

IN-AR-341

State University of New York at Stony Brook
Group Health Association of America (GHAA)
International Resources Group, Ltd. (IRG)

Health Care Financing in Latin America and the Caribbean

Research Report No. 9

**Household Demand for Medical Care
in Santo Domingo, Dominican Republic**

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FOREWORD

This is the ninth in a series of technical reports on Health Care Financing in Latin America and the Caribbean (HCF/LAC), produced at the State University of New York at Stony Brook under contract with the United States Agency for International Development. The research on which this report is based was conducted under sub-contracts with International Resources Group (IRG), Ltd., of Setauket, New York; Abt Associates, Inc., of Cambridge, Massachusetts; and Instituto de Estudios de Poblacion y Desarrollo (IEPD) of Santo Domingo, Dominican Republic.

Research in the Dominican Republic under the HCF/LAC project was accomplished in two phases. The first phase, directed by Luis Carlos Gomez with the assistance of computer specialist Alvaro Lopez (both working as consultants to IRG), consisted of the preparation of the overall plan for the demand study, the design of a household survey to create the database needed for the study, the execution of the survey, and the subsequent preparation of the database. Gomez is the author of the HCF/LAC report on the survey methods and preliminary findings, Household Survey of Health Services Consumption in Santo Domingo, Dominican Republic: Methodology and Preliminary Findings (HCF/LAC Research Report No. 8, September, 1988), a document that should be considered a companion volume to the present report.

Concurrently, a second companion document, a supply-side study of the Santo Domingo health sector entitled Organizacion, Cobertura, Financiamiento, y Utilizacion de los Servicios de Salud del Distrito Nacional por Sectores, was prepared by a team of researchers under the auspices of IEPD in Santo Domingo. The team, led by Isis Duarte, included Carmen Julia Gomez, Gerard La Forgia, and Maritza Molina. Financial support and technical assistance were provided through the HCF/LAC project.

The second phase of the research began with the preparation, by Ricardo Bitran of Abt Associates, Inc., of a first draft of the present report, containing econometric estimates of the determinants of demand for curative health care in Santo Domingo. Bitran was assisted by Julia Watson of Boston University. Guidance for the econometric estimation was provided by Professors Randall Ellis of Boston University and Luis Locay of SUNY/Stony Brook.

This draft document, together with the earlier HCF/LAC report by Gomez and the IEPD supply-side study, provided the basis for an in-depth discussion of research findings and their policy implications at a two-day workshop held in Santo Domingo on January 19-20, 1989. Conducted at the invitation of USAID/Dominican Republic and host country health sector authorities, with funding provided by the mission, the workshop was attended by 53 Dominican health professionals, representing all four of the country's health subsectors as well as academic and research institutions, and by 13 representatives of U.S. and international organizations (see Appendix C for a list of workshop participants). The three studies discussed provided -- for the first time, according to workshop participants -- a comprehensive overview of the health sector of the National District of the Dominican Republic from the perspectives of both supply and demand.

Throughout both phases of the study, guidance and support were provided by Sonia Candelario of the Dominican Republic's Secretaria de Estado de Salud Publica y Asistencia Social (SESPAS), Winston Alvarez of the Instituto Dominicano de Seguros Sociales (IDSS), Luis Betances of the Asociacion de Iguales Medicas (AIM), and Lee Hougen and Lisa Early, both of USAID/DR. Maritza Molina of IEPD coordinated all preparations for the workshop, while Maria Castillo of USAID/DR provided assistance both prior to and during the workshop. The draft document, as presented at the workshop, was reviewed by Philip Musgrove, Regional Economic Advisor of the Pan American Health Organization and an HCF/LAC Advisory Committee member, whose cogent suggestions helped the report's author and editors to clarify a number of ambiguities in preparing this final version.

This report represents the conclusion of the second phase of HCF/LAC research in the Dominican Republic. Its final chapter, prepared at SUNY/Stony Brook by the HCF/LAC project director and Gretchen Gwynne, research associate to the project, presents conclusions and recommendations emanating directly from the Bitran/Watson analysis of the survey data, but amplified by workshop participants as their discussions were reflected in a detailed record of workshop proceedings prepared by several rapporteurs. Editing of the final report was the responsibility of Dr. Gwynne, who was assisted by Chandra Shrestha of SUNY/Stony Brook.

Dieter K. Zschock
Director, HCF/LAC

EXECUTIVE SUMMARY

Introduction

This report analyzes the demand for medical care (defined as curative, non-dental health care provided by a physician) in Santo Domingo, Dominican Republic. The analysis is based on data collected during a 1987 household survey, carried out under the HCF/LAC project, in which 11,565 members of 2,537 households, selected from among the 1.8 million residents of Santo Domingo, were interviewed. The survey included questions on socioeconomic variables (such as age, sex, income, and education); on respondents' self-perceived health problems among members of the household; on households' utilization -- within a two-week recall period -- of the health services provided by the country's ministry of health (Secretaria de Estado de Salud Publica y Asistencia Social, or SESPAS), social security institute (Instituto Dominicano de Seguros Sociales, or IDSS), the Armed Forces, and private providers; on patients' coverage by IDSS, the Armed Forces, or private health insurance programs; and on out-of-pocket payments made by patients for health services and medications.

A model of consumer behavior was developed in order to estimate the effects of various explanatory (or independent) variables on two types of household decisions (dependent variables): whether or not to seek medical care in case of illness, and which health subsector to use in obtaining care. In the case of outpatient services, eight different explanatory variables -- IDSS coverage, household income, sex, age, education, price of medical care, travel time to health facilities, and type of health problem -- were tested for their effect on each of the two dependent variables. This process was repeated for inpatient care, with two differences. First, the decision to seek or not to seek inpatient care was not analyzed, since inpatients have less choice, relative to outpatients, about whether or not to seek care. Second, the effects of price on inpatients' choice of subsector were not studied, since estimating price effects would involve further analysis of the database.

An in-depth discussion of the analysis and its policy implications took place among representatives of the four health subsectors in the Dominican Republic, academic and research institutions, and U.S. and international organi-

zations, at a two-day workshop held in Santo Domingo in January, 1989. The findings and recommendations that follow emanated from both the demand analysis and the workshop.

The Demand for Medical Care

Patterns of Utilization. Over the two-week survey recall period, nearly 42 percent of the population of Santo Domingo experienced some symptom of illness. Among them, about a third sought health care from a physician; two-thirds did not. The majority of those who did not seek care reported that self-treatment was adequate or that treatment appeared unnecessary, but workshop participants noted that between 10 and 20 percent were apparently constrained from seeking medical care by a lack of money.

Of 204,000 curative outpatient visits to physicians during the recall period, approximately 56 percent took place in private facilities, 30 percent in SESPAS facilities, 10 percent in IDSS facilities, and 4 percent in Armed Forces facilities. The survey recall period for hospitalizations was 23 months, during which some 81,000 people -- or 4.5 percent of Santo Domingo's population -- sought inpatient care due to illness or accident. The distribution of these hospitalizations by subsector was quite similar to that observed for outpatient care: 60 percent of patients were hospitalized in the private subsector, 29 percent in SESPAS, 7 percent in IDSS, and 4 percent in Armed Forces hospitals. However, the total number of hospitalizations was probably underreported due to recall bias over a two-year period.

More than 75 percent of the population had no health care coverage other than that available to all Dominican citizens through SESPAS. About 23 percent of the population had coverage through IDSS, private health insurance, and/or the Armed Forces, with some double coverage and cross-utilization of these services. Two-thirds of private subsector outpatients and three-fourths of private hospital patients did not have private insurance coverage, and about 90 percent of these patients paid for their care directly.

Over 90 percent of SESPAS users, of both outpatient and inpatient curative care, were exempted from payment in accordance with the policy of SESPAS to provide free care. The remaining 10 percent paid user fees averaging RD\$ 35 (US\$ 7.70) for ambulatory care and RD\$ 414 (US\$ 90.00) for hospitalization. This contrasts with higher average private subsector expenditures of RD\$ 60 (US\$ 13.00) and RD\$ 600 (US\$ 132.00) for outpatient and inpatient care, respectively. The higher cost of private care was due in part to charges for drugs, which accounted for about half the average patient's

total expenditure per visit in the private subsector but less than a third in SESPAS.

Between 30 and 40 percent of IDSS patients, both outpatients and inpatients, were not IDSS beneficiaries, but regardless of their beneficiary status -- the majority (over 90 percent) were exempted from payment. Utilization of Armed Forces services by non-beneficiaries was even higher.

Travel times to health facilities, by subsector, were short for most patients, and thus not a significant factor in decisions to seek care and in which subsector to seek it. Average waiting times for outpatient care, however, were important. Waiting times at SESPAS, IDSS, and Armed Forces outpatient facilities were similar, ranging from an hour to an hour and a quarter, but in the private subsector the average waiting time was substantially less; 60 percent of patients waited less than 30 minutes, and the overall subsector average was only 49 minutes.

Determinants of Demand. Econometric estimates of the determinants of demand showed that children under one constituted the group with the highest proportion of those with a health problem who actually sought medical care (49 percent). The second highest proportion, 34 percent, were children in the 1-4 age group. In contrast, children aged 5-14 constituted the age group with the lowest fraction of those with self-reported illness seeking professional care -- only 23 percent. These results were virtually identical across all income groups.

Household income had only a small effect on the probability of seeking care: for both outpatient and inpatient care, all individuals with higher household incomes were only slightly more likely to seek care than those with lower incomes. Once a decision to seek care had been made, however, the choice of which subsector to visit was more strongly influenced by income: those with higher household incomes were more likely to visit private physicians, and less likely to visit either SESPAS or IDSS physicians, than those with lower incomes. For virtually every household income category, the demand for private physicians was greater than the demand for physicians of other subsectors.

For both sexes and across all age groups, a higher level of educational attainment was associated with a greater probability of seeking medical care if ill, and of choosing a private subsector doctor rather than a SESPAS or IDSS physician once the decision to seek care was made.

Utilization of inpatient care was markedly different by sex and age. There was a far greater preference for private

hospitalization among females than males. The preference for private hospital care of infants was strong, at the expense of both SESPAS and IDSS; in contrast, children between the ages of 1-4, and male children in particular, were the least likely to be hospitalized in private facilities and most likely to be hospitalized in SESPAS or IDSS facilities.

Education had a positive effect on the likelihood that an individual in need of inpatient care -- male or female -- would choose a private hospital. While in general the preference for private hospitalization was strong, higher-income individuals were only slightly more likely to choose private facilities than lower-income individuals.

Effects of Prices on Demand. Price simulations revealed that the health care seeking behavior of people in all income groups was not very sensitive to either private subsector or SESPAS price changes, although people with lower incomes tended to be more sensitive to price changes than higher-income individuals.

When the effects of a substantial increase in SESPAS prices were simulated, utilization of SESPAS services decreased only slightly across all household income groups.

Simulating the effects of changes in private subsector prices showed that even if private subsector outpatient care were free of charge to the user, three-quarters of those perceiving themselves to be ill would not seek care in any subsector -- a finding that remained the same across all household income groups.

The decision to seek outpatient care from a doctor in any subsector would not be strongly affected by private subsector price changes. Those in lower income groups would tend to seek outpatient curative care -- regardless of subsector -- only slightly less frequently the higher the price. Private-subsector price variations would, however, affect the proportion of people seeking care from the private sector. Those who did decide to seek care would tend to shift to the public subsector with rising private subsector prices.

Conclusions and Recommendations

The strong preference in Santo Domingo for private health services, even among the low-income population, the uninsured, and those eligible for care elsewhere, suggests the quality of curative care offered in the private subsector is perceived as better than comparable services provided by SESPAS and IDSS. Improvements are needed in the quality of public subsector care (possibly financed with revenues from

increased user fees).

Cross-utilization of services, whereby patients with coverage in one subsector utilize the services of another, exists among all subsectors; moreover, non-beneficiaries are routinely treated free of charge at IDSS and Armed Forces facilities, while SESPAS hospitals are reportedly overburdened with ambulatory patients. Workshop participants recommended that the responsibility of each subsector, with respect to users' incomes, health coverage, and health needs, be more clearly defined. Other suggestions were (a) that patients treated free of charge at SESPAS facilities be screened for IDSS, Armed Forces, or private insurance coverage so that those with coverage could be charged for their care; (b) that a referral system, both within and among subsectors and based on current utilization patterns, be established to channel users to the services to which they are entitled; and (c) that it may be necessary to restrict access to SESPAS hospitals for ambulatory care, possibly by charging patients for any health services provided in a hospital emergency room setting that, in the opinion of the attending doctor, could have been treated on a non-emergency basis in the patient's local SESPAS outpatient facility.

By virtue of their strong preference for private subsector curative care, residents of Santo Domingo have demonstrated their willingness to pay for health services of good quality, more efficiently provided. Even in the public subsector, however, charging higher fees of those not exempt will not significantly reduce demand, especially if quality improvements could offset the negative effect of price increases. It is recommended that SESPAS explore ways in which more and/or higher user fees could be imposed, either upon a larger proportion of users and/or for a wider range of services. This would require the use of a means test. In order to gain experience with expanded user fee charges, an experimental cost recovery project, involving both outpatient and inpatient facilities, should be designed and implemented. All revenues collected should be retained by the facilities involved to improve the quality of their services, provide subsidies to the medically indigent, and finance selected preventive and health promotional activities.

To encourage the expansion of private health insurance coverage in Santo Domingo among the 77 percent of the population with no such benefits, health sector officials should require more employers -- even employers of part time and/or domestic workers -- to provide health insurance benefits for their employees. This would allow health insurers to increase their pay-out ratios as the volume of their coverage increased.

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GLOSSARY OF TERMS AND ACRONYMS

AIM	Asociacion de Iguales Medicas, Santo Domingo
beneficiary	an individual who is entitled, by virtue of direct enrollment or dependent status, to free or subsidized health care, or who is covered by a third-party (pre-paid) health insurance mechanism
HCF/LAC	Health Care Financing in Latin America and the Caribbean (USAID-funded contract administered by State University of New York at Stony Brook)
IDSS	Instituto Dominicano de Seguros Sociales (Dominican Social Security Institute)
IEPD	Instituto de Estudios de Poblacion y Desarrollo (Institute of Population and Development Studies, Dominican Republic)
<u>iguales</u>	health services delivery organizations similar to health maintenance organizations
IRG	International Resources Group, Ltd.
medical care	curative, non-dental health care provided by a physician
SESPAS	Secretaria de Estado de Salud Publica y Asistencia Social (State Secretariat of Health and Social Services, Dominican Republic)
SUNY	State University of New York
USAID	US Agency for International Development

I. INTRODUCTION

The "demand" for health care -- that is, the quantity of health services that will be purchased (assuming their availability) by consumers -- is determined by a number of variables, such as consumers' incomes, the prices charged for health services, their quality (as perceived by consumers), coverage by third-party payment mechanisms (e.g., social and private insurance), and the distance that consumers have to travel to obtain the services available to them. Health care demand studies, such as the one presented in this report, attempt to measure the extent to which each of these variables affects a given population's demand for health care.

The demand for health care is also conditioned by demographic, biological, sociocultural, and institutional factors. A study of a given population's demand for health services thus requires data on the population's household characteristics, on health care consumers' perceptions of illness, and on the determinants of household decisions to utilize health services, including the organization of health services available to the population and the ways households contribute -- via direct and third-party payments -- to the financing of health services delivery. Such data are ordinarily gathered via household surveys, complemented by data from institutional sources.

In the Dominican Republic, health services are financed and delivered by the government, through its Secretaria de Estado de Salud Publica y Asistencia Social (SESPAS), Instituto Dominicano de Seguros Sociales (IDSS), and the Armed Forces, as well as by private subsector institutions (e.g., several private insurance companies, the Asociacion de Iguales Medicas (AIM), Asociacion de Clinicas y Hospitales Privadas, private voluntary organizations, and individual providers). Health care utilization and expenditure data, however, are derived primarily from supply-side information systems, rather than from the demand side. Prior to the work on which this report is based, there had been no household survey in the Dominican Republic specifically undertaken for the purpose of analyzing health care seeking behavior (1).

A. The Santo Domingo Household Survey

To generate the database needed to analyze the demand for health services in Santo Domingo, the HCF/LAC project conducted a stratified, probabilistic sample survey of 11,565 individuals in 2,537 households, selected from among the estimated 1.8 million inhabitants of Santo Domingo (Gomez 1988:5, Table II.1). The survey, implemented between October and December, 1987, was designed to identify both the patterns and determinants of public and private health services utilization by households (2). The population was divided into three strata according to socioeconomic residential characteristics, and -- since the strata were of unequal size -- sample results were weighted by the reciprocal of a household's probability of selection to produce unbiased estimates for each stratum. Survey questions focused on socioeconomic variables (such as age, sex, education, economic activity, household assets, and income), the fees paid by households to providers for health services and medications, and household access to so-called "third-party" or "risk-sharing" types of health services coverage, provided through social security, private health insurance programs, or the Armed Forces. In addition, an inventory of existing health care facilities (clinics, hospitals, doctors' and dentists' offices, and pharmacies) was compiled, and information on health services characteristics was assembled from both primary and secondary sources (see Duarte et al. 1988).

The results of this work, including a discussion of the methods used in the survey, the demographic and socioeconomic findings most relevant for the present demand analysis, and a number of preliminary cross-tabulations of patterns of utilization of and access to health services in Santo Domingo, are presented in the HCF/LAC research report Household Survey of Health Services Consumption in Santo Domingo, Dominican Republic: Methodology and Preliminary Findings (Gomez 1988), which should be considered a companion volume to the present report (3). A detailed description, in Spanish, of the methods employed in the household survey is also available (Gomez 1987).

B. Policy Implications of Demand Studies

Health care seeking decisions by households -- whether or not to seek care outside the home and where to seek it -- have important policy implications. To some extent, these choices can be directly influenced by health sector

decision-makers in order to achieve certain public health goals. The Santo Domingo household survey data show, for example, that approximately 70 percent of the people who perceived some health problem during the two weeks prior to the survey chose not to seek health care outside their homes. Most of them undoubtedly recovered, but it is conceivable that the health status of some of them deteriorated significantly as a result of their negative choice. If policy-makers and public health officials were provided with information on why some individuals who perceive health problems decide not to seek care, they would be better able to influence individuals' decisions in order to promote greater use of available services.

Some of the factors that influence health care seeking decisions cannot be controlled by public health officials in the short term. For example, the level of education of a person suffering an illness may be a major determinant of his or her decision to seek care, yet a population's educational level can be improved only in the long run. Moreover, education, even if it does affect health care seeking decisions, lies outside the purview of health planners. However, other variables, which may be key determinants of the decision to seek care, may be subject to direct influence by health officials. For example, the price of health services, the amount of time people must spend traveling to and from health facilities, and the amount of time they must wait for services at these facilities are variables that health planners can modify in the short or medium term to achieve specific changes in health services utilization.

Understanding how those who have decided to seek health care outside their homes choose among different providers is also of interest to public health officials. If such officials should conclude, for example, that the private subsector could provide primary care for those at middle and higher income levels more efficiently than the public subsector, data on the determinants of users' choices of subsector would help them to take the necessary steps -- price subsidization is one example -- to promote greater use of private facilities. Alternatively, should health officials wish to promote greater use of public facilities through improvements in quality, estimates of the likely increase in utilization (given certain quality improvements), of the costs of various quality improvement measures, and of the potential of user fees to cover part of the expenditures involved would be indispensable. Demand analyses can provide estimates of the effect, on utilization of both public and private services, of changes in prices, perceived quality, waiting time, and travel distance.

C. Organization of Report

The goal of this report is to analyze the determinants of decisions to seek curative health care in Santo Domingo, as well as the determinants of choices among various health care providers on the part of those who choose to seek care. The analysis was undertaken at two levels. First, patterns of both outpatient and inpatient curative health care seeking behavior in Santo Domingo were identified. Second, a statistical analysis of the determinants of the demand for curative care from providers associated with different subsectors of the Santo Domingo health sector was performed.

The report is organized as follows. Chapter II provides background information on the study, and briefly describes the methods used. Chapter III, intended as a prelude to the demand analysis presented in Chapters IV and V, contains a descriptive overview of outpatient and inpatient medical care utilization in Santo Domingo (throughout the report, the term "medical care" is used for curative, non-dental care provided by a physician). The chapter focuses on patients' choices of which health subsector to patronize. Chapters IV and V -- the first devoted to outpatient and the second to inpatient medical care -- present the results of the statistical analysis of determinants of the demand for care, as well as a series of simulation exercises to illustrate both policy choices and the effect of demand determinants on health care seeking behavior.

A preliminary draft of the report was subjected to critical review and further interpretation at a workshop for Dominican and international health sector experts, held in Santo Domingo in January, 1989. Subsequently, the draft was revised, and a final chapter (Chapter VI), containing conclusions and recommendations reflecting not only the results emanating directly from the econometric analysis but also interpretations of these findings offered by workshop participants, was added.

Appendix A contains tables presenting additional simulation and statistical results. Appendix B provides a detailed methodological treatment of the econometric model used in the statistical analysis.

II. BACKGROUND AND METHODS

A. Organization of the Health Sector in Santo Domingo

Health care providers in Santo Domingo can be classified as belonging to one of four major subsectors. These are the public subsector, in which care is provided by the Secretaria de Estado de Salud Publica y Asistencia Social (the State Secretariat of Health and Social Services, or SESPAS); the social security subsector, in which care is provided by the Instituto Dominicano de Seguros Sociales (the Dominican Institute of Social Security, or IDSS); the Armed Forces subsector (4); and the private subsector, which includes both for-profit and non-profit institutions.

SESPAS facilities provide health care at little or no charge to all citizens. Health care provided by IDSS is available to the employees of IDSS-affiliated employers, and includes maternal and infant care for workers' dependents. These services are free of charge and, in principle, are unavailable to people who are not direct IDSS beneficiaries or their eligible dependents. The health facilities run by the Armed Forces provide medical care to members of the Armed Forces and their dependents at no charge. Again, these services are intended only for Armed Forces members and their dependents. Finally, the private subsector encompasses a heterogenous group of institutions and individual practitioners whose facilities vary in size and complexity and are run by private entities. Most private facilities are for-profit institutions whose revenue is derived from a combination of user fees and pre-paid arrangements. A few private facilities are non-profit, although most charge fees for their services.

In this report, a "beneficiary" is an individual who is entitled to free or subsidized health care, or who is covered by a third-party (pre-paid) health insurance mechanism; those who choose to pay full cost out-of-pocket are therefore not beneficiaries. By definition, all residents of Santo Domingo are beneficiaries of SESPAS. The beneficiaries of IDSS are those workers who contribute, through wage deductions, to the Social Security fund, as well as their spouses (for health care related to pregnancy only) and children under the age of one year. Armed Forces beneficiaries are the members of the Armed Forces and their dependents, while private subsector beneficiaries are the members and dependents of iguales medicas (organizations similar to health maintenance organizations) or of private health insurance plans.

B. Methodological Considerations

It was mentioned earlier that the demand for health care is determined by a number of explanatory variables. A health care demand equation is a mathematical expression that shows how the amount of care that individuals are willing to purchase from a given provider varies as a function of such variables. These variables include, among others, some that characterize health care providers (e.g., subsector affiliation, prepayment arrangements provided, direct fees charged, and waiting time at a provider's facility); others that characterize individuals (e.g., sex, age, educational level, and income); and still others that jointly characterize both providers and patients (e.g., the distance from a patient's home to a given health care facility). Based on observed services utilization, the way in which such explanatory variables influence the quantity of care demanded can be estimated through the use of statistical techniques. This process is called the "estimation" of a demand equation.

The outcome of the demand estimation process is a series of numerical coefficients associated with each explanatory variable, each of which measures the magnitude of the impact of that variable on the demand for health services while also taking into account the effects of all other variables in the equation. For example, one result of demand estimation might be that if the price of services provided in the private sector goes up by 10 percent, the quantity of services people are willing to seek from private providers goes down by 2.5 percent. Such demand estimation results can be used to simulate the impact on demand of various policy interventions such as raising or lowering direct user fees, providing more prepayment opportunities at affordable contribution levels, improving the quality of services, and reducing travel and waiting times.

In order to perform a demand analysis, a model of consumer behavior must be formulated. Appendix B provides a detailed description of the behavioral model used in this study (5). An important feature of this model is its use of the concept of the quality of health care (see Gertler, Locay, and Sanderson 1987). Quality is typically associated with characteristics of providers only. It has usually been measured, for example, by the qualifications of providers or by the types and amounts of drugs available in providers' pharmacies. In contrast, the quality of a given health care provider in this study is measured by the degree of self-perceived improvement in an individual's health status as a result of obtaining curative care from that provider (note that, as used here, quality does not involve objective

assessment by a health professional). Thus quality is not only affected by the attributes of providers but also by the characteristics of users (see also Bitran 1988). This means that two individuals with the same health problem who visit the same provider may perceive the quality of the care they receive differently -- even if they are given the same care. When this occurs, the quality differential results from a difference in the perceived improvement -- whether subjectively or objectively assessed -- in the health status of the two individuals after undergoing the prescribed treatment.

Our use of the concept of health care quality implies that -- with the exception of price, income, and travel time -- the variables explaining the amount of health services that will be demanded reflect how people perceive the quality of those services. For example, suppose that the statistical analysis showed education to have a positive and significant influence on the utilization of private health services, and a positive but less significant effect on the utilization of public providers' care. Such a finding would be interpreted as indicating that better-educated people perceive private providers' services to be of higher quality than public services to a greater degree than less well-educated people do. This may be because people with higher levels of education can use private providers' services more effectively to improve their health status, although other interpretations are also possible. Thus, the demand model would predict that people with higher levels of education would be more likely to visit private than public providers.

For this report, the demand estimation process was carried out at two levels. In the first step, in order to assess how the model's explanatory variables influence the demand for services from SESPAS, IDSS, and the private sub-sector, only those people seeking medical care -- which we have defined as curative, non-dental care provided by a physician -- were considered (as opposed to all individuals with a health problem receiving care from any type of provider). In the second step, the first-stage estimation results were used to study how the model's explanatory variables affect the decision to seek medical care outside the home by people who are ill or injured.

III. PATTERNS OF HEALTH SERVICES UTILIZATION

This chapter first reviews some relevant findings concerning illness perception and health services utilization as reported in Gomez (1988). It then describes the patterns of outpatient health services utilization and hospitalizations of those in the survey population seeking what we have termed medical care. Preventive care, dental care, non-curative maternity and child care, and care given by providers other than physicians are not analyzed here.

A. Review of Household Survey Findings

Nearly 42 percent of the population of Santo Domingo -- some 756,000 people -- experienced some symptom of illness during the survey period, but only 15 percent -- roughly a third of those who perceived a health problem, or some 279,000 individuals -- actually utilized health services (Gomez 1988:54, Table IV.1). The other two-thirds of those who felt ill either treated themselves or decided that no remedy was needed. Only 7 percent of those who felt ill but did not seek care cited inability to pay for a consultation as the reason for not seeking care; however, when this group is combined with the 8 percent who reported not seeking care because they could not pay for medications, plus some fraction of the 24 percent citing "other reasons" for not seeking care, the proportion of those not seeking care because of indigence is considerable -- perhaps as high as 10-20 percent (the three groups of respondents are not mutually exclusive). Over 60 percent of all outpatient and 70 percent of all inpatient health services utilization was by females -- much of it associated with pregnancy and childbirth, only some of which involved illness. Virtually all women requiring prenatal care obtain such services, with over 80 percent reporting more than one consultation.

Beneficiary coverage through the IDSS, private health insurance, and the Armed Forces accounted for about 23 percent of all health services utilization in Santo Domingo, with some "double coverage" (6) and "cross-utilization" (7) of services among these three forms of third-party coverage. Not surprisingly, private health insurance coverage was relatively highest among those in the high socioeconomic residential stratum; social security coverage was highest in the middle stratum, although some in the low stratum also had such coverage. Many, even in the lowest household income

strata, paid out-of-pocket fees for private outpatient care.

Among the more than 75 percent of the population who did not have the benefit of prepaid health coverage, over half used private health services for outpatient care. Most of the rest -- including some who were entitled to other forms of coverage -- used SESPAS services (Gomez 1988, Table IV.7). SESPAS was the dominant provider of inpatient services, particularly for maternity care -- including utilization by many who were entitled to services under social security, private health insurance, or the Armed Forces (Gomez 1988:67, Table IV.14).

B. Outpatient Curative Care

It was noted above that some 279,000 individuals in Santo Domingo utilized health services because of a perceived health problem during a two-week recall period (Gomez 1988, Table IV.1). Of these 279,000 people, most visited medical doctors, but some visited dentists, nurses, health promoters, or other types of health care providers (Gomez 1988, Table IV.4); moreover, some visits were for preventive rather than for curative care. When one subtracts, from the total population who utilized health services, those who visited health care providers solely to seek preventive or dental care and those who sought curative care from providers other than physicians, this leaves approximately 219,000 individuals who, during the survey's two-week recall period, perceived themselves to have had a non-dental health problem requiring curative care and who visited a physician because of it (Table III.1A). It is this group on which this report focuses.

These 219,000 people made approximately 221,000 visits to physicians. Table III.1B shows the distribution of these outpatient curative visits by subsector, excluding those visits that took place in health facilities unidentified by subsector. Approximately 30 percent of visits took place in SESPAS facilities, 10 percent in IDSS facilities, 4 percent in Armed Forces facilities, and 56 percent in private facilities.

1. The Decision to Seek Care. Tables III.2 through III.6 relate patients' decisions to seek medical care to their age, sex, education, health status, and household income. Table III.2 shows that health care seeking behavior differs significantly with age. Children under one constituted the group with the highest proportion of those with a health problem who actually sought medical care (48.6 percent). The second highest proportion, 34 percent, was found among children in the 1-4 age group. It is notable that children aged 5-14

TABLE III.1A
ESTIMATED NUMBER OF INDIVIDUALS
WITH A SELF-REPORTED HEALTH PROBLEM,
SANTO DOMINGO (D.R.), 1987

	Number	Percent
People with a health problem *	699,712	100.0
People who did not seek medical care	480,643	68.7
People who sought medical care	219,069	31.3

* Total excludes individuals who utilized health services for preventive or dental care.

TABLE III.1B
NUMBER OF OUTPATIENT CURATIVE CARE VISITS
TO A PHYSICIAN, BY SUBSECTOR,
SANTO DOMINGO (D.R.), 1987 *

Subsector visited	Number	Percent
SESPAS (a)	60,501	29.7
IDSS (b)	21,236	10.4
Armed Forces	8,427	4.1
Private	113,790	55.8
Total	203,954	100.0

* Excluding 17,419 visits to unidentified providers.

a - Secretaria de Estado de Salud Publica y Asistencia Social

b - Instituto Dominicano de Seguros Sociales

TABLE III.2
 DECISION TO SEEK OUTPATIENT MEDICAL
 CARE ACCORDING TO PATIENT'S AGE,
 SANTO DOMINGO (D.R.), 1987
 (in percentages)

Age category (years)	Sought care	Did not seek care	Age group total	Age composition of all those with a health problem
Under 1	48.6	51.4	100.0	6.1
1-4	34.0	66.0	100.0	11.5
5-14	22.8	77.2	100.0	16.7
15-44	32.6	67.4	100.0	44.9
45 or over	28.7	71.3	100.0	20.8
Total	31.3	68.7	100.0	100.0

TABLE III.3
 DECISION TO SEEK OUTPATIENT MEDICAL CARE
 ACCORDING TO PATIENT'S SEX,
 SANTO DOMINGO (D.R.), 1987
 (in percentages)

Sex	Sought care	Did not seek care	Total	Sex composition of all those with a health problem
Male	30.6	69.4	100.0	42.0
Female	31.8	68.2	100.0	58.0
Total	31.3	68.7	100.0	100.0

constituted the age category with the lowest fraction -- only 23 percent -- of those with self-reported illness seeking professional care (8). About 30 percent of all those 15 years and older with self-reported illness sought medical care. Females with a self-perceived health problem sought care in only a slightly higher proportion than males (Table III.3), but it should be noted that maternal care, which accounts for a large proportion of health services utilization by females, is not included in the table (9).

Table III.4 shows that parents with a post-secondary educational achievement level were significantly more likely to seek medical care for their children who were ill than parents with lower educational achievement (who were in the large majority). This suggests that parents with less than a completed high school education may also lack health-specific knowledge that would make them more likely to seek care for their children. Among adults themselves, the likelihood of seeking curative care was not demonstrably related to educational achievement. Adults in general, however, were more likely to seek curative care if they were ill than to seek such care for their children if the latter were ill.

The type of health problem from which an individual perceived himself or herself to be suffering appeared to have an important effect on the decision to seek care (Table III.5). Intestinal problems as the sole cause of self-reported illness represented only 5 percent of health problems, but close to half of those reporting this problem as their only medical complaint sought care. In contrast, respiratory problems without other complications accounted for 21 percent of all reported illness, but only one out of five people so affected actually sought care. Accident victims (who represented only 1.5 percent of reported health problems) sought care in 75 percent of all cases. (Although one's perception of the severity of one's condition also affects the decision to seek care, the analysis did not control for this.)

Finally, monthly household income seems to have had a modest but positive impact on the decision to seek care (Table III.6): the higher the household income, the greater the proportion of the total number of ill people seeking medical care. Note, however, that in addition to being less likely to seek care if ill, poorer people were much less apt to report themselves ill in the first place than wealthier people. This may be because definitions of adequate health vary culturally, and poor respondents' definition of good health differs from that of more affluent people. Households with monthly incomes under RD\$ 400 represented 42 percent of all households, but only 30 percent of people in this income group declared a health problem. In contrast, only 5 percent of all households had incomes of RD\$ 2000 or more, but 16

TABLE III.4

DECISION TO SEEK OUTPATIENT MEDICAL CARE
 ACCORDING TO EDUCATIONAL ACHIEVEMENT,
 SANTO DOMINGO (D.R.), 1987
 (in percentages)

A: Patients under 15 years of age.

Highest education level achieved in household (years)	Sought care	Did not seek care	Group total	Education profile of all those with a health problem
1-6	28.8	71.2	100.0	9.1
7-12	28.3	71.7	100.0	21.2
13-18	36.9	63.1	100.0	6.1
19+	64.0	36.0	100.0	1.1
Subtotal	30.8	69.2	100.0	37.5

B: Patients 15 years of age and older.

Education of patient (years)	Sought care	Did not seek care	Group total	Education profile of all those with a health problem
0	29.0	71.0	100.0	0.2
1-6	32.3	67.7	100.0	26.6
7-12	32.3	67.7	100.0	29.5
13-18	33.4	66.6	100.0	5.6
19+	14.0	86.0	100.0	0.6
Subtotal	32.2	67.8	100.0	62.5
TOTAL	31.3	68.7	100.0	100.0

TABLE III.5

DECISION TO SEEK OUTPATIENT MEDICAL CARE
 ACCORDING TO TYPES OF SELF-PERCEIVED HEALTH PROBLEMS,
 SANTO DOMINGO (D.R.), 1987
 (in percentages)

Self-perceived health problem	Sought care	Did not seek care	Group total	Distribution among all those with a health problem
Respiratory problem only	20.2	79.8	100.0	21.3
Intestinal problem only	46.6	53.4	100.0	4.6
Respiratory and intestinal problem	34.9	65.1	100.0	4.1
One illness other than respiratory or intestinal	31.9	68.1	100.0	31.2
Respiratory and/or intestinal problems in conjunction with another illness	33.7	66.3	100.0	19.3
Respiratory and/or intestinal problems in conjunction with two other illnesses	32.1	67.9	100.0	15.2
Accident	74.8	25.2	100.0	1.5
Other combinations	34.8	65.2	100.0	2.8
Total	31.3	68.7	100.0	100.0

TABLE III.6

DECISION TO SEEK OUTPATIENT MEDICAL CARE
 ACCORDING TO MONTHLY HOUSEHOLD INCOME,
 SANTO DOMINGO (D.R.), 1987
 (in percentages)

Household income (RD\$ of Nov., 1987)	Sought care	Did not seek care	Income group total	Percentage of all those with a health problem	Household income stratification *
Under \$400	29.0	71.0	100.0	29.8	41.8
\$400 - 799	28.2	71.8	100.0	24.6	32.6
\$800 - 1,299	30.1	69.9	100.0	19.6	13.5
\$1,300 - 1,999	35.2	64.8	100.0	10.0	6.3
\$2,000 or more	35.3	64.7	100.0	16.0	5.8
.....					
Total	31.3	68.7	100.0	100.0	100.0

* - From Gomez (1988), Table III.9, p.28.

percent of all those declaring a health problem were in this group.

2. Choice of Subsector. In Table III.7, visits to physicians are broken down by subsector visited and the beneficiary status of patients. As previously noted, some 56 percent of all visits to physicians took place in the private subsector, 30 percent in SESPAS, 10 percent in IDSS, and 4 percent in the Armed Forces. Almost a third of the visits taking place in IDSS facilities were made by people who were not eligible for IDSS coverage -- a surprising finding, since IDSS is not mandated to provide care to non-beneficiaries. A similar phenomenon can be observed in Armed Forces facilities, where almost half of the visits were made by non-beneficiaries. Finally, about two-thirds of the consultations at private facilities were made by individuals who were neither iguales members nor beneficiaries of private health insurance plans. Most of them were therefore obliged to pay the full fee charged for the services they received, although it should be noted that about 14 percent of the consultations made by individuals who were neither insured nor iguales members were provided free of charge (10).

3. Outpatients' Expenditures. Outpatients' expenditures included out-of-pocket payments for office visits, drugs, and exams. In Table III.8, patients are classified according to their status as beneficiaries of the various health subsectors and by whether or not they incurred direct, out-of-pocket expenditures. Several interesting findings emerge. First, because of the SESPAS policy of providing free care, over 90 percent of SESPAS users made no payments for the care they received. Some 10 percent of SESPAS patients did make some payments (the magnitude of these expenditures is discussed below), which reflects the user fees occasionally charged by SESPAS (see Lewis 1987; Duarte et al. 1988).

Table III.8 also shows that virtually all IDSS beneficiaries were provided medical care at no charge in IDSS facilities, which is consistent with the Social Security Institute's free care policy. Interestingly, the vast majority (86.0 percent) of IDSS users who were not IDSS beneficiaries were also given free care. All beneficiaries and non-beneficiaries of the Armed Forces obtained medical care at no charge in the Armed Forces facilities.

Except in cases in which some copayment is required, private subsector beneficiaries of iguales or insurance companies should not incur out-of-pocket expenditures for outpatient medical care received from providers affiliated with these iguales or insurance companies; instead, iguales and insurance companies are billed directly by private providers for the care given to beneficiaries. However, if the

TABLE III.7

OUTPATIENT MEDICAL CARE VISITS BY SUBSECTOR VISITED
AND BENEFICIARY STATUS OF PATIENT,
SANTO DOMINGO (D.R.), 1987

Subsector visited	Beneficiaries		Non-beneficiaries		Beneficiaries and Non-beneficiaries		Percent of all visits
	Total	%	Total	%	Total	%	
SESPAS	60,501	100.0	--	--	60,501	100.0	29.7
IDSS	14,558	68.6	6,678	31.4	21,236	100.0	10.4
Armed Forces	4,615	54.8	3,812	45.2	8,427	100.0	4.1
Private	37,362	32.8	76,428	67.2	113,790	100.0	55.8

Total	117,036	57.4	86,918	42.6	203,954	100.0	100.0

TABLE III.8

DIRECT PAYMENT FOR OUTPATIENT MEDICAL CARE
BY SUBSECTOR VISITED AND BENEFICIARY STATUS OF PATIENT
SANTO DOMINGO (D. R.), 1987

Subsector visited	Beneficiaries						Non-Beneficiaries					
	Direct payment made						Direct payment made					
	No		Yes				No		Yes			
	Total	%	Total	%	Total	%	Total	%	Total	%	Total	%
BESPAS	54,739	90.5	5,762	9.5	60,501	100.0	--	--	--	--	--	--
IDSS	14,396	98.9	162	1.1	14,558	100.0	5,745	86.0	933	14.0	6,678	100.0
Armed Forces	4,615	100.0	0	0.0	4,615	100.0	3,812	100.0	0	0.0	3,812	100.0
Private	28,559	76.4	8,803	23.6	37,362	100.0	10,943	14.3	65,485	85.7	76,428	100.0
Total	102,309	87.4	14,727	12.6	117,036	100.0	20,500	23.6	66,418	76.4	86,918	100.0

Note: Direct payments are fees paid by a patient to a provider. When a patient is a beneficiary of the subsector visited, some or all of the cost of care is borne through indirect payment mechanisms: e.g., tax revenue or insurance payments.

beneficiary of an iguala or of private insurance visits a non-affiliated provider, the patient must pay the provider for the care received. Table III.8 shows that some 76 percent of private subsector beneficiaries who went to private facilities incurred no direct expenses for their care, which indicates that they visited affiliated providers who required no payments. At the same time, about 24 percent of private subsector beneficiaries incurred some expenses for the care they received, which suggests that those people visited providers not affiliated with their igualas or insurance companies or that they visited affiliated providers who required some form of payment.

The payments made by private subsector users who were neither insured nor members of igualas are particularly interesting. As expected, the large majority (85.7 percent) of the people in this group paid for the health services they received, yet (as noted above) about 14 percent were exempted from payment. When individuals in this group, and the facilities they had visited, were identified, it became evident that the facilities that had provided free care to the uninsured were, for the most part, for-profit clinics that customarily provide free care to some low-income patients.

The average expenditure associated with an outpatient visit to a physician is shown, by subsector, in Table III.9. Averages were computed using only those patients who made direct payments for the care they received (i.e., user fees for consultations and charges for medications, lab tests, etc.). Average fees for service ranged from a low of RD\$ 5 at SESPAS facilities to a high of RD\$ 15 in private facilities. On average, private subsector patients spent a total of RD\$ 60 (US\$ 13.24) (11) for a consultation, drugs, and exams -- almost twice as much as those SESPAS patients who paid some cost-recovery fees and nearly three times as much as IDSS' few paying patients. The relatively high cost of private visits was due, in part, to the charges for drugs, which accounted for about half of the average patient's total expenditure in the private subsector but less than a third in SESPAS and only one-fifth in IDSS.

4. Outpatients' Household Income. The distribution of patients' monthly household income, by subsector consulted, is shown in Table III.10. Monthly household income can be converted into annual dollar per capita income by multiplying the former figure by 12, and dividing the result by the average family size of 4.14 times the exchange rate. Thus a monthly household income of RD\$ 800 represents an annual per capita income of about US\$ 512 [$512 = 800 \times 12 / (4.14 \times 4.53)$] (12). The table shows that those who visited SESPAS facilities tended to have lower monthly household incomes than others. For example, 67 percent of SESPAS users had monthly

TABLE III.9

AVERAGE DIRECT PAYMENT ASSOCIATED WITH
 OUTPATIENT MEDICAL CARE VISITS BY PATIENTS
 WHO WERE OBLIGED TO PAY FOR THEIR CARE,
 SANTO DOMINGO (D.R.), 1987
 (in RD\$ of November, 1987)

Purpose of payment	SESPAS	IDSS	Private
Payment for the visit	5	7	15
Payment for drugs	10	5	32
Payment for lab tests	20	11	13
Total payment associated with a visit	35	23	60

TABLE III.10
 DISTRIBUTION OF PATIENTS' MONTHLY HOUSEHOLD INCOME
 BY SUBSECTOR VISITED FOR OUTPATIENT MEDICAL CARE,
 SANTO DOMINGO (D.R.), 1987
 (in percentages)

Monthly household income (in RD\$ of Nov., 1987)	SESPAS	IDSS	Armed Forces	P
Less than 200	18.1	5.2	0.0	
200 - 300	12.9	8.0	5.6	
301 - 400	12.1	7.0	14.0	
401 - 600	14.8	11.4	5.8	
601 - 800	8.8	17.0	7.2	
801 - 1,300	19.3	24.3	24.1	
1,301 - 2,000	9.4	13.8	4.3	
2,000 or more	4.6	13.3	39.0	

TABLE III.11
 DISTRIBUTION OF MONTHLY HOUSEHOLD INCOME
 FOR USERS OF PRIVATE SECTOR OUTPATIENT MEDICAL CARE,
 WHO NEITHER WERE INSURED NOR MADE ANY DIRECT PAYMENT,
 SANTO DOMINGO (D.R.), 1987

Monthly household income range (in RD\$ of Nov., 1987)	Percentage share	Cumulative percentage
Less than 200	20.4	20.4
200 - 300	14.1	34.5
301 - 400	6.3	40.8
401 - 600	13.7	54.5
601 - 800	11.1	65.6
801 - 1,300	13.0	78.6
1,301 - 2,000	12.7	91.3
2,001 or more	8.7	100.0

household incomes of RD\$ 800 or less, while only 49 percent of IDSS users, 33 percent of those who visited Armed Forces doctors, and 47 percent of those who saw private subsector physicians had monthly household incomes below RD\$ 800.

Table III.11 shows the household income distribution of those private subsector health care recipients who received free care from medical doctors. A comparison of the cumulative income distribution from Table III.11 with the distributions shown in Table III.10 reveals that uninsured private subsector patients who received free care had a distribution of income similar to that of SESPAS users. These results confirm that the free care provided by private physicians to uninsured patients benefits people belonging predominantly to low-income groups.

5. Travel Time to Facilities. Travel time has been shown to have an important influence on decisions to seek curative care (see, e.g., Dor, Gertler and van der Gaag 1987). Table III.12 shows average patient travel times to medical facilities, by subsector visited. The average travel time was similar for SESPAS and private patients, while patients visiting Armed Forces and IDSS doctors spent somewhat more time in travel. In some cases, subsector differences are quite large percentage-wise, but the travel time averages show that these differences are probably unimportant in absolute terms, due to the compact nature of the Santo Domingo urban area: the difference between the highest and lowest subsector average is only 12 minutes. In the case of Santo Domingo, therefore, health services appear to be within reasonable distance of most users.

6. Waiting Time at Facilities. Waiting time, like travel time, can influence the decision to seek care as well as the choice of provider. Table III.13 shows that waiting time distributions were quite similar in SESPAS, IDSS, and Armed Forces facilities: in these subsectors, approximately 45 percent of patients waited 30 minutes or less prior to receiving care. The average waiting times for these subsectors were also quite similar, ranging from one hour in IDSS facilities to one hour and fourteen minutes in SESPAS facilities. In the private subsector, however, 60 percent of patients waited less than 30 minutes, and the overall subsector average was only 49 minutes -- 25 minutes less than the average for SESPAS facilities. This may, in part, account for the relatively high percentages of private care users even among those of low-income status.

It should be reiterated in conclusion that the findings presented above are based upon analyses of approximately 219,000 individuals who, during the survey's two-week recall period, perceived themselves to have had a non-dental health

TABLE III.12

CUMULATIVE DISTRIBUTION OF AND AVERAGE TRAVEL TIME
FOR OUTPATIENT MEDICAL CARE VISITS, BY SUBSECTOR,
SANTO DOMINGO (D.R.), 1987
(in percentages)

Travel time	SESPAS	IDSS	Armed Forces	Private
10 minutes or less	35.1	19.4	4.8	27.4
20 minutes or less	55.6	46.1	29.4	49.4
30 minutes or less	75.1	70.1	56.8	70.1
45 minutes or less	81.2	75.4	65.5	78.9
1 hour or less	95.8	89.7	87.1	91.0
Average travel time (minutes)	28	38	40	30

TABLE III.13

CUMULATIVE DISTRIBUTION OF AND AVERAGE WAITING TIME
FOR OUTPATIENT MEDICAL CARE VISITS, BY SUBSECTOR,
SANTO DOMINGO (D.R.), 1987
(in percentages)

Waiting time	SESPAS	IDSS	Armed Forces	Private
10 minutes or less	22.6	18.2	22.2	33.9
20 minutes or less	45.5	47.1	42.2	60.0
30 minutes or less	64.1	66.1	64.4	75.9
45 minutes or less	80.5	77.7	71.1	84.6
1 hour or less	88.4	83.5	73.3	87.3
Average waiting time (minutes)	74	60	69	49

problem requiring curative care and who visited a physician because of it. These 219,000 individuals made approximately 221,000 curative outpatient visits to medical doctors during the survey period.

C. Inpatient Curative Care

In this section, only hospitalizations due to illness or accidents are considered; hospitalizations for deliveries or for diagnostic procedures are excluded, since these forms of care may be sufficiently different to warrant different models of health care seeking behavior.

1. Choice of Subsector. Compared to outpatients, inpatients usually have less choice about whether or not to seek health care; either they are referred from outpatient care, or suffer from an illness or injury serious enough to warrant direct admission to an inpatient facility. For this reason, the household survey collected data only on inpatients' choices of subsector (as opposed to data on both the decision to seek inpatient care and the choice of subsector). Table III.14 shows that about 81,000 people, or 4.5 percent of Santo Domingo's population, sought inpatient care due to illness or accident during a 23-month recall period prior to the household survey (it is important to note, however, that the total number of hospitalizations may be underestimated due to faulty recall) (13). The distribution of hospitalizations by subsector was as follows: 60 percent of patients were hospitalized in the private subsector, 29 percent in SESPAS, 7 percent in IDSS, and 4 percent in Armed Forces hospitals.

When the beneficiary status of patients is considered relative to the subsector visited, findings similar to those observed for outpatient medical care emerge. First, a large percentage (41.1 percent) of all those hospitalized in IDSS facilities were not beneficiaries of IDSS (the comparable figure for outpatient medical care was 31.4 percent). Similarly, about 45 percent of those hospitalized in Armed Forces hospitals were not affiliated with the Armed Forces -- a figure that is also similar to that for outpatient medical care. Third, over three-quarters of private subsector hospitalizations involved uninsured individuals, a percentage greater than was observed for outpatient medical care.

2. Inpatients' Expenditures. The proportion of SESPAS inpatients who received free care (90.4 percent) is almost identical to that observed for outpatient care; only 9.6 percent of those hospitalized in SESPAS facilities paid for their care (Table III.15). Among those hospitalized in IDSS facilities (as was the case with IDSS outpatients), virtually

TABLE III.14

HOSPITALIZATIONS DURING A 23-MONTH REFERENCE PERIOD
 BY SUBSECTOR AND BENEFICIARY STATUS OF PATIENT
 SANTO DOMINGO (D.R.), 1987

Subsector hospitalized	Beneficiaries		Non-beneficiaries		Beneficiaries and Non-beneficiaries		Percent of all hospita- lizations
	Total	%	Total	%	Total	%	
BESPAS	23,317	100.0	--	--	23,317	100.0	28.8
IDSS	3,427	58.9	2,390	41.1	5,817	100.0	7.2
Armed Forces	1,663	55.4	1,339	44.6	3,002	100.0	3.7
Private	11,159	22.8	37,761	77.2	48,920	100.0	60.4

Total	39,566	48.8	41,490	51.2	81,056	100.0	100.0

TABLE III.15

DIRECT PAYMENT FOR HOSPITALIZATION
 BY SUBSECTOR HOSPITALIZED AND BENEFICIARY STATUS OF PATIENT
 SANTO DOMINGO (D.R.), 1987

Subsector hospita- lized	Beneficiaries						Non-beneficiaries						If payment made, average payment
	Direct payment made						Direct payment made						
	No		Yes				No		Yes				
	Total	%	Total	%	Total	%	Total	%	Total	%	Total	%	
BESPAS	21,069	90.4	2,248	9.6	23,317	100.0	--	--	--	--	--	--	414
IDBS	3,224	94.1	203	5.9	3,427	100.0	2,252	94.2	138	5.8	2,390	100.0	131
Armed Forces	1,663	100.0	0	0.0	1,663	100.0	1,339	100.0	0	0.0	1,339	100.0	--
Private	6,210	55.7	4,949	44.3	11,159	100.0	2,779	7.4	34,982	92.6	37,761	100.0	595
Total	32,166	81.3	7,400	18.7	39,566	100.0	6,370	15.4	35,120	84.6	41,490	100.0	--

all IDSS beneficiaries were given free care, and the percentage of non-IDSS beneficiaries who paid for their care (5.8 percent) was even lower than what was observed for outpatient medical care. All Armed Forces patients were given free care regardless of beneficiary status -- a situation also observed for outpatient medical care. A large proportion of private subsector beneficiaries (44.3 percent) incurred some expenditures associated with hospitalization, which probably reflects limits, deductibles, and copayments set by iguallas and private insurance companies. Finally, over 90 percent of uninsured users of private subsector inpatient facilities paid for their care -- a percentage greater than what was observed for outpatient medical care. Of patients who paid for the care they received, SESPAS patients paid, on average, RD\$ 414 per hospitalization in cost-recovery fees, compared with an average of RD\$ 595 per hospitalization paid by private subsector patients.

3. Inpatients' Household Income. Table III.16 shows that inpatients at private and Armed Forces hospitals had similar household income distributions, suggesting that the socioeconomic status of users of these two subsectors was similar. In contrast, SESPAS inpatients include a higher proportion with household incomes falling into the lower income groups. At higher household incomes, a lower proportion of individuals within income groups chose SESPAS for hospitalization (Table III.17). The opposite effect was observed in the case of the private subsector: people from higher-income households had a greater tendency to choose private hospitals or clinics.

4. Inpatients' Travel and Waiting Times. Subsector average travel time to inpatient facilities did not differ significantly from travel time to outpatient facilities. Unlike outpatient visits to physicians, however, hospitalizations are, for the most part, infrequent and important events in people's lives. It is therefore unlikely that minor travel time differences among alternative inpatient facilities will have an important effect on the choice of facility. Average waiting time to obtain a hospital bed -- once a patient presented himself or herself for admission -- was under two hours in both private and Armed Forces facilities. SESPAS and IDSS waiting times to obtain a hospital bed were somewhat higher, but most individuals in these two subsectors had to wait less than half a day from the time they requested a hospital bed to the time a bed was made available.

TABLE III.16

DISTRIBUTION OF HOSPITAL PATIENTS' MONTHLY HOUSEHOLD INCOME,
 BY SUBSECTOR HOSPITALIZED,
 SANTO DOMINGO (D.R.), 1987
 (in percentages)

Monthly household income (in RD\$ of November, 1987)	SESPAS	IDSS	Armed Forces	Private	All subsectors
Less than 200	14.7	5.8	2.8	6.3	9.5
200 - 300	20.6	9.6	12.6	9.8	13.6
301 - 400	15.6	15.9	11.1	10.5	12.9
401 - 600	20.7	29.2	22.4	16.7	18.9
601 - 800	10.7	11.5	8.3	14.0	12.2
801 - 1,300	9.6	17.1	22.4	19.2	15.6
1,301 - 2,000	2.5	5.4	16.0	8.9	6.5
2,001 or more	5.6	5.5	4.4	14.6	10.8
.....
Total	100.0	100.0	100.0	100.0	100.0

TABLE III.17

DISTRIBUTION OF SUBSECTOR OF HOSPITALIZATION
 BY LEVELS OF PATIENTS' MONTHLY HOUSEHOLD INCOME,
 SANTO DOMINGO (D.R.), 1987
 (in percentages)

Monthly household income (in RD\$ of November, 1987)	SESPAS	IDSS	Armed Forces	Private	All subsectors
Less than 200	58.9	5.0	1.0	35.1	100.0
200 - 300	54.8	5.5	3.1	36.6	100.0
301 - 400	44.9	9.9	3.0	42.2	100.0
401 - 600	39.5	12.0	4.1	44.4	100.0
601 - 800	31.9	7.4	2.4	58.3	100.0
801 - 1,300	22.7	8.7	5.1	63.5	100.0
1,301 - 2,000	14.3	6.5	8.7	70.5	100.0
2,001 or more	12.2	5.2	2.7	79.9	100.0

IV. ESTIMATES: OUTPATIENT CURATIVE CARE

The descriptive analysis of outpatient behavior presented in Chapter III, which was based on simple cross-tabulations of variables, suggested apparent relationships between pairs of variables. However, such cross-tabulations do not reveal the statistical significance of relationships between variables. Further, the demand for out-patient medical care involves the interaction of not just two but many variables. This chapter, based on a statistical analysis of the outpatient medical care decisions reflected in the household survey, isolates the effects of each of a number of explanatory variables -- ones that are both measurable and normally considered influential in decision-making -- on the demand for outpatient medical care.

The estimates of this demand analysis were derived from a behavioral model that is employed in this chapter to simulate the likely effects of changes in explanatory variables on the demand for outpatient medical care in Santo Domingo. Tables containing additional simulations and statistical results, and a detailed description of the model and discussion of related methodological considerations, may be found in Appendices A and B, respectively.

A. Influence of Sex, Age, and Income on Demand for Outpatient Care

Based on technical results presented in Appendix B (Table B.1), Table IV.1 presents the statistical probabilities of various outpatient medical care choices on the part of females, as a function of their age and household income. Table IV.2 contains the comparable probabilities for males. It is again important to note the qualifying comments in these tables' footnotes: that the individuals reflected have an average educational level of 7.8 years (or, in the case of those under 15 years old, that the best-educated adult in each of these individuals' families has 7.8 years of education), that these individuals are ill rather than accident victims, and that IDSS beneficiaries are excluded. (The reason that IDSS beneficiaries and non-beneficiaries are analyzed separately in Tables IV.5 and IV.8 is that their health care seeking behavior differs significantly from that of non-beneficiaries: they are much more likely to seek care from IDSS facilities than non-beneficiaries.)

TABLE IV.1

DECISION TO SEEK OUTPATIENT CURATIVE CARE AND CHOICE OF SUBSECTOR
AS A FUNCTION OF AGE AND HOUSEHOLD INCOME: FEMALES,
SANTO DOMINGO (D.R.), 1987

Person's age (years)	Decision	Household income quintile * (RD\$ of November, 1987)							
		I: RD\$ 200		II: RD\$ 450		III: RD\$ 850		IV: RD\$ 1500	
		Proba- bility	Subsector choice (%)	Proba- bility	Subsector choice (%)	Proba- bility	Subsector choice (%)	Proba- bility	Subsector choice (%)
Under 1	No medical care	0.501		0.500		0.497		0.494	
	Private doctor	0.265	53.1	0.273	54.6	0.283	56.2	0.299	59.1
	SESPAS doctor	0.220	44.1	0.214	42.8	0.207	41.2	0.195	38.5
	IDSS doctor	0.014	2.8	0.013	2.6	0.013	2.6	0.012	2.4
		1.000	100.0	1.000	100.0	1.000	100.0	1.000	100.0
1 - 4	No medical care	0.703		0.701		0.699		0.696	
	Private doctor	0.162	54.5	0.167	55.9	0.173	57.5	0.183	60.2
	SESPAS doctor	0.133	44.8	0.130	43.5	0.126	41.9	0.119	39.1
	IDSS doctor	0.002	0.7	0.002	0.7	0.002	0.7	0.002	0.7
		1.000	100.0	1.000	100.0	1.000	100.0	1.000	100.0
5 - 14	No medical care	0.800		0.799		0.799		0.796	
	Private doctor	0.095	47.5	0.098	48.7	0.102	50.7	0.109	53.4
	SESPAS doctor	0.100	50.0	0.098	48.8	0.095	47.3	0.091	44.6
	IDSS doctor	0.005	2.5	0.005	2.5	0.004	2.0	0.004	2.0
		1.000	100.0	1.000	100.0	1.000	100.0	1.000	100.0
15 - 44	No medical care	0.724		0.722		0.710		0.716	
	Private doctor	0.188	68.2	0.193	69.4	0.199	70.8	0.208	73.3
	SESPAS doctor	0.076	27.5	0.074	26.6	0.071	25.3	0.066	23.2
	IDSS doctor	0.012	4.3	0.011	4.0	0.011	3.9	0.010	3.5
		1.000	100.0	1.000	100.0	1.000	100.0	1.000	100.0
Over 45	No medical care	0.770		0.772		0.766		0.763	
	Private doctor	0.188	81.8	0.191	83.8	0.195	83.3	0.202	85.3
	SESPAS doctor	0.030	13.0	0.029	12.7	0.028	12.0	0.025	10.5
	IDSS doctor	0.012	5.2	0.008	3.5	0.011	4.7	0.010	4.2
		1.000	100.0	1.000	100.0	1.000	100.0	1.000	100.0

Note: Results in this table are estimated for a female with 7.8 years of education (for females under the age of 15, highest level of education achieved in the household is used), who is not an IDSS beneficiary, and who did not have an accident. The average private sector price faced by this individual was RD\$ 34.30.

* - The highest household income quintile is omitted here because the results are statistically unreliable.

TABLE IV.2

DECISION TO SEEK OUTPATIENT CURATIVE CARE AND CHOICE OF SUBSECTOR
AS A FUNCTION OF AGE AND HOUSEHOLD INCOME: MALES,
SANTO DOMINGO (D.R.), 1987

Person's age (years)	Decision	Household income quintile * (RD\$ of November, 1987)							
		I: RD\$ 200		II: RD\$ 450		III: RD\$ 850		IV: RD\$ 1500	
		Proba- bility	Subsector choice (%)	Proba- bility	Subsector choice (%)	Proba- bility	Subsector choice (%)	Proba- bility	Subsector choice (%)
Under 1	No medical care	0.538		0.536		0.533		0.530	
	Private doctor	0.236	51.0	0.244	52.6	0.255	54.6	0.272	57.8
	SESPAS doctor	0.202	43.7	0.196	42.2	0.189	40.5	0.177	37.7
	IDSS doctor	0.024	5.3	0.024	5.2	0.023	4.9	0.021	4.5
		1.000	100.0	1.000	100.0	1.000	100.0	1.000	100.0
1 - 4	No medical care	0.734		0.732		0.731		0.727	
	Private doctor	0.142	53.3	0.147	54.8	0.153	56.9	0.164	60.1
	SESPAS doctor	0.120	45.3	0.117	43.7	0.113	42.0	0.106	38.8
	IDSS doctor	0.004	1.4	0.004	1.5	0.003	1.1	0.003	1.1
		1.000	100.0	1.000	100.0	1.000	100.0	1.000	100.0
5 - 14	No medical care	0.823		0.822		0.822		0.819	
	Private doctor	0.081	45.8	0.084	47.2	0.088	49.4	0.095	52.5
	SESPAS doctor	0.088	49.7	0.086	48.3	0.083	48.5	0.079	43.6
	IDSS doctor	0.008	4.5	0.008	4.5	0.007	4.1	0.007	3.9
		1.000	100.0	1.000	100.0	1.000	100.0	1.000	100.0
15 - 44	No medical care	0.752		0.751		0.748		0.744	
	Private doctor	0.161	65.0	0.165	66.3	0.172	68.3	0.181	71.0
	SESPAS doctor	0.067	27.0	0.065	26.1	0.062	24.6	0.057	22.3
	IDSS doctor	0.020	8.0	0.019	7.6	0.018	7.1	0.017	6.7
		1.000	100.0	1.000	100.0	1.000	100.0	1.000	100.0
Over 45	No medical care	0.796		0.794		0.791		0.787	
	Private doctor	0.159	77.7	0.162	78.7	0.167	79.9	0.175	82.2
	SESPAS doctor	0.026	12.8	0.025	12.1	0.024	11.5	0.022	10.3
	IDSS doctor	0.019	9.5	0.019	9.2	0.018	8.6	0.016	7.5
		1.000	100.0	1.000	100.0	1.000	100.0	1.000	100.0

Note: Results in this table are estimated for a male with 7.8 years of education (for males under the age of 15, highest level of education achieved in the household is used), who is not an IDSS beneficiary, and who did not have an accident. The average private sector price faced by this individual was RD\$ 34.30.

* - The highest household income quintile is omitted here because the results are statistically unreliable.

Tables IV.1 and IV.2 can be used to assess the simultaneous effects of age and household income on outpatient medical care seeking behavior. They show that -- except for infants under one year in income quintiles III and above -- for all age groups, both sexes, and across four household income quintiles there is a greater probability that care will not be sought in the face of a (non-accident-related) health problem than that care will be sought (see Appendix B for results from the fifth and highest household income quintile) (14).

The tables show that the likelihood of seeking outpatient care is predictably related to both age and, to a lesser extent, income. For both sexes and across all income quintiles, almost half of all infants (i.e., children under the age of one year) with a health problem are taken to see a doctor, but this proportion is much lower for all other age groups -- most notably for school-age children (i.e., the 5-14 age group). Among females, over one-fourth of those between 1-4 and between 15-44, and about one-fourth of those over 45, see a doctor when ill, but in the 5-14 age group, only one-fifth are taken to see a doctor when they report feeling ill. (This may indicate that the 5-14 age group is underserved, but could also suggest that individuals in this age group suffer from fewer serious health problems and more insignificant illnesses not requiring medical care than members of other age groups.) The same general proportions hold true among males, except that even fewer than one-fifth of the 5-14 age group see a doctor when ill. Thus age has a significant effect on the probability of seeking outpatient care. It is worth noting that model-predicted behavior, as reflected in Tables IV.1 and IV.2, corresponds exactly to the actual behavior of ill people as described in Chapter III.

A comparison of Tables IV.1 and IV.2 reveals that behavioral differences between males and females are not very significant. The remainder of this chapter thus presents results for males only. Another important reason for performing the analysis for males is that most IDSS affiliates are males. Thus, in order to assess the differences in health care seeking behavior between beneficiaries and non-beneficiaries of IDSS (as in Tables IV.4, IV.5, IV.7, and IV. 8), it is necessary to consider males as opposed to females.

The proportions of each age group who see a doctor when ill are similar across income quintiles: for both sexes and across all age groups, ill individuals with higher household income have only a slightly greater probability of seeking outpatient care than those with lower household income. For example, the econometric results predict that of all females in the 15-44 age group in Table IV.1, those in (the low-income) quintile I see a doctor in 27.6 percent of re-

ported cases of illness (1 - 0.724), while those in (the upper-middle-income) quintile IV see a doctor in 28.4 percent of cases (1 - .716). In the 45 and over age group, those in quintile I seek outpatient care in 23 percent of cases (1 - 0.770), while those in quintile IV seek care in 23.7 percent of cases (1 - 0.763). Income thus appears to have only a small effect on the probability of seeking outpatient medical care -- a finding with potentially important implications.

In contrast, among those who have decided to seek care the choice of which subsector to visit is more strongly influenced by household income. Relative to lower-income people, those who enjoy higher household incomes are less likely to visit either SESPAS or IDSS physicians, and more likely to visit private physicians. Yet for virtually every household income category the demand for private physicians is greater than the demand for physicians of other subsectors: more than half of all those who are ill and decide to seek outpatient care see private doctors. With only a few exceptions, these results hold across all age and income groups (the exceptions are females aged 5-14 in quintiles I and II, and males aged 5-14 in quintiles I-III; slightly fewer than half see private doctors.) For example, of all adult females (15-44 age group) in the lowest income quintile who choose to seek care, 68 percent visit a private subsector physician; of the same age cohort in the highest income quintile shown, 73 percent visit a private physician. The proportions of people who chose SESPAS and IDSS doctors decline as household income goes up.

The preference for private subsector care, while strong across all segments of the Santo Domingo population, is most pronounced for adults. For example, ill female children (1-4 years of age) in the third income quintile who are taken to a doctor see a private physician in 58 percent of all cases. In contrast, individuals in the same income quintile who are 45 or older see a private subsector physician in 83 percent of all cases. The reverse is true of those who visit SESPAS doctors: ill female children, aged 1-4, in quintile III are taken to SESPAS doctors in 42 percent of cases, while only 12 percent of those 45 and over in the same quintile visit SESPAS doctors (perhaps reflecting a SESPAS focus on well-baby care). As can be seen from Tables IV.1 and IV.2, the statistical model predicts low rates of use of IDSS doctors. This is not a surprising finding, since (as explained previously) these tables do not include beneficiaries of IDSS. However, predicted use of IDSS doctors in the tables, though low, is not zero, due to the fact that some users of IDSS are not IDSS beneficiaries (see Chapter III).

Tables IV.1 and IV.2 reflect an important difference between the outpatient medical care seeking decisions of males

and females. While females, across all age and income groups, are only to a very small extent more likely to seek outpatient medical care than males (see also Table III.3), they choose to consult private subsector doctors in a much higher proportion than males.

B. Influence of Education on Outpatient Medical Care Seeking Behavior

The estimates of the demand analysis (see Appendix B) also show the effect of education on outpatient medical care decisions. In general, the higher a person's level of education, the greater the probability of seeking medical care and of choosing a private subsector doctor (see Table IV.3); again, the qualifying notes included in the table should be read carefully in order to understand that the results pertain to the largest possible segment of the population -- *i.e.*, excluding only IDSS beneficiaries -- and also include several other variables.

The greater tendency of those with more education to utilize private subsector doctors is observed across all income levels. For example, a middle-income individual (*i.e.*, in the third household income quintile), with only two years of education, has a 24.8 percent ($1 - 0.752$) probability of seeking outpatient care if he reports being ill, and a 50.8 percent probability of choosing a private subsector physician. In contrast, an individual with the same income but 10 years of education, while only a bit more likely to seek care (25.5 percent probability, or $1 - 0.745$), is much more likely to choose a private subsector physician (73.8 percent probability).

Correspondingly, those who perceive themselves as ill are less apt to use SESPAS and IDSS providers the higher their educational level. Across all income quintiles, the most dramatic inverse relationship is the lower use of SESPAS services associated with higher educational levels; the decline in the use of IDSS services in each quintile is less dramatic, but still noteworthy.

C. Influence of Price on Outpatient Medical Care Seeking Behavior

1. SESPAS Prices. Tables IV.4 and IV.5 (in which the effects of price and income are analyzed separately for non-beneficiaries and beneficiaries of IDSS) illustrate the impact, on outpatient medical care seeking behavior, of a potential policy decision: the establishment of higher prices at SESPAS facilities. Both tables show decision probabilities

TABLE IV.3

DECISION TO SEEK OUTPATIENT CURATIVE CARE AND CHOICE OF SUBSECTOR
AS A FUNCTION OF EDUCATION AND HOUSEHOLD INCOME: MALES,
SANTO DOMINGO (D.R.), 1987

Years of education	Decision	Household income quintile * (RD\$ of November, 1987)							
		I: RD\$ 200		II: RD\$ 450		III: RD\$ 850		IV: RD\$ 1500	
		Proba- bility	Subsector choice (%)	Proba- bility	Subsector choice (%)	Proba- bility	Subsector choice (%)	Proba- bility	Subsector choice (%)
2	No medical care	0.755		0.754		0.752		0.749	
	Private doctor	0.116	47.5	0.120	48.7	0.126	50.8	0.136	54.1
	SESPAS doctor	0.104	42.4	0.101	41.1	0.098	39.5	0.093	37.1
	IDSS doctor	0.025	10.3	0.025	10.2	0.024	9.7	0.022	8.8
		1.000	100.0	1.000	100.0	1.000	100.0	1.000	100.0
4	No medical care	0.754		0.753		0.751		0.748	
	Private doctor	0.132	53.7	0.136	55.1	0.142	57.1	0.152	60.4
	SESPAS doctor	0.091	37.0	0.088	35.6	0.085	34.1	0.080	31.7
	IDSS doctor	0.023	9.3	0.023	9.3	0.022	8.8	0.020	7.9
		1.000	100.0	1.000	100.0	1.000	100.0	1.000	100.0
6	No medical care	0.753		0.752		0.750		0.747	
	Private doctor	0.147	59.5	0.152	61.3	0.158	63.2	0.168	66.4
	SESPAS doctor	0.078	31.6	0.075	30.2	0.072	28.8	0.067	26.5
	IDSS doctor	0.022	8.9	0.021	8.5	0.020	8.0	0.018	7.1
		1.000	100.0	1.000	100.0	1.000	100.0	1.000	100.0
8	No medical care	0.751		0.749		0.747		0.743	
	Private doctor	0.163	65.5	0.168	66.9	0.174	68.8	0.184	71.6
	SESPAS doctor	0.066	26.5	0.064	25.5	0.061	24.1	0.056	21.8
	IDSS doctor	0.020	8.0	0.019	7.6	0.018	7.1	0.017	6.6
		1.000	100.0	1.000	100.0	1.000	100.0	1.000	100.0
10	No medical care	0.749		0.747		0.745		0.740	
	Private doctor	0.178	70.9	0.183	72.4	0.189	73.8	0.198	76.1
	SESPAS doctor	0.055	21.9	0.053	20.9	0.051	19.9	0.047	18.1
	IDSS doctor	0.018	7.2	0.017	6.7	0.016	6.3	0.015	5.8
		1.000	100.0	1.000	100.0	1.000	100.0	1.000	100.0
12	No medical care	0.746		0.744		0.741		0.737	
	Private doctor	0.192	75.8	0.197	76.9	0.203	78.4	0.212	80.7
	SESPAS doctor	0.046	18.3	0.044	17.2	0.042	16.2	0.038	14.4
	IDSS doctor	0.016	6.1	0.015	5.9	0.014	5.4	0.013	4.9
		1.000	100.0	1.000	100.0	1.000	100.0	1.000	100.0

Note: Results in this table are estimated for a 15-44 year-old male, who is not an IDSS beneficiary, and who did not have an accident. The average private sector price faced by this individual was RD\$ 34.60.

* - The highest household income quintile is omitted here because the results are statistically unreliable.

TABLE IV.4

DECISION TO SEEK OUTPATIENT CURATIVE CARE AND CHOICE OF SUBSECTOR
AS A FUNCTION OF SESPAS PRICES AND HOUSEHOLD INCOME: MALES,
EXCLUDING BENEFICIARIES OF IDSS,
SANTO DOMINGO (D.R.), 1987

		Household income quintile * (RD\$ of November, 1987)							
		I: RD\$ 200		II: RD\$ 450		III: RD\$ 850		IV: RD\$ 1500	
SESPAS price	Decision	Proba- bility	Subsector choice (%)	Proba- bility	Subsector choice (%)	Proba- bility	Subsector choice (%)	Proba- bility	Subsector choice (%)
RD\$ 1.83	No medical care	0.752		0.751		0.749		0.745	
	Private doctor	0.161	64.9	0.165	66.3	0.171	66.1	0.181	70.9
	SESPAS doctor	0.067	27.0	0.065	26.1	0.062	24.7	0.057	22.4
	IDSS doctor	0.020	8.1	0.019	7.6	0.018	7.2	0.017	6.7
			1.000	100.0	1.000	100.0	1.000	100.0	1.000	100.0
RD\$ 10	No medical care	0.753		0.752		0.749		0.744	
	Private doctor	0.164	66.4	0.168	67.7	0.173	68.9	0.182	71.1
	SESPAS doctor	0.063	25.5	0.061	24.6	0.060	23.9	0.057	22.3
	IDSS doctor	0.020	8.1	0.019	7.7	0.018	7.2	0.017	6.6
			1.000	100.0	1.000	100.0	1.000	100.0	1.000	100.0
RD\$ 20	No medical care	0.754		0.752		0.749		0.745	
	Private doctor	0.167	67.9	0.170	68.5	0.175	69.7	0.182	71.3
	SESPAS doctor	0.058	23.6	0.058	23.4	0.057	22.7	0.056	22.0
	IDSS doctor	0.021	8.5	0.020	8.1	0.019	7.6	0.017	6.7
			1.000	100.0	1.000	100.0	1.000	100.0	1.000	100.0
RD\$ 30	No medical care	0.755		0.753		0.749		0.744	
	Private doctor	0.170	69.4	0.173	70.0	0.177	70.5	0.183	71.5
	SESPAS doctor	0.054	22.0	0.054	21.9	0.055	21.9	0.056	21.9
	IDSS doctor	0.021	8.6	0.020	8.1	0.019	7.6	0.017	6.6
			1.000	100.0	1.000	100.0	1.000	100.0	1.000	100.0

Note: Results in this table are estimated for a 15-44 year-old male with 7.8 years of education who did not have an accident. The average private sector price faced by this individual was RD\$ 34.30.

* - The highest household income quintile is omitted here because the results are statistically unreliable.

TABLE IV.5

DECISION TO SEEK OUTPATIENT CURATIVE CARE AND CHOICE OF SUBSECTOR
AS A FUNCTION OF SESPAS PRICES AND HOUSEHOLD INCOME: MALES,
BENEFICIARIES OF IDSS ONLY,
SANTO DOMINGO (D.R.), 1987

		Household income quintile * (RD\$ of November, 1987)							
		I: RD\$ 200		II: RD\$ 450		III: RD\$ 850		IV: RD\$ 1500	
SESPAS price	Decision	Proba- bility	Subsector choice (%)	Proba- bility	Subsector choice (%)	Proba- bility	Subsector choice (%)	Proba- bility	Subsector choice (%)
RD\$ 1.83	No medical care	0.724		0.723		0.721		0.720	
	Private doctor	0.089	32.3	0.093	33.6	0.099	35.5	0.108	38.6
	SESPAS doctor	0.037	13.4	0.036	13.0	0.036	12.9	0.034	12.1
	IDSS doctor	0.150	54.3	0.148	53.4	0.144	51.6	0.138	49.3
			1.000	100.0	1.000	100.0	1.000	100.0	1.000	100.0
RD\$ 10	No medical care	0.724		0.723		0.722		0.719	
	Private doctor	0.090	32.6	0.094	33.9	0.099	35.6	0.109	38.8
	SESPAS doctor	0.034	12.3	0.034	12.3	0.034	12.2	0.034	12.1
	IDSS doctor	0.152	55.1	0.149	53.8	0.145	52.2	0.138	49.1
			1.000	100.0	1.000	100.0	1.000	100.0	1.000	100.0
RD\$ 20	No medical care	0.726		0.724		0.721		0.719	
	Private doctor	0.090	32.9	0.094	34.1	0.100	35.8	0.109	38.8
	SESPAS doctor	0.031	11.3	0.032	11.6	0.033	11.8	0.034	12.1
	IDSS doctor	0.153	55.8	0.150	54.3	0.146	52.3	0.138	49.1
			1.000	100.0	1.000	100.0	1.000	100.0	1.000	100.0
RD\$ 30	No medical care	0.725		0.724		0.722		0.719	
	Private doctor	0.091	33.1	0.095	34.4	0.100	36.1	0.109	38.9
	SESPAS doctor	0.029	10.5	0.030	10.9	0.031	11.2	0.033	11.8
	IDSS doctor	0.155	56.4	0.151	54.7	0.146	52.7	0.138	49.3
			1.000	100.0	1.000	100.0	1.000	100.0	1.000	100.0

Note: Results in this table are estimated for a 15-44 year-old male with 7.8 years of education who did not have an accident. The average private sector price faced by this individual was RD\$ 34.30.

* - The highest household income quintile is omitted here because the results are statistically unreliable.

and subsector choices for the four lowest income quintiles. SESPAS prices are currently near zero (15), but could conceivably be increased for those with a demonstrated ability and willingness to pay. The resulting revenue could be used to improve the quality of SESPAS services, and thus counteract any decline in utilization that might occur as a result of the price increase. In general, according to these tables, if SESPAS prices were to increase, utilization of SESPAS services would correspondingly decrease, across all household income quintiles shown, although the decrease would not be dramatic. This suggests that SESPAS could charge user fees to more individuals, and possibly increase its fees as well, while experiencing only a relatively small reduction in outpatient care visits to SESPAS doctors.

When Table IV.4 is compared with Table IV.7, which shows the effects of increases in private subsector prices on the choices of non-IDSS beneficiaries, a surprising finding emerges: a significant proportion of people in the lower household income quintiles would, if faced with a SESPAS price of RD\$ 30, utilize SESPAS services even though they could see a private subsector physician for the same price. If faced with an RD\$ 30 private subsector price, 24 percent would utilize SESPAS services (Table IV.6); if faced by an RD\$ 30 SESPAS price, 22 percent would still use SESPAS services (Table IV.4). This finding holds true across all income groups -- possibly because of some patients' proximity to and/or familiarity with SESPAS services.

Raising SESPAS prices would tend to reduce visits to SESPAS doctors for outpatient care, but improving the quality of services could boost utilization enough to offset the effect of the price increase, potentially resulting in a net increase in the use of SESPAS services at higher prices. To illustrate the revenue-producing potential of higher SESPAS fees, consider the following example. If the price rose from its current average of near zero to RD \$20 per visit, the number of visits to SESPAS facilities by people aged 15-44 in the RD \$200 income group would decrease from 450,000 annual visits to 400,000. The resulting revenue raised by SESPAS would be about RD \$8 million (16). (Additional calculations, taking into consideration all age and sex categories and all income groups, would of course have to be made to assess the full effect of such a measure.)

If raising SESPAS prices were to be considered as a policy option, it would be equally important for SESPAS to determine how the quality of its services could be improved with the increased revenue that would result. For example, waiting time at SESPAS facilities could be reduced, medicines could be made available in greater quantities, auxiliary electric power generation capabilities in outpatient facili-

TABLE IV.6

DECISION TO SEEK OUTPATIENT CURATIVE CARE AND CHOICE OF SUBSECTOR
AS A FUNCTION OF SESPAS PRICES AND TRAVEL TIME TO SESPAS FACILITIES: MALES,
EXCLUDING BENEFICIARIES OF IDSS,
SANTO DOMINGO (D.R.), 1987

SESPAS price		Decision		Travel time * (in minutes)					
				28		22		16	
				Proba- bility	Subsector choice (%)	Proba- bility	Subsector choice (%)	Proba- bility	Subsector choice (%)
RD\$ 1.83	No medical care	0.751		0.750		0.750			
	Private doctor	0.165	66.3	0.163	65.2	0.161	64.1		
	SESPAS doctor	0.065	26.1	0.068	27.2	0.071	28.3		
	IDSS doctor	0.019	7.6	0.019	7.6	0.019	7.6		
			
		1.000	100.0	1.000	100.0	1.000	100.0		
RD\$ 10	No medical care	0.751		0.751		0.750			
	Private doctor	0.168	67.5	0.166	66.7	0.164	65.6		
	SESPAS doctor	0.061	24.5	0.064	25.7	0.067	26.8		
	IDSS doctor	0.020	8.0	0.019	7.6	0.019	7.6		
			
		1.000	100.0	1.000	100.0	1.000	100.0		
RD\$ 20	No medical care	0.752		0.752		0.751			
	Private doctor	0.170	68.5	0.168	68.0	0.167	67.1		
	SESPAS doctor	0.058	23.4	0.060	24.3	0.063	25.3		
	IDSS doctor	0.020	8.1	0.019	7.7	0.019	7.6		
			
		1.000	100.0	1.000	100.0	1.000	100.0		
RD\$ 30	No medical care	0.753		0.752		0.752			
	Private doctor	0.173	70.0	0.171	69.0	0.169	68.1		
	SESPAS doctor	0.054	21.9	0.057	23.0	0.060	24.2		
	IDSS doctor	0.020	8.1	0.020	8.0	0.019	7.7		
			
		1.000	100.0	1.000	100.0	1.000	100.0		

Note: Results in this table are estimated for a 15-44 year-old male with 7.8 years of education who did not have an accident. The average private sector price faced by this individual was RD\$ 34.30.

* - 28 minutes was the observed average travel time for SESPAS users.

ties could be enhanced, and better incentive systems to improve management and medical staff performances could be introduced. If these and/or other measures could improve SESPAS users' perception of the quality of care, then the decline in utilization might never occur.

Table IV.5 shows how increases in SESPAS prices would affect the behavior of IDSS beneficiaries (recall that many IDSS beneficiaries use SESPAS rather than IDSS services.) The effects observed parallel those predicted in Table IV.4 for non-IDSS beneficiaries. With rising SESPAS prices, visits to SESPAS doctors by IDSS beneficiaries would decline only slightly, across all four household income quintiles shown, while visits to private doctors would increase slightly across all income groups. The effect of increasing SESPAS prices on the utilization of IDSS medical services is thus only minimally positive -- and then only among the lower portions of the household income spectrum.

The more significant finding from Table IV.5 is that, overall, only about half of those eligible for IDSS health care actually use IDSS services -- fewer in the higher than in the lower household income quintile. Comparing this and the private subsector price tables (IV.7 and IV.8), it is clear that the tendency to use one's IDSS benefits would be greater if there were a private subsector price increase than if there were a SESPAS price increase.

The technical results shown in Appendix B also suggest that travel time to a SESPAS facility has a negative (although statistically insignificant) effect on the probability of seeking care from a given provider: all other things being equal, an individual with a health problem will choose a facility closer to his or her home over one that is farther away. One explanation for the observed preference for private subsector visits is that there are more private practitioners located near residences.

Table IV.6 estimates the effects of combining two potential SESPAS policy measures: an increase in price and a reduction in travel time (achieved by constructing new SESPAS outpatient services in low- and middle-income neighborhoods). As noted above, a price increase would reduce utilization, but at the same time would yield additional revenue which could be used to build and operate new facilities.

What would be the effect, for example, on the population subgroup in income quintile II if the price of a SESPAS visit were increased from its average of below RD \$2 to RD \$10 (see the additional assumptions shown at the bottom of the Table IV.6)? If, at the same time, average travel time to SESPAS facilities were reduced from the current 28 minutes to 16

minutes, the total number of visits to SESPAS by this population subgroup would remain virtually unchanged, and the fee increase would bring SESPAS an estimated incremental revenue of RD \$3.6 million per year (17).

2. Private Subsector Prices. As in the two SESPAS price tables (IV.4 and IV.5), the effects of prices in the private subsector on the decision to seek outpatient care and choice of subsector are shown both for non-IDSS beneficiaries (Table IV.7) and for IDSS beneficiaries (Table IV.8). The reason these analyses were undertaken separately is that the outpatient care seeking behavior of individuals in the two groups differs; as pointed out earlier, IDSS beneficiaries are more likely to seek medical care at IDSS facilities than are non-beneficiaries. Like the SESPAS tables, both private subsector tables show decision probabilities and subsector choices for the four lowest income quintiles. Note that because the price variable in the demand equations was statistically significant only at the 85 percent confidence level (see Appendix B), these estimates should be interpreted cautiously as to their reliability.

Several important findings emerge from a review of Table IV.7. First, even if private subsector outpatient care were free of charge to the user (*i.e.*, a private subsector price of RD\$ 0), three-quarters of those perceiving themselves to be ill would not seek outpatient care in any of the three subsectors -- a finding that remains the same across all four household income quintiles shown. This suggests that (a) three-quarters of those who feel ill do not consider themselves ill enough to spend time or effort on a doctor's visit, or (b) there is a low propensity to seek health care among the survey population, for which a cultural or educational explanation might be sought.

Second, the decision to seek outpatient care from a doctor -- in any one of the three subsectors -- is only weakly affected by prices in the private subsector. Those in the lower income quintiles (I-III) do tend to seek outpatient care -- regardless of subsector -- less frequently the higher the prices they are charged, but the effect is not very strong. For example, (male) individuals in the lowest (RD \$200) income quintile, faced with a private subsector price of zero, would seek out-patient care from a doctor in 25.6 percent ($1 - 0.744$) of cases. If the same individuals faced a private subsector price of RD \$60 -- the average price actually paid by uninsured patients who visit private subsector physicians -- they would seek care (again in any subsector) only a bit less frequently, in 24.3 percent ($1 - 0.757$) of cases.

Third, among those who do decide to seek outpatient care

TABLE IV.7

DECISION TO SEEK OUTPATIENT CURATIVE CARE AND CHOICE OF SUBSECTOR
AS A FUNCTION OF PRIVATE SECTOR PRICES AND HOUSEHOLD INCOME: MALES,
EXCLUDING IDSS BENEFICIARIES,
SANTO DOMINGO (D.R.), 1987

		Household income quintile * (RD\$ of November, 1987)							
		I: RD\$ 200		II: RD\$ 450		III: RD\$ 850		IV: RD\$ 1500	
Private sector price	Decision:	Proba- bility	Subsector choice (%)	Proba- bility	Subsector choice (%)	Proba- bility	Subsector choice (%)	Proba- bility	Subsector choice (%)
RD\$ 0	No medical care	0.744		0.743		0.744		0.744	
	Private doctor	0.185	72.2	0.185	72.0	0.184	71.8	0.184	71.8
	SESPAS doctor	0.055	21.5	0.056	21.8	0.056	21.9	0.056	21.9
	IDSS doctor	0.016	6.3	0.016	6.2	0.016	6.3	0.016	6.3
			1.000	100.0	1.000	100.0	1.000	100.0	1.000	100.0
RD\$ 30	No medical care	0.753		0.750		0.748		0.745	
	Private doctor	0.164	65.9	0.167	66.8	0.173	68.7	0.181	70.9
	SESPAS doctor	0.066	26.5	0.064	25.6	0.061	24.2	0.067	22.4
	IDSS doctor	0.019	7.6	0.019	7.6	0.018	7.1	0.017	6.7
			1.000	100.0	1.000	100.0	1.000	100.0	1.000	100.0
RD\$ 60	No medical care	0.757		0.755		0.751		0.744	
	Private doctor	0.146	60.0	0.154	62.8	0.165	66.3	0.182	71.1
	SESPAS doctor	0.075	30.9	0.070	28.6	0.065	26.1	0.057	22.3
	IDSS doctor	0.022	9.1	0.021	8.6	0.019	7.6	0.017	6.6
			1.000	100.0	1.000	100.0	1.000	100.0	1.000	100.0
RD\$ 90	No medical care	0.762		0.757		0.752		0.742	
	Private doctor	0.132	55.4	0.144	59.8	0.161	64.9	0.187	72.5
	SESPAS doctor	0.082	34.5	0.075	31.1	0.067	27.0	0.055	21.3
	IDSS doctor	0.024	10.1	0.022	9.1	0.020	8.1	0.016	6.2
			1.000	100.0	1.000	100.0	1.000	100.0	1.000	100.0

Note: Results in this table are estimated for a 15-44 year-old male with 7.8 years of education who did not have an accident.

* - The highest household income quintile is omitted here because the results are statistically unreliable.

TABLE IV.8

DECISION TO SEEK OUTPATIENT CURATIVE CARE AND CHOICE OF SUBSECTOR
AS A FUNCTION OF PRIVATE SECTOR PRICES AND HOUSEHOLD INCOME: MALES,
BENEFICIARIES OF IDSS ONLY,
SANTO DOMINGO (D.R.), 1987

Private sector price		Household income quintile * (RD\$ of November, 1987)							
		I: RD\$ 200		II: RD\$ 450		III: RD\$ 850		IV: RD\$ 1500	
		Proba- bility	Subsector choice (%)	Proba- bility	Subsector choice (%)	Proba- bility	Subsector choice (%)	Proba- bility	Subsector choice (%)
RD\$ 0	No medical care	0.719		0.718		0.720		0.719	
	Private doctor	0.112	39.9	0.112	39.7	0.110	39.3	0.110	39.3
	SESPAS doctor	0.033	11.7	0.034	12.1	0.034	12.1	0.034	12.1
	IDSS doctor	0.136	48.4	0.136	48.2	0.136	48.6	0.136	48.6
		1.000	100.0	1.000	100.0	1.000	100.0	1.000	100.0
RD\$ 30	No medical care	0.723		0.722		0.722		0.719	
	Private doctor	0.091	32.8	0.095	34.2	0.100	36.0	0.109	38.8
	SESPAS doctor	0.037	13.4	0.036	12.9	0.035	12.6	0.034	12.1
	IDSS doctor	0.149	53.8	0.147	52.9	0.143	51.4	0.138	49.1
		1.000	100.0	1.000	100.0	1.000	100.0	1.000	100.0
RD\$ 60	No medical care	0.727		0.725		0.724		0.719	
	Private doctor	0.076	27.8	0.083	30.2	0.093	33.5	0.110	39.1
	SESPAS doctor	0.039	14.3	0.038	13.8	0.037	13.3	0.034	12.1
	IDSS doctor	0.158	57.9	0.154	56.0	0.148	53.2	0.137	48.8
		1.000	100.0	1.000	100.0	1.000	100.0	1.000	100.0
RD\$ 90	No medical care	0.728		0.727		0.724		0.719	
	Private doctor	0.066	24.2	0.075	27.5	0.089	32.3	0.114	40.6
	SESPAS doctor	0.041	15.1	0.039	14.3	0.037	13.4	0.033	11.7
	IDSS doctor	0.165	60.7	0.159	58.2	0.150	54.3	0.134	47.7
		1.000	100.0	1.000	100.0	1.000	100.0	1.000	100.0

Note: Results in this table are estimated for a 15-44 year-old male with 7.8 years of education who did not have an accident.

* - The highest household income quintile is omitted here because the results are statistically unreliable.

there is a strong preference for private physicians across all household income quintiles. At a private subsector price of zero, 72 percent of all those who sought outpatient care from a physician, across all income groups, would choose private medical care. Another 22 percent would choose to see a SESPAS physician; 6 percent would see an IDSS physician. Even at a high private subsector price of RD\$ 90, there would still be a strong preference, across all income groups, for private care.

If prices in the private subsector were to increase, so would the tendency to seek care from SESPAS and IDSS physicians, for all but members of the highest household income quintile shown (quintile IV) -- even though the population reflected in the table are not beneficiaries of IDSS. If the private subsector price for outpatient care were zero, 6.3 percent of all those in the lowest income quintile who decided to seek care would utilize IDSS services, a proportion that would rise to 10.1 percent of those in this lowest quintile if faced with a private subsector price of RD\$ 90. The same tendency can be noted, if less dramatically, for income quintiles II and III. Only for those in income quintile IV would IDSS utilization not increase with rising private subsector prices -- apparently because rising private subsector prices would not deter these more affluent individuals from seeking private care.

Table IV.7 shows that -- even though the proportion of ill people deciding to seek care would not be significantly affected by changes in private subsector prices -- the tendency of those who did decide to seek care would be to shift towards or away from the private subsector, depending on prices. For example, there is a 60 percent probability that those in the lowest income quintile who perceived an illness and who decided to seek outpatient care would go to the private subsector if the price were RD \$60. If this price were reduced to zero, the number of people in the lowest income quintile seeking care outside the home would not change significantly, but 72 percent of them would go to a private subsector physician.

Thus, private-subsector price reductions would result in an increase in demand for private medical care and corresponding decreases in SESPAS and IDSS visits. To continue with the same example, a price reduction from RD \$60 to zero would increase low-income quintile private-subsector utilization by 26 percent (18). If the price increased from RD \$30 to RD \$60 -- a 100 percent increase -- the proportion of ill people seeking care in the private subsector would decrease from 18.4 to 16.3 percent, a relatively minor reduction in probability, although it should be noted that the decline would be concentrated in the lowest-income quintile (19).

Because of the magnitude of this effect, the potential increase in demand in response to a decrease in private subsector prices is considerable. There are, for instance, 360,000 inhabitants of Santo Domingo in the lowest household income quintile. In a two-week period, some 40 percent (144,000) of them would have a (non-dental) health problem, and about 45 percent of that group (64,800 people) would be in the 15-44 age category (see Table III.2). At a private-subsector price of RD \$60, these ill people would make about 9,500 ($64,800 \times 14.6$ percent) visits to private subsector physicians. At a private-subsector price of zero, however, approximately 12,000 ($64,800 \times 18.4$ percent) would visit private subsector providers. The cost of fully subsidizing the private-subsector price for this population segment would be RD \$150,000 ($RD \$60 \times [12,000 - 9,500]$) every two weeks, or RD \$15.6 million annually. From a policy perspective, then, there are a number of choices to be made -- among them, for example, a choice between (a) charging those who can afford to pay for SESPAS services, if they choose to use them, and (b) reducing the demand for public services by subsidizing the use of the private subsector by those with limited ability to pay for their outpatient care.

Table IV.8 presents, for IDSS beneficiaries only, information similar to that shown in Table IV.6 for non-beneficiaries. It suggests that, if private subsector prices were to increase, fewer IDSS beneficiaries in the lowest income groups would choose to seek outpatient care if ill, but that those who did seek care would shift away from the private subsector in favor of IDSS and SESPAS services. This is similar to the tendency shown in Table IV.7 for non-beneficiaries of IDSS.

Only 48 percent of IDSS beneficiaries would actually use IDSS services if the private subsector price for outpatient care were zero -- an observation that is true across all four income groups shown. Note also, however, that even though eligible for IDSS care and paying zero in the private subsector, about 12 percent of those in all four income groups would still decide to consult SESPAS doctors, perhaps for reasons of familiarity with or the quality of SESPAS services.

Both tables suggest that a private subsector price subsidy would promote greater use of private physicians by low-income groups, and illustrate how the costs of such a measure might be anticipated.

V. ESTIMATES: INPATIENT CURATIVE CARE

This chapter presents the results of a statistical analysis of the demand for curative inpatient care, thus taking into consideration only hospitalizations necessitated by illness or injury. (Analyses of the patterns of utilization for curative as well as other types of inpatient care, including diagnostic procedures and deliveries, can be found in Gomez 1988). The approach employed here in analyzing the determinants of demand for inpatient care is similar to that used in Chapter IV for outpatient care, with two important differences.

The first difference is methodological, an effect of the sample employed and the specific decisions under analysis. In the case of Chapter IV, two outpatient decisions were studied (whether or not to seek health care, and -- among those who made the decision to seek care -- which subsector to visit), and all individuals who had been ill during the recall period were included in the sample. In the case of the present chapter, in contrast, the decision to seek care (that is, to be hospitalized) was not analyzed, since individuals in need of inpatient care have little choice, relative to outpatients, about whether or not to seek health care: either they are referred for hospitalization following an outpatient visit, or their health problem is serious enough to require direct hospitalization. Thus, for inpatient care, only the determinants of choices of subsector in which to be hospitalized were studied, and only people who had been hospitalized were included in the sample.

The second difference between Chapters IV and V is that the effects of price changes on subsector choice, analyzed in Chapter IV, are not reported here. The technical reasons for this difference between the two chapters -- discussed in greater detail in Appendix B -- are based on the inability of the behavioral model to isolate properly the effects of price on subsector choice. One possible explanation for this limitation is that the model fails to capture and measure appropriately the influence of perceived quality of care on the choice of subsector. For example, the model predicts that, other things being equal, individuals will prefer higher prices to lower ones -- a prediction consistent with the hypothesis that patients perceive higher-priced providers as offering higher-quality services, but inconsistent with both economic theory and common sense, which predict that -- other

things being equal -- people will prefer lower to higher prices. A secondary consequence of this problem is that the influence of income on subsector choice, according to the model, is lower than expected (20).

The statistical results, for inpatient care, of the analysis of subsector choice can be found in Appendix A, Table A.11, along with the regression coefficients of a private subsector price equation (Table A.12). These results were incorporated into a behavioral model that is used in this chapter to simulate the probabilities that an individual requiring inpatient care will choose to be hospitalized in a SESPAS, IDSS, or private subsector facility.

A. Influence of Sex, Age, and Income on Choice of Subsector

It was mentioned in Chapter IV that the health care seeking behavior of IDSS beneficiaries in Santo Domingo differs from that of non-beneficiaries, since the former are much more likely to seek care from IDSS facilities than the latter. Tables V.1 through V.4 thus distinguish between these two groups of inpatients. Tables V.1 and V.2 present, respectively, the results of simulations for female and male non-beneficiaries of IDSS, with an average of 7.2 years of education and whose hospitalization was not necessitated by an accident or the need for surgery. The probabilities of subsector choice by IDSS beneficiaries are presented separately in Tables V.3 and V.4.

Tables V.1 and V.2 can be used to assess the simultaneous influence of age and household income on inpatients' choice of subsector. The tables show that, for both sexes and across all age groups, higher-income individuals are only slightly more likely to choose private facilities than lower-income individuals: for example, a female in the 15-44 year old age category with a household income of RD \$200 will choose a private facility in 81.6 percent of cases, while a female in the same age category but with a higher household income of RD \$2500 will choose a private provider with the slightly higher probability of 82 percent. While these results are generally consistent with what was observed in Chapter IV for outpatient care, they indicate a far greater preference among females for private hospitalization than among males, especially considering the fact that the analysis refers only to curative care and thus excludes normal deliveries.

The same tables also show that there are marked differences in the patterns of subsector choice, among both females and males, across age groups. Children aged 1-4 years -- and male children in particular -- are much less likely to be

TABLE V.1

CHOICE OF SUBSECTOR FOR INPATIENT CARE
AS A FUNCTION OF AGE AND HOUSEHOLD INCOME: FEMALES,
EXCLUDING BENEFICIARIES OF IDSS,
SANTO DOMINGO (D.R.), 1987

Person's age (years)		Household income quintile				
		I: RD\$ 200	II: RD\$ 450	III: RD\$ 850	IV: RD\$ 1500	V: RD\$ 2500
		Subsector choice (%)	Subsector choice (%)	Subsector choice (%)	Subsector choice (%)	Subsector choice (%)
Under 1	Private	82.1	82.1	82.1	82.3	82.4
	SESPAS	15.5	15.5	15.5	15.4	15.3
	IDSS	2.4	2.4	2.4	2.3	2.3
	
		100.0	100.0	100.0	100.0	100.0
1 - 4	Private	55.9	55.9	56.0	56.1	56.2
	SESPAS	36.9	36.9	36.8	36.7	36.6
	IDSS	7.2	7.2	7.2	7.2	7.2
	
		100.0	100.0	100.0	100.0	100.0
5 - 14	Private	81.2	81.2	81.3	81.4	81.5
	SESPAS	17.1	17.1	17.0	16.9	16.8
	IDSS	1.7	1.7	1.7	1.7	1.7
	
		100.0	100.0	100.0	100.0	100.0
15 - 44	Private	81.6	81.7	81.7	81.8	82.0
	SESPAS	16.6	16.5	16.5	16.4	16.2
	IDSS	1.8	1.8	1.8	1.8	1.8
	
		100.0	100.0	100.0	100.0	100.0
Over 45	Private	74.7	74.7	74.8	75.0	75.4
	SESPAS	19.0	19.0	18.9	18.8	18.5
	IDSS	6.3	6.3	6.3	6.2	6.1
	
		100.0	100.0	100.0	100.0	100.0

Note: Results in this table are estimated for a female with 7.2 years of education (for females under the age of 15, highest level of education achieved in the household is used), who is not an IDSS beneficiary, and who did not have an accident or surgery. The prices of a hospitalization imputed to each subsector were the observed averages: private - RD\$ 414; SESPAS - RD\$ 36; IDSS - RD\$ 19.

TABLE V.2

CHOICE OF SUBSECTOR FOR INPATIENT CARE
AS A FUNCTION OF AGE AND HOUSEHOLD INCOME: MALES,
EXCLUDING BENEFICIARIES OF IDSS,
SANTO DOMINGO (D.R.), 1987

Person's age (years)		Household income quintile				
		I: RD\$ 200	II: RD\$ 450	III: RD\$ 850	IV: RD\$ 1500	V: RD\$ 2500
Subsector	Subsector	choice (%)	choice (%)	choice (%)	choice (%)	choice (%)
Under 1	Private	68.8	68.8	68.9	69.0	69.1
	SESPAS	26.2	26.2	26.1	26.0	25.9
	IDSS	5.0	5.0	5.0	5.0	5.0
	
		100.0	100.0	100.0	100.0	100.0
1 - 4	Private	37.7	37.7	37.7	37.8	38.0
	SESPAS	50.0	50.0	50.0	49.9	49.7
	IDSS	12.3	12.3	12.3	12.3	12.3
	
		100.0	100.0	100.0	100.0	100.0
5 - 14	Private	67.7	67.7	67.8	68.0	68.2
	SESPAS	28.7	28.7	28.6	28.5	28.3
	IDSS	3.6	3.6	3.6	3.5	3.5
	
		100.0	100.0	100.0	100.0	100.0
15 - 44	Private	68.2	68.3	68.4	68.5	68.8
	SESPAS	27.9	27.8	27.7	27.6	27.4
	IDSS	3.9	3.9	3.9	3.9	3.8
	
		100.0	100.0	100.0	100.0	100.0
Over 45	Private	57.9	58.0	58.2	58.3	58.7
	SESPAS	29.7	29.6	29.5	29.4	29.1
	IDSS	12.4	12.4	12.3	12.3	12.2
	
		100.0	100.0	100.0	100.0	100.0

Note: Results in this table are estimated for a male with 7.2 years of education (for males under the age of 15, highest level of education achieved in the household is used), who is not an IDSS beneficiary, and who did not have an accident or surgery. The prices of a hospitalization imputed to each subsector were the observed averages: private - RD\$ 414; SESPAS - RD\$ 36; IDSS - RD\$ 19.

hospitalized in private subsector facilities than members of other age groups, and have by far the highest probability, among all age groups, of being hospitalized in SESPAS facilities. Male children in the 1-4 age group (Table V.2) are hospitalized in SESPAS facilities in half of all cases; for female children in the same age group, the figure is 37 percent of all cases. Among all age groups and across both sexes, the next highest likelihood of choosing SESPAS for hospitalization -- among males over the age of 45 -- is only 30 percent.

The two tables also show an especially strong preference, across all income groups, for private subsector hospitalization of infants. Children under the age of one year represent the age group with the highest probability of hospitalization in private facilities, at the expense of both SESPAS and IDSS facilities. Children between the ages of 1-4, in contrast, constitute the group with the least likelihood of hospitalization in private facilities and the greatest likelihood of hospitalization in SESPAS facilities.

Tables V.3 and V.4 contain the same data for IDSS beneficiaries as Tables V.1 and V.2 show for non-beneficiaries. Three important findings emerge from a comparison of these two sets of tables. First, as expected, IDSS beneficiaries are (almost four times) more likely to use Social Security facilities than non-beneficiaries. For example, male non-beneficiaries in the 15-44 age group (Table V.2) choose IDSS in only about 4 percent of cases, while male beneficiaries in the same age group (Table V.4) choose IDSS in about 15 percent of cases.

Second, individuals eligible for hospitalization under IDSS have a higher probability of choosing to be hospitalized in private facilities (as well as a higher probability of choosing to be hospitalized in IDSS facilities) than do non-beneficiaries of IDSS. For example, females in the 15-44 age group who are not entitled to IDSS benefits go to private providers in 82 percent of cases (Table V.1). In contrast, female IDSS beneficiaries in the same age group seek care at private facilities with an even greater likelihood of about 85 percent (Table V.3). What is even more notable here is that females aged 15-44 who are beneficiaries of IDSS go to IDSS facilities with a likelihood of only 7 percent, perhaps because female IDSS beneficiaries are not covered for hospitalizations due to illness or injury but only for maternity-related problems. The greater likelihood that IDSS beneficiaries (relative to non-beneficiaries) will choose hospitalization in private subsector or IDSS facilities is at the expense of SESPAS inpatient services.

Finally, Tables V.3 and V.4 show that both male and fe-

TABLE V.3

CHOICE OF SUBSECTOR FOR INPATIENT CARE
AS A FUNCTION OF AGE AND HOUSEHOLD INCOME: FEMALES,
BENEFICIARIES OF IDSS ONLY,
SANTO DOMINGO (D.R.), 1987

Person's age (years) Subsector		Household income quintile				
		I: RD\$ 200	II: RD\$ 450	III: RD\$ 850	IV: RD\$ 1500	V: RD\$ 2500
		Subsector choice (%)	Subsector choice (%)	Subsector choice (%)	Subsector choice (%)	Subsector choice (%)
Under 1	Private	92.9	93.0	93.0	93.0	93.1
	SESPAS	3.3	3.2	3.2	3.2	3.2
	IDSS	3.8	3.8	3.8	3.8	3.7
		..... 100.0	..... 100.0	..... 100.0	..... 100.0	..... 100.0
1 - 4	Private	75.1	75.2	75.3	75.5	75.7
	SESPAS	9.9	9.9	9.9	9.8	9.7
	IDSS	15.0	14.9	14.8	14.7	14.6
		..... 100.0	..... 100.0	..... 100.0	..... 100.0	..... 100.0
5 - 14	Private	91.7	91.7	91.7	91.8	91.9
	SESPAS	4.7	4.7	4.7	4.7	4.6
	IDSS	3.6	3.6	3.6	3.5	3.5
		..... 100.0	..... 100.0	..... 100.0	..... 100.0	..... 100.0
15 - 44	Private	85.3	85.3	85.5	85.5	85.7
	SESPAS	7.9	7.9	7.8	7.8	7.7
	IDSS	6.8	6.8	6.7	6.7	6.6
		..... 100.0	..... 100.0	..... 100.0	..... 100.0	..... 100.0
Over 45	Private	51.6	51.7	51.9	52.2	52.6
	SESPAS	13.6	13.6	13.5	13.4	13.3
	IDSS	34.8	34.7	34.6	34.6	34.1
		..... 100.0	..... 100.0	..... 100.0	..... 100.0	..... 100.0

Note: Results in this table are estimated for a female with 7.2 years of education (for females under the age of 15, highest level of education achieved in the household is used), who is a beneficiary of IDSS, and who did not have an accident or surgery. The prices of a hospitalization imputed to each subsector were the observed averages: private - RD\$ 414; SESPAS - RD\$ 36; IDSS - RD\$ 19.

TABLE V.4

CHOICE OF SUBSECTOR FOR INPATIENT CARE
AS A FUNCTION OF AGE AND HOUSEHOLD INCOME: MALES,
BENEFICIARIES OF IDSS ONLY,
SANTO DOMINGO (D.R.), 1987

Person's age (years)		Household income quintile				
		I: RD\$ 200	II: RD\$ 450	III: RD\$ 850	IV: RD\$ 1500	V: RD\$ 2500
Subsector	Subsector	choice (%)	choice (%)	choice (%)	choice (%)	choice (%)
Under 1	Private	85.1	85.1	85.2	85.3	85.6
	SESPAS	6.0	6.0	6.0	5.9	5.8
	IDSS	8.9	8.9	8.8	8.8	8.6
	
		100.0	100.0	100.0	100.0	100.0
1 - 4	Private	56.4	56.5	56.7	56.9	57.3
	SESPAS	15.0	15.0	14.9	14.9	14.7
	IDSS	28.6	28.5	28.4	28.2	28.0
	
		100.0	100.0	100.0	100.0	100.0
5 - 14	Private	83.1	83.1	83.2	83.3	83.5
	SESPAS	8.6	8.6	8.6	8.5	8.4
	IDSS	8.3	8.3	8.2	8.2	8.1
	
		100.0	100.0	100.0	100.0	100.0
15 - 44	Private	72.0	72.1	72.2	72.5	72.7
	SESPAS	13.4	13.4	13.3	13.2	13.1
	IDSS	14.6	14.5	14.5	14.3	14.2
	
		100.0	100.0	100.0	100.0	100.0
Over 45	Private	30.9	31.0	31.1	31.4	31.6
	SESPAS	16.3	16.3	16.3	16.2	16.2
	IDSS	52.8	52.7	52.6	52.4	52.2
	
		100.0	100.0	100.0	100.0	100.0

Note: Results in this table are estimated for a male with 7.2 years of education (for males under the age of 15, highest level of education achieved in the household is used), who is a beneficiary of IDSS, and who did not have an accident or surgery. The prices of a hospitalization imputed to each subsector were the observed averages: private - RD\$ 414; SESPAS - RD\$ 36; IDSS - RD\$ 19.

male IDSS beneficiaries aged 45 years or over have a much greater probability of choosing Social Security facilities than members of younger age groups. This effect is particularly strong in the case of males (Table V.4), who choose IDSS facilities in more than half of all cases. A possible explanation for this finding is that, in general, individuals in the highest age group undergo the most expensive medical procedures. In contrast to the two other subsectors, and particularly the private subsector, IDSS may constitute an attractive option for individuals in this age group due to its "free" care and possibly to its reputation for high quality for certain complex medical procedures.

The relatively low utilization by female IDSS beneficiaries of IDSS facilities at younger ages may be due to IDSS' limited coverage of dependents. Higher utilization by females over 45 suggests that females over the age of 45 are more apt to be fully-covered workers rather than dependents entitled to fewer benefits. Another factor affecting older IDSS beneficiaries' greater utilization of IDSS facilities may be that older workers, both male and female, are on average less well-educated and poorer than younger workers, and are thus less able to afford private care.

B. Influence of Education on Choice of Subsector

As in the case of outpatient care (Table IV.3), education has a positive and important effect on the likelihood that an individual in need of hospital care will choose a private subsector facility. This effect, virtually identical for males and females, is shown for females in Table V.5. The table presents the subsector choice probabilities for inpatient care for female non-beneficiaries of IDSS, by income and as a function of education (or, for patients under the age of 15, the education of the best-educated household member). The table shows, for example, that individuals with only two years of education are approximately 17 percentage points less likely to choose private providers than individuals with 12 years of education.

A more significant finding from this table is that even the most poorly-educated, lowest-income individuals will select private hospital care almost 80 percent of the time -- a figure that reaches 96 percent of the time in the case of high-income, highly-educated individuals.

TABLE V.5

CHOICE OF SUBSECTOR FOR INPATIENT CARE
AS A FUNCTION OF EDUCATION AND HOUSEHOLD INCOME: FEMALES,
EXCLUDING BENEFICIARIES OF IDSS,
SANTO DOMINGO (D.R.), 1987

Years of edu- cation	Subsector	Household income quintile				
		I: RD\$ 200	II: RD\$ 450	III: RD\$ 850	IV: RD\$ 1500	V: RD\$ 2500
		Subsector choice (%)	Subsector choice (%)	Subsector choice (%)	Subsector choice (%)	Subsector choice (%)
2	Private	78.5	78.5	78.6	78.8	79.0
	SESPAS	20.4	20.4	20.3	20.1	19.9
	IDSS	1.1	1.1	1.1	1.1	1.1
		100.0	100.0	100.0	100.0	100.0
4	Private	84.1	84.1	84.2	84.3	84.6
	SESPAS	14.8	14.8	14.7	14.6	14.4
	IDSS	1.1	1.1	1.1	1.1	1.0
		100.0	100.0	100.0	100.0	100.0
6	Private	88.5	88.5	88.6	88.6	88.8
	SESPAS	10.5	10.5	10.4	10.4	10.2
	IDSS	1.0	1.0	1.0	1.0	1.0
		100.0	100.0	100.0	100.0	100.0
8	Private	91.7	91.7	91.6	91.8	91.9
	SESPAS	7.4	7.4	7.3	7.3	7.2
	IDSS	0.9	0.9	0.9	0.9	0.9
		100.0	100.0	100.0	100.0	100.0
10	Private	94.1	94.1	94.1	94.2	94.2
	SESPAS	5.1	5.1	5.1	5.0	5.0
	IDSS	0.8	0.8	0.8	0.8	0.8
		100.0	100.0	100.0	100.0	100.0
12	Private	95.8	95.8	95.8	95.8	95.9
	SESPAS	3.5	3.5	3.5	3.5	3.4
	IDSS	0.7	0.7	0.7	0.7	0.7
		100.0	100.0	100.0	100.0	100.0

Note: Results in this table are estimated for a 15-44 years old female who is not an IDSS beneficiary, and who did not have an accident or surgery. The prices of a hospitalization imputed to each subsector were the observed averages: private - RD\$ 414; SESPAS - RD\$ 36; IDSS - RD\$ 19.

VI. CONCLUSIONS AND RECOMMENDATIONS

The conclusions and recommendations offered in this chapter are based not only on the demand analysis of medical care (curative, non-dental health care provided by a physician) presented in this report, but also on three other sources: the HCF/LAC and IEPD documents that preceded this report (Gomez 1988; Duarte et al. 1988), and in-depth discussions, at a USAID/ Dominican Republic-sponsored workshop held in Santo Domingo in January, 1989, of these two documents plus the preliminary draft of the present report.

Participants at the Santo Domingo workshop (see Appendix C) were in broad agreement on two important points underlying the reliability of the demand analysis. First, the survey data constitute a credible reflection of the health care seeking behavior of the population of Santo Domingo. Second, although both the descriptive overview of the patterns of health services utilization and the econometric estimates of the determinants of utilization involve, of necessity, certain simplifying assumptions, the conclusions that emanate from these analyses nevertheless suggest a number of concrete recommendations that can be implemented, on an experimental basis, as part of an ongoing policy dialogue and continuing research effort. Thus each of the conclusions listed below is followed by one or more specific, action-oriented recommendations.

1. Preference for private care. There is a strong preference in Santo Domingo for private health services, even among the low-income population, the uninsured, and those eligible for care elsewhere (e.g., IDSS beneficiaries): 56 percent of all out-patient medical consultations and 60 percent of all hospitalizations for curative care take place in private facilities, while public services (particularly outpatient services) are reportedly underutilized. This suggests that users perceive the quality of curative care offered in the private subsector as better than comparable services provided by SESPAS and IDSS.

According to workshop participants, specific causes of these perceptions may include (a) longer waiting times, less convenient doctors' hours, poorly-maintained equipment, and inadequate pharmaceuticals supplies at public facilities; (b) inappropriate public sector personnel policies; (c) poor public hospital administration (including insufficient decentralization of decision-making to hospital administra-

tors); (d) a disproportionate concentration of SESPAS resources -- financial, human, and pharmaceutical -- on hospitals, particularly in the National District; and (e) a lack of clear performance standards and goals in the public subsector.

Recommendations: The user preference for private sector health care in the National District has resulted in a mismatch between the tenets of public policy (under which SESPAS is to play the leading role as a provider of primary health care) and actual resources distribution and utilization (which favor the private sector). Steps toward alleviating this mismatch include (a) a more complete market analysis, which focuses on the structure of the health care market in Santo Domingo and identifies the subsector best suited to serving each population segment; (b) a study of the population's perceptions of the quality of care received at public health facilities, and of the potential for positive enhancement of these perceptions -- not only via improvements in the quality of public sector care (possibly using revenues from user fees, discussed under no. 4, below) but also via public education campaigns; (c) public sector acknowledgement of the important role played by private -- and possibly also IDSS -- health care financing and services delivery, which should help to liberate more SESPAS resources for preventive and ambulatory care in the National District and/or reduce SESPAS' concentration of curative care in Santo Domingo so as to allocate more resources to the rest of the country; (d) a thorough review of current public hospital administration practices in the Dominican Republic; and (e) the establishment of unified performance standards and coordinated policy goals for all public and private health care providers.

2. Cross-utilization of services. There is extensive cross-utilization and misuse of health services among the four main health subsectors in Santo Domingo. Ten percent of those who visit SESPAS outpatient facilities are eligible for health care under IDSS, the Armed Forces, and/or private insurance. Almost half of all IDSS beneficiaries choose the private sector for their care, while 26 percent of outpatient consultations at IDSS facilities are made by patients who are neither IDSS nor private insurance beneficiaries, yet who are treated without charge. A related finding is that hospital emergency facilities are being used for much ambulatory and preventive care.

Recommendations: As noted above, the responsibility of each subsector should be more clearly defined with respect to users' incomes, membership in health insurance plans or eligibility for health coverage, and health needs. One could argue that maintaining free choice among health care providers in the various subsectors is desirable, but all

patients those treated free of charge at SESPAS health facilities should be screened for IDSS, Armed Forces, or private insurance coverage, and those with any kind of insurance coverage should be charged for their care, or SESPAS should bill these providers for the care rendered their beneficiaries.

Second, in order to reduce inappropriate cross-utilization of services, a referral system, both within and among subsectors, should be developed, based on current utilization patterns as reflected in the household survey database and supplemented by institutional utilization data. Eventually, this system should encourage utilization of primary care facilities in all four subsectors, channeling users to the services to which they are entitled by virtue of insurance contributions and limiting SESPAS services to the medically indigent and those who choose to pay for them (if they are not of low-income status). A sector-wide health information system would be needed to make this referral process feasible. Finally, it may be necessary to restrict access to SESPAS hospitals for ambulatory care. One way to accomplish this would be to charge patients for any health services provided in a hospital emergency room setting that (in the opinion of the attending doctor) could have been treated on a non-emergency basis in the patient's local SESPAS clinic or health center.

3. Underserved population. Two-thirds of the inhabitants of Santo Domingo do not seek health care when they perceive themselves to be ill. While the majority of those who do not seek care when ill report that self-treatment is adequate or that treatment appears unnecessary, a troubling proportion -- between 10 and 20 percent -- report lack of money for a doctor's visit or for medicines as the reason for not seeking medical care in case of illness.

Recommendations: Since SESPAS health services are provided free of charge for most users, the substantial proportion of the population who report indigence as their reason for not seeking health care when it is needed suggests that (a) this population segment cannot afford to travel to a SESPAS facility, either because of transportation costs or the costs of lost work time; (b) patients are unaware that free health care is available at SESPAS facilities; (c) they cannot afford the cost of drugs that are prescribed in conjunction with their free visits; or (d) other cultural, educational, or economic factors constrain the health services utilization of this population segment. (These factors may also constrain the utilization of the two-thirds of the population who do not seek health care when ill; a fourth of those who do not seek care when ill identify no specific reason why care is not sought.)

While the econometric results point to explanations in terms of the independent variables tested, workshop participants saw the need for more comprehensive analyses of the questions raised by the non-utilization findings, in order that the health services utilization of those who are in need of care but currently underserved is ultimately improved. The large number of people who perceive illness but do not seek care, in combination with the over-utilization of hospitals for outpatient curative care, may argue for the improvement of existing PHC facilities and perhaps for the construction of additional facilities, both private and SESPAS, in low-income urban communities.

4. Effects of user fees on utilization. Although lower-income patients are more sensitive to the prices charged for health services than higher-income patients, projecting the effects of higher prices on the utilization of outpatient health services in both the private and public subsectors suggests that higher fees would reduce utilization only slightly, even among those with low incomes.

Recommendations: In many developing countries, ministries of health now impose user fees, and some use the revenues collected to improve the quality of public health services. This report has shown that at SESPAS facilities in Santo Domingo (where less than 10 percent of those attended now pay user fees), charging higher fees will not significantly reduce utilization, and improving the quality of services might enhance utilization enough to off-set the effect of price increases, potentially resulting in a net increase in the use of SESPAS services at higher prices. It is recommended that SESPAS explore ways in which more and/or higher user fees could be imposed, either upon a larger proportion of users and/or for a wider range of services. This would require the use of a means test. In order to gain experience with expanded user fee charges, an experimental cost recovery project, involving both outpatient and inpatient facilities, should be designed and implemented. Revenues collected should be retained by the facilities involved to improve the quality of their services, provide subsidies to the medically indigent, and finance selected preventive and health promotional activities.

5. Effects of price variations on subsector choice. Although raising prices would have little impact on the overall proportion of all people seeking medical care, higher prices would affect the subsectorial distribution of those seeking care. Specifically, higher private subsector prices would lower the proportion of people seeking private care, especially among lower income groups, and increase utilization of SESPAS and IDSS services. Conversely, price reductions in

the private subsector (or increases in the public sector) would result in an increase in demand for private care (and corresponding decreases in SESPAS and IDSS visits). (It should be noted in this regard that much of the relatively high cost of visits to private health care providers is due to charges for drugs, which account for over half the average private sector patient's total expenditure but less than a third of average expenditures in SESPAS and only one-fifth in IDSS.)

Recommendations: This report provides estimates of the revenues that could be generated by increasing the user fees charged of SESPAS users. The model used in these estimates should be tested in order to evaluate the managerial and acceptability issues that would inevitably arise. Two one-to-two-year experiments should be designed to evaluate the feasibility and effects of broadening user fee charges and/or increasing rates for those users already being charged. One trial might be held at the hospital that is currently undergoing an in-depth cost analysis under another USAID-funded project (REACH), where the detailed cost and user fee data available will provide a strong base for designing such an experiment. One or two SESPAS clinics should also be selected for trials for the initiation of user fees, either on a sliding scale across-the-board or selectively for certain services and/or users. A detailed design should be prepared for such an experiment, preceded by an analysis of the clinics' users and services offered. Concurrently, the essential medicines program should be redesigned in order to make these medicines available through the private sector in addition to SESPAS and IDSS.

6. Differences in health services utilization by sex, age, education, and income. The sex, age, and education of patients significantly affect health services utilization in Santo Domingo, but while differences in utilization by level of income are statistically significant, income is not an important determinant of health services utilization. Utilization by females outweighs that of males, in part because females outnumber males in Santo Domingo (by 53 to 47 percent). In addition, the econometric analysis demonstrates that females are more likely than males to seek health care -- especially private care -- when they perceive themselves to be ill. Infants and children under the age of five are more likely to obtain medical care when illness is perceived than members of younger or older age groups; in contrast, utilization among ill school-age children (ages 5-14) is relatively low. Educational attainment is positively related to the likelihood of seeking private sector curative care, both inpatient and outpatient.

Recommendations: Two follow-up activities are recom-

mended: first, a study of health services utilization by females, focusing on their more intensive use of private subsector services (relative to males); and second, an investigation into the significantly lower utilization of health services among ill school-age children (ages 5-14), compared with both younger and older age groups.

7. Insurance Coverage. About 23 percent of the population of Santo Domingo has some form of health insurance coverage (other than through SESPAS), either by virtue of beneficiary status under IDSS or the Armed Forces or through enrollment in a private prepayment plan (health insurance or membership in an iguala.) The other 77 percent of city residents have no such benefits. According to workshop participants, the potential for private sector expansion of coverage is great, but there is as yet no coordinated health sector policy on extension of health insurance coverage.

Recommendations: To encourage the development and proliferation of private health insurance coverage in Santo Domingo, health sector officials should consider the following options. First, more employers -- even employers of part time and/or domestic workers -- should be required to provide health insurance benefits for their employees, which would allow health insurers to increase their pay-out ratios as the volume of their coverage increased. Unnecessary utilization of services by the insured could be controlled by deductibles and copayments. Second, users of SESPAS facilities who have insurance coverage should be required to draw upon their coverage (the effects of this requirement should be part of the design of the pricing experiments suggested in recommendation no. 5, above). As they work toward the development of a coordinated policy on extension of coverage, health sector officials should take note of actual utilization patterns, identified and discussed in this report.

8. IDSS coverage. Despite their mandatory contributions to social security, many IDSS beneficiaries in Santo Domingo choose private health care or even SESPAS services. The result is that the number of patients cared for at IDSS health facilities is small, relative to the amount of money spent on health care delivery at these facilities.

Recommendation: Instead of mandating increased contributions to IDSS in order to extend health coverage by constructing new facilities, the possibility of contracting social security health services out to private providers should be explored. The cost saving should make it possible to expand coverage at current rates, in part because employers would be more willing to join IDSS under this option.

9. Waiting time. Waiting time differences among the health subsectors are considerable. Waiting times at SESPAS, IDSS, and Armed Forces average an hour or longer (in the case of SESPAS, workshop participants cited administrative inefficiencies and physicians' insufficient hours as causes for long waits). At private facilities, the average wait is only slightly more than half an hour. Waiting time differences may be significant in determining subsector choice, and may account, in part, for the relatively high percentages of private care users among members of low-income groups.

Recommendations: Two measures are recommended. First, waiting times at public health facilities could be significantly reduced if the number of nurses and other paramedical providers per doctor were increased and the functions of both paramedical providers and doctors were redefined. Paramedical providers could, for example, perform more patient screening and administer more preventive care. For this redistribution of activities to be acceptable to patients, however, further training for paramedical providers plus health education will be needed. Second, in the short term, while efforts are made to reduce waiting times, waits in SESPAS facilities should be used for immediate-impact health education and promotion of preventive services, including vaccination, family planning, etc.

10. Policy dialogue. The two HCF/LAC reports, the IEPD supply-side report, and the January, 1989, Santo Domingo workshop provided an unprecedented opportunity for the initiation of much-needed sector-wide coordination and continuing dialogue. Representatives of the four major health subsectors who attended the workshop agreed that this policy dialogue, as well as continued research on present conditions in the health sector of Santo Domingo, should receive a high priority in the immediate future.

Recommendations: Some institutionalized means should be established by which representatives of the four health subsectors can (a) continue the sector-wide, policy-oriented dialogue prompted by the HCF/LAC and IEPD reports and workshop discussions; (b) identify and coordinate follow-up research needs, and (c) plan and implement intrasectorial changes. This could be accomplished by forming a high-level commission of 8-12 health sector leaders, representing SESPAS, IDSS, the Armed Forces, AIM, private health insurance carriers, and universities and research institutions. The group should be convened monthly to discuss policy implications and practical steps toward health subsector coordination and cooperation, based on the results of existing research studies and any additional studies that might be identified with the group's guidance. The dialogue begun at the USAID-sponsored workshop should be continued at the level

of the National District, which (as the country's capital and largest city) accounts for a disproportionate share of public sector health financing and services delivery. The possibility of promoting such an approach at the national level should also be considered.

11. Further analysis. The household survey database contains much information that has not yet been fully analyzed. The econometric analysis of demand determinants presented in this report, for example, covered only curative care (which, as the largest subset of the database, could be treated with the greatest precision and statistical confidence); the considerable data on preventive care -- as well as many other parts of the database -- have yet to be fully utilized.

Recommendations: Since the data actually analyzed in this report and its companion volumes reflect only a fraction of the information contained in the Santo Domingo household survey database, additional analysis -- particularly of the data on preventive care -- is needed to complement the findings presented in the three reports. All three documents should be widely circulated, and the data they contain should continue to be analyzed and discussed.

In addition to preventive care data, other data of potential importance for follow-up analysis include (a) variations in the intensity of health services utilization by patients with different kinds of coverage; (b) the relationship between health services utilization by individuals with acute vs. those with chronic health problems; (c) other determinants of health care seeking behavior that were not used in the demand analysis (e.g., degree of incapacity as an indicator of severity of illness, occupational characteristics); and (d) supply inventory data (only used superficially thus far).

If the number of observations in a given sample is too small for econometric analysis, such data can nevertheless support follow-up case studies of particular residential areas or even individual households -- studies that might yield additional insights or provide the basis for the pricing experiments recommended above. Moreover, demand analyses of the type presented here should be repeated periodically, to observe changes in health conditions and user behavior and to evaluate the effects of specific health care interventions.

Given the dearth of Dominicans trained to analyze the kinds of data contained in the survey database, it is advisable to establish an ongoing health care financing research capability in the Dominican Republic by training two or more individuals to continue working with the survey database and

institutional data sources. An existing local institution should be selected to conduct this research and to provide support services for the policy commission, recommended above.

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ENDNOTES

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1. Several earlier household surveys in the Dominican Republic did include some questions on health care use.
2. "Patterns" of health services utilization are descriptive relationships between any two variables (e.g., the number of visits to physicians by age, sex, subsector visited, etc.). No causality is implied in the choice of variables. "Determinants" are explanatory variables (e.g., household income, price per physician visit, education, etc.) that are assumed to have predictable and statistically significant relationships to particular dependent variables (e.g., the number of physician visits).
3. The household survey report includes data on curative, preventive, and dental care. In contrast, the present report focuses only on curative care provided by medical doctors ("medical" care).
4. While Chapter III of this report takes into account all four health subsectors (SESPAS, IDSS, the Armed Forces, and private providers), the Armed Forces subsector was dropped from the statistical analyses (Chapters IV and V) due its relatively small size.
5. For other recent work on demand analysis, the interested reader is directed to Heller 1982; Akin et al. 1985, 1986; Mwabu 1986; Gertler, Locay, and Sanderson 1987; and Dor, Gertler, and van der Gaag 1987.
6. Double coverage occurs when an individual is eligible for different forms of third-party coverage. The extent to which these different forms duplicate or complement one another was not determined in the household survey.
7. Cross-utilization is the use of more than one subsector (whether or not the patient is a beneficiary of any subsector involved). It is not known from the household survey whether this represents a duplication or complementary provision of services.
8. In other health care demand studies, the same pattern of utilization by age has been observed; see, e.g., Gertler et al. 1986; Bitran et al. 1988.

9. It is because maternal care is excluded that these figures differ significantly from those presented in Gomez 1988, Table IV.2.
10. See discussions of Tables III.8 and III.11, below.
11. The official exchange rate at the time of the survey in November, 1987, was RD\$ 4.53 per US\$ 1.00.
12. For comparative purposes, the official annual per capita income in the Dominican Republic was US\$ 710 in 1986 (World Bank 1988).
13. Even if the total number of hospitalizations is under-reported, the estimated distribution of hospitalizations among subsectors is judged to be reliable.
14. The statistical behavioral model used in this chapter to simulate individual behavior does not predict behavior accurately for individuals in the highest (fifth) income quintile. This is because the effect of prices on behavior is not linear, and thus does not accurately predict the behavior of the highest-income population segment.
15. Among the survey respondents, the average patient expenditure on a SESPAS visit was RD\$ 1.83.
16. At a price of RD \$1.83, the proportion of ill people seeking care from SESPAS would be 6.7 percent ($[1 - 0.733] \times 27.1$ percent). This percentage, multiplied by the number of ill people in this population group (64,800), yields a projected number of visits of 4,340 in a two-week period, or 450,000 annually. At RD \$20, 5.8 percent ($[1 - 0.754] \times 23.7$ percent) of those with a health problem would seek care from SESPAS, making 3,800 visits in a two-week period, or 400,000 in a year. The revenue raised would be 400,000 times the price of RD \$20, or RD \$8 million.
17. At a price of RD \$2 and a travel time of 28 minutes, the table estimates that 6.5 percent ($[1 - 0.751] \times 26.0$ percent) of all people with a health problem within this group -- or 4,200 people ($64,800 \times 6.5$ percent) -- would seek care from SESPAS facilities in a two-week period (64,800 is the number of people within this group who would become ill in a two-week period). If the price were raised to RD \$10 and travel time reduced to 16 minutes, approximately 6.7 percent ($[1 - 0.750] \times 26.9$ percent) of all ill people -- or 4,300 people ($64,800 \times 6.7$ percent) -- would visit a SESPAS facility -- an almost identical percentage. The annual incremental revenue would be RD \$3,600,000 ($[\text{RD } \$10 - \text{RD } \$2] \times 4,300 \times 52 \times 2$). SESPAS would have to assess whether this revenue would be sufficient to build new facilities such that

average travel time to SESPAS facilities would be reduced to 16 minutes or less.

19. At a price of RD \$60, 14.6 percent ($[1 - 0.757] \times 60.2$ percent) of patients would see private subsector doctors; at no cost, 18.4 percent ($[1 - 0.744] \times 72.0$ percent) would seek care in the private subsector. The percentage change from 14.6 percent to 18.4 percent is 26 percent.

10. In economic terms, these results suggest that, at that price level, the price elasticity of demand for private services is -0.11. Thus, demand for private services appears to be price inelastic, even in the lowest income group.

20. Income enters into the demand equations interacted with ($i.e.$, multiplied by) price. Because perceived quality of care appears to be imbedded in price, explanatory variables associated with price (such as price times income) cannot be used to simulate adequately the effect of these variables on the demand for care in various subsectors. Thus the model predicts -- in the case of income -- a lower-than-expected effect of income on demand.

**APPENDIX A:
ADDITIONAL SIMULATIONS AND STATISTICAL RESULTS**

TABLE A.1

OUTPATIENT CARE
CONDITIONAL LOGIT ESTIMATED COEFFICIENTS AND T-STATISTICS
CHOICE OF SUBSECTOR^a AND DECISION TO SEEK CARE^b

	Subsector choice				Decision to seek care outside home	
	SESPAS		IDSS		Do Not Seek Care	
	Coefficient	t-Statistic	Coefficient	t-Statistic	Coefficient	t-Statistic
Constant	-0.80	2.23	-1.87	3.79	1.57	10.17
Price ^c	-0.11×10^{-1}	1.57	-0.11×10^{-1}	1.57	-	-
Price squared ^c	0.28×10^{-4}	0.58	0.28×10^{-4}	0.58	-	-
Price times income ^c	0.63×10^{-3}	3.89	0.63×10^{-3}	3.89	-	-
Travel time ^c	-0.91×10^{-2}	1.02	-0.91×10^{-2}	1.02	-	-
Age: ^d						
under 1 year	1.65	4.13	-0.17	0.29	-1.12	6.95
2 - 5 years	1.64	4.31	-1.53	2.05	-0.26	1.90
6 - 14 years	1.89	5.17	-0.22	0.39	0.29	2.11
15 - 44 years	0.92	3.59	0.74×10^{-3}	0.00	-0.21	3.17
Sex ^d	-0.30×10^{-2}	0.02	0.65	2.56	0.15	0.91
Years of education	-0.13	7.52	0.99×10^{-1}	3.53	-0.15×10^{-1}	1.90
Chronic illness ^d	-0.12	0.67	-0.22	0.78	-0.42	5.14
Accident ^d	0.53	1.81	0.24	0.44	-2.12	0.52
Patient is IDSS beneficiary ^{c,d}	2.63	10.86	2.63	10.86	-	-
Inclusive value	-	-	-	-	0.21	3.62

- (a) Private sector coefficients have been normalized; therefore, SESPAS and IDSS coefficients are calculated relative to the private sector coefficients.
- (b) In the decision to seek care equation, the coefficients associated with the "seek care" choice have been normalized; therefore, the "do not seek care" coefficients are calculated relative to the "seek care" choice.
- (c) The coefficients are restricted to be equal across subsectors.
- (d) Dummy variables. In the age variables, the omitted dummy is age over 44 years. The sex dummy takes on a value of 1 if the person was a male and zero otherwise. The chronic illness dummy takes on a value of 1 if the person had a chronic illness and zero otherwise. The accident dummy takes on a value of 1 if the person had an accident and zero otherwise. Finally, the IDSS beneficiary variable takes on a value of 1 if the person was an IDSS beneficiary who faced the IDSS option and zero otherwise.

TABLE A.2

DECISION TO SEEK CARE AND CHOICE OF SUBSECTOR BY MALES
AS A FUNCTION OF A PERSON'S AGE AND INCOME GROUP

Person's age	Decision	Income quintile (RD\$ of November, 1987)				
		I RD\$ 200	II RD \$450	III RD \$850	IV RD \$1500	V RD \$2500
Under 1	Self Care	0.538	0.536	0.534	0.530	0.523
	Private	0.236	0.244	0.255	0.272	0.299
	SESPAS	0.202	0.196	0.189	0.177	0.159
	IDSS	0.024	0.024	0.023	0.021	0.019
2 - 5	Self Care	0.734	0.732	0.730	0.727	0.721
	Private	0.142	0.147	0.153	0.164	0.181
	SESPAS	0.120	0.117	0.113	0.106	0.095
	IDSS	0.004	0.004	0.003	0.003	0.003
6 - 14	Self Care	0.823	0.822	0.821	0.818	0.815
	Private	0.081	0.084	0.088	0.095	0.107
	SESPAS	0.088	0.086	0.083	0.079	0.072
	IDSS	0.008	0.008	0.007	0.007	0.006
15 - 44	Self Care	0.752	0.751	0.748	0.744	0.738
	Private	0.161	0.165	0.172	0.181	0.196
	SESPAS	0.067	0.065	0.062	0.057	0.051
	IDSS	0.020	0.019	0.018	0.017	0.015
Over 45	Self Care	0.795	0.794	0.791	0.787	0.781
	Private	0.159	0.162	0.167	0.175	0.186
	SESPAS	0.026	0.025	0.024	0.022	0.019
	IDSS	0.019	0.019	0.018	0.016	0.014

Assumptions: The person is a male with 7.8 years of education, who is not an IDSS beneficiary, and who did not have an accident (for individuals under the age of 15 highest level of education achieved in the household is chosen). Average private sector price: RD \$34.3.

TABLE A.3

DECISION TO SEEK CARE AND CHOICE OF SUBSECTOR BY FEMALES
AS A FUNCTION OF A PERSON'S AGE AND INCOME GROUP
(Projections Made Using Statistical Model)

Person's age	Decision	Income quintile (RD\$ of November, 1987)				
		I RD\$ 200	II RD \$450	III RD \$850	IV RD \$1500	V RD \$2500
Under 1	Self Care	0.501	0.499	0.497	0.493	0.487
	Private	0.265	0.273	0.283	0.299	0.325
	SESPAS	0.220	0.214	0.207	0.195	0.178
	IDSS	0.014	0.013	0.013	0.012	0.011
2 - 5	Self Care	0.703	0.702	0.700	0.696	0.691
	Private	0.162	0.167	0.173	0.183	0.199
	SESPAS	0.153	0.130	0.126	0.119	0.108
	IDSS	0.002	0.002	0.002	0.002	0.002
6 - 14	Self Care	0.800	0.799	0.798	0.796	0.792
	Private	0.095	0.098	0.102	0.109	0.120
	SESPAS	0.100	0.098	0.095	0.091	0.084
	IDSS	0.005	0.005	0.004	0.004	0.004
15 - 44	Self Care	0.724	0.722	0.720	0.716	0.710
	Private	0.188	0.193	0.199	0.208	0.222
	SESPAS	0.076	0.074	0.071	0.066	0.059
	IDSS	0.012	0.011	0.011	0.010	0.009
Over 45	Self Care	0.771	0.769	0.766	0.762	0.756
	Private	0.188	0.191	0.195	0.202	0.213
	SESPAS	0.030	0.029	0.028	0.025	0.022
	IDSS	0.012	0.008	0.011	0.010	0.008

Assumptions: The person is a female with 7.8 years of education, who is not an IDSS beneficiary, and who did not have an accident (for individuals under the age of 15 highest level of education achieved in the household is chosen). Average private sector price: RD \$34.3.

TABLE A.4

DECISION TO SEEK CARE AND CHOICE OF SUBSECTOR
AS A FUNCTION OF THE PRICE FACED BY PEOPLE
IN THE PRIVATE SECTOR AND ACCORDING TO
INCOME

Private sector price	Decision	Income quintile (RD\$ of November, 1987)				
		I RD\$ 200	II RD \$450	III RD \$850	IV RD \$1500	V RD \$2500
1. <u>Non-beneficiaries of IDSS</u>						
\$0	Self care	0.744	0.744	0.743	0.743	0.743
	Private	0.185	0.185	0.184	0.184	0.184
	SESPAS	0.055	0.056	0.056	0.056	0.057
	IDSS	0.016	0.016	0.016	0.016	0.016
\$30	Self care	0.752	0.750	0.748	0.744	0.739
	Private	0.164	0.167	0.173	0.181	0.195
	SESPAS	0.066	0.064	0.061	0.057	0.052
	IDSS	0.019	0.019	0.018	0.017	0.015
\$60	Self care	0.757	0.755	0.751	0.744	0.732
	Private	0.146	0.154	0.165	0.182	0.209
	SESPAS	0.075	0.070	0.065	0.057	0.045
	IDSS	0.022	0.021	0.019	0.017	0.013
\$90	Self care	0.762	0.758	0.752	0.742	0.724
	Private	0.132	0.144	0.161	0.187	0.227
	SESPAS	0.082	0.075	0.067	0.055	0.038
	IDSS	0.024	0.022	0.020	0.016	0.011
2. <u>Beneficiaries of IDSS</u>						
\$0	Self care	0.719	0.719	0.719	0.719	0.718
	Private	0.112	0.112	0.111	0.111	0.111
	SESPAS	0.033	0.034	0.034	0.034	0.034
	IDSS	0.136	0.136	0.136	0.136	0.136
\$30	Self care	0.723	0.722	0.721	0.719	0.716
	Private	0.091	0.095	0.100	0.109	0.122
	SESPAS	0.037	0.036	0.035	0.034	0.032
	IDSS	0.149	0.147	0.143	0.138	0.129
\$60	Self care	0.726	0.725	0.723	0.719	0.712
	Private	0.076	0.083	0.093	0.110	0.139
	SESPAS	0.039	0.038	0.037	0.034	0.030
	IDSS	0.158	0.154	0.148	0.137	0.120
\$90	Self care	0.728	0.727	0.724	0.718	0.706
	Private	0.066	0.075	0.089	0.114	0.160
	SESPAS	0.041	0.039	0.037	0.033	0.027
	IDSS	0.165	0.159	0.150	0.134	0.107

Assumptions: Projections made for a male who with 7.8 years of education aged 15-44 years who did not have an accident.

TABLE A.5

DECISION TO SEEK CARE AND CHOICE OF SUBSECTOR
AS A FUNCTION OF THE PRICE FACED BY PEOPLE IN SESPAS
AND ACCORDING TO INCOME

Private sector price	Decision	Income quintile (RD\$ of November, 1987)				
		I RD\$ 200	II RD \$450	III RD \$850	IV RD \$1500	V RD \$2500
1. <u>Non-beneficiaries of IDSS</u>						
\$1.83	Self care	0.753	0.751	0.748	0.744	0.738
	Private	0.161	0.165	0.171	0.181	0.197
	SESPAS	0.067	0.065	0.062	0.057	0.051
	IDSS	0.020	0.019	0.018	0.017	0.015
\$10	Self care	0.753	0.751	0.749	0.745	0.738
	Private	0.164	0.168	0.173	0.182	0.195
	SESPAS	0.063	0.061	0.060	0.057	0.052
	IDSS	0.020	0.019	0.018	0.017	0.015
\$20	Self care	0.754	0.752	0.749	0.745	0.737
	Private	0.167	0.170	0.175	0.182	0.194
	SESPAS	0.058	0.058	0.057	0.056	0.055
	IDSS	0.021	0.020	0.019	0.017	0.014
\$30	Self care	0.755	0.753	0.750	0.745	0.737
	Private	0.170	0.173	0.177	0.183	0.192
	SESPAS	0.054	0.054	0.055	0.056	0.057
	IDSS	0.021	0.020	0.019	0.017	0.014
2. <u>Beneficiaries of IDSS</u>						
\$1.83	Self care	0.724	0.723	0.722	0.719	0.715
	Private	0.089	0.093	0.099	0.108	0.124
	SESPAS	0.037	0.036	0.036	0.034	0.032
	IDSS	0.150	0.148	0.144	0.138	0.128
\$10	Self care	0.724	0.723	0.722	0.719	0.715
	Private	0.090	0.094	0.099	0.109	0.124
	SESPAS	0.034	0.034	0.034	0.034	0.033
	IDSS	0.152	0.149	0.145	0.138	0.128
\$20	Self care	0.725	0.724	0.722	0.719	0.715
	Private	0.090	0.094	0.100	0.109	0.123
	SESPAS	0.031	0.032	0.033	0.034	0.035
	IDSS	0.153	0.150	0.146	0.138	0.127
\$30	Self care	0.725	0.724	0.722	0.719	0.715
	Private	0.091	0.095	0.100	0.109	0.123
	SESPAS	0.029	0.030	0.031	0.033	0.037
	IDSS	0.155	0.151	0.146	0.138	0.126

Assumptions: Projections made for a male who with 7.8 years of education aged 15-44 years who did not have an accident.

TABLE A.6

DECISION TO SEEK CARE AND CHOICE OF SUBSECTOR
AS A FUNCTION OF THE TRAVEL TIME TO SESPAS FACILITIES
AND ACCORDING TO SESPAS'S PRICE

SESPAS Price	Decision	Travel time (*) (Minutes)				
		28	25	22	19	16
\$1.83	Self care	0.751	0.750	0.750	0.750	0.750
	Private	0.165	0.164	0.163	0.162	0.161
	SESPAS	0.065	0.066	0.068	0.069	0.071
	IDSS	0.019	0.019	0.019	0.019	0.019
\$10	Self care	0.751	0.751	0.751	0.751	0.750
	Private	0.168	0.167	0.166	0.165	0.164
	SESPAS	0.061	0.063	0.064	0.066	0.067
	IDSS	0.019	0.019	0.019	0.019	0.019
\$20	Self care	0.752	0.752	0.752	0.751	0.751
	Private	0.170	0.169	0.168	0.168	0.167
	SESPAS	0.058	0.059	0.060	0.062	0.063
	IDSS	0.020	0.020	0.019	0.019	0.019
\$30	Self care	0.753	0.753	0.752	0.752	0.752
	Private	0.173	0.172	0.171	0.170	0.169
	SESPAS	0.054	0.056	0.057	0.058	0.060
	IDSS	0.020	0.020	0.020	0.020	0.019

Assumptions: Projections made for a 15-44 year-old male with 7.8 years of education, who is not an IDSS beneficiary, who belongs to the income quintile II (monthly household income of RD\$450), and who did not have an accident.

(*) 28 minutes was the observed average travel time for SESPAS users.

TABLE A.7

DECISION TO SEEK CARE AND CHOICE OF SUBSECTOR
AS A FUNCTION OF A PERSON'S EDUCATION
AND INCOME CATEGORY

Years of education	Decision	Income quintile (RD\$ of November, 1987)				
		I RD\$ 200	II RD \$450	III RD \$850	IV RD \$1500	V RD \$2500
2	Self care	0.755	0.754	0.752	0.749	0.744
	Private	0.116	0.120	0.126	0.136	0.152
	SESPAS	0.104	0.101	0.098	0.093	0.084
	IDSS	0.025	0.025	0.024	0.022	0.020
4	Self care	0.754	0.753	0.751	0.748	0.742
	Private	0.132	0.136	0.142	0.152	0.168
	SESPAS	0.091	0.088	0.085	0.080	0.072
	IDSS	0.023	0.023	0.022	0.020	0.018
6	Self care	0.753	0.752	0.749	0.746	0.740
	Private	0.147	0.152	0.158	0.168	0.184
	SESPAS	0.078	0.075	0.072	0.067	0.060
	IDSS	0.022	0.021	0.020	0.018	0.016
8	Self care	0.751	0.750	0.747	0.743	0.737
	Private	0.163	0.168	0.174	0.184	0.199
	SESPAS	0.066	0.064	0.061	0.056	0.050
	IDSS	0.020	0.019	0.018	0.017	0.015
10	Self care	0.749	0.747	0.745	0.740	0.733
	Private	0.178	0.183	0.189	0.198	0.213
	SESPAS	0.055	0.053	0.051	0.047	0.041
	IDSS	0.018	0.017	0.016	0.015	0.013
12	Self care	0.746	0.744	0.741	0.737	0.729
	Private	0.192	0.197	0.203	0.212	0.226
	SESPAS	0.046	0.044	0.042	0.038	0.033
	IDSS	0.016	0.015	0.014	0.013	0.011

Assumptions: Projections made for a 15-44 year-old male, who is not an IDSS beneficiary, who did not have an accident, and who faces a private sector price of RD\$34.6.

TABLE A.8

AMBULATORY CARE
PRIVATE SECTOR
HEDONIC PRICE REGRESSION
OLS ESTIMATES*

Variables	Coefficient	t-Statistic
Constant	16.88	1.56
Patient had category 2 illness**	19.47	2.12
Patient had category 3 illness**	114.52	5.26
Patient had private insurance**	-6.94	0.86
Age	-0.12	0.56
Sex***	-13.01	1.47
Patient had chronic illnesses**	10.97	1.23
Patient had an accident**	-5.24	0.34
Number of health facilities in patient's neighborhood	0.14	2.73

Degrees of Freedom: 693

Adjusted r-square: 0.0453

* All private sector patients included.

** Dummy variables = 1 if patient had problem
0 otherwise

*** Dummy variables = 1 for male patients
0 for female patients

TABLE A.9

AMBULATORY CARE
PRIVATE SECTOR
HEDONIC PRICE REGRESSION
OLS ESTIMATES*

Variables	Coefficient	t-Statistic
Constant	26.16	2.07
Patient had category 2 illness**	22.34	2.15
Patient had category 3 illness**	112.16	4.86
Patient had private insurance**	-17.25	1.93
Age	-0.18	0.74
Sex***	-16.54	1.69
Patient had chronic illness**	12.83	1.29
Patient had an accident**	-6.28	0.37
Number of health facilities in patient's neighborhood	0.16	2.84

Degrees of freedom: 620

Adjusted r-square: 0.0518

* Excluded uninsured private patients who were exempted from payment.

** Dummy variables = 1 if patient had problem
0 otherwise

*** Dummy variable = 1 for male patients
0 for female patients

TABLE A.10

AMBULATORY CARE
HEDONIC TRAVEL TIME REGRESSIONS
OLS ESTIMATES*

	Subsector					
	SESPAS		IDSS		Private	
	Coefficient	t-Statistic	Coefficient	t-Statistic	Coefficient	t-Statistic
Constant	26.44	4.14	12.39	0.89	17.40	4.44
Number of facilities in neighborhood	-0.08	0.07	-4.60	1.29	-0.05	3.37
Age	-0.38	3.39	0.79	3.26	0.18	2.89
Sex ^{***}	4.96	1.36	-7.44	0.99	1.33	0.53
Intestinal illness ^{**}	0.42	0.07	28.30	2.06	7.47	1.72
Illness 1 other than respiratory and/or intestinal ^{**}	0.42	0.07	28.30	2.06	7.47	1.72
Illness 1 in addition to respiratory and/or intestinal ^{**}	-9.37	2.00	22.82	2.21	1.14	0.35
Illness 2 ^{**}	2.55	0.37	18.92	1.47	5.73	1.50
Accident ^{**}	10.09	1.49	-8.03	0.64	18.81	4.41
Adjusted r-square	0.04		0.16		0.05	
Degrees of freedom	313		102		693	

** Dummy variables = 1 if patient had problem
0 otherwise

*** Dummy variable = 1 for male patients
0 for female patients

TABLE A.11
 INPATIENT CARE
 CONDITIONAL LOGIT ESTIMATED COEFFICIENTS AND T-STATISTICS

	SESPAS		IDSS	
	Coefficient	t-Statistic	Coefficient	t-Statistic
Constant	2.80	5.66	1.24	1.99
Price	0.10×10^{-1}	8.65	0.11×10^{-1}	8.65
Price squared	-0.11×10^{-5}	1.41	-0.11×10^{-5}	1.41
Price times income	0.41×10^{-5}	0.33	0.41×10^{-5}	0.33
Travel time	0.37×10^{-1}	1.46	0.37×10^{-1}	1.46
Age: under 1 year	-2.01	2.53	-2.79	2.96
2 - 5 years	-0.69	0.94	-1.22	1.62
6 - 14 years	-1.63	2.49	-2.83	3.53
15 - 44 years	-1.04	2.48	-2.13	4.21
Sex	0.67	2.50	0.93	2.20
Years of education	-0.20	6.34	-0.65×10^{-1}	1.59
Minor surgery	2.11	4.43	1.52	1.86
Major surgery	12.03	6.22	10.90	5.27
Accident	0.88	2.19	0.96	1.95
Patient is IDSS beneficiary	---	---	2.04	4.86

TABLE A.12

INPATIENT CARE
PRIVATE SECTOR
HEDONIC PRICE REGRESSIONS
OLS ESTIMATES

Variables	Coefficient	t-Statistic
Constant	316.79	2.82
Patient had private insurance*	-323.29	-2.25
Age	3.26	0.84
Patient had minor surgery**	174.68	0.72
Patient had major surgery**	1,513.86	7.53
Number of days in the hospital	7.44	0.92

Degrees of Freedom: 280

Adjusted r-square: 0.18

* Dummy variable = 1 if patient had private insurance or was an
iguala beneficiary
0 otherwise

** Dummy variable = 1 surgery of specified level was performed
0 otherwise

**APPENDIX B:
MODEL USED FOR DEMAND ANALYSIS**

This Appendix provides a detailed description of the behavioral model used in the study as well as the statistical estimation techniques.

Behavioral Model

The behavioral model used in this study follows closely that developed by Gertler et al. (1987) and Dor et al. (1987). It is assumed that individuals derive utility from their health status and from the consumption of non-health goods and services. Individuals' health status is negatively affected by illness. Ill individuals must decide whether or not to obtain health care. If obtained, the ability of individuals to transform health care into an improved health status depends on many factors such as the persons's age, sex, education, and type of health problem.

In order to obtain health care services, individuals have to incur both monetary and nonmonetary costs. Monetary costs are the out-of-pocket payment made to the provider and the payments made for transportation to the health care facilities. Non-monetary costs are the time spent by individuals traveling to and from the provider's facility and the time spent waiting at the facility.

Out-of-pocket costs affect individuals' utility since they reduce the amount of income available to purchase non-health goods and services. Time costs also affect utility negatively since they reduce individuals' time available for leisure or for income-producing activities.

More formally, let us denote by U_{ij} the utility obtained by individual i when consuming provider's j health services given that he or she has a health problem. Let H_{ij} be an individual's expected health status after receiving care, R_{ij} the goods and services consumed by person i after

paying provider j , and T_{ij} the time spent by individual i in obtaining care from provider j .

Thus:

$$U_{ij} = U (H_{ij}, R_{ij}, T_{ij}) \quad (1)$$

Individuals are assumed to have limited monetary resources. Their total expenditures on health and non-health goods and services must not exceed available income. Let Y_i' be income available to individual i , P_{ij}' the price that individual i must pay provider j per unit of health care, M_{ij} the quantity of health care services purchased, W the unit price of a composite of non-health goods and services, and R_{ij} the amount of these goods and services consumed by individual i . The following budget constraint must hold:

$$Y_i' = (P_{ij}' \cdot M_{ij}) + (W \cdot R_{ij}) \quad (2)$$

An individual with a health problem must choose provider j and the amount of medical care M_{ij} which will maximize utility as specified in (1) subject to the budget constraint in (2).

It is assumed that the quantity of care to be consumed (M_{ij}) is determined by the provider and unknown at the time of the first visit. Further, it is assumed that the quantity of care that patients expect to obtain is fixed across providers and close to one (visit). In order to simplify the notation one can normalize the budget constraint in prices, using as denominator the price of non-health goods and services.

Thus, (2) becomes

$$Y_i = P_{ij} + R_{ij} \quad (3)$$

where $P_{ij} = P_{ij}'/W$ and $Y_i = Y_i'/W$.

It is important to point out that this model allows for price discrimination on the part of the provider. In other words, a provider who produces a homogeneous health service may charge different prices to different individuals. This feature of the model reflects a common practice among medical professionals in Santo Domingo.

If the quantity of medical care were an endogenous variable, individuals with a health problem would face two decisions: which provider to choose, and how much care to obtain from the chosen provider, given its price and time costs. However, since the amount of care has been assumed to be equal to one, ill people must only decide from which provider to obtain care.

The substitution of (3) into (1) yields a utility function shown in (4), that relates utility to the person's income, to the prices of goods and services, and to the health status and leisure time.

$$V_{ij} = V_{ij} (H_{ij}, Y_i - P_{ij}, T_{ij}) \quad (4)$$

As in Gertler et al (1987), quality of health care can be defined by establishing a relationship between a person's health status before obtaining care, H_{i0} , and after getting care from provider j , H_{ij} . For example, quality can be defined as the difference between health status after and before treatment

$$Q_{ij} = H_{ij} - H_{i0} \quad (5)$$

Solving for H_{ij} in (5), one can obtain a relationship between after-treatment health status, pre-treatment health status, and quality of care.

$$H_{ij} = H_{i0} + Q_{ij} \quad (6)$$

Health care quality, Q_{ij} , is assumed to be a function of individual's and provider's characteristics. Thus,

$$Q_{ij} = Q_{ij} (X_i, Z_j) \quad (7)$$

where X_i and Z_j denote individual and provider characteristics, respectively. Expression (6) can therefore be re-written as follows:

$$H_{ij} = H_{i0} + Q_{ij}(X_i, Z_j) \quad (8)$$

Substituting for H_{ij} , as defined in (8), into (4), above and after completing the specification, one obtains an expression for individuals' indirect utility which can be estimated empirically.

Empirical Specification

An indirect utility function quadratic in consumption was used in the empirical analysis.¹

$$V_{ij} = H_{ij} + a \cdot (Y_i - P_{ij}) + b \cdot (Y_i - P_{ij})^2 + c \cdot T_{ij} \quad (9)$$

Substituting for H_{ij} from (8) into (9) one gets the following expression for individuals' utility:

$$V_{ij} = H_{i0} + Q_{ij}(X_i, Z_j) + a(Y_i - P_{ij}) + b \cdot (Y_i - P_{ij})^2 + c \cdot T_{ij} \quad (10)$$

Individuals with a health problem choose the provider from which they can obtain the highest utility. Since an individual's income and pre-treatment health status do not vary by provider, expression (10) reduces to

$$V_{ij} = Q_{ij}(Y_i, Z_j) + a \cdot P_{ij} - 2b \cdot Y_i \cdot P_{ij} + b \cdot P_{ij}^2 + c \cdot T_{ij} \quad (11)$$

Finally, if we let quality be a linear function of individual and provider characteristics, expression (11) becomes:

$$V_{ij} = a \cdot P_{ij} + b \cdot (P_{ij}^2 - 2 Y_i \cdot P_{ij}) + c \cdot T_{ij} + D_i \cdot X_i + E_j \cdot Z_j \quad (12)$$

where D_i and E_j are vectors of parameters and X_i and Z_j are vectors of individual and provider attributes, respectively.

Estimation

Individuals with a health problem face two types of decisions. First, they must decide whether or not to seek care. Second, conditional upon seeking care, they must decide

from which provider to seek care. The two-step decision-making process has been estimated using nested logit (MacFadden, 1981). Nested logit does not suffer from the independence from irrelevant alternatives (IIA) problem and is a more general formulation of McFadden's conditional logit.

Nested logit can be estimated using full information maximum likelihood (FIML). However, the likelihood function is highly non linear, and programming a maximization algorithm can be a difficult and time-consuming process.

An alternative to the full information maximum likelihood method is a two-step procedure. The disadvantage of FIML over the two-step procedure is that any misspecification at one stage also contaminates the estimated parameters at the other stage. The distributional assumptions of the error term are also stronger for FIML than for the two step procedure.

Two-step estimation is done as follows: In the first step, only those individuals who sought care are considered in order to estimate the parameters of expression (12). Using the estimated parameters, the "inclusive value" is calculated, which represents an exponentially weighted sum of the utilities that could be obtained from each alternative provider. In the second step, the inclusive value is used as an additional variable in the indirect utility expression.

It must be noted that V_{ij} in (12) is unobserved. What is actually observed is the decisions made by people, i.e., the provider chosen. Thus, the dependent variable is a dichotomous variable which takes on two values contingent upon the choice made. Traditionally, dichotomous variables are arbitrarily labelled 1 and 0, the former value being used if the choice is made and the later if not. Of course, any other labelling is equally valid. The independent variables are those specified on the right-hand side of equation (12).

As explained in Chapter 3, the focus of this analysis is individual's choice of health care subsector. In principle, each person who is ill can obtain care from providers in any of three subsectors: the public sector (SESPAS), Social Security (IDSS), or the private sector.

Using the nested logit formulation, the probability that an individual who decides to seek care chooses subsector j is given by the expression

$$\text{Prob}_j = \frac{e^{W_j \cdot d / (1-g)}}{e^{W_{SE} \cdot d / (1-g)} + e^{W_{ID} \cdot d / (1-g)} + e^{W_{PR} \cdot d / (1-g)}} \quad (13)$$

where g is the correlation coefficient among the error terms of the indirect utility functions associated with each alternative, d is a vector containing the parameters (a, b, c, D_i, E_j) specified in expression (12), above, W is a vector containing the independent variables (P_{ij}, P_{ij}², 2Y_i · P_{ij}, T_{ij}, X_i, Z_j) of expression (12), and the subindices SE, ID, and PR denote the subsectors of SESPAS, IDSS, and private, respectively.

For example, expression (13) can be used to compute the probability that someone who is ill chooses SESPAS (j=SE). In that case, the numerator in (13) would be e^{W_{SE} · d / (1-g)}. Similar expressions can be used to compute the probability of choosing IDSS or PRIVATE. Note that the denominator in all three expressions is the same.

The product of probability expressions as specified in (13) constitutes the likelihood function whose maximization yields the estimated vector of parameters d / (1-g). The inclusive value for SESPAS, IDSS, and PRIVATE is defined as follows:

$$S_{SIP} = \ln \left(e^{W_{SE} \cdot d / (1-g)} + e^{W_{ID} \cdot d / (1-g)} + e^{W_{PR} \cdot d / (1-g)} \right) \quad (14)$$

where \ln denotes natural logarithm.

Once the inclusive value has been calculated, probability expressions for the CARE/NO CARE options are defined as follows:

$$\text{Prob}_{\text{NO CARE}} = \frac{e^{W_N \cdot h}}{e^{W_N \cdot h} + e^{S \cdot (1-g)}} \quad (15)$$

and

$$\text{Prob}_{\text{CARE}} = \frac{e^{S \cdot (1-g)}}{e^{W_N \cdot h} + e^{S \cdot (1-g)}} \quad (16)$$

where S is the inclusive value of expression (14), W_N is the vector of variables characterizing the NO CARE alternative, and h is the corresponding vector of parameters.

In summary, the parameters $d/(1-g)$ are calculated in the first step and used to compute the inclusive value. These parameters show how individual and provider characteristics influence the choice of subsector once the decision to seek care has been made. In the second step, the inclusive value is used as a variable characterizing the CARE option in order to estimate the vector of parameters h .

After estimation, probability calculations can be done as follows:

$$\frac{\text{Prob}_{\text{NO CARE}}}{\text{Prob}_{\text{CARE}}} = \frac{e^{W_N \cdot h}}{e^{S \cdot (1-g)}} = k_1 \quad (17)$$

$$\frac{\text{Prob}_{\text{SESPAS}}}{\text{Prob}_{\text{IDSS}}} = e^{\frac{(W_{\text{SE}} - W_{\text{ID}}) \cdot d}{(1-g)}} = k_2 \quad (18)$$

$$\frac{\text{Prob}_{\text{SESPAS}}}{\text{Prob}_{\text{PRIVATE}}} = e^{\frac{(W_{\text{SE}} - W_{\text{PR}}) \cdot d}{(1-g)}} = k_3 \quad (19)$$

$$\text{Prob}_{\text{NO CARE}} + \text{Prob}_{\text{SESPAS}} + \text{Prob}_{\text{IDSS}} + \text{Prob}_{\text{PRIVATE}} = 1 \quad (20)$$

Equations (17) through (20) constitute a system of four equations with unknowns $\text{Prob}_{\text{NO CARE}}$, $\text{Prob}_{\text{SESPAS}}$, $\text{Prob}_{\text{IDSS}}$, and $\text{Prob}_{\text{PRIVATE}}$.

Solving for these four unknowns one obtains the following recursive solution for probability expressions:

$$\text{Prob}_{\text{IDSS}} = \frac{1}{(1+k_1) \cdot (1+k_2+k_2/k_3)} \quad (21)$$

$$\text{Prob}_{\text{SESPAS}} = k_2 \cdot \text{Prob}_{\text{IDSS}} \quad (22)$$

$$\text{Prob}_{\text{PRIVATE}} = (k_2/k_3) \cdot \text{Prob}_{\text{IDSS}} \quad (23)$$

$$\text{Prob}_{\text{NO CARE}} = k_1 \cdot (\text{Prob}_{\text{SESPAS}} + \text{Prob}_{\text{IDSS}} + \text{Prob}_{\text{PRIVATE}}) \quad (24)$$

Hedonic Price and Travel Time Equations

An individual who has a health problem and who decides to seek care faces three choices: to go to SESPAS facilities, to go to IDSS facilities, or to go to private facilities.

Each choice is characterized by a price and a travel time. Individuals make the subsector choice based on the ex-ante expected price and travel time. For estimation purposes, it is necessary to impute a price and a travel time to each of the three options faced by ill individuals. Unfortunately, the only information available is the ex-post price actually paid to the single provider in the subsector chosen and the distance actually travelled.

A price and a travel time is imputed to each of the three options faced by an individual using hedonic predicted values. A hedonic price equation is an equation which has as dependent variable the out-of-pocket price paid by the patient to the provider, and as independent variables those variables which affect the price, such as the insurance status of the patient and the type of medical problem. A hedonic travel time equation has as dependent variable the travel time to the provider's facility, and as independent variables those variables which are presumed to affect travel time, such as the age of the patient and the number of facilities of the corresponding subsector in the patient's neighborhood.

A hedonic price equation was estimated to impute private sector prices. The prices actually paid by private-sector users were regressed on the independent variables. The regression results are shown in Tables A.6 and A.7 for ambulatory care and in Table A.10 for inpatient care. As shown in Chapter 3, most SESPAS and IDSS users pay a price of zero. Rather than using the hedonic price technique to impute prices in these two sectors, the average price actually paid was used as the expected price. In SESPAS, the average price of a consultation was RD\$1.83, and in IDSS it was RD\$0.42.

Table A.8 shows estimation results from the hedonic price regression, excluding from the sample uninsured private patients who were exempted from payment. As expected, the coefficient which measures whether or not people have private insurance becomes much more significant when uninsured, non-paying patients are excluded (Table A.8) than when they are left in the sample (Table A.7). Finally, hedonic travel time equations were estimated and used to impute travel time in the three subsectors. The estimated coefficients from the hedonic travel time regressions are shown in Table A.9 for ambulatory care.

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