cost "quantum" (annual output valued at 1998 unit costs) behaved in a volatile manner after the reform, although on average it was less than that recorded in the 1970s. Between 1994 and 1998 the trend has been a slight increase in primary care expenditure and emergency care expenses. The most remarkable change occurred in secondary and tertiary care expenditure, which dropped dramatically between 1995 and 1996, recovering only half of its previous level in the following years. All three categories exhibit a lower expenditure in the 1990s than in the 1970s. Primary health care's share of total spending remained approximately constant in both periods, at around 30 percent (Figure 4). Expenditure shares for secondary and tertiary care fell while the spending share of emergency care increased.

**Table 11. Quantum per Member by Level of Care at INSS-EMP.
Nicaragua, 1974-1978; 1994-1998 (US\$1998)**

| Index | Pre-Reform | | | | | Post-Reform | | | | |
|---|------------|------|------|------|------|-------------|------|------|------|------|
| | 1974 | 1975 | 1976 | 1977 | 1978 | 1994 | 1995 | 1996 | 1997 | 1998 |
| Total quantum per member | 117 | 142 | 159 | 156 | 142 | 26 | 139 | 61 | 101 | 90 |
| Quantum per member in primary care | 36 | 45 | 47 | 45 | 41 | 9 | 35 | 26 | 31 | 29 |
| Quantum per member in secondary and tertiary care | 66 | 80 | 91 | 91 | 80 | 15 | 89 | 26 | 53 | 45 |
| Quantum per member in emergency care | 16 | 17 | 21 | 20 | 21 | 2 | 14 | 10 | 17 | 15 |

Source: Authors' estimates using data from INSS 1974-1978 and 1994-1997, database 1998

Figure 4. Percent of Total Expenditures INSS-EMP. Nicaragua 1974-78; 1994-98



Source: Authors' estimates using data from INSS 1974-1978 and 1994-1997, database 1998.

6.1.4 Physicians' Satisfaction with the Reformed System

Nearly 60 percent of the physicians surveyed felt that with EMPs, INSS beneficiaries were receiving more preventive care and less elective surgery (Table 12). The physicians' overall satisfaction with the reformed system was fairly high (Table 13). Almost two-thirds of those surveyed were either satisfied or very satisfied with the system overall. The public EMPs received the lowest ratings, with only 50 percent of the physicians satisfied, and the new EMPs received the highest ratings, with all physicians satisfied. Across all the EMPs, the factor that physicians rated lowest was their remuneration. The factor with the highest score was training, with 80 percent of physicians being satisfied or better. In the public EMPs, the health infrastructure and remuneration received lower ratings than the average.

**Table 12. Physicians' Working Conditions by Type of EMP.
Nicaragua, 1999 (% of physicians Satisfied or Very Satisfied)**

| | Type Of EMP | | | | | | | | Total |
|--|-------------|-------|-----|-----|---------|-------|--------|---------|-------|
| | Large | Small | Old | New | Managua | Other | Public | Private | |
| Seniority in the specialty (years) | 5 | 6 | 5 | 5 | 5 | 5 | 5 | 5 | 5 |
| Seniority in the profession (years) | 10 | 9 | 10 | 10 | 10 | 9 | 11 | 9 | 10 |
| Seniority in the EMP (years) | 2 | 2 | 2 | 1 | 2 | 1 | 2 | 2 | 2 |
| Full-time contracts (%) | 51 | 14 | 48 | 0 | 50 | 36 | 50 | 44 | 46 |
| Part-time contracts (%) | 49 | 86 | 52 | 100 | 50 | 64 | 50 | 56 | 54 |
| More than one employer (%) | 67 | 86 | 68 | 100 | 72 | 64 | 90 | 64 | 70 |
| Feel they earn more or much more than before (%) | 65 | 43 | 62 | 50 | 57 | 71 | 56 | 63 | 61 |
| Feel that there has been a change in remuneration mechanisms (%)* | 32 | 50 | 34 | 50 | 39 | 25 | 44 | 32 | 35 |
| Feel that there has been a change in the type of health services delivered (%)** | 65 | 29 | 55 | 69 | 60 | 50 | 62 | 50 | 59 |

Source: Survey of physicians who work in EMPs, 1999.

*Regarding the actual payment modality, of the 46 physicians surveyed, 45 have a fixed salary and one has a salary plus incentives.

**Of the 26 physicians who felt that there was a change, 11 responded that there was more preventative care, 20 that there were more diagnostic tests, 13 that there was less elective surgery, 10 that there were less medical prescriptions, and 3 that there is less flexibility in prescribing medications.

**Table 13. Physicians' Satisfaction by Type of EMP. Nicaragua, 1999
(% of Physicians Satisfied or Very Satisfied)**

| | Type of EMP | | | | | | | | Total |
|----------------------------------|-------------|-------|-----|-----|---------|-------|--------|---------|-------|
| | Large | Small | Old | New | Managua | Other | Public | Private | |
| Overall satisfaction | 64 | 57 | 61 | 100 | 56 | 79 | 50 | 67 | 63 |
| Satisfaction with remuneration | 36 | 0 | 33 | 0 | 28 | 36 | 20 | 33 | 30 |
| Satisfaction with infrastructure | 59 | 57 | 59 | 50 | 56 | 64 | 40 | 64 | 59 |
| Satisfaction with training | 79 | 86 | 80 | 100 | 84 | 71 | 80 | 81 | 80 |
| Satisfaction with resources | 54 | 29 | 50 | 50 | 53 | 43 | 50 | 50 | 50 |

Source: Survey of physicians who work in EMPs. On a scale of 1 to 5, 4 or 5 was marked.

6.1.5 User Satisfaction

On average, patients waited for about half an hour to receive care, and patients of public EMPs had to wait longer than patients of private EMPs. The small and the new EMPs demanded less time of their patients. The length of the actual visit was similar in all EMP categories. Except in the small EMPs, a physician saw nearly all those surveyed. The length of a visit with a physician was similar in all EMP categories, averaging 13 minutes.

More than 70 percent of the users surveyed in all EMP categories felt that, overall, the health care provided was good (Table 14). There were not significant differences in patient satisfaction between public and private EMPs and among EMPs in Managua and elsewhere.

Table 14. Patients' Satisfaction by Type of EMP. Nicaragua, 1999 (%)

| | Patients' Satisfaction | | | |
|--------------------------|------------------------|-------------------|------------------|----------------------|
| | Overall | With the Facility | With the Service | With the Medications |
| Size | | | | |
| Large | | | | |
| Fair or poor | 27.6 | 21.4 | 16.1 | 28.4 |
| Good or excellent | 72.4 | 72.4 | 72.4 | 72.4 |
| Small | | | | |
| Fair or poor | 23.7 | 18 | 20.5 | 33.3 |
| Good or excellent | 76.3 | 82 | 79.5 | 66.7 |
| Ownership | | | | |
| Private | | | | |
| Fair or poor | 26.9 | 20.8 | 18.4 | 27.4 |
| Good or excellent | 73.1 | 79.2 | 81.6 | 72.6 |
| Public | | | | |
| Fair or poor | 28.2 | 21.4 | 10.5 | 34.8 |
| Good or excellent | 71.8 | 78.6 | 89.5 | 65.2 |
| Years in business | | | | |
| Old | | | | |
| Fair or poor | 27.3 | 21.2 | 16.5 | 28.6 |
| Good or excellent | 72.7 | 78.8 | 83.5 | 71.4 |
| New | | | | |
| Fair or poor | 22.2 | 11.1 | 22.2 | 44.4 |
| Good or excellent | 77.8 | 88.9 | 77.8 | 55.6 |
| Location | | | | |
| Managua | | | | |
| Fair or poor | 27.4 | 20.9 | 17.1 | 30.1 |
| Good or excellent | 72.6 | 79.1 | 82.9 | 69.9 |
| Other | | | | |
| Fair or poor | 26.6 | 21.1 | 15.8 | 26.6 |
| Good or excellent | 73.4 | 78.9 | 84.2 | 73.4 |
| Total | | | | |
| Fair or poor | 27.2 | 21.1 | 10.4 | 44.4 |
| Good or excellent | 72.8 | 78.9 | 89.6 | 55.6 |

Source: Survey of EMPs' patients, 1999

With respect to the specific satisfaction factors, the new EMPs received the highest ratings regarding the facility (comfort, cleanliness, and quality of medical equipment). Similarly, the small EMPs, the private EMPs, and the EMPs in Managua received higher ratings for their facilities than their counterparts. Patients felt that public EMPs provided the best care (admission, care from physicians, care from nurses, services from other professionals), although those facilities scored low for availability and quality of medications. Similarly, the large EMPs, the old EMPs, and those outside of Managua were rated higher than their counterparts on this factor.

In summary, patient waiting time, the duration of care, and the qualifications of the medical personnel suggest that care was of fair quality, a view that is shared by the users surveyed.

6.2 Working Conditions and Characteristics of EMP Physicians

This section examines the trends in EMP physician income in the post-reform period, and explores any systematic differences in physicians' working conditions according to EMP size, years in business, location, and ownership. As explained in section 4, one would expect that the introduction of capitation should induce more flexible and incentive-based labor terms and conditions. Particularly, the share of physicians' performance-based income would increase under a capitation payment mechanism. Capitation may also induce EMPs to negotiate exclusive deals with physicians, so their sources of income and the number of employers should diminish. Therefore, the predominant work schedule should be full-time. It is more likely that more experienced physicians would not participate in the system, since they already have enough private patients. Physicians' perceptions would depend on how the reform has altered their incomes and alternatives to practice medicine. The U.S. experience shows that physician average pay has decreased in real terms after the introduction of capitation and managed care (Martin, 1998).

Income. Physicians' real income grew significantly after the reform was implemented, although with major differences in average income among EMP categories (Table 15). Between 1994 and 1999, the large EMPs increased their average annual payment to physicians by a factor of nearly five in real terms. In contrast, from 1995 to 1997, the small EMPs reduced their payments to doctors, such that only by 1999 were the physicians able to restore their 1994 income levels. In 1999, physicians working in small EMPs were paid half as much as those employed in large EMPs; likewise, doctors employed in old EMPs made twice as much as those in new EMPs. The income of doctors working in EMPs located in Managua on average was two-thirds higher than that of doctors employed outside of the capital city. Public EMPs paid somewhat better than the private ones. The amount that public EMPs pay to doctors grew by nearly a factor of six between 1994 and 1999, surpassing the private EMPs by 16 percent in 1999. The observed increase in doctor's average pay in Nicaragua may be explained by the overall growth in resources managed by INSS after the reform.

**Table 15. Physicians' Average Annual Remuneration by Type of EMP.
Nicaragua, 1994-1998 (US\$ 1999)**

| Type of EMP | Physician's Annual Income (US\$ 1999) | | | | | |
|-------------|---------------------------------------|-------|-------|-------|-------|-------|
| | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 |
| Large | 825 | 1,276 | 1,687 | 1,890 | 2,539 | 3,792 |
| Small | 1,031 | 923 | 913 | 893 | 1,498 | 1,982 |
| Old | 896 | 1,277 | 1,640 | 1,818 | 2,461 | 3,615 |
| New | 0 | 0 | 0 | 0 | 605 | 1,350 |
| Managua | 974 | 1,410 | 1,844 | 1,976 | 2,719 | 3,997 |
| Other | 596 | 790 | 938 | 1,196 | 1,609 | 2,418 |
| Public | 688 | 1,616 | 1,971 | 1,845 | 2,933 | 3,940 |
| Private | 905 | 1,112 | 1,457 | 1,710 | 2,227 | 3,399 |

Source: Survey of physicians who work in EMPs, 1999

Sources of income. Between 1994 and 1996 nearly 30 percent of the total income of an average physician employed by an EMP came from sources other than the EMP (Table 16). In 1998, this percentage increased to almost 40 percent.

Table 16. Sources of Physicians' Total Income. Nicaragua, 1994-1998 (US\$ 1999)

| Year | EMP | | Other | | Total | |
|------|-------|----|-------|----|-------|-----|
| | US\$ | % | US\$ | % | US\$ | % |
| 1994 | 856 | 66 | 451 | 34 | 1,307 | 100 |
| 1995 | 1,222 | 71 | 489 | 29 | 1,711 | 100 |
| 1996 | 1,569 | 71 | 632 | 29 | 2,201 | 100 |
| 1997 | 1,738 | 67 | 862 | 33 | 2,600 | 100 |
| 1998 | 2,381 | 63 | 1,374 | 37 | 3,755 | 100 |
| 1999 | 3,517 | 69 | 1,596 | 31 | 5,113 | 100 |

Source: Survey of physicians who work in EMPs, 1999

Experience. EMP physicians had an average of 10 years experience in the profession and five years in their specialty. Public EMPs stood out for having physicians with slightly more experience than the average.

Work schedule. Most EMP doctors have a part-time contract with the EMP. In newer EMPs, doctors have contracts for a more reduced work schedule than in more mature EMPs, a difference also present between small and large EMPs. Finally, it is noteworthy that in the public EMPs, 90 percent of the physicians have more than one employer, yet a full half of them have a full-time contract with the MOH.

Physicians' perceptions of the system. More than 60 percent of those surveyed felt that their overall income had improved with the creation of the EMPs. Interestingly, the percentage of physicians who recognized this improvement was much greater outside of Managua than in Managua, although the percentage increase in income had been the same in the capital. Despite the fact that all but one received a fixed salary, about one in three physicians felt that the remuneration mechanisms had changed. The persistence of fixed salaries instead of bonuses or other payments at risk implies

that the capitation incentives are not directly transferred to the individuals who have the greatest influence on expenditure and clinical decisions.

6.3 Effect of the reform on market structure

What impact has the introduction of capitated payments had on the health care market structure?⁴ This section examines the EMP market's evolution in terms of growth in overall enrollment, number of EMPs in business, EMP average size, and market concentration. However, one must keep in mind that any changes in market structure observed in Nicaragua may be due more to the opening of the health care system to the private sector and to competition than to the implementation of capitated contracts. These may have a more direct impact on the distribution of risks among EMPs. Since capitation confers incentives to the provider to select low risk enrollees, this study attempts to establish whether or not there are differences in the risk pool of different EMP categories. It thus analyzes the policyholder's profile in terms of family group size, and beneficiary age, gender, and length of enrollment. Any differences in these factors among EMP groups would reveal some type of market segmentation on the basis of risk. This hypothesis assumes that certain types of EMP practice more "effective" cream skipping or cherry picking than others, and that this "effectiveness" may be related to location, ownership, and years in business.

6.3.1 Market Characterization

As in other markets (Bitrán and Almarza, 1997; Espinosa, 1998), one would expect that during the initial phase of the reform in Nicaragua there would be a great proliferation of EMPs, of which only the most efficient would be able to remain in business in the long term.

Currently, there are 37 EMPs in the market, of which only two are public. The number of private EMPs has more than doubled since 1994, while the two public EMPs have been in existence since the inception of the reform. Out of the 37 EMPs in operation in the market in 1999, only 13 are located in Managua, although the total number of EMPs has increased more slowly in Managua than elsewhere in the country.

Between 1994 and 1998, the average annual growth in EMP enrollment, including affiliates and their dependents, was 36 percent. In 1998 the total number of EMP beneficiaries represented 6 percent of the nation's total population. That same year EMP size ranged from 30 members in the smallest to 19,000 members in the largest, with an average pool size of 4,100 insured, and a median of 1,500 (see Table 17).

⁴ In economics, markets are classified according to structural variables that are believed to determine the extent and characteristics of competition. Those variables that have received the most attention are number of buyers and sellers, extent of product substitutability, costs, ease of entry and exit, and extent of mutual interdependence [Baumol, 1982; Colton, 1993]. In the traditional framework, these structural variables determine the following taxonomy of market structures (Fischer, 1997):

- (1) Perfect Competition—many sellers of a standardized product,
- (2) Monopolistic Competition—many sellers of a differentiated product,
- (3) Oligopoly—few sellers of a standardized or a differentiated product, and
- (4) Monopoly—a single seller of a product for which there is no close substitute.

Table 17. Average Number of Insured by Type of EMP. Nicaragua, 1998.

| Type of EMP | Average | Minimum | Maximum | Number of Observations |
|-------------|---------|---------|---------|------------------------|
| Small | 924 | 30 | 2.626 | 20 |
| Big | 7.210 | 1.843 | 19.019 | 21 |
| Private | 3.835 | 30 | 19.019 | 39 |
| Public | 10.168 | 9.351 | 10.984 | 2 |
| Managua | 7.188 | 79 | 18.474 | 15 |
| Other | 2.388 | 30 | 19.019 | 26 |
| Old | 6.330 | 354 | 19.019 | 23 |
| New | 1.351 | 30 | 6.890 | 18 |
| Total | 4.144 | 30 | 19.019 | 41 |

Sources: INSS: Statistical Yearbooks 1974 -1978 and 1994-1997. Database 1998

Note: Two EMPs have been excluded from the sample because they no longer stay in the market in 1998.

One method used to assess market concentration is the Herfindhal Index.⁵ It adds the square of market shares for each firm in the relevant market. The closer the index's value is to 1, the greater the degree of market concentration. The U.S. Federal Trade Commission considers that an index greater than 0.20 deserves an antitrust investigation. In the case of the EMP market, the Herfindhal index measures the degree of market concentration based on the participation of each EMP over the total number of contributors. As can be seen from Table 18, in Managua, market concentration has decreased rapidly in recent years, scarcely reaching a value of 0.07. This study was not able to compute the index for other cities because it did not have desegregated data nor a clear definition of the market.

Table 18. Number of EMPs and Market Concentration Index. Nicaragua 1994-1998

| Year | Number Of EMPs By Ownership | | Number of EMPs By Location | | Herfindhal Index * |
|------|--------------------------------|--------|-------------------------------|-------|-----------------------|
| | Private | Public | Managua | Other | Managua |
| 1994 | 11 | 2 | 6 | 7 | 0,236 |
| 1995 | 21 | 2 | 10 | 13 | 0,138 |
| 1996 | 26 | 2 | 12 | 16 | 0,093 |
| 1997 | 29 | 2 | 13 | 18 | 0,077 |
| 1998 | 35 | 2 | 13 | 24 | 0,067 |

Sources: INSS 1974 -1978 and 1994-1997, database 1998

* Only the insured population is considered; an index for total members was not calculated because information was not available.

⁵ For a discussion about this index, see Tirole, J., 1988:221-223.

6.3.2 Market segmentation

There seem to be no substantial differences in the members' characteristics among the different types of EMPs (Table 19). The only remarkable differences are in the percentage of female patients. It is noteworthy that small EMPs show proportionately fewer female patients than larger EMPs, suggesting that those insurers may discriminate against women. This happens in other countries as well. In Chile, for example, the public insurer concentrates a greater proportion of female enrollees than the private health plans.

In any event, the incentives for EMPs to engage in risk selection against women appear to be modest, and may be largely limited by the low health coverage that the law grants to female dependents.

Table 19. Member Profile by Type of EMP. Nicaragua, 1999

| Type Of EMP | Average Age of Patients | Average Age of Insured Patients | Average Age of Dependants (Spouses and Children) | Duration of Enrollemnt in Current Emp (in Months) | % Female Patients |
|-------------|-------------------------|---------------------------------|--|---|-------------------|
| Large | 28,9 | 33,3 | 16,6 | 26,4 | 57,3 |
| Small | 27,2 | 30,3 | 14,7 | 16,2 | 42,5 |
| | | | | | |
| Old | 28,6 | 32,8 | 16,3 | 25,3 | 55,5 |
| New | 31,2 | 34,6 | 19,5 | 21,3 | 55,6 |
| | | | | | |
| Managua | 29,1 | 32,6 | 18,2 | 26,6 | 56,3 |
| Other | 27,8 | 33,6 | 12,7 | 21,7 | 53,7 |
| | | | | | |
| Public | 27,9 | 32,1 | 12,5 | 27,4 | 55,1 |
| Private | 28,9 | 33,1 | 17,3 | 24,5 | 56,9 |
| | | | | | |
| Total | 28,7 | 32,9 | 16,4 | 25,1 | 55,5 |

Source: Survey on EMPs' patients, 1999

Note: Data in this table are not representative of the universe of insured and members

7. Conclusions

The main objective of this study has been to determine whether the expected effects of capitation have been observed in the Nicaraguan context. According to economic theory and the empirical studies carried out in the United States, capitation encourages a greater technical and allocative efficiency in the provision of services. This should translate, among other effects, into the growth and relatively more intense utilization of outpatient care, a decrease in hospitalization rates and the average length of hospital stays, and, in general, lower unit costs and expenditures. On the other hand, capitation may also have adverse effects on the quality of and access to health care and encourage risk selection.

The conclusions derived from the previous analysis are limited because the study was not able to isolate effects and perform tests to show statistically significant relationships. However, some variables behaved as expected, notably the following:

- > The utilization rate for GP visits has increased, while the utilization rate for specialist visits remained about constant;
- > According to the opinions of surveyed physicians, the EMPs have adopted a mix of services that emphasizes prevention and primary care over higher levels of care;
- > The EMPs show a greater average resolute capacity than the MOH;
- > The EMPs show a shorter average length of stays than the MOH;
- > The EMPs show a higher utilization rate for outpatient care than the MOH.

If post-reform results are compared with the INSS before the Sandinista regime, greater cost containment and efficiency are evident. However, because these results are influenced by changes in insurance coverage, technology, and the country's epidemiological situation, it is not possible to attribute them solely to the change in the provider payment mechanism.

In conclusion, most of the variables studied show that there have been changes in the quantity, cost, and types of health services delivered, as an effect of the implementation of a capitation payment system. However, the trends observed may also be partly a consequence of other phenomena that are impossible to isolate with available data.

On the other hand, the study did not find evidence of changes in physicians' working conditions or remuneration basis, except for their incomes. The vast majority of physicians are paid on a fixed salary basis. Apparently, EMPs use utilization controls rather than financial incentives to promote cost-conscious behavior among their physicians. Between 1994 and 1999, physicians' income grew considerably, although with major differences in average income among EMPs categories. Increases in pay for doctors may be due to the expansion in the amount of resources mobilized by INSS after the reform.

The private health provider (EMP) market has become increasingly consolidated since the reform was implemented. The number of EMPs has grown significantly since the implementation of

the system and the market has tended to become less concentrated. Also, the EMPs are evenly distributed between the capital and other parts of the country, and in recent years the number of EMPs has grown more rapidly in non-metropolitan areas.

A second objective of this study has been to evaluate the reform from the perspective of public policy. Many Latin American countries have shown interest in adopting the model implemented in Nicaragua, that is, in contracting health care services out to third parties instead of keeping them in house. Therefore, as far as the available information permits, this study attempts to establish the desirability of applying this model to other countries.

In Nicaragua the reform has generated a high level of satisfaction among physicians and patients, in a cost-contained environment. However, these results may be specific to the Nicaraguan context. It must be remembered that both doctors and patients are comparing their current situation with the one observed during the Sandinista regime, characterized by the absence of a private sector, impoverished physicians, and no choice for patients. This marks a difference with the United States where capitation was introduced in a fee-for-service and indemnity insurance environment. The types of services delivered seem to have made INSS health spending more efficient, with a greater emphasis on outpatient and preventive care. Finally, as far as economic conditions have allowed, INSS has increased coverage in terms of its benefits package and in terms of its membership. Also, the EMPs spontaneously offer additional benefits as a way of increasing enrollment.

In spite of the positive results, the model may also generate negative effects that should be taken into account when designing the regulatory framework.

- > The technical quality may have deteriorated. For example the average length of stay observed seem very low, and the rate of emergency care has experienced an explosive growth. The capitation incentive may induce providers to save by providing lower quality care, so this study recommends both more research and closer monitoring on quality;
- > Competition between providers may be based on risk selection instead of on cost and quality. In Nicaragua, however, this study found no evidence of this phenomenon.

Finally, experience in Nicaragua suggests that public providers behave less efficiently than their private counterparts. However, the confirmation of this hypothesis requires a more sophisticated study that would control for case mix and other variables, such as administrative constraints that may be influencing the results.

All in all, the model seems to have more advantages than disadvantages. Its problems may be lessened through an effective regulatory framework.

Annex: Bibliography

- Baumol, William J. 1982: "Contestable Markets: An Uprising in the Theory of Industry Structure." *American Economic Review* (March): 1-15.
- Bitrán, Ricardo and Almarza, Francisco Javier. 1997. "Las instituciones de salud previsional (ISAPRES) en Chile." LC/L.1038. Santiago de Chile: Comisión Económica para América Latina y el Caribe, Serie Financiamiento del Desarrollo.
- Colton, Roger D. 1993: "Consumer Information and Workable Competition in Telecommunications." *Journal of Economic Issues* 27(3) (September): 775-792.
- Comité Técnico de Cuentas Nacionales en Salud. 1997. *Estudio de Fuentes de Financiamiento y Gastos en Salud 1995-1996*: Informe Final, Managua.
- Enthoven, A. 1997. "The market-based reform of America's health care financing and delivery system: managed care and managed competition." Presentation draft to Innovations in Health Care Financing, a conference sponsored by The World Bank.
- Espinosa, C. March 1999. "Enhancing the political feasibility of health sector reform: The case of Chile." Unpublished report for Data for Decision Making Project, Harvard School of Public Health.
- Espinosa, C. 1999. "Descentralización financiera: marco conceptual e instrumentos." Informe final para proyecto CIEPLAN-BID.
- Fischer, Charles C. 1997. "What Can Economics Learn From Marketing's Market Structure Analysis?" <http://www.westga.edu/~bquest/1997/ecnmkt.html>
- Folland, Sherman, Allen Goodman, and Miron Stano. 1997. *The Economics of Health and Health Care*. New York: Macmillan, Second Edition.
- Gabel, J. 1997. "Ten ways HMOs have changed during the 1990s." *Health Affairs*, May/June.
- Grimaldi, P. 1998. "Risk adjustment for health status." *Nursing Management* 29(3), pp. 18,20-21.
- Instituto Nicaragüense de Seguridad Social, Gerencia General de Salud Previsional, Oficina de Investigación y Desarrollo. 1997. "El nuevo modelo de salud previsional: surgimiento, evolución y tendencias." Managua.
- INSS, Oficina de Planificación, Unidad Actuarial y de Estadística. 1994-1997. *Anuario Estadístico* (Statistical Yearbooks) 1994-1997. Managua.
- INSS, Departamento de Estadística. 1974-78. *Anuario Estadístico del INSS* (Statistical Yearbooks of the INSS), 1974-1978. Managua.

- Martin, E. 1998. "Physician pay remains stagnant: Despite some gains, inflation and workforce issues are eroding income." American College of Physicians-American Society of Internal Medicine, ACP Observer Nov 98.
- McGuire, A., Henderson, J. and Mooney, G. 1988. *The Economics of Health Care*. London: Routledge.
- Miller, Robert H. and Luft, Harold S. 1994. "Managed Care Plan Performance Since 1980: A Literature Analysis." *Journal of the American Medical Association* 271: 1512-9.
- Miller, Robert H. and Luft, Harold S. 1997. "Does Managed Care Lead to Better or Worse Quality of Care?" *Health Affairs* September/October 1997: 7-25.
- Minyard, K. and Oviat, B. 1996. "A study of physicians, hospitals, and payers in the Atlanta health care market." *The Journal of the Medical Association of Georgia* 85(April).
- Newhouse, J. 1996: "Reimbursing health plans and health providers: efficiency in production vs. selection." *Journal of Economic Literature* XXXIV (September 1996): 1236-1263.
- Newhouse, Joseph P. 1998. "Risk Adjustment: Where Are We Now?" *Inquiry* 35: 122-131.
- Price Waterhouse Coopers. 1998. *Estimación del Per Capita Año 1998*. International Monetary Fund and Banco Central de Nicaragua.
- Phelps, C. 1992. *Health Economics*. New York: HarperCollins Publishers.
- Rice, T. 1997. "Physician payment policies: impacts and implications." *Annual Review of Public Health* 18: 549-65.
- Robinson, J. 1993. "Payment mechanisms, non-price incentives, and organizational innovation in health care." *Inquiry* 30 (Fall 1993): 328-333.
- Robinson, J. and Cassalino, L. 1996. "Vertical integration and organizational networks in health care." *Health Affairs*. 15(1): 7-22
- Smith, P. et al. 1997. "Principal-agent problems in health care systems: an international perspective." *Health Policy* 41: 37-60.
- The Governance Committee 1994. *The Grand Alliance II: Capitation Strategy*. Washington, DC: The Advisory Board Company.
- The Governance Committee. 1995. *The Grand Alliance: Physician Compensation Strategy*. Washington DC: The Advisory Board Company.
- Tirole, J. 1988. *The Theory of Industrial Organization*. Cambridge: The MIT Press.
- Williamson, O. 1996. *The Mechanisms of Governance*. Oxford University Press, New York.
- Wouters, Annemarie (2000). Unpublished comments to draft of this report.

