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Analysis of Health Manpower Behavior: Physicians and Dentists

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Final Report

Analysis of Health Manpower Behavior: Physicians and Dentists

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ANALYSIS OF HEALTH MANPOWER BEHAVIOR: FOCUS ON PHYSICIANS AND DENTISTS

Abstract

1. PHYSICIANS

The possible inclusion of outpatient care benefits in the health care financing reform package highlights the need to determine the alternative features of the reform package as well as to analyze the effects the package would have vis-a-vis the objectives of reform. The proposal also points out the need to determine the support policies required to mitigate the adverse or unintended effects of the reform.

This study seeks to contribute to this discussion on the reform proposals. Specifically, it seeks to provide analyses of the factors affecting physician productivity and prices of their services at the clinic, their willingness to participate in financing schemes, and their career decisions.

1.1 Physician productivity and prices

This part of the paper seeks to answer the following research questions:

a. What factors affect expansion of outpatient services? What are the impacts of expansion of services on outpatient service prices?

b. What other factors affect outpatient service prices which could have a bearing on the design of reimbursement levels?

In order to answer these questions, a model of a physician maximizing utility over income and leisure was hypothesized. The model assumes that prices for outpatient and inpatient services, the rate of hospitalization and the levels of physician time per outpatient and inpatient service are choice variables of the physician which affect the patient load that he/she generates.

These are empirically implemented by estimating the determinants of average consultations time and average consultation fees. Average consultation time was estimated based on the premise that average consultation time partly determines the total number of services provided or physician productivity. The paper also estimates the determinants of average consultation fee, including average consultation time as a factor to see the partial effects of productivity on prices. Equations for average consultation time and average consultation fee were estimated by three-stage least squares regression, emphasizing their simultaneous nature.

Some of the findings on the determinants of average consultation time include the following:

a. Physicians who had more years of practice, who are fellows or diplomates of specialty organizations and who delegated tasks to assistants had lesser average consultation time;

b. Variables which represented the potential demand for physician services at the clinic also reduced average consultation time of physicians;

c. The presence of an ecg, x-ray or ultrasound machine in the clinic increased the amount of time per consultation; and

d. Physicians who admitted most of their patients in tertiary hospitals and who practiced in localities with higher average inpatient visit fees had longer average consultation times.

Findings for average consultation fees include:

a. Physicians who were married and who had more years of practice charged higher outpatient consultation fees;

b. Physicians practicing in independent outpatient clinics charged about P 17 less than physicians practicing in hospital-based clinics;

c. The presence of an airconditioner and specialized machines also increased outpatient consultation fees;

d. Physicians followed prevailing fees in the municipality or locality;

e. Physicians who admitted patients in tertiary hospitals charged P 21 more than those who admitted patients in primary or secondary hospitals; and

f. Shorter consultation time translated to higher consultation fees.

Since consultation time affected average consultation fees, factors which affected consultation time also affected consultation fees. The net effects therefore include:

a. Variables which proxied for the demand for outpatient services have positive effects on average consultation fees;

b. Presence of aircon and equipment had lower although still positive net effects on prices. The same holds true for physicians who admit patients in tertiary hospitals;

c. Utilization of assistants increase average consultation fees; and

d. Variables which could proxy for greater skill and experience also had positive effects on prices.

Given these findings, inclusion of outpatient benefits in health care financing reform could lead to reductions in consultation time and increases in outpatient consultation fees. There could therefore be additional costs that would be incurred if outpatient consultation fees are included. Estimates of the amount that need to be budgeted for the implementation of the reform should therefore consider additional increases in professional fees.

Another implication of the results is that in order to increase the number of patients that can be accommodated by physicians per hour spent in the clinic, increasing the incidence and complexity of tasks delegated to assistants should be encouraged. However, this would come at a cost. The effect on average consultation fees should therefore be considered in setting reimbursement levels if greater productivity of physician time is to be encouraged.

Likewise, an active policy to solicit the participation of more productive or better quality physicians may require that differential reimbursement be applied for their services.

In the event of inclusion of outpatient benefits in financing schemes, there remains the issue of which aspects of the total price or clinic characteristics (e.g. amenities including airconditioners or special equipment) ought to be reimbursed.

Relatedly, if different reimbursement levels are applied to hospital-based and independent clinics, then there could be implications on the recipients of the subsidies from this measure. This is due to initial indications that patients patronizing these types of clinics differ with respect to incomes.

The following analysis, however, is to be qualified. Factors which determine total hours worked need to be considered in examining productivity at the clinic. This is because only a partial measure of productivity was used.

It was noted that there could be different types of patients patronizing independent and hospital-based clinics. This differentiation needs to be confirmed in order to ascertain the recipients of subsidies from differential reimbursement.

Finally, errors in the data set, resulting from sampling and non-sampling biases, provide the limits to the analysis that has been done.

1.2 Physician participation in financing schemes

This part of the paper seeks to answer the question of how important reimbursement levels are vis-a-vis other factors in fostering physician participation in financing schemes.

In order to answer this question, a modified model of a utility maximizing physician was employed. A participating physician generates additional income from financed patients, although the amounts received are partly determined by reimbursement rates. In addition to increments in the unit costs of practice due to higher patient loads, costs of collection, billings and delays also come with physician participation in financing schemes.

Estimation of probit models of participation in Medicare and in private financing schemes constitutes the empirical operationalization of these concepts. Further, two alternative equations for participation in private financing schemes were estimated using different reimbursement variables. Participation in our case is defined as accreditation with the concerned financing scheme.

The results for accreditation in Medicare include the following:

a. General practitioners are 32 percent less likely to participate in Medicare than specialists, so are single physicians;

b. A physician practicing in hospital-based clinic is 20 percent more likely to participate in Medicare than those practicing in independent clinics;

c. The higher the average consultation fee prevailing in the municipality, the less likely the physician is to participate;

d. Higher average per capita expenditures in the municipality of the physician increases the likelihood of participation in Medicare; and

e. The proportion of fees reimbursed by Medicare, the time elapsed before reimbursement and the proportion of households with at least one member of Medicare do not seem to explain participation of physicians in Medicare well.

The respective results for participation in private financing schemes include:

a. Specialists and board certified physicians are more likely to participate in private financing schemes;

b. Physicians who admit patients in private hospitals are more than 20 percent likely to participate;

c. The higher the average consultation fee in the municipality or province of the physician, the lesser the propensity to participate;

d. When reimbursement is measured as a proportion of the inpatient visit fees of the physician, then the higher the reimbursement, the more likely the physician is to join a financing scheme;

e. When reimbursement is measured as a proportion of the average inpatient visit fee prevailing, reimbursement is not a significant variable;

f. The length of time it takes to be reimbursed and the proportion of the population who are members of HMOs or private insurance do not seem to figure significantly in participation decisions; and

g. It seems that marketing efforts of private health financing schemes figure more prominently in the participation decisions of physicians.

These results give rise to several implications and issues. Since participation is more likely for those practicing in hospital based clinics and specialists, efforts to accredit general practitioners and those practicing in independent clinics may need to be stepped up.

Given current billing practices, it would seem that varying reimbursement rates and reducing the delay in reimbursement may not be the more effective measures to induce participation in Medicare. Efforts to increase utilization by Medicare members and claiming from Medicare may be the more effective measures.

On the other hand, substantial increases in Medicare reimbursement and substantial reductions in reimbursement time may be necessary to change current billing practices and encourage participation.

The importance of financial variables in inducing participation is seen in the results of physician participation in private financing schemes where reimbursement rates matter in physician decisions to participate.

The results could have been more refined if better measures of variables including covered population, reimbursement rate for private health financing schemes, delays in reimbursement specially for private schemes were available.

1.3 Physician career decisions: location

How important are financial incentives in determining physician career decisions, specifically location? This is the question that the third section of the paper seeks to answer.

The conceptual framework assumes that different utility levels are achieved by physicians in locating in urban and rural municipalities. These utility levels are further hypothesized to be affected by variables representing the physician's prior contact with the community, characteristics of the area, presence of medical support and facilities, potential income or demand for the physicians' services and other physician characteristics. A probit model of physician decision to locate in an urban or rural municipality operationalizes these concepts. The estimated coefficients are used to simulate the effects of current policy parameters.

The results indicate that:

a. The set of variables which represent potential demand and physician income in an area, including average household expenditures, average consultation fees and costs of practice as proxied by wages of assistants, are significant determinants of the decision to locate in an urban municipality;

b. Support services, as proxied by the number of primary and secondary hospitals also explain the likelihood of location; and

c. The set of variables which represent the physician's prior contact with a community, age at a time of graduation and gender does not seem to affect the decision to locate to a significant extent.

Using these results and applying the current values of current DOH program, it was found that a policy package consisting of both cost subsidies and increased compensation could encourage physicians to locate in a rural area. However, policies should be designed in order that probabilities are maximized at lesser cost to the program.

One of the limitations of the model is that the characteristics of the area are not explicitly included. This underlies the importance of using better measures of the variables before the model can be used for finer policy analysis and design.

2. DENTISTS

The present low levels of utilization of dental health services and the high income elasticity for these services suggest that substantial increases in demand could result as the general economy and the incomes of the populace improve. This supposition can lead to a host of questions as follows. Will increased demands automatically translate into provider availability? What then determines the distribution of dentists in the Philippines? Will increases in demand lead to price and expenditure increases? What other factors determine prices?

The paper then attempts to contribute in answering these questions by studying dentist practice patterns, specifically their location decisions, and the determinants of dentist prices.

2.1 Dentist career patterns and decisions: location

This part of the paper focuses on studying the following research questions:

a. What is the current dentist distribution?

b. What are some factors which influence dentist location decisions?

It was noted that more than 40 percent of total dentists and more than 45 percent of private dentists were congregated in the NCR. Given this, the probabilities of private dentists locating in Metro Manila or outside Metro Manila were estimated.

The decision to locate in a certain area is hypothesized to be the result of the dentist maximizing his/her utility over the choice of location. Utility is assumed to be a random function because of imperfect perceptions and errors in measuring all the variables. The level of indirect utility is hypothesized to be determined by vectors of individual specific characteristics and values of attributes of the choices of location. Assuming a logistic distribution of the errors, a mixed logit model of the probability of dentist locating in the NCR or outside NCR is estimated.

The results indicate that:

a. The proportion of population residing in an urban area, a proxy for the characteristics of the area, positively and significantly affects the decision of the dentist to locate in an area;

b. Of variables representing the potential demand for the services of the dentist, only literacy rates are positive and significant;

c. Part of the effect of increases in household incomes and demand may be captured by the positive and significant effect of increases in the average incomes of self-employed dentists. The marginal effects indicate that an increase in the average monthly income of self-employed dentists could increase the probability of locating in an area;

d. Increases in the average costs of practice decreases the probability of a dentist locating in that area; and

e. As a dentist increases in age, the probability of locating in Metro Manila increases.

Some of the implications of the results are:

a. To the extent that literacy rates are good indicators of having had at least primary education, basic education may significantly affect the demand for dental services;

b. Masures which tend to increase the demand for dentist services, to the extent that they lead to increases in the incomes of self-employed dentists, could also increase the probability of locating in that area;

c. Factors which increase the costs of doing business, whether it be increases in the unit prices of the inputs used or shifts in the types of services provided may therefore affect the probabilities of dentists locating in those regions; and

d. Changes in the age profile of dentists could therefore have implications on the geographic distribution of dentists.

The empirical verification is limited to the extent that some of the determinant variables, specifically those which describe the characteristics of the area, may not be represented or represented inadequately. Another problem which arises in the presence of some variables which describe the particular choice is the correlation between these variables. In this case, the estimates would therefore be more indicative of the effects of groups of variables rather than just one and should therefore be interpreted accordingly.

2.2 Dental service prices

This section attempts to answer the following questions:

a. What are the effects of increases in demands on dental service prices?

b. What other factors affect dental service prices?

In order to achieve this, the determination of dentist service prices is situated within the context of dentist decisions with respect to mode of employment, hours of work and levels of output. The level of prices that can be charged becomes a factor in the determination of the particular income and leisure combination attainable by a self-employed dentist and consequently, on the decision to be self-employed or to seek employment elsewhere. Positing that dentists would choose to be self-employed if the utility derived from income and leisure from self-employment is greater than that from employment, the level of prices observed would therefore be affected by factors which affect the prior decision to become self-employed.

The prices of single uncomplicated extractions and one-surface amalgam fillings charged by self-employed dentists are the dental service prices that were estimated. To account for the correlation of the variables which affects the mode of practice with the variables which affect prices, Heckman's two-step procedure was adopted.

Regional dummies were used instead of regional averages of indicators such as the number of sellers or market structure, other factors affecting demand like income, education and incidence of dental problems, and unit costs of variable factors of production.

Results of the probit equation for self-employment indicate that:

a. Every year increase in age lessens the probability of the dentist to be self-employed. However, the coefficient of the square of age is positive, implying that the effect of age on the probability of self-employment is u-shaped;

b. Although female dentists were more likely to be self-employed, older females were more likely to be employed; and

c. Regions where the likelihood of dentists to be self-employed is lower than those in the NCR include Region 1, 5, 6, 8, 9, and 10 while the likelihood of being self-employed is higher than that for NCR in the Cordillera Autonomous Region (CAR).

Estimates of the prices of single extractions and one-surface amalgam fillings indicate that:

a. Although both equations share a common set of hypothesized determinants, the list of significant determinants is different for each price;

b. Every year increase in age of dentist increases the prices of single extractions and one-surface amalgam fillings;

c. Female dentists charged less than male dentists for single extractions. Dental specialists like orthodontists, pedodontists, oral surgeons and prosthodontists charge higher or nearly double the average price of single extractions;

d. Dentists located in rural areas charged less for extractions than those in urban areas;

e. Ownership of equipment by the dentist increases the prices charged for extractions and fillings;

f. Prices of extractions are lower in Regions 2, 3, 4, and 5 than those in the NCR and higher in Region 7 than NCR. Prices of fillings are lower than the NCR in Regions 1, 2 and 4 while prices are higher relative to the NCR in Region 11. Prices in the rest of the regions are not significantly different from those in the NCR; and

g. Although the coefficients for the inverse of the Mills ratio are insignificant, the presence of self-selection cannot be rejected due to limitations in the data set.

The results for the probit equation imply that changes in the age and sex distribution of dentists in the Philippines could have effects on the mode of practice choices of dentists. From the pattern of the regions where the likelihood of self-employment is higher, it seems that demand and income considerations do affect the decision to become self-employed. This implies that as household incomes increase, as demand for health care services increase and as the incomes of self-employed dentists increase, the distribution of dentists across practice modes would likely be affected.

Based on the patterns of effects of the regional dummies on prices of extractions and amalgam fillings, movements in household incomes, literacy rates, incidence of caries, costs of practice and number of private and public dentists to levels like those in the NCR could increase prices of extractions in Regions 2, 3, 4, and 5, and prices of fillings in Regions 1, 2, 4, and 5. This indicates that increases in expenditures due to increases in prices can be expected as the levels of demand increase.

Taking the presence of equipment as representing possible increases in the costs of practice, it can be expected that increases in the rate of adoption by dentists of technological advancement in the form of new dental equipment would increase the prices charged for dental care services.

It can be argued that regional dummies represented a unique combination of the indicator variables at hand. The use of regional dummies, however, disables the separation of the individual effects of the demand factors on the dependent variables. While attempts to explain the effects of regional dummies can be traced to the levels of the variables, these explanations remain as hypotheses and conjectures which need further confirmation.

Part I: Physicians

Section 1

INTRODUCTION

1.1 OUTPATIENT BENEFITS IN HEALTH CARE FINANCING REFORM

In 1972, the Philippine Medical Care Commission was established, ushering the implementation of a compulsory health insurance scheme, the Medicare Program. Coverage of the original program, Medicare I, included public and private sector employees and their dependents and subsequently, retirees and the self-employed. Coverage of the informal sector is to be included in Medicare II, a program which has not been implemented.

Under Medicare, benefits are limited to in-patient or hospitalization costs. These costs include professional fees for surgical procedures and in-patient consultations, room and board expenses, operating room fees, drugs and medicines, and laboratory and other diagnostic tests and procedures. Ceilings on reimbursable amounts for hospital services depend on the type of the hospital where a patient has been confined and on the service which has been rendered. Professional fees for surgical procedures are currently reimbursed based on a Relative Value Scale while non-surgical procedures are paid fixed amounts per visit. Specialists receive higher rates than general practitioners.

Since its implementation however, the Medicare Program has failed to reach the target support value of 70 percent. The highest proportion of total hospitalization expenses paid for by Medicare in 1989 was 48.9 percent, the usual being about 30 percent. It is no wonder then that clamor for expanding the coverage of the system is ongoing.

Pressures for expanding the coverage of the system are not limited to increases in reimbursable ceilings for hospital expenses. Evaluation and studies performed on the Medicare Program have broached the idea of expanding the coverage to include primary and outpatient services. These suggestions resulted from the perception that in covering hospital expenses only, Medicare has increased incentives to treat patients in a hospital setting. Since hospital care is relatively more expensive than outpatient care, this tendency has led to increasing health care costs. Increasing health care costs have, in turn, made it difficult for Medicare support values to catch up.

Aside from improving Medicare coverage, the inclusion of outpatient benefits is believed to aid in reducing total health care financing costs. As means to access outpatient services are eased, beneficiaries are encouraged to demand preventive care services such as check-ups and immunizations as well as to seek care at earlier stages of the disease. At these stages, treatments are relatively more inexpensive. Seeking care at earlier stages also prevents or minimizes the occurrence of complications. In this way, hospitalizations required to treat complicated and severe cases can be reduced or minimized, leading to substantial savings in health care expenditures.

That there is sufficient scope for reduction in these costs can be gleaned from data on the ten leading causes of hospitalizations for 1989 from the Philippine Medical Care Commission data (Please see Table 1.1). Acute bronchitis, bronchopneumonia, PTB, influenza, and upper respiratory tract infection still figure prominently among the leading causes. That there is sufficient scope in treating diseases in the early stages is further shown by the distribution of diagnosed acute diseases/sicknesses by first place of consultation (Table 1.2). Of those diagnosed with acute diseases/sicknesses/injuries, 58.1 percent first consulted with a private clinic, a rural health unit, a puericulture center or barangay health station. For the National Capital Region, this proportion is 44.3 percent with the maximum of 73 percent registered in Region 8. The figure averages 60 percent for the whole Philippines. It can be inferred that some factors prevent those who are feeling ill from seeking treatment while the disease is at early stages and instead wait until the disease is at the acute stage before consultation. It is likely that these people will be referred to a higher level facility for treatment.

In addition, providing and ensuring access to primary and outpatient services through expansion of social insurance may be more appropriate solutions to the country's health needs. From 1981-1987, the ten leading causes of morbidity have included diarrhea, bronchitis, influenza, pneumonia, measles, chicken pox and tuberculosis. Known treatments to these diseases can be performed without confining the patients in a hospital. Outpatient consultations plus appropriate drugs and medicines are the usual throughputs needed in the treatment of these diseases.

Even though treatments to the leading causes of morbidity are available on an outpatient basis, it may be more and more difficult for the average workingman to access these treatments. Sluggish economic growth and rising unemployment have decreased real per capita incomes. Average inflation still reaches double digit rates. Poverty incidence remained at a high 49.5 percent in 1988 which indicates that majority of the population are unable to provide for a minimum level of subsistence consumption.

Double digit inflation rates have not been confined to the non-medical sector. Increases in the prices of private medical services have averaged 13 percent in 1982-91, that for pharmaceuticals and medical supplies have reached 15.3 percent for 1982-90 (Table 1.3). Data culled from surveys of consultation fees of Metro Manila physicians show that average fees for initial consultations for all practitioners have reached P131 and P168 in 1990 and 1991 (Table 1.4). Minimum fees have stayed the same at P 50 for both years. In comparison, daily legislated minimum wages for Metro Manila are P100.57 and P127.83 for the same years. This means that for families depending on a single minimum wage earner, professional fees for a single consultation would mean foregoing at least fifty percent of a day's subsistence earnings in 1990 and at least 40 percent in 1991. Basing computations on average fees, a day's wage would not be enough even for consultation fees for both years. This would not include the drugs and medicines which would be needed for treatment. Relief is not in sight as the same survey reveals that physicians are planning to increase their fees by an average of 19

Table 1.1

Ten Leading Causes of Hospitalization, 1989

Cause of hospitalization	Number of cases
1. Gastroentiritis, Acute	587
2. Bronchitis, Acute	468
3. Bronchopneumonia	387
4. Bronchial Asthma	233
5. Typhoid Fever	165
6. Gastritis, Acute	146
7. Upper Respiratory Tract Infection	140
8. Influenza (Viral)/Flu	123
9. Koch's Infection/PTB	122
10. Intestinal Amoebiasis	121
	2,492

Source: PMCC Survey Data Base

Table 1.2

Number and Percent Distribution of Diagnosed Acute Diseases/Sickness/Injuries
by Place of First Consultation and by Health Region
Philippines, 1987

Region	Total	Home	Gov't. Hospital	Private Hospital	Private Clinic	Rural Health Unit	Pueri-culture Center	Barangay Health Station
PHILIPPINES	754,663	6.6	18.3	17.0	21.6	21.5	1.2	13.8
NCR	97,302	7.5	19.2	29.0	21.5	8.6	1.1	13.1
REGION 1	66,052	5.8	14.6	21.6	20.4	24.4	1.4	11.8
REGION 2	35,808	3.0	19.6	7.9	21.1	42.3	-	6.1
REGION 3	101,856	7.8	22.3	16.9	20.4	25.1	-	7.5
REGION 4	103,153	3.4	20.4	17.4	22.3	23.0	0.6	12.9
REGION 5	39,272	1.3	15.9	22.0	22.0	18.9	-	19.9
REGION 6	54,604	14.4	20.8	8.7	25.0	19.9	-	11.2
REGION 7	63,456	12.8	10.9	4.5	13.3	24.8	7.9	25.8
REGION 8	28,719	4.9	13.3	9.0	19.0	40.9	-	12.9
REGION 9	40,732	-	38.3	12.0	8.8	12.2	-	28.7
REGION 10	56,674	4.4	14.3	28.3	25.5	15.4	0.7	11.4
REGION 11	39,506	3.0	8.3	18.3	37.0	21.8	1.2	10.4
REGION 12	27,529	17.1	11.7	3.2	31.5	19.2	2.7	14.6

Source: National Health Survey, 1987; Department of Health

Table 1.3

Inflation Rate of Private Medical Services, Pharmaceutical and Medicinal Supplies and All Items Philippines, 1982-1991 (CPI: 1978 = 100)

Year	Private Medical Services	Pharmaceutical and Medicinal Supplies	All Items
1982	15.10	10.24	10.25
1983	9.25	12.07	9.99
1984	30.27	55.22	50.29
1985	18.70	18.53	23.16
1986	6.75	11.99	0.77
1987	5.96	7.97	3.77
1988	6.02	6.54	8.76
1989	4.86	7.66	10.60
1990	11.47	8.78	12.67
1991	21.06	-	17.69
Average	12.94	15.44	14.79

Source: National Statistics Office

Table 1.4

Physician Consultation Fees for Initial Consultation Metro Manila, 1990 & 1991

	1990	1991
Consultation fees and Legislated wage (in pesos)		
Minimum fee	50.00	50.00
Average fee	131.00	168.00
Maximum fee	600.00	600.00
Minimum Wage	100.57	127.83
Ratio of Minimum Wage to: (in %)		
Minimum fee	49.72	39.11
Average fee	130.26	131.42
Maximum fee	596.60	469.37

Sources: Wyatt Survey of Physician Fees, 1990 and 1991;
NPPS, NEDA (legislated minimum wage)

percent. It is no wonder then that deaths without medical attendance still comprise about 60 percent of total deaths as of 1988.

The recognition that costs of outpatient consults are rising has partly led to the growth of risk-pooling schemes and pre-need plans which include outpatient consults as one of the benefits. Estimates of the number of health maintenance organization (HMO) enrollees have risen from 375,000 in 1989 to about 500,000 to 600,000 in the first quarter of 1991.[1] Although representing barely a percent of total population, these numbers indicate a noteworthy increase in enrollment in just two years. Corporate clients still make up the majority of HMO enrollees, although this in itself is a recognition that HMOs can provide a wider range of health care benefits to employees for lesser cost. In effect, there is an implicit demand for such schemes which include outpatient services as part of the benefits.

This fact has been recognized by the PMCC with the PMCC-HMO tie-up. The rationale of the project was to increase Medicare benefits without increasing premium contributions. The high growth of enrollment in the tie-up project is an indication that Medicare members perceive their need for higher benefits. It seems that the same premium contributions did not lead to a decline in quality of care provided as interviews conducted by the SGV in the course of evaluation of the tie-up show general satisfaction with the outpatient care received from affiliated providers. Although more evaluation is needed of the tie-up project, it points to the potential of including outpatient care among Medicare benefits for the same premium.

The pressures to expand Medicare coverage, the rising costs of outpatient consultations, the need to reduce health care expenditures and the need to solve the country's basic health problems all point to the inclusion of outpatient and primary services as a possible reform area for the social insurance program.

1.2 PHYSICIAN BEHAVIOR AND OUTPATIENT BENEFITS

An important task in the operationalization of the reform proposal is the design of alternative features of the financing schemes. Some of the key operational features of the reform package that would have to be decided include benefits, reimbursement mode, reimbursement level and institutional arrangements.

Benefits refer to the range of outpatient health care services which are to be financed. Reimbursement mode refers to the alternative ways of paying the providers for outpatient services. The prevailing alternative is the fee-for-service mode where providers are paid for each service that they provide to patients. A capitation payment, on the other hand, would reimburse physicians a flat rate per person per time period regardless of the number of consultations and services

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[1] Gamboa, Rhais. Background Paper on Health Insurance in the Philippines.

rendered. A salary or time-based payment such as retainer fees would compensate physicians a fixed amount for a time period, again regardless of the amount of services rendered or the number of patients seen.

Reimbursement level for services refers to the amount paid for services rendered. In a fee-for-service mode, a fixed or flexible fee schedule could be adopted. A fixed fee schedule would pay providers the same fixed amount for the same service rendered. The amount could be based on the average fees in a certain region or on costs of providing the service. An example of the latter would be the Resource-Based Relative Value Scale which considers the costs of providing the service in terms of physician time, effort and skill required to perform a particular service or procedure. A flexible fee schedule, on the other hand, would vary physician payment for the same service according to some criteria. These criteria can include the location of the facility, the characteristics of the clinic, the characteristics of the physician (e.g. a consultation rendered by a general practitioner as opposed to a specialist) and the severity of the case.

The level of capitation payment may depend on a host of factors. These are usually negotiated between the financing organization and the providers. Bases for negotiations include expectations of morbidity rates and the respective costs of treatment for a covered population (actuarial costs), the costs of producing the particular health care service and provider characteristics, among others.

Institutional arrangements deal with how beneficiaries could access services and how providers could be accredited and reimbursed. At least two arrangements come to mind, one where Medicare directly deals with the providers of services (and where beneficiaries access the services directly produced by these providers) and one where there is an intermediary, either an HMO or health insurance firm that contracts with the providers (and where beneficiaries access services from accredited providers of these organizations).

Part of the design of alternative features of the reform package is an assessment of the possible effects that some of these features would have. Specifically, there is a need to know whether or not the design of the reform package would bring the system nearer to its goals of containing costs while improving access to health care. Whether there are unintended effects which require other policy handles should also form part of the analysis.

Some specific aspects which need to be considered in the design of alternative reform measures can be identified by reviewing the possible effects that the package is expected to have on the system.

Inclusion of outpatient benefits in Medicare is expected to increase the demand for such services. Given this increase, there is the question of whether services will be able to expand in order to meet this demand. The ability to meet expanded requirements for services is related to the manner in which outpatient services are produced, or to increases in productivity. Specifically, they relate to the application of physician time inputs and other clinic inputs. How these factors move would therefore indicate whether there are possible expansion in services and the possible cost implications to the clinic of such increases in services.

The question of whether services would expand is partly determined by physician willingness to accept payment from Medicare as compensation for services. If too few physicians are willing to accept payment from Medicare for outpatient services, then access to physician outpatient services would not expand. Analysis of the role of reimbursement levels, reimbursement modes and other factors in the physician services market in fostering physician participation in financing schemes is therefore a necessary input.

Since the increase in outpatient benefits is expected to increase demand for services, upward pressure on prices results. There is the question of what the potential overall impact on service prices would be. For beneficiaries of the reform package, the answer is important in that upward movements in prices could result in lower support values. This is illustrated with the experience of Medicare I where increases in the reimbursement rates for services have failed to bring support values of Medicare to their targeted levels. This has been partly blamed on the rapid increases of prices of providers, thereby making it difficult for support values to catch up.

For non-beneficiaries increases in the out-of-pocket prices paid may reduce their access to health services, therefore implying some losses in welfare. If non-members of Medicare are those least able to afford health services, then some inequities are perpetuated.

In these instances, the total costs of care to consumers or patients would have increased, thus preventing the attainment of affordability and access to health care. For the administrators of the system, increases in service prices could lead to increasing costs and could endanger the sustainability of the reform measure.

In addition to the cost implications of the potential increases in prices brought out by inclusion of outpatient benefits, other factors which may affect the pricing decisions of physicians should be considered. These factors help in determining appropriate reimbursement levels, or help anticipate the possible issues which could arise in determining reimbursement levels.

The need to analyze the possible effects of the reform package has pointed to the need to study aspects of productivity and cost in outpatient services, the prices charged for these services and physician participation in health financing schemes. In addition, there are concerns with respect to the long-run effects of the reform package. These refer to the longer run effects of the reform package on the supply of health manpower, specifically physicians.

In a pioneering study, Reyes and Picazo (1990) have noted the uneven distribution of health manpower, with health professionals tending to locate in Metro Manila and other urban areas. Fewer health professionals locate in the relatively poor and lagging regions of the country where the need for health care by residents may be more urgent and may be largely unmet.

Outcomes in the physician services market include the price paid for services and the quantities of services supplied. Together with costs of producing services, these determine physician incomes. It can be expected that the reform package would have differing effects on incomes of physicians in different areas owing to differences in the demand and supply conditions in different areas. These therefore translate to different levels of physician incomes. As such, location decisions of physicians would be affected, either contributing or correcting the imbalances in manpower distribution.

Given these possible effects, it is imperative to ascertain the importance of financial incentives in physician career choices as it affects decision on location and specialty.

1.3 STUDY OBJECTIVES AND OVERVIEW OF RESULTS

The possible inclusion of outpatient care benefits in the health care financing reform package highlights the need to determine the alternative features of the reform package as well as to analyze the effects the package would have vis-a-vis the objectives of reform. The proposal also points out the need to determine the support policies required to mitigate the adverse or unintended effects of the reform.

This study seeks to contribute to this discussion on the reform proposals. Specifically, it seeks to provide analyses of the factors affecting physician productivity and prices of their services at the clinic, their willingness to participate in financing schemes, and their career decisions.

1.3.1 Physician productivity and prices

This part of the paper seeks to answer the following research questions:

a. What factors affect expansion of outpatient services? What are the impacts of expansion of services on outpatient service prices?

b. What other factors affect outpatient service prices which could have a bearing on the design of reimbursement levels?

In order to answer these questions, a model of a physician maximizing utility over income and leisure was hypothesized. The model assumes that prices for outpatient and inpatient services, the rate of hospitalization and the levels of physician time per outpatient and inpatient service are choice variables of the physician which affect the patient load that he/she generates.

These are empirically implemented by estimating the determinants of average consultations time and average consultation fees. Average consultation time was estimated based on the premise that average consultation time partly determines the total number of services provided or physician productivity. The paper also estimates the determinants of average consultation fee, including average consultation time as a factor to see the partial effects of productivity on prices. Equations for average consultation time and average consultation fee were estimated by three-stage least squares regression, emphasizing their simultaneous nature.

Some of the findings on the determinants of average consultation time include the following:

a. Physicians who had more years of practice, who are fellows or diplomates of specialty organizations and who delegated tasks to assistants had lesser average consultation time;

b. Variables which represented the potential demand for physician services at the clinic also reduced average consultation time of physicians;

c. The presence of an ecg, x-ray or ultrasound machine in the clinic increased the amount of time per consultation; and

d. Physicians who admitted most of their patients in tertiary hospitals and who practiced in localities with higher average inpatient visit fees had longer average consultation times.

Findings for average consultation fees include:

a. Physicians who were married and who had more years of practice charged higher outpatient consultation fees;

b. Physicians practicing in independent outpatient clinics charged about P 17 less than physicians practicing in hospital-based clinics;

c. The presence of an airconditioner and specialized machines also increased outpatient consultation fees;

d. Physicians followed prevailing fees in the municipality or locality;

e. Physicians who admitted patients in tertiary hospitals charged P 21 more than those who admitted patients in primary or secondary hospitals; and

f. Shorter consultation time translated to higher consultation fees.

Since consultation time affected average consultation fees, factors which affected consultation time also affected consultation fees. The net effects therefore include:

a. Variables which proxied for the demand for outpatient services have positive effects on average consultation fees;

b. Presence of aircon and equipment had lower although still positive net effects on prices. The same holds true for physicians who admit patients in tertiary hospitals;

c. Utilization of assistants increase average consultation fees; and

d. Variables which could proxy for greater skill and experience also had positive effects on prices.

Given these findings, inclusion of outpatient benefits in health care financing reform could lead to reductions in consultation time and increases in outpatient consultation fees. There could therefore be additional costs that would be incurred if outpatient consultation fees are included. Estimates of the amount that need to be budgeted for the implementation of the reform should therefore consider additional increases in professional fees.

Another implication of the results is that in order to increase the number of patients that can be accommodated by physicians per hour spent in the clinic, increasing the incidence and complexity of tasks delegated to assistants should be encouraged. However, this would come at a cost. The effect on average consultation fees should therefore be considered in setting reimbursement levels if greater productivity of physician time is to be encouraged.

Likewise, an active policy to solicit the participation of more productive or better quality physicians may require that differential reimbursement be applied for their services.

In the event of inclusion of outpatient benefits in financing schemes, there remains the issue of which aspects of the total price or clinic characteristics (e.g. amenities including airconditioners or special equipment) ought to be reimbursed.

Relatedly, if different reimbursement levels are applied to hospital-based and independent clinics, then there could be implications on the recipients of the subsidies from this measure. This is due to initial indications that patients patronizing these types of clinics differ with respect to incomes.

The following analysis, however, is to be qualified. Factors which determine total hours worked need to be considered in examining productivity at the clinic. This is because only a partial measure of productivity was used.

It was noted that there could be different types of patients patronizing independent and hospital-based clinics. This differentiation needs to be confirmed in order to ascertain the recipients of subsidies from differential reimbursement.

Finally, errors in the data set, resulting from sampling and non-sampling biases, provide the limits to the analysis that has been done.

1.3.2 Physician participation in financing schemes

This part of the paper seeks to answer the question of how important reimbursement levels are vis-a-vis other factors in fostering physician participation in financing schemes.

In order to answer this question, a modified model of a utility maximizing physician was employed. A participating physician generates additional income from financed patients, although the amounts received are partly determined by reimbursement rates. In addition to increments in the unit costs of practice due to higher patient loads, costs of collection, billings and delays also come with physician participation in financing schemes.

Estimation of probit models of participation in Medicare and in private financing schemes constitutes the empirical operationalization of these concepts. Further, two alternative equations for participation in private financing schemes were estimated using different reimbursement variables. Participation in our case is defined as accreditation with the concerned financing scheme.

The results for accreditation in Medicare include the following:

a. General practitioners are 32 percent less likely to participate in Medicare than specialists, so are single physicians;

b. A physician practicing in hospital-based clinic is 20 percent more likely to participate in Medicare than those practicing in independent clinics;

c. The higher the average consultation fee prevailing in the municipality, the less likely the physician is to participate;

d. Higher average per capita expenditures in the municipality of the physician increases the likelihood of participation in Medicare; and

e. The proportion of fees reimbursed by Medicare, the time elapsed before reimbursement and the proportion of households with at least one member of Medicare do not seem to explain participation of physicians in Medicare well.

The respective results for participation in private financing schemes include:

a. Specialists and board certified physicians are more likely to participate in private financing schemes;

b. Physicians who admit patients in private hospitals are more than 20 percent likely to participate;

c. The higher the average consultation fee in the municipality or province of the physician, the lesser the propensity to participate;

d. When reimbursement is measured as a proportion of the inpatient visit fees of the physician, then the higher the reimbursement, the more likely the physician is to join a financing scheme;

e. When reimbursement is measured as a proportion of the average inpatient visit fee prevailing, reimbursement is not a significant variable;

f. The length of time it takes to be reimbursed and the proportion of the population who are members of HMOs or private insurance do not seem to figure significantly in participation decisions; and

g. It seems that marketing efforts of private health financing schemes figure more prominently in the participation decisions of physicians.

These results give rise to several implications and issues. Since participation is more likely for those practicing in hospital based clinics and specialists, efforts to accredit general practitioners and those practicing in independent clinics may need to be stepped up.

Given current billing practices, it would seem that varying reimbursement rates and reducing the delay in reimbursement may not be the more effective measures to induce participation in Medicare. Efforts to increase utilization by Medicare members and claiming from Medicare may be the more effective measures.

On the other hand, substantial increases in Medicare reimbursement and substantial reductions in reimbursement time may be necessary to change current billing practices and encourage participation.

The importance of financial variables in inducing participation is seen in the results of physician participation in private financing schemes where reimbursement rates matter in physician decisions to participate.

The results could have been more refined if better measures of variables including covered population, reimbursement rate for private health financing schemes, delays in reimbursement specially for private schemes were available.

1.3.3 Physician career decisions: location

How important are financial incentives in determining physician career decisions, specifically location? This is the question that the third section of the paper seeks to answer.

The conceptual framework assumes that different utility levels are achieved by physicians in locating in urban and rural municipalities. These utility levels are further hypothesized to be affected by variables representing the physician's prior contact with the community, characteristics of the area, presence of medical support and facilities, potential income or demand for the physicians' services and other physician characteristics. A probit model of physician decision to locate in an urban or rural municipality operationalizes these concepts. The estimated coefficients are used to simulate the effects of current policy parameters.

The results indicate that:

a. The set of variables which represent potential demand and physician income in an area, including average household expenditures, average consultation fees and costs of practice as proxied by wages of assistants, are significant determinants of the decision to locate in an urban municipality;

b. Support services, as proxied by the number of primary and secondary hospitals also explain the likelihood of location; and

c. The set of variables which represent the physician's prior contact with a community, age at a time of graduation and gender does not seem to affect the decision to locate to a significant extent.

Using these results and applying the current values of current DOH program, it was found that a policy package consisting of both cost subsidies and increased compensation could encourage physicians to locate in a rural area. However, policies should be designed in order that probabilities are maximized at lesser cost to the program.

One of the limitations of the model is that the characteristics of the area are not explicitly included. This underlies the importance of using better measures of the variables before the model can be used for finer policy analysis and design.

1.4 ORGANIZATION OF THE PAPER

The rest of the paper comprises the details of the models and the results. Section 2 discusses aspects of productivity, costs and prices of physician services with special attention to services at the clinic. Section 3 discusses physician participation in financing schemes while Section 4 discusses physician career decisions.

Each of the sections begins with a presentation of the trends and structure of the variables at hand. This is followed by general descriptions of the framework and models employed. Estimation results and a discussion of the same follow. Reiteration of the results and some policy issues conclude each section.

Section 2

PHYSICIAN PRODUCTIVITY AND PRICES AT THE CLINIC

2.1 INTRODUCTION

This part of the paper aims to assess some of the factors bearing on physician productivity and prices, and implicitly on costs with focus on clinic services. Trends in physician productivity and prices in other settings are also presented. As will be made clear in the general framework that would be presented, these variables are part of the same decision-making process. The next part of the paper provides a description of the trends in physician productivity and prices, including an outline of the general relationship between productivity, costs and prices. Aside from presenting the general trends in the variables in question, the exercise also introduces the data to be used for further analysis and the possible biases that the data may have. This helps in qualifying the results and policy implications later on. Another part formalizes the analytical and empirical model used in the analysis. The last section discusses the data set used for the regression, the results and some policy issues and implications.

The data on physician practice patterns used in the succeeding analysis were mainly culled from the Outpatient Clinic Survey of the DOH-PIDS Baseline Studies. The survey covered clinics and physicians in Regions 2, 7, 10 and National Capital Region (NCR), in particular, two provinces in each of the regions outside NCR: Quirino and Cagayan in Region 2, Cebu and Bohol in Region 7 and Misamis Oriental and Surigao del Norte in Region 10.

Clinics were originally classified as either independent or hospital-based. Independent clinics were those located in the communities, either attached to residences of physicians or in buildings located in commercial areas. Hospital based clinics were those located in medical arts buildings or in clinic spaces in hospitals being rented out to private physicians. Independent clinics were sampled in accordance with the sample barangays of the household survey while hospital-based clinics were sampled from the sample hospitals of the hospital survey. Sampling of clinics was limited to five general specialties: general practice, internal medicine, obstetrics-gynecology, pediatrics and surgery. The total sample yielded 184 independent clinics and 182 hospital based clinics.

In addition, clinics of physicians who were affiliated with alternative financing schemes were also sampled. This has led to the expansion of the clinic types surveyed to include company clinics (representing employer-based financing), HMO/Insurance clinics and school clinics.

The total sample size is 384 clinics and physicians broken down as follows: 6 percent from Region 2, 23 percent from Region 7, 15.1 percent from Region 10 and about 56 percent from the NCR. The sample would have been higher if not for the high refusal rates of the physicians, specially those in the NCR. Given that the refusals may be systematically related to certain physician characteristics and practice patterns, the data to be presented could therefore have some biases. In this regard, caution should be exercised in the interpretation of the results specially as the means presented are unweighted. This limitation of the data should thus be recognized. Results may therefore be indicative rather than definitive.

2.2 PHYSICIAN PRODUCTIVITY

This part of the paper attempts to document some observed trends in physician productivity. In discussing overall productivity trends, overall productivity is decomposed into its hourly productivity and physician work effort components. As it will be discussed later on, this decomposition would prove helpful in outlining the determinants of total productivity.

Since physician services are inputs into the production of health, some would argue that the true measure of productivity would be the health outcomes of patients. In this regard, the definition of productivity that is used, the number of patients that a physician sees in a particular time period in both clinics and hospitals, is limited.

Aside from abstracting from the health outcomes of patients, this measure is limited in that services performed on the patient and the severity of the cases are not considered. Different time intensities of services performed on patients or different time intensities required of more severe cases would understate or overstate productivities as measured by number of patients seen. Neither does this measure consider whether patients seen are new or old patients, or whether the consult is a follow-up consult for chronic illness.

An alternative measure of productivity believed to overcome these limitations would be to consider the total amount of billings or total revenues of physicians. The main assumption in forwarding this measure is that prices somehow reflect the different time intensities and severities. Prices are also assumed to reflect the content of the particular consultation or encounter. Total revenues could therefore be constructed by multiplying total visits by price paid per visit. However, this measure would also be fraught with limitations if prices are determined by factors other than the severity of illness. As it is a common practice in the Philippines, different prices are charged to patients belonging to different income classes even if the same services are performed on them. On the more practical side, total revenue estimates from physicians are also difficult to obtain due to high refusal rates.

In the absence of these revenue measures, the total number of patients seen in a week is adopted. In order to qualify the productivity measure, patients are further divided into patients seen in clinics and confined patients. This dichotomy permits differentiation of services performed and severity of illness of patients treated in inpatient settings versus those in outpatient settings. Further differentiation is allowed for specialization of physicians.

2.2.1 Observed trends in physician productivity at the clinic and at the hospital

The first columns of Tables 2.1, 2.2, and 2.3 present physician productivity at all clinics, at the particular clinic surveyed, and in hospitals. Looking at the average number of clinic patients seen in a week at all clinics (Table 2.1), it appears that physicians in

Table 2.1

CLINIC PATIENTS, CLINIC HOURS, CLINIC PATIENTS PER HOUR

	AVERAGE NO. OF CLINIC PATIENTS PER WEEK	NO. OF CASES	AVERAGE NO. OF HRS. IN ALL CLINICS PER WEEK	NO. OF CASES	TOTAL PATIENTS PER HOUR	NO. OF CASES
REGION						
2 Cagayan Valley	80.59	22	49.43	21	1.60	20
7 Central Visayas	75.05	85	33.81	86	2.45	84
10 Northern Mindanao	54.17	58	34.28	58	1.95	58
National Capital Region	49.39	205	26.37	210	2.56	205
For entire sample	57.89	370	30.59	375	2.39	367
SPECIALTY						
General Practice	71.34	86	38.16	85	2.47	84
Internal Medicine	55.68	80	25.98	83	2.97	80
Ob-Gyne	39.36	74	27.54	74	1.73	74
Pediatrics	67.93	76	30.39	79	2.78	76
Surgery	50.92	53	30.00	53	1.72	52
YEARS OF PRACTICE						
5 years and below	58.53	45	27.93	46	2.64	45
6 to 10 years	47.59	104	31.08	104	1.88	104
11 to 15 years	58.28	76	28.88	77	2.28	76
16 to 20 years	67.21	67	31.12	67	3.50	67
21 to 25 years	65.57	21	28.88	25	2.44	21
26 to 30 years	41.61	23	35.32	22	1.36	21
31 to 35 years	86.63	19	37.95	19	2.07	18
36 to 40 years	46.25	8	29.00	8	2.00	8
SEX						
Male	52.00	157	29.22	157	2.37	155
Female	62.23	213	31.57	218	2.40	212
NUMBER OF CLINICS						
One	58.81	186	30.43	185	2.30	182
Two	55.28	113	30.86	116	2.39	113
Three	60.63	63	29.83	65	2.77	63
Four	57.75	8	38.25	8	1.51	8

Source of data: DOH-PIDS Outpatient Clinic Survey

Table 2.2

CONSULTATIONS, CLINIC HOURS, CONSULTATIONS PER HOUR IN CLINIC 1

	AVERAGE NO. OF CONSULTATIONS PER WEEK IN CLINIC 1	NO. OF CASES	AVERAGE NO. OF HOURS PER WEEK IN CLINIC 1	NO. OF CASES	NO. OF CONSULTATIONS PER HOUR	NO. OF CASES
REGION						
Cagayan Valley	62.67	21	42.29	21	1.50	19
Central Visayas	51.51	82	28.14	86	2.21	81
Northern Mindanao	43.57	54	30.84	58	1.89	54
National Capital Region	31.62	183	17.23	208	2.74	182
For entire sample	40.24	340	23.27	373	2.41	336
SPECIALTY						
General Practice	52.26	82	33.12	84	2.16	79
Internal Medicine	38.04	69	18.93	82	2.99	69
Ob-Gyne	24.34	70	18.86	74	1.79	70
Pediatrics	49.32	73	22.61	79	2.88	73
Surgery	31.87	46	21.70	53	2.12	45
YEARS OF PRACTICE						
5 years and below	29.25	40	21.11	45	2.02	39
6 to 10 years	34.66	93	20.99	104	2.31	93
11 to 15 years	41.17	71	23.42	77	2.65	71
16 to 20 years	43.41	64	23.13	67	2.85	64
21 to 25 years	65.55	22	23.20	25	2.56	22
26 to 30 years	34.05	21	30.95	21	1.32	19
31 to 35 years	47.20	15	32.63	19	1.60	14
36 to 40 years	34.14	7	23.25	8	2.68	7
SEX						
Male	34.46	142	22.69	157	2.44	139
Female	44.37	198	23.70	216	2.39	197
TYPE OF CLINIC						
Hospital-based clinic	30.13	164	17.67	178	2.61	164
Independent Outpatient	49.15	163	29.43	178	2.16	159
Company Clinic	76.67	6	16.50	8	4.46	6
Polyclinic	15.00	1	11.00	1	1.36	1
School Clinic	35.50	2	16.67	3	1.31	2
HMO/Insurance Clinic	45.50	4	23.00	4	1.57	4

Source of data: DOH-PIDS Outpatient Clinic Survey

Table 2.3

HOSPITAL PATIENTS, HOSPITAL HOURS, HOSPITAL PATIENTS PER HOUR

	AVERAGE NO. OF PATIENTS SEEN IN HOSPITAL PER WEEK	NO.OF CASES	AVERAGE NO. OF HRS. SPENT IN HOSPITAL PER WEEK	NO.OF CASES	HOSPITAL PATIENTS PER HOUR	NO.OF CASES
REGION						
Cagayan Valley	5.19	8	8.75	6	0.91	5
Central Visayas	12.68	59	16.13	50	1.48	48
Northern Mindanao	8.69	48	11.84	46	1.22	46
National Capital Regio	8.49	169	11.39	155	1.52	151
For entire sample	9.30	284	12.33	257	1.44	250
SPECIALTY						
General Practice	9.36	41	13.34	34	1.48	33
Internal Medicine	9.14	66	12.47	63	1.29	60
Ob-Gyne	6.60	65	11.47	59	1.57	58
Pediatrics	10.45	63	9.31	58	1.33	56
Surgery	11.74	48	16.85	42	0.96	42
YEARS OF PRACTICE						
5 years and below	10.77	24	14.24	21	1.46	19
6 to 10 years	7.65	91	12.06	77	1.22	77
11 to 15 years	9.50	66	11.09	60	1.69	59
16 to 20 years	10.06	49	13.23	49	1.52	47
21 to 25 years	13.38	17	13.98	17	1.83	17
26 to 30 years	10.50	14	9.42	13	1.47	12
31 to 35 years	6.52	12	9.09	11	0.86	11
36 to 40 years	8.40	5	15.75	4	0.57	3
SEX						
Male	10.43	125	14.15	110	1.31	108
Female	8.42	159	10.97	147	1.54	142
NUMBER OF HOSPITALS						
One	7.54	71	9.08	65	1.35	62
Two	8.15	73	8.93	65	2.13	62
Three	10.79	128	16.29	115	1.10	115
Four	10.32	7	12.71	7	1.10	6
Five	11.25	3	6.33	3	2.31	3
Eight	12.00	2	8.49	2	2.06	2

Source of data: DOH-PIDS Outpatient Clinic Survey

Region 2 see the most number of patients, while physicians in the NCR see the least number of patients. On the average, physicians in Region 2 see about 80 patients per week while those in the NCR see about 50 patients per week. However, a decline in the number of patients seen as the level of development of the region increases is not borne by the data since physicians in Region 7 see more patients than those in Region 10. It may be that physicians in the NCR have understated their patient loads or that the survey may have captured the low patient load physicians.. Anecdotal evidence would tend to support the understatement hypothesis.

The same trend in number of patients seen is apparent as one looks at the number of patients where the interview was obtained (Table 2.2). The number of consultations would differ from the number of patients seen to the extent that there are other services performed on patients aside from consultations and to the extent that physicians hold multiple clinics. Physicians in Region 2 appear to have the most number of consultations in a week where the interview was taken while sample physicians in the NCR appear to have the least number of consultations in a week.

Turning to hospital patients, the opposite trend can be seen. Physicians in Region 2 see the least average number of patients in hospitals in a week, only about five, while those in Region 7 see about 12 patients a week. Meanwhile, the number of patients seen in hospitals in Regions 10 and NCR does not differ significantly. The low number of patients seen in hospitals in a week in Region 2 could be related to the number of private hospitals where physicians can follow up their patients. Referrals to physicians employed in public hospitals may be the norm instead of following up patients in private hospitals.

Looking at the number of patients seen across specialties, general practitioners see the most number of patients in a week, followed by pediatricians and internists. Surgeons and obstetricians see the least number of patients. These trends may be reflective of the relative time intensity of the services which are provided by these two specialties relative to the others. The number of patients seen by internists and pediatricians could also be due to greater proportions of follow-up and check-up cases which do not require as thorough a workout.

The in-patient setting of the most services performed by surgeons is reflected in the number of patients seen in a week in hospitals. Surgeons sampled see about 11 confined patients per week on the average. Although it was expected that obstetricians would have the same trend in the number of patients seen in hospitals, they register in fact the lowest number of patients seen in a week. Although it was expected that general practitioners would refer patients who need confinement to other physicians, the results show that the number of patients seen in a week in hospitals by general practitioners may not differ significantly from the average numbers seen by internists and pediatricians.

Are there productivity differences between physicians of certain characteristics? The number of patients seen in a week in all clinics by years of experience indicate that here are, although the direction in the productivity differences is not too pronounced. For nstance, while number of patients seems to reach a high at 16 to 25 years of experience, no continuous increase is seen between 5 to 15 years and no continuous decline is seen rom 26 to 40 years. A clearer trend in productivity is seen if measured by the number of consultations in a week. A peak is reached by physicians with 21 to 25 years of experience with the number of consults increasing steadily before that and declining after that period.

Female physicians in the sample appear to have higher number of patients seen than male physicians, either reckoning by number of patients seen in a week or number of consultations in a week.

The number of patients seen in hospitals in a week appears to he highest for those with 21 to 25 years of experience. Physicians belonging to this category see about 13 patients a week on the average. Starting with physicians with 6 to 10 years experience, the number of patients seen rises steadily up to the peak, after which a decline is seen. The relatively high number of patients seen in hospitals in week by the least experienced physicians needs to be looked into further.

Are physicians holding multiple clinics and hospital affiliations more productive than those with just one? The last lines of Tables 2.1 and 2.3 provide indicative answers to this question. There seems to be no large differences in productivity between physicians maintaining single or multiple clinics. Although physicians maintaining three clinics see the most number of patients on average, they are only about two patients better off than physicians with single clinics. It would seem therefore that physicians choose to practice in multiple clinics in order to achieve certain levels of total productivity or patient load for outpatients.

On the other hand, the number of patients seen in a week seems to increase with the number of hospital affiliations of physicians. Those with five hospitals where patients are admitted have about four more patients on average than those with only one affiliation. This seems to indicate that physician productivity in terms of patients seen in hospitals is affected by the constraints in the number of facilities available.

Are there differences in the number of consultations by type of clinic? The last lines of Table 2.2 show that the number of consultations in a week in outpatient clinics is higher than those in hospital based clinics. Company clinics seem to post the highest number of consultations in a week. Physicians in HMO or insurance clinics approximate the productivity of those in independent clinics.

2.2.2 Trends in productivity components

In order to better describe the trends in the number of patients seen, it would be best to consider the following identity:

$$\text{Patients seen at time } t = \text{Hours spent working in time } t \; * \\ \text{Number of patients seen per hour}$$

Hours spent working reflect the work effort put in by the physician while number of patients seen in an hour reflects the productivity of each hour spent. While the first measure would directly reflect the physician's preferences for income and leisure, the second measure could be hypothesized as being affected by more technical determinants such as the level and quality of other inputs and how these are combined and employed;

i.e., the organization of the practice. The emphasis on physician hour spent in each setting also recognizes the fact that physician time input is the major input in the production of these services.

It should be noted, however, that the components are not entirely independent of one another. Greater hourly productivities in both clinics and hospitals determine to a large extent returns to physician time. These are factors which affect time allocation between leisure and work and between outpatient and inpatient settings.

Columns 3 and 5 of Tables 2.1 and 2.3 describe the levels of these two components of productivity. Hours spent in a week in all clinics seem to decrease as the level of development of the region increases. Physicians in Regions 2 spend about 50 hours a week in clinics while physicians in Regions 7 and 10 spend about 34 hours a week in clinics. Physicians in the NCR spend on average about 26 hours in all clinics in a week.

Despite lesser hours spent in a week in clinics, physicians in the NCR have greater hourly productivities than their counterparts. The hourly productivities indicated for the NCR may be still be understated if the total number of patients seen are understated. The opposite trends from number of hours worked is observed relative to the development of the region. As the level of development increases, hourly productivities also increase. Although physicians in Metro Manila spend less hours in clinics, they seem to conduct their clinic hours at a less leisurely pace than their counterparts in the other regions.

As far as the number of hours spent in a week in the clinic where the interview was conducted, the same decline in hours worked as the level of development of the region increases is apparent. However, the figures are not strictly comparable since physicians in the NCR hold multiple clinics, therefore hours worked may be divided among all the clinics maintained.

On the other hand, the hourly productivity trends seen in the number of patients show that the number of consultations per hour is higher in Region 7 and NCR than in Regions 2 and 10.

Looking at the various physician specializations in the sample, general practitioners spend the highest average time working in all their clinics while internists spend the least amount of time. While it was expected that surgeons would be spending less time at their clinics, results from the survey indicate that they spend on average about the same number of hours as pediatricians.

The similarity in hourly productivity in the sense of total patients per hour between obstetricians and surgeons may be reflective of the time intensities of the consults or services that they deliver. Internists appear to have the highest hourly productivity, followed by pediatricians and general practitioners.

Although internists spend less hours in clinics, higher hourly productivities compensate for the lesser amount of time spent. Higher number of patients seen by pediatricians is a result of longer hours spent in clinics and higher hourly productivities.

Physicians who have practiced for less than 25 years seem to be spending between 28 to 31 hours in clinics in a week. However, those with 26 to 35 years of experience seem to be spending more hours in clinics, i.e., from 35 to 38 hours. The number of hours spent in clinics declines to about 30 hours a week for those with 36 to 40 years of experience.

Hourly productivities peak at 16 to 20 years experience, with about 3.5 patients per hour. Those with less than five years experience seem to have higher hourly productivities than those between 6 to 15 years.

This trend seems to indicate that the pattern in the source of physician productivity shifts after peak productivity is reached. Before 16 years of experience, hourly productivity seems to be the major source of productivity increases while after 20 years, increases in hours worked seem to account for more patient encounters. Between 16 to 20 years, hourly productivity seems to be driving the total number of patients seen.

Gender differences in both hours worked and hourly productivities do not seem to be significant.

Total hours worked by physicians maintaining multiple clinics do not significantly differ from those maintaining single clinics. Hourly productivities likewise do not vary much across number of clinics.

Variations in the components of productivity in different clinics are shown in the last lines of Table 2.2. Physicians practicing in hospital-based clinics spend about 18 hours a week in their clinics while those practicing in independent outpatient clinics spend about 30 hours a week. Those working in company clinics spend about the same time as those in hospital-based clinics.

Although hourly productivity in hospital-based clinics is higher than those in independent clinics, this does not seem to be substantially different. It seems, therefore, that the higher number of consultations in independent clinics is due to longer hours spent by physicians there. Highest hourly productivity is registered for company clinics and this seems to be the main factor in reaching total consultations.

Turning to productivities at the hospital setting, physicians in Region 7 appear to spend on average the most number of hours in hospitals while those in Region 2 spend the least number. For the hours spent in hospitals, physicians in the NCR get to see more patients relative to their counterparts in the regions.

As expected, surgeons spend the highest average number of hours for patient care in hospitals. Surprisingly, general practitioners in the sample spend longer hours in hospitals than internists and ob-gynes. Pediatricians in the sample spend the least amount of time in hospitals. Despite shorter hours, however, pediatricians seem to have the highest hourly productivities in hospitals which account for their having the second highest average number of patients seen. Surgeons, owing to time intensity of the services that they perform, have the lowest rate of patients seen per hour.

Looking at years of practice, a drop in patient care hours spent in hospitals is apparent for those with 26 to 35 years of experience. Highest average number of patient care hours in hospitals is registered by those with 21 to 35 years of practice and those with lower than five years of practice. Those with 21 to 35 years of practice have the highest average hourly productivities.

There is an interesting observation regarding the trends in the number of hours spent in clinics and hospitals by years of practice of the physician. Table 2.4 presents the total number of hours worked in clinics and hospitals and the proportion of time spent in each setting. Those with up to 25 years of experience spent time in hospitals from a range of about 26 to 28 percent. However, after 25 years of practice, the proportion declines to about 25 and then to 20 percent. While total hours worked do not decline, there is a shifting of time spent from hospitals toward clinics. Another interesting observation is the decline in hourly productivity in both clinics and hospitals for physicians with more than 25 years of experience.

Male physicians spend more time in hospitals than female physicians although they have lesser hourly productivities. However, the higher hourly productivities of female physicians are not enough to offset the lesser amount of time spent in hospitals, hence the lower total number of patients seen.

The behavior of time spent in hospitals by the number of hospital affiliations seem to follow an inverted U-shape. Average hours spent in hospitals are highest for those with two hospital affiliations but decline afterwards. However, hourly productivities seem to follow a U-shape. These trends therefore seem to offset each other at the level of three or more hospitals so that patients seen do not differ by as much.

2.2.3 Some hypotheses on factors affecting productivity components

The preceding tables have noted that hourly productivities contribute a significant amount to the number of patients seen in clinics and hospitals. Hourly productivities can be related to the level and quality of inputs used in the setting as well as ways in which they are combined. In the case of hospitals, hourly productivities may be related to the level of hospital inputs per physicians like the number of nurses, residents and support staff. In the clinic setting, these factors could include the utilization of assistants and the tasks delegated to them. They could also be related to the intensity of the use of other clinic resources.

Some indications on the utilization of assistants can be seen in Table 2.5. About 25.2 percent of the sampled physicians indicated that they do not utilize assistants in their clinics. Reasons cited by physicians for non-utilization of assistants include manageability of workloads and high wages of assistants which physicians could not afford.

The way assistants are utilized also affects the hourly productivity of the physician in the clinic. Greater task delegation could mean finer division of labor among the productive inputs in the clinic, which may imply greater number of patients per hour spent in clinics. The extent of task delegation is gleaned from Table 2.6. As it can be noted, tasks delegated to assistants include clerical and office tasks, physical examination tasks,

Table 2.4

Consultation Fees, Costs and Patient Care Hours*

	Average Usual Fee / Non-Physician Costs /1	Average Total Hours Spent in Clinics and Hospitals /2	Average Total Hours Spent in Clinics	Hours Spent in Hospitals / Total Patient Care Hours
	(1)	(2)	(3)	(4)
REGION				
II Cagayan Valley	0.90	51.90	49.40	15.22
VII Central Visayas	1.26	43.20	33.80	30.56
X Northern Mindanao	1.21	43.70	34.30	25.55
National Capital Region	1.38	34.80	26.40	27.18
SPECIALTY				
General Practice	0.95	43.50	38.20	21.67
Internal Medicine	1.85	35.40	26.00	27.04
Obstetrics-Gynecology	1.59	36.70	27.50	26.85
Pediatrics	1.32	37.20	30.40	26.18
Surgery	0.93	43.30	30.00	34.57
YEARS OF PRACTICE				
5 years and below	0.96	34.40	27.90	28.77
6 to 10 years	1.52	40.00	31.10	26.24
11 to 15 years	1.45	37.50	28.90	27.27
16 to 20 years	1.40	40.80	31.10	28.52
21 to 25 years	0.88	38.40	28.90	27.56
26 to 30 years	1.13	40.90	35.30	25.21
31 to 35 years	1.77	43.20	37.90	19.75
36 to 40 years	0.97	36.90	29.00	36.58

* PRELIMINARY UNWEIGHTED AVERAGES

/1 Non-Physician costs include expenditures for rent, supplies, drugs, repairs, compensation of assistants, licenses, insurance, utilities and other overhead expenses.

/2 Obtained by summing the number of hours spent in all clinics plus the number hours spent in affiliated hospitals

Source of data: DOH -PIDS Outpatient Clinic Survey

Table 2.5

Proportion of Physicians who Employ Assistants

Proportion of sample physicians who employ assistants: 74.67%

Reasons for not utilizing assistants	No. of Cases	Proportion (%)
1. Work load is manageable	64	68.09
2. High costs of getting an assistant	22	23.40
3. Prefers direct supervision of patients	4	4.26
4. Combinations of (1), (2),and (3)	3	3.19
5. No regular clinic days	1	1.06
	94	100.00

Source: DOH-PIDS Outpatient Clinic Survey

Table 2.6

Proportion of Physicians who Delegate Tasks to Assistants

TASKS	% of sample
A. CLERICAL AND OFFICE TASKS	
Do billing	45.30
Fill out insurance forms	17.90
Schedules appts. for x-ray & other lab work	26.20
Schedules admissions to hospitals	25.90
Schedules appointments for consultation	51.30
Type progress note on chart	10.90
B. PHYSICAL EXAMINATION TASKS	
Obtain weight and height	48.40
Take BP on initial visit	26.20
Take temperature	38.90
Administer screening tests for hearing	2.10
Administer screening tests for vision	2.80
Perform tonometry	1.00
Perform proctoscopic exam	1.00
Perform pelvic examination	3.90
Collection of specimen	13.70
C. HISTORY AND PATIENT CONTACT TASKS	
Take and record routine elements of history	19.40
Take and record history of present illness	13.50
D. LABORATORY AND RELATED TASKS	
Obtain and mount ECG tracings	10.40
Obtain venus blood samples	6.00
Procure urine sample for lab	11.40
Perform urinalysis	7.30
Determine hemoglobin	7.00
Determine hematocrit	5.20
Perform blood cell counts/smears	6.00
Perform pulmonary function studies	1.30
Perform skin tests	7.50
E. THERAPY	
Administer immunization	7.50
Administer medications intramuscularly	9.30
Administer medications intravenously	3.40
Perform ear irrigations	3.10
Remove sutures	9.10
Give diet instructions	9.30

Source of data: DOH-PIDS Outpatient Clinic Survey

history and patient contact tasks, laboratory and related tasks and therapy. Greater proportions of physicians delegate clerical and office tasks relative to therapeutic tasks. Tasks such as obtaining height and weight, taking blood pressure and temperature are the common physical examination tasks delegated. Scheduling appointments and billing are the common clerical and office tasks delegated. Less than ten percent of sample physicians entrust the performance of laboratory tests and therapy to assistants.

Table 2.7 reprises average consultations per hour and average non-physician costs per consultation. Average non-physician costs per consultation may be used as indicators of the intensity of the use of other resources in the production of outpatient consults. It can be noted that higher hourly productivities are coincidental with higher non-physician costs. The intensity of the use of other resources could therefore be potential sources of hourly productivity increases.

2.2.4 Some intermediate observations

Defined as number of patients seen in a specific time period, it was shown that there are productivity differences across the regions of the country, across characteristics of physicians and across number of hospitals and clinics. Added productivity differences could be observed across different types of outpatient clinics.

These productivity differences were shown to be due to differences in both hours worked and hourly productivities. Total number of patients seen could therefore be attributed to movements in either or both components.

The inverse of number of consultations per hour is the amount of time spent per patient in a consultation. In this respect, investigating the factors which could account for lesser time spent for consultation should give an idea on one aspect of productivity increases. This would be the subject of further empirical investigation in the succeeding parts of the paper.

2.3 PHYSICIAN FEES AND RELATION WITH COSTS, PRODUCTIVITY AND PHYSICIAN TIME ALLOCATION

2.3.1 Physician fee variations: some reasons

Appendix A outlines some trends and observations regarding physician fees in the Philippines. These observations include the following:

a) that there are wide variations in fees charged for both outpatient and inpatient visits and procedures,

b) there are variations in fees across regions, with Metro Manila showing the highest level of fees,

c) there are also differences in fees charged for the same procedure performed by a different provider,

Table 2.7

Average Consultation per Hour and Average Non-physician Cost per Consultation

	Consultation per hour	Non-physician cost per consultation
REGION		
2 Cagayan Valley	1.50	48.41
7 Central Visayas	2.21	66,90
10 Northern Mindanao	1.89	51.35
National Capital Region	2.74	80.49
For entire sample	2.41	70,52
SPECIALTY		
General Medicine	2.16	45.29
Internal Medicine	2.99	90.65
Obstetrics-Gynecology	1.79	52.26
Pediatrics	2.88	60.34
Surgery	2.12	129.75
YEARS OF PRACTICE		
5 years and below	2.02	60.84
6 to 10 years	2.31	69.35
11 to 15 years	2.65	60.12
16 to 20 years	2.85	95,04
21 to 25 years	2.56	86.80
26 to 30 years	1.32	52.60
31 to 35 years	1.60	54,96
36 to 40 years	2.68	86.83
SEX		
Male	2.44	90.58
Female	2.39	56.26

Source: DOH-PIDS Outpatient Clinic Survey

d) specialists charge higher fees than general practitioners and among specialists, primary care specialists such as pediatricians and obstetricians charge lower fees than non-primary care physicians,

e) the level of fees vary by the category and ownership of the hospital affiliation of the physician, and

f) there are variations in inpatient professional fees across room accommodation.

Aside from variations in the levels of fees charged, there are also differences in modalities applicable in the determination of inpatient fees (both visits and procedures). While some practitioners do not charge separate visit fees from the professional fees of a procedure, others do. Some practitioners apply the same rate for visits and procedures regardless of the room accommodation of the patient but as earlier seen, the more common mode is to charge according to the room. In fact, some practitioners determine their charges as equal to or as a percentage of the room rate.

How then can these variations be explained? The more obvious explanations would refer to differences in the severity levels and difficulty of the cases that are encountered by physicians. Fees in these cases would somehow reflect the higher costs due to more intensive use of physician skills, know-how and time. About 40.7 percent of respondents in the DOH-PIDS survey noted that they base fees depending on the illness of the patient (Table 2.8).

The costs of practice, including implicitly the physician wage are also possible explanations for the variations in prices. About 18.4 percent of respondents to the DOH-PIDS survey noted that the cost of living and operational expenses are some of their bases for setting fees.

Some attribute these price differences to the quality of physician services provided. However, there are disagreements on the measures or indicators of quality to be used. These give way to a variety of variables which are used to indicate quality such as physician characteristics including years of practice, specialization, board certification; the physical characteristics of the facility, equipment and clinic amenities; and or the performance of accepted or standard procedures and others. The relationships of these variables and the health outcomes of patients have not clearly been established.

In addition, the Wyatt survey results indicate that one of the major bases for setting physician fees is the patient's ability to pay. Hence room accommodation of patients, which is used as and indicator of ability to pay, is used as a basis for differential charging by physicians. The oft given rationale for this practice is the charity motive, that is subsidizing poorer patients at the expense of richer patients. From the Outpatient Clinic Survey of the PIDS-DOH Project, about 74.45 percent of respondents cited that they base fees on the economic status of the patient and 20.88 percent base fees on the room accommodation.

On the other hand, these differences in prices could be taken as evidence of the

Table 2.8

Physician Bases for Setting Fees

Bases for price setting	Percent of Respondents
Economic status of patients	74.45
Depends upon illness	40.66
Fee structure of other doctors	39.01
Predetermined fee structure	29.12
Relationship with patient	20.88
Room accommodation	20.88
Self-structured fee	20.05
Cost of living / Operational expenses	18.41
If patient has health insurance	17.86

Source of data: DOH-PIDS Outpatient Clinic Survey

price-setting power of physicians and hence could be related to the structure of the physician services market. The effects of the market structure on prices is relevant in analyzing the effects of the number of physicians on physician prices. Does the increase in the number of physicians increase or decrease competitive pressures? What are the effects of movements in competitive pressures on the levels of physician fees? An indicator of the cognizance of competitive pressures in the market for physician services is the response of physicians that they base fees on the fee structure of other doctors (39.01 percent of respondents) or a `predetermined fee structure' (29.12 percent of respondents).

3.2 Outline of the relationships

As an illustration of an analysis based on some of the concepts of the previous iscussion, some results of the Outpatient Clinic Survey of the DOH-PIDS project are to be resented. These results are not used definitively, rather they could point to certain trends hich could be validated in more detail. This part of the paper also seeks to set the stage or the integration of further empirical analysis of outpatient productivity, costs and prices.

The first three columns of Table 2.9 enumerate the unweighted mean minimum, maximum and usual fees charged for outpatient consultations by region, specialty of hysician, years of practice and type of clinic. Independent clinics are those located in the ommunities, either attached to residences of physicians or in buildings located in ommercial areas. Hospital based clinics are those located in medical arts buildings or in linic spaces in hospitals being rented out to private physicians.

The trends in the physician fees in the survey essentially follow those from the econdary data presented in the Appendix. Lowest consultation fees prevail in Region 2 while highest fees prevail in Metro Manila. Average minimum and average fees for Region 10 are higher than those in Region 7 while the reverse is true for high fees. Consultation fees of general practitioners are lower than specialist fees.

Physicians who have been practicing for no more than five years charge lower than heir more experienced counterparts. Fees of physicians practicing for 6 to 20 years are ather flat, followed by decreases in the next ten years, increases again by the 31st year and decrease after the 35th year. The sampled physicians therefore do not show a continuous ncrease in consultation fees as years of practice increase.

Consultation fees of physicians practicing in hospital-based clinics are higher than those in independent clinics.

How much of these variations are caused by cost differences? The fourth column of Table 2.9 presents non-physician costs per consultation in clinics. Costs have been computed as the sum of expenditures for rent, supplies, drugs, repairs, compensation of assistants, licenses, insurance, utilities and other overhead expenses. These costs have been divided by the weekly rate of consultations. Note that to the extent that there are other services that the clinic provides, the costs per consultation may be overstated. Supplies and drugs used for these other services are allocated to consultations. To the extent that some of the inputs used are unpaid, then costs could be understated. Examples of these cases are

Table 2.9

Consultations: Fees, Costs and Rate

	Average Mininum Fee (Pesos) (1)	Average Usual Fee (Pesos) (2)	Average Maximum Fee (Pesos) (3)	Average Non-Physician Costs per Consultation /1 (Pesos) (4)	Average Minimum Fee Cost per Consultation (5)=(1)/(4)	Average Usual Fee / Cost per Consultation (6)=(2)/(4)	Average Maximum Fee / Cost per Consultation (7)=(3)/(4)	Mean Proportion of low Income patients (8)	Mean Proportion of middle income patients (9)	Mean Proportion of high Income patients (10)	Weighted Average Fee / Cost per Consultation (11)=[(5)*(8)]+[(6)*(9)]+[(7)*(10)]	Average Consultations per Hour /2 (12)
REGION												
II Cagayan Valley	28.10	43.80	67.00	48.41	0.58	0.90	1.38	0.57	0.31	0.14	0.79	1.50
VII Central Visayas	44.70	59.90	94.20	47.56	0.94	1.26	1.98	0.51	0.38	0.12	1.18	2.21
X Northern Mindanao	47.90	63.10	78.70	52.32	0.92	1.21	1.50	0.46	0.40	0.13	1.09	1.89
National Capital Region	74.40	101.60	125.20	73.40	1.01	1.38	1.71	0.38	0.50	0.13	1.29	2.74
SPECIALTY												
General Practice	34.20	45.10	66.00	47.45	0.72	0.95	1.39	0.61	0.27	0.11	0.85	2.16
Internal Medicine	75.00	98.30	122.50	53.21	1.41	1.85	2.30	0.36	0.49	0.14	1.73	2.99
Obstetrics-Gynecology	67.60	92.40	119.40	58.06	1.16	1.59	2.06	0.35	0.55	0.13	1.54	1.79
Pediatrics	60.40	84.30	107.10	64.05	0.94	1.32	1.67	0.41	0.47	0.12	1.20	2.88
Surgery	66.80	91.30	125.70	98.31	0.68	0.93	1.28	0.42	0.44	0.14	0.87	2.12
YEARS OF PRACTICE												
5 years and below	50.90	62.10	87.00	64.90	0.78	0.96	1.34	0.50	0.39	0.09	0.88	2.02
6 to 10 years	65.60	89.40	112.00	58.91	1.11	1.52	1.90	0.38	0.50	0.14	1.44	2.31
11 to 15 years	63.90	83.50	110.80	57.73	1.11	1.45	1.92	0.39	0.48	0.13	1.38	2.85
16 to 20 years	53.50	83.30	100.90	59.34	0.90	1.40	1.70	0.45	0.42	0.12	1.20	2.85
21 to 25 years	63.20	76.50	95.00	87.33	0.72	0.88	1.09	0.37	0.48	0.15	0.85	2.56
26 to 30 years	41.30	62.50	79.00	55.23	0.75	1.13	1.43	0.56	0.30	0.13	0.95	1.32
31 to 35 years	79.20	97.20	143.30	54.96	1.44	1.77	2.61	0.50	0.38	0.12	1.71	1.60
36 to 40 years	65.80	86.20	120.00	88.83	0.74	0.97	1.35	0.54	0.29	0.13	0.86	2.70
TYPE OF CLINIC												
Hospital Based Clinic	75.80	103.20	136.80	69.45	1.09	1.49	1.97	0.35	0.52	0.13	1.42	2.60
Independent Clinic	46.30	62.10	78.70	54.17	0.85	1.15	1.45	0.51	0.37	0.12	1.03	2.20

* PRELIMINARY UNWEIGHTED AVERAGES

/1 Non-Physician costs include expenditures for rent, supplies, drugs, repairs, compensation of assistants, licenses, insurance, utilities and other overhead expenses.

/2 Obtained by dividing the number of consultations in a week by the number of hours spent in a week in the clinic.

Source of data: DOH-PIDS Outpatient Clinic Survey

clinics which are attached to physician residences and unpaid family members who are acting as assistants.

Comparing these costs with prices gives us an idea on how prices move with non-physician costs. As it can be seen, costs per consultation are highest in the NCR. Costs in Regions 2, 7 and 10 do not differ by large amounts from each other. Average costs per consultation per specialty show that costs of general practitioners are lowest, followed by internists then by OB-Gynes. Pediatricians may have higher costs per consult on account of drugs used for immunization. Surgeons in the sample had the highest costs per consult due to higher costs of utilities, compensation for assistants, supplies and drugs.

Again, physicians with lower than five years practice have higher costs per consultation than those with more. Costs per consult are relatively flat from 6-20 years of practice, and from 26-35 years of practice. The data show a relatively large increase in costs for those who have had 21-25 years of practice. The reasons for this increase remain to be investigated in more detail. Those who have been practicing from 36 to 40 years have higher costs. The increase in costs for latter may reflect lower patient loads while clinic costs are still high.

Costs per consult in hospital based-clinics are also higher than those for independent clinics. An investigation of the cost components show that on average, expenditures for hospital-based clinics are not the highest. However, it may be reasonable to suppose that physicians in these clinics spend for all of these items unlike in independent clinics when one or more cost items are not spent for, most particularly rent.

It appears from the data that costs may matter in setting physician fees. Whatever efficiencies to be garnered in decreasing costs could therefore translate to lower physician fees.

The differences between non-physician costs and consultation fees could be used as very rough indicators of the returns to physicians in the provision of outpatient services. Note that these returns include the compensation for physician time as an input as well as entrepreneurial inputs of the physician.

Columns 5-7 of Table 2.9 present the ratio of minimum, usual and maximum consultation fees with cost per consultation. A ratio greater than one indicates that fees are higher than costs; the greater the ratio, the higher is the return that physicians earn.

Average minimum fees are lower than non-physician costs per consultation in Regions 2, 7, and 10, while they are just about equivalent in NCR. As the relative development of the region increases, the ratio of minimum fees to costs approaches one. These indicate that physicians waive the returns to their effort in charging their minimum fees, since they are just about recovering the non-physician costs per consult.

On the other hand, usual fees are higher than costs per consults except in Region 2. However this proportion is very near one. Maximum fees are everywhere higher than costs per consultation. It is apparent that in both usual fees and high fees, the excess of fees over costs increases with the relative income of the region. Margins are highest in the NCR and lowest in Region 2.

Looking at specialties, the ratios are everywhere greater than one for maximum fees, with GPs having lowest ratios as against internists having about a value of 2.3. For low fees, internists and OB-Gynes still have ratios greater than one. Of note are the low ratios registered by surgeons. It could be argued that some of the consultations provided by surgeons may in fact be follow-up consultations of inpatient procedures. The fees for these consults has been included in the fees for those procedures already.

As it had been stated earlier, newer physicians have lower margins relative to older physicians. Lower margins are also apparent with those who have practiced for 36 to 40 years. Higher margins are apparent with physicians in hospital-based clinics than those in independent clinics.

Given the structure of prices, it can be noted that physicians earn different returns to their time in charging their minimum, maximum and usual prices. These differences vary by region, specialty of the physicians, years of practice and type of clinic. Since there are differences in the returns to physician time in charging these fees, one could ask whether the quantity or the quality of the services provided to those charged with these prices varies accordingly.

Looking at the ratio of consultation fees and non-physician costs can also provide insights into the provision of charity care or price discriminating behavior of physicians. If charging their minimum fees constitutes the provision of charity care, this could well indicate that physicians could reduce fees up to the level of non-physician costs or even lower. Higher margins charged for maximum fees could therefore be means to recover the waiver of physician returns in the charging of minimum fees. Calculation of a simple average of margins from charging low and high fees results in a value which is very near the margin from charging usual fees.

The extent to which physicians could practice price discrimination depends on the distribution of his patients according to income. Columns 8-10 of Table 2.9 presents the mean proportion of patients belonging to the three income groups. Note that these proportions are the physician's perceptions of the distribution of his patients across the income groups. It can be supposed that these proportions are based on relative incomes rather than absolute incomes since no definite income ranges were given as standards by which physicians would classify patients. It can also be supposed that these proportions have already been affected by the physician's pricing decisions, i.e., that this is the distribution of his patients according to income given the structure of minimum, maximum and average fees that the physician charges.

As expected, the average proportion of low income patients is lowest in Region 2 and highest in the NCR. As the relative development of the region increases, the proportion of those in the middle income ranges broadens. Note that the mean proportion of high income patients does not seem to vary by significant amounts across the regions.

Obstetricians and internists have the lowest mean proportions of patients belonging to the lowest income groups while general practitioners have the highest. Nearly half of the patients of specialists belongs to the average income groups while the figure is about thirty percent for general practitioners. The proportion of high income patients seems to be stationary across specialties.

Younger physicians seem to have higher proportions of patients belonging to the lower income groups and the least proportion of patients belonging to the highest income groups. Of note is the increase in the proportions of patients belonging to the lower income groups for physicians with longer years of practice, i.e., from 26 years and over. This could be indicative of preferences of older physicians to provide more charity care than their younger counterparts.

About half of the patients of independent clinics are perceived to belong to low income groups, while half of those who patronize hospital-based clinics belong to the average income groups. The same stationary proportion of high income patients is shown.

From the trends in the perceived distribution of patients according to income, it would seem that the shift in the patient compositions occurs between the lower income and the average income groups. Those with high incomes seem to be a stable percentage of patients. A meaningful question to ask is whether these patients are enough to subsidize the poorer ones, or if there are subsidies coming from the middle income patients as well.

Assuming that physicians charge minimum fees to low income patients, usual fees to average income patients and maximum fees to high income patients, a weighted average return could be computed. Column 11 presents the weighted average fee to consultation cost ratio.

The first observation regarding the margin that has been computed is that they are generally still greater than one. Therefore, there are could still be positive returns to physicians in differential pricing for outpatient consultations. Exceptions to these cases are for physicians in Region 2, those who are general practitioners and those who have had less than five years of practice, and those who have had 21-30 years of practice. The latter are surprising since one would expect older physicians to have higher positive returns.

The second observation is that the weighted returns seem to be everywhere lower than the margins obtained from charging just the usual fees of physicians. The difference ranges from .02 to about .20 points. Among the regions, the difference is highest for Regions 2 and 10. Among the specialties, those of pediatricians and internal medicine moved by larger amounts. Physicians in independent clinics had lower returns from differential pricing than those in hospital-based clinics. It would seem from the results that on the average, physicians earn lower returns on a per consultation basis from the practice of charging different fees to different patient groups.

This finding could lead to the assertion that differential pricing by physicians in fact lowers the returns that they get from the practice of medicine. However, the analysis has proceeded with one crucial assumption, i.e., that the services provided to both low income and high income patients are the same. Assuming the structure of returns connected with charging different prices to patients of different income groups, there is the question of how these different returns affect the number of consultations and services prescribed for hese patients. Are physicians prescribing lower amounts of care for lower income patients elative to higher income patients? This question is relevant to ask especially if physicians im to achieve the usual return given by average fees. Some increases in the quantity of ervices provided may therefore be resorted to in order equalize returns, and therefore ower average physician margins may not be realized.

In the economics literature, returns to a factor of production are related to its roductivity, the higher the productivity, the higher the returns. Therefore, higher returns o physicians may be related to their relative productivities.

A very rough partial indicator of physician productivity at the clinic is the number f consultations per hour. As was noted earlier, this measure abstracts from the case-mix of the consultations as well as the severity of illnesses of patients of certain physicians.

The last column of Table 2.9 reprises the number of consultations per hour shown earlier. On a regional basis, it can be seen that NCR physicians seem to be more productive in the sense of consultations per hour while those in Region 2 are least productive. These differences are reflected in the returns to physician work as measured by usual fees over costs per consultation.

Basing on specialties, it can be noted that while pediatricians seem to be nearly as productive as internists, internists are getting higher returns again as measured by usual fees over costs per consultation. It could be asserted that differences in the margins and productivities across specialties may be reflective of higher intensity of work effort. Do consultations performed by internists involve more effort than those of pediatricians? On the other hand, there could be other factors that are influencing pediatrician fees and consequently the returns to pediatricians relative to internists.

Physician productivity seems to increase with the years of practice, up to about 25 years and then decreases thereafter. Again these are roughly consistent with the trend in physician margins. The same is true for type of clinic-- physicians with hospital-based clinics seem to have higher productivities than those with independent clinics. This is roughly consistent with the margins in Table 2.9.

Since physician returns and fees seem to be related to productivity, it could be worthwhile to scan the determinants of physician productivity in order to see the effects on prices.

It was noted earlier that the fees physicians receive for certain services could influence their behavior in the choice of services to provide and their input mixes. The major input in the production of physician services is physician time. Therefore, the time allocation decisions of physicians could have implications on the mix of physician services that are produced.

The first column of Table 2.10 reproduces the ratio of usual consultation fees to costs per consultation. The next column indicates the number of hours spent by physicians in patient care in hospitals and clinics in a week. The third column enumerates the number of hours spent in clinics while the fourth column enumerates the proportion of hours spent

Table 2.10

Consultation Fees, Costs and Patient Care Hours*

	Average Usual Fee / Non-Physician Costs /1 (1)	Average Total Hours Spent in Clinics and Hospitals /2 (2)	Average Total Hours Spent in Clinics (3)	Hours Spent in Hospitals / Total Patient Care Hours (4)
REGION				
II Cagayan Valley	0.90	51.90	49.40	15.22
VII Central Visayas	1.26	43.20	33.80	30.56
X Northern Mindanao	1.21	43.70	34.30	25.55
National Capital Region	1.38	34.80	26.40	27.18
SPECIALTY				
General Practice	0.95	43.50	38.20	21.67
Internal Medicine	1.85	35.40	26.00	27.04
Obstetrics-Gynecology	1.59	36.70	27.50	26.85
Pediatrics	1.32	37.20	30.40	26.18
Surgery	0.93	43.30	30.00	34.57
YEARS OF PRACTICE				
5 years and below	0.96	34.40	27.90	28.77
6 to 10 years	1.52	40.00	31.10	26.24
11 to 15 years	1.45	37.50	28.90	27.27
16 to 20 years	1.40	40.80	31.10	28.52
21 to 25 years	0.88	38.40	28.90	27.56
26 to 30 years	1.13	40.90	35.30	25.21
31 to 35 years	1.77	43.20	37.90	19.75
36 to 40 years	0.97	36.90	29.00	36.58

*PRELIMINARY UNWEIGHTED AVERAGES
/1 Non-Physician costs include expenditures for rent, supplies, drugs, repairs, compensation of assistants, licenses, insurance, utilities and other overhead expenses.
/2 Obtained by summing the number of hours spent in all clinics plus the number hours spent in affiliated hospitals.

Source of data: DOH-PIDS Outpatient Clinic Survey

in hospitals in a week. Note that the time spent in hospitals is specifically stated as the time spent in caring for confined patients. Time spent in a hospital-based clinic caring for outpatients is considered a part of time spent in clinics.

The average proportion of time spent in hospitals is lowest in Region 2, followed by Region 10, NCR and Region 7, respectively. The trend of the number of hours spent in clinics and the proportion of time spent in hospitals is contrary to what could be expected if one just took into account the margins of consultation fees and non-physician costs. It would seem that the higher the margin, the longer the time spent in caring for confined patients relative to outpatients. Trends coming out of the tabulation by specialty indicate that higher margins in clinics may not translate into longer hours spent in clinics.

Aside from considerations of severity of cases that physicians handle, the probable explanation for these trends is that margins that physicians receive for providing inpatient care may be higher than those for outpatient visits. These higher returns may provide the counter-incentive for physicians to spend less time at the clinics. Likewise, the analysis has been limited to time allocation decisions. The results need to be validated by looking at the actual number of services that is prescribed for patients in both an inpatient and outpatient setting.

The preceding discussion has illustrated the interrelationship between physician productivity, costs and prices. A system view of the factors affecting these variables is therefore the subject of the next section.

2.4 PHYSICIAN BEHAVIOR: A MODEL

As a springboard to the formulation of the framework of the study, the first section shall deal on the general process followed by physicians in deciding on the care of patients. The different roles of the physician in this process and the various outcomes of the process are also described.

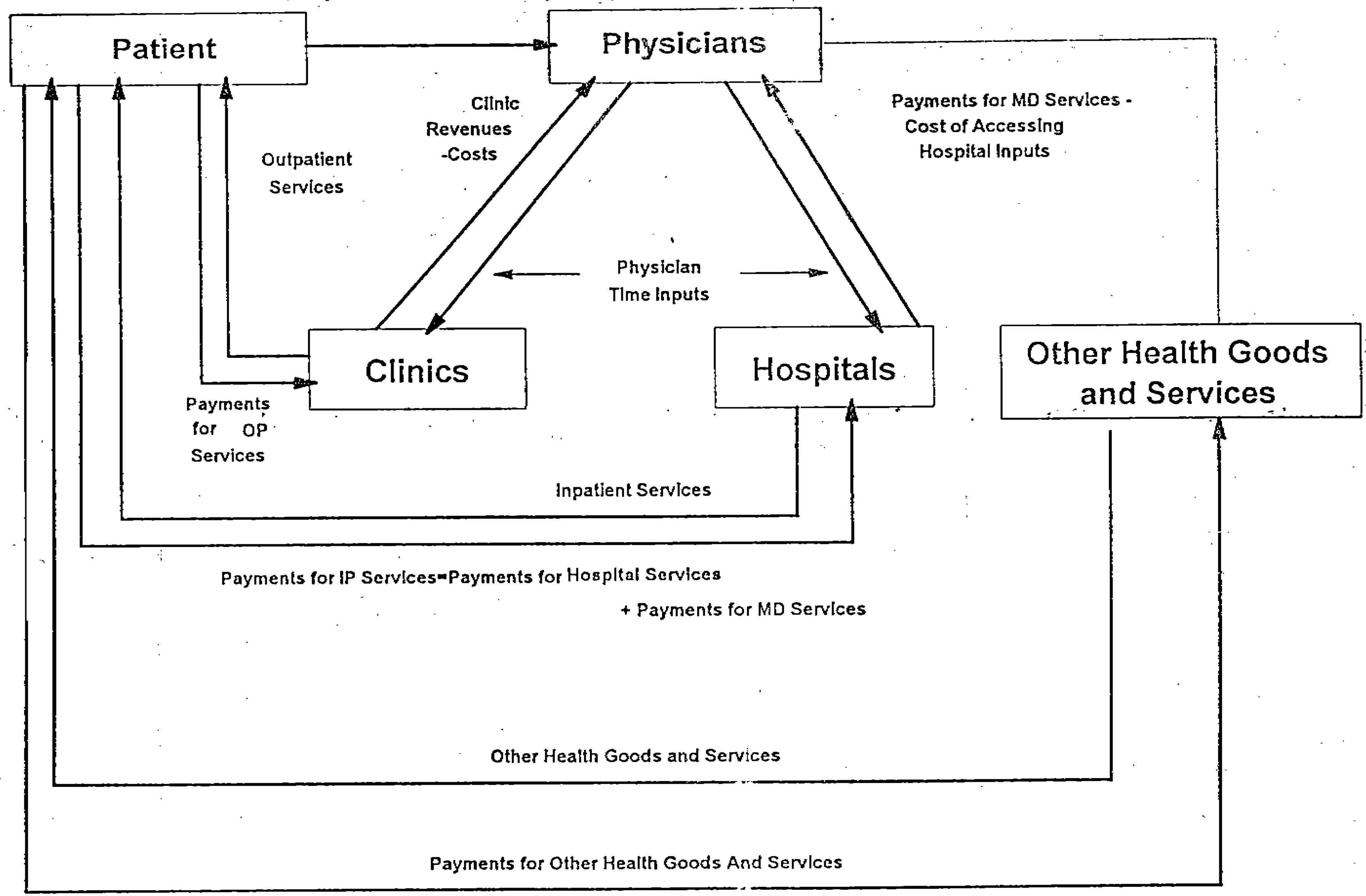
The second section focuses on the formalization of this process in a model of physician behavior which would be adopted in this study.

2.4.1 Physician decisions

The process followed by the physician in the treatment of patients can be represented by Figure 2.1. The process is initiated by the patient approaching the physician for care. Initial contact between the patient and the physician could occur in a physician's private clinic, the outpatient department of a hospital or a hospital emergency room.

In any of these settings, the physician is the one approached regarding decisions on the treatment which is to be given to the patient. This is due to the feature of the health care market where consumers have little or no information on diseases, their causes and the alternative courses of treatment. Physicians are entrusted the task of coordinating the course of caring for patients, including the determination of the amounts of health care services which are consumed by patients. This includes services which he/she produces

Fig. 2.1: A Model of the Physician Services Market



such as consultations or visits, surgical and other special procedures. The physician's degree of influence extends to services which he/she does not produce directly. For instance, the physician essentially determines the types and amounts of drugs and medicines to prescribe to patients, and the types and amounts of diagnostic tests to order. The physician determines the number of days a patient would be confined in a hospital, if a patient is to be confined at all, as well as utilization of the services of other physicians through referrals.

The physician does not only decide on what and how much services are to be utilized by the patient but also where these services would be performed or accessed. For instance, he/she could decide to perform minor surgical procedures in outpatient clinics or in a higher level facility such as a primary hospital. He/she may decide to refer patients to outside laboratories for tests and other diagnostic procedures, or decide to confine patients in a hospital for the same work-out.

This role of the physician as a decision maker is supplemented by his/her role as provider of inputs in the production of the services that are prescribed for the patient. Health care services such as outpatient and inpatient consultations, surgeries and diagnostic and therapeutic procedures among others are produced using physician time as the major input. Due to the level of specialized knowledge and skill necessitated in the performance of these services, there may be limited input substitution possibilities available. The physician's time and effort are necessary inputs in the production of these services.

Physician time, like physician output, can be allocated according to the type of service produced as well as the setting at which the service is produced. Practitioners divide their working time between the clinic and hospital, and between specific clinics and hospitals. In addition to patient care, teaching and research and administrative duties in the hospital or clinic may occupy the physician's time.

At the clinic setting, physicians are not only providers of their own time, they are also entrepreneurs employing and paying for inputs such as assistant hours, medical supplies and drugs, and medical equipment. They are not just managers of the course of care for patients but also of their own clinic firms. In the production of outpatient services at the clinic setting, the physician decides on the amount of clinic inputs to use. Together with the unit prices for these inputs, utilization of these inputs partly determines the cost of production of physician outpatient services.

For the physician services rendered to patients, physicians decide on the prices to charge. Together with the prices set by hospitals and other producers of health goods and services, these prices determine the total outlays of patients for health care. Physician influence on this outlays stems from two possible sources, the amount of services and goods that physicians prescribe, and the level of prices charged for physician services.

However, these payments do not wholly translate into physician incomes. Physician incomes from clinics would depend on how much revenues are garnered less the costs of producing these services. Since the patient bears the cost of the hospital inputs used in producing physician services, the income that physicians receive from hospital based services that he/she provides depends on the charges for the services less any costs that he/she incurs in order to access these inputs. These costs may not be pecuniary at all. They may take the form of time spent serving in hospital committees and other administrative functions.

From this model, several outcomes are apparent. The first outcome is the welfare of the patient. Welfare would encompass both improvements in health status as well as the financial burden that patients would have to bear for the cost of care. The second is the effects physician decisions would have on the total income that they would receive in the course of their practice. This income could come from both outpatient and inpatient physician services.

2.4.2 A Model of physician behavior

Given the description of the process followed by physicians in managing the care of patients, a model of physician behavior is postulated. The physician's objective is first defined, followed by definitions of the arguments which influence the physician objective function.

Physician Objectives. Several alternative ways of representing physician objectives have been proposed in the literature. The earliest tendency was to characterize the physician as a profit-maximizing firm. The physician was therefore characterized as a usual business firm which chose the level of services it offered in order to maximize net revenues.

This characterization of the physician as a profit-maximizing firm was further modified by proposing that physicians made decisions in order to achieve a target level of income. These models were proposed in order to fit the observed trends in the data relating physician prices, incomes and workloads. It was widely observed that increases in physician supply as embodied in physician population ratios were positively related to physician fees. Further, increases in expenditures for physician services were not fully explained by increases in physician workloads.[1] These models proposed that practitioners shifted the level of demand for their services to prevent downward movement in prices and promote higher utilization of their services thereby leading to a preservation of their incomes. The level of target incomes was assumed to depend on the incomes of other physicians and professionals.

The view has been criticized on the grounds that variations in target incomes and trade-off between increased fees and increased visits to achieve the target income cannot be easily explained, and that the evidence did not adjust for increased accessibility of patients (i.e., reduction of time costs for patients) and quality of visits that could underlie increases

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[1] Fuchs (1986) in his study of the supply of surgeons and the demand for operations found a positive effect of supply on price with an elasticity of 0.5 at the means of the variables. Redisch, Gabell and Blaxall (1981) present data from the 1975 Physician Survey in the United States which indicate that fee levels are positively related with physician density.

in expenditures.

In addition, the characterization of the physician as a profit-maximizing firm has been largely modified by considering the office-practice as a simple owner-operated firm. The physician has been considered as a self-employed worker instead of being just an entrepreneur. A simple owner-operated firm might choose to maximize a function of profits and of the owner's or manager's leisure. Translating this to physicians gives rise to the characterization of the physician as maximizing utility derived not only from net income but also from leisure time. This characterization was used by Sloan (1975) in analyzing the physician's hours of work decision.

Integrating the characterization of the physician firm as a simple owner-operated firm plus the concern over other aspects of practice has led to the formulation of "extended utility maximization" models. Practice style as an argument in the extended utility function had been cited in order to take account of physician preferences over the style of medicine that they decide to practice and the lifestyle that they seek outside of practice. Aspects of this objectives include preferences over certain types of patients or clinical problems (see for example Feldstein 1970). Physician preferences for convenience and attributes of practice such as patient load also enter into the inclusion of practice style as an argument in the utility function.

Given these developments, it is proposed that physicians maximize utility and not just profits or income. Arguments which enter the utility function include physician income and leisure. It is further assumed that physician preferences over style of practice and other lifestyle considerations are captured by physician preferences over leisure.

Formally, these translate to:

$$U = U(Y^{MD}, L; MDCHAR) \qquad (2\text{-}1)$$

where U = Physician utility

Y^{MD} = Physician income

L = Physician leisure

MDCHAR = Vector of physician characteristics affecting preferences for income and leisure

Increases in physician income and leisure are expected to increase physician utility at decreasing rates. With U_i as the change in utility due to a change in argument i, $U_i > 0$, $U_{ii} < 0$. Increasing physician income without increases in leisure. The same holds for increases to physician leisure without commensurate increases in physician incomes.

Physician Leisure. The total amount of leisure time that the physician enjoys depends on the number of patients that she sees in both the outpatient and inpatient setting and the amount of time spent per patient. Assuming that:

t^c	=	quantity of physician time per service at the outpatient setting or clinic
t^h	=	quantity of physician time per service at the inpatient setting or hospital
N	=	practice size or patient load of the physician at the clinic
a	=	proportion of patients hospitalized
T	=	total time available to the physician.

Then:

$$L = T - (t^c N + t^h a N). \qquad (2\text{-}2)$$

It is assumed in the following analysis that one service is performed per patient. Increases in the number of patients seen at the clinic decreases the amount of leisure time that the physician can enjoy. On the other hand, these can be offset by decreases in the quantity of physician time per service that is spent for each patient. Out of the total number of patients seen in the clinic, a proportion, a, would be referred to hospitals for confinement and further workout. The greater the proportion of patients hospitalized, the greater are the demands on physician working time.

Physician Income. In general, physician income is the excess of physician revenues over costs. Physician revenues are obtained from the total number of physician outpatient and inpatient services rendered multiplied by the prices charged for these services. Physician costs at the outpatient setting are costs associated with producing outpatient services. Since the patient pays for the charges for hospital inputs used in the production of physician inpatient services, then the costs to the physician would just be the costs of accessing these hospital inputs.

Letting N and a be as defined earlier and

P^c	=	Unit price of physician outpatient service
P^h	=	Unit price of physician inpatient service

Physician revenues is therefore characterized as $P^c N + P^h a N$.

Expenditures of the physician in the production of physician outpatient services consist of the payments to the non-physician inputs used in the production of these services. These inputs used include time spent by physician aides, medical secretaries and non-medical personnel in the clinic, drugs, medicines and other medical supplies, clinic space and utilities. It is assumed that the greater the number of patients, the higher are these costs. It is further assumed that the higher the wages and input prices paid for these non-physician inputs, the higher are these non-physician costs.

Further, non-physician costs are likewise assumed to be affected by a vector of [illegible] characteristics which pertain to certain attributes of the outpatient services performed [illegible] amenities (see for example Held and Pauly, 1983). Such amenities or attributes of the output include location of the facilities, presence of certain clinic amenities like airconditioners and magazines, or the availability of other clinic services. Depending on the attributes or amenities, these are expected to increase or decrease non-physician costs in the clinic.

Let.

C^c = Non-physician costs of producing physician outpatient services.

W^{INP} = Vector of prices for clinic inputs,

CLNCHAR = Vector of clinic characteristics.

The costs of producing physician outpatient services could therefore be characterized as:

$$C^c = C^c\,(N, W^{INP}, CLNCHAR) \qquad (2\text{-}3)$$

As noted earlier, the costs of hospital inputs that physicians use in the production of physician inpatient services are borne by the patient. However, it can be expected that there would still be some costs that physicians bear in order to gain access to hospital facilities. These costs may include monetary outlays such as shares of stock that physicians may need to purchase or non-monetary outlays such as participation in various hospital committees. These costs could also include delays in admitting patients or low priority given to the particular physician's patients. It is expected that the number of patients that physicians hospitalize would affect these costs. These costs could decrease to the extent that physicians become more familiar with the operations, staff and facilities of the hospital as he/she admits more patients. Further, hospital administrators may give higher priority to a specific physician's patients if he/she is a regular "client" of the hospital. On the other hand, participation in various hospital activities may increase as the number of admitted patients increases.

It is also expected that these costs are dependent on the inputs and characteristics of the hospital where physicians admit patients. For instance, a higher level facility may have more stringent accreditation criteria for physicians. On the other hand, a hospital with more beds may be able to accommodate patients more readily than smaller ones. The ownership of the hospital may affect the ability of physicians to apply hospital inputs in ways which enhance his/her productivity (Pauly 1982). Physicians admitting patients in teaching hospitals may also spend some of their time for teaching purposes, thereby increasing the time costs to the physician for admitting patients.

The cost of accessing hospital inputs for the physician therefore takes the form:

$$C^h = C^h\,(HOSCHAR, aN), \qquad (2\text{-}4)$$

where

C^h = Costs to physician in accessing hospital inputs,

HOSCHAR = Vector of hospital characteristics including ownership and hospital inputs.

Depending on the particular characteristic, HOSCHAR could have negative or positive effects on physician costs. The number of patients hospitalized may have positive or negative effects on these costs.

Therefore :

$$Y^{MD} = P^cN + P^h aN - C^c(N, W^{INP}, CLNCHAR)$$
$$- C^h(aN, HOSCHAR) \qquad (2\text{-}5)$$

Physician Patient Load. In the model that is proposed, the physician patient load or practice size, N, is analogous to the demand function for the physician services. The practice size or patient load of the physician is proposed to be affected by the physician's treatment and pricing decisions (McCombs 1984, Farley 1986). The patient load function therefore incorporates elements of the physician's role as the clinical and economic agent of the patient as well as market constraints.

Implicit in the consideration of number of patients is the level of patient benefits that are derived from the physician's treatment and pricing decisions. The higher the level of patient benefits derived from a particular physician, the higher is the number of patients the physician expects to have. This contention assumes that patients can evaluate the services provided by physicians with enough accuracy. Physicians lure and retain patients by giving them good service. The size of the physician's practice is therefore dependent on the patient benefits that are obtained and patient satisfaction with these services.

This representation of number of patients as dependent on the level of patient satisfaction also incorporates the elements of ethical constraints governing physician practices. Incorporating ethical constraints in physician practices has previously been operationalized by including the level of patient benefits as a direct argument in the utility function of the physician. In the formulation proposed, patient benefits still enter into the utility function of the physician insofar as they affect the patient load and ultimately the income of the physician.

Improvements in health status as well as the consumption of other goods and services are elements in the determination of patient benefits.

That improvements in health status determine patient benefits highlights the observation that physician services and other health goods and services are consumed only insofar as they contribute to the improvement of the health status of the patient. Improvements in the health status of a patient are assumed to depend on the quantities of health care services consumed by the patient. Since physician time inputs are major inputs in the management of care and the provision of the service itself, patient health and benefits are assumed to be positively affected by physician time inputs in the clinic and at the hospital. These are also consistent with the observation that patients evaluate the quality of the service rendered by the amount of time spent by the physician with the patient.

intensities in the use of clinic and hospital resources in the provision of outpatient and inpatient services are realized by including clinic and hospital characteristics in determining improvements in health and therefore in patient benefits. Physician decision on the rate of hospitalizations, which signals the use of inpatient services, also inputs in the determination of health improvements and patient benefits. Changes in the health status of patients due to different levels of time inputs of physicians per service at both the clinic and the hospital and the different levels of clinic and hospital inputs are bound by the degree of substitution and complementation of these inputs in the production of health services.

Consumption of other goods and services is represented by patient income after paying for physician and other health goods and services. Increases in the prices charged by physicians for inpatient and outpatient services therefore reduce the net income of the patient. These are expected to reduce patient benefits and therefore the number of patients of the physician. Increasing hospitalization rates also increases expenditures for medical care and therefore reduces net income.

The formulation of the practice size function is also amenable to the inclusion of assumptions on product differentiation in health care. Each physician can be thought of as delivering services which are differentiated with respect to the type or style of the output, the characteristics of the facilities wherein they are produced, and the characteristics of the physicians delivering them in addition to the patient benefits that they result in. These attributes can either characterize the level of quality of the services produced or the level of amenities provided to patients. We can therefore think of a vector of clinic, physician and hospital characteristics and amenities which patients consider in choosing which physician to patronize. One such characteristic is location of the facilities where physicians practice. Another possible characteristic is whether the physician is a specialist or not. As Held and Pauly (1983) define it, the critical notion is that "quality" or "amenity" causes patients to choose one facility over another.

It is also expected that N, like the usual demand function, is affected by the prices charged by other providers of care. The lower the prices charged by other providers, the lesser is the number of patients that the physician can expect to have. Other socioeconomic characteristics of the population like income and health needs which affect demand are also assumed to affect the number of patients of a particular physician.

Our practice size or patient load function then becomes:

$$N = N(t^c, t^h, P^c, P^h, a, \text{CLNCHAR}, \text{HOSCHAR}, \text{MDCHAR}, \text{PATCHAR}, \mathrm{P}^c, \mathrm{P}^h) \qquad (2\text{-}6)$$

where:

MDCHAR = Vector of physician characteristics,
PATCHAR = Vector of patient characteristics including income and health needs,
P^c = Vector of prices charged for outpatient services by other providers
P^h = Vector of prices charged for inpatient services by other providers

Integrating the specification of the patient load function in the formulation of physician income and leisure results in:

$$Y^{MD} = P^cN(t^c, t^h, P^c, P^h, a, \text{CLNCHAR}, \text{HOSCHAR}, \text{MDCHAR}, \text{PATCHAR}, \underline{P}^c, \underline{P}^h)$$
$$+ P^h aN(t^c, t^h, P^c, P^h, a, \text{CLNCHAR}, \text{HOSCHAR}, \text{MDCHAR}, \text{PATCHAR}, \underline{P}^c, \underline{P}^h)$$
$$- C^c(N(t^c, t^h, P^c, P^h, a, \text{CLNCHAR}, \text{HOSCHAR}, \text{MDCHAR}, \text{PATCHAR}, \underline{P}^c, \underline{P}^h), W^{INP}, \text{CLNCHAR})$$
$$- C^h(aN(t^c, t^h, P^c, P^h, a, \text{CLNCHAR}, \text{HOSCHAR}, \text{MDCHAR}, \text{PATCHAR}, \underline{P}^c, \underline{P}^h), \text{HOSCHAR}), \quad (2\text{-}7)$$

$$L = T - (t^cN(t^c, t^h, P^c, P^h, a, \text{CLNCHAR}, \text{HOSCHAR}, \text{MDCHAR}, \text{PATCHAR}, \underline{P}^c, \underline{P}^h)$$
$$+ t^h aN(t^c, t^h, P^c, P^h, a, \text{CLNCHAR}, \text{HOSCHAR}, \text{MDCHAR}, \text{PATCHAR}, \underline{P}^c, \underline{P}^h)). \quad (2\text{-}8)$$

These definitions of income and leisure are therefore substituted in the physician utility function (2-1). Physicians therefore choose the levels of time inputs, t^c and t^h, prices, P^c and P^h, and hospitalization rate a, in order to maximize utility. It can be argued that hospital characteristics and clinic characteristics are also offshoots of physician decisions on hospital accreditation and investments in clinic space and equipment. For the following analysis, however, these variables are considered as predetermined on the assumption that these decisions have been made at a prior time. Recognizing that they are affected by the same variables considered by the physician in determining prices and time per service introduces some biases in the empirical analysis.

The first order conditions for maximization then become:

$$\partial U/\partial t^c = \partial U/\partial Y^{MD}\,(P^c.\partial N/\partial t^c + aP^h.\partial N/\partial t^c$$
$$-\partial C^c/\partial N.\partial N/\partial t^c - \partial C^h/\partial aN\,(a.\partial N/\partial t^c))$$
$$- \partial U/\partial L\,(N + t^c.\partial N/\partial t^c + at^h.\partial N/\partial t^c) = 0 \quad (2\text{-}9)$$

$$\partial U/\partial t^h = \partial U/\partial Y^{MD}\,(P^c.\partial N/\partial t^h + aP^h.\partial N/\partial t^h$$
$$-\partial C^c/\partial N.\partial N/\partial t^h - \partial C^h/\partial aN\,(a.\partial N/\partial t^h))$$
$$\partial U/\partial L\,(t^c.\partial N/\partial t^c + aN + at^h.\partial N/\partial t^c) = 0 \quad (2\text{-}10)$$

$$\partial U/\partial P^c = \partial U/\partial Y^{MD}\,(N + P^c.\partial N/\partial P^c + aP^h.\partial N/\partial P^c$$
$$-\partial C^c/\partial N.\partial N/\partial P^c - \partial C^h/\partial aN\,(a.\partial N/\partial P^c))$$
$$- \partial U/\partial L\,(t^c.\partial N/\partial P^c + at^h.\partial N/\partial P^c) = 0 \quad (2\text{-}11)$$

$$\partial U/\partial P^h = \partial U/\partial Y^{MD} \, (P^c.\partial N/\partial P^h + aN + aP^h.\partial N/\partial P^h$$
$$-\partial C^c/\partial N.\partial N/\partial P^h - \partial C^h/\partial aN \, (a.\partial N/\partial P^h))$$
$$\partial U/\partial L \, (t^c.\partial N/\partial P^h + at^h.\partial N/\partial P^h) = 0 \qquad (2\text{-}12)$$

$$\partial U/\partial a = \partial U/\partial Y^{MD} \, (P^c.\partial N/\partial a + P^h N + aP^h.\partial N/\partial a$$
$$-\partial C^c/\partial N.\partial N/\partial a - \partial C^h/\partial aN \, (N + a.\partial N/\partial a))$$
$$- \partial U/\partial L \, (t^c.\partial N/\partial a + at^h.\partial N/\partial a + t^h N) = 0 \qquad (2\text{-}13)$$

The first order conditions (2-9)-(2-13) state that levels of physician time per outpatient and inpatient service, prices of outpatient and inpatient service and the rate of hospitalization would be chosen so that the additional increases in utility due to income that these variables generate are just equal to the decreases in utility due to decreases in leisure generated by the same. The amount of offsetting of income and leisure depends partly on the relative valuations that individual physicians place on increases in income relative to increases in leisure and on the degree or extent of movements in physician income and leisure.

For example, the first bracketed term in condition (2-11) details the net increase in income due to an increase in outpatient service price. The first term inside represents the direct effect on revenues from outpatient services due to an increase in prices. This is just equivalent to the number of patients served. However, to the extent that the patient load decreases due to a decrease in patient income and benefits due to an increase in prices, then the direct revenue effect is diluted. These diminution occurs for revenue from both outpatient services and inpatient services, i.e., the second and third terms. Diminution in the latter occurs since the physician has a lesser number of patients who can be referred for further workout in the hospital. However, the net income effect is also determined by the effects of the price changes on the costs to the physician at both the clinic and the hospital. These are represented by the last two terms inside the first bracket.

The second bracketed term represents the change in leisure due to the price changes. Since the number of patients is expected to decrease due to the price change, commensurate increases in leisure would result. The physician may therefore not mind that revenue increases are not large as long as his leisure time is increased.

To the extent that increases in costs due to higher patient loads do not completely offset the increases in revenues due to greater amount of physician time per outpatient service, then increases in income would result from greater amounts of physician time per service. However, these would result in less leisure time for the physician as his patient load at both clinics and hospitals and the time required to care for these patients increase.

These relationships support the observation that physicians may not act as pure or perfect agents of the patients. Since the physician has other objectives such as the maximization of his income or leisure, or the attainment of a particular style of practice, then considerations regarding patient welfare will be balanced off or traded off with their effects on these physician objectives.

Assuming that an optimum exists, solving conditions (2-9)-(2-13) would yield the prices, time per service and hospitalization rates that would optimize the physician's utility.

The solution values depend on the signs and magnitudes of several important relationships which include: $\partial U/\partial Y^{MD}$, $\partial U/\partial L$, $\partial N/\partial t^c$, $\partial C^c/\partial N$, $\partial C^h/\partial a N$, $\partial N/\partial t^h$, $\partial N/\partial P^c$, $\partial N/\partial P^h$, and $\partial N/\partial a$. Optimal values of the endogenous variables can be expressed as functions of the exogenous variables. The effects of the exogenous variables in the model can therefore be considered as representing the net effects taking into consideration the underlying relationships.

Optimal values of the physician choice variables can therefore be expressed as:

$t^{c*} = t^{c*}$ (CLNCHAR, HOSCHAR, MDCHAR, PATCHAR, W^{INP}, P^c, P^h),
$t^{h*} = t^{h*}$ (CLNCHAR, HOSCHAR, MDCHAR, PATCHAR, W^{INP}, P^c, P^h),

$P^{c*} = P^{c*}$ (CLNCHAR, HOSCHAR, MDCHAR, PATCHAR, W^{INP}, P^c, P^h),

$P^{h*} = P^{h*}$ (CLNCHAR, HOSCHAR, MDCHAR, PATCHAR, W^{INP}, P^c, P^h),

$a^* = a^*$ (CLNCHAR, HOSCHAR, MDCHAR, PATCHAR, W^{INP}, P^c, P^h).

Substituting these optimal values in (2-6) also solves for N^*. Repeated substitutions of the values of the choice variable and N^* in (2-2) solve for L^*, in (2-3), (2-4) and (2-5) solve for C^{c*}, C^{h*}, Y^{MD*}, and finally into (2-1) for U^* as functions of the exogenous variables.

Since the focus of the paper is on productivity and prices at the clinic, estimates of the optimal values of t^c and P^c would be generated.

Although estimates of the system of equation as functions of exogenous variables are helpful, the relationships between some of the physician choice variables are lost. To partially address this problem, it was assumed that one of the choice variables in the model has been preallocated or solved beforehand. Solving the optimization problem treating one of the choice variables as preallocated gives solution values to the other choice and endogenous variables as functions of the exogenous variables and the preallocated choice variable. For the purposes of the paper, the physician time per outpatient service was chosen as the preallocated choice variable. The choice of this variable as preallocated is expected to give indications on the relation between time inputs of physicians and outpatient service prices.

The equations that would be estimated would therefore take the form:

$t^{c*} = t^{c*}$ (CLNCHAR, HOSCHAR, MDCHAR, PATCHAR, W^{INP}, P^c, P^h),

$P^{c*} = P^{c*}$ (CLNCHAR, HOSCHAR, MDCHAR, PATCHAR, W^{INP}, P^c, P^h, t^{c*}).

2.4.2 Empirical implementation

To estimate the functions, linear functional forms are assumed. These are in the form:

$$t^{c*} = a0 + a1'*\text{CLNCHAR} + a2'*\text{HOSCHAR} + a3'*\text{MDCHAR} + a4'*\text{PATCHAR} + a5'*W^{INP} + a6'*P^{c} + a7'*P^{h} + e_{tc}.$$

$$P^{c*} = b0 + b1'*\text{CLNCHAR} + b2'*\text{HOSCHAR} + b3'*\text{MDCHAR} + b4'*\text{PATCHAR} + b5'*W^{INP} + b6'*P^{c} + b7'*P^{h} + b8'*t^{c*} + e_{Pc},$$

where ai's and bi's are vectors of parameters corresponding to the set of explanatory variables.

Since the level of time inputs per outpatient service, t^{c*}, are the results of optimizing behavior of the physician, then estimating the set of equations by ordinary least squares result in inconsistent estimates of parameters. To get around this problem, the system of equations is estimated using three-stage least squares.

2.5 DATA AND RESULTS

2.5.1 Data set and variables

Several data sets from the various surveys of the DOH-PIDS project were linked in order to come up with the data set used for the regression runs. Physician characteristics, clinic characteristics, and physician time allocation and prices were obtained from the Outpatient Clinic Survey. Variables on the household incomes and expenditures and other characteristics were obtained from the Household Survey in municipalities corresponding to the location of the clinic. The characteristics of the hospitals where physicians admit patients were culled from the DOH-Bureau of Licensing and Regulation hospital statistical reports and the Hospital Survey of the project. Other secondary data were sourced from published sources. Table 2.11 presents the list of variables used, their definition and source.

Table 2.12 presents the definitions and descriptive statistics of the variables used in the regression runs. Of the total sample clinics, about 169 observations with complete responses to the variables were used in the analysis. The high drop-out rate of respondents due to missing data precluded the estimation of average consultation time and average consultation fee by specialty of the physician. Dividing the sample into the five specialties and running the equations on these subsamples would tend to highlight the differences across specialties in the case mix, illness profile and the types of services provided. A less than perfect substitute to correct this is the inclusion of specialty dummies in the regression runs.

To represent the price of outpatient service, the average consultation fee of the physician is used. This variable was chosen since, as outlined earlier, there could be bases for charging minimum and maximum consultation fees which cannot be sufficiently controlled in the regression. These variables include severity of the illness of particular

Table 2.11

List of Variables, Definition, and Source

Variable	Definition	Source
CONS1AFE	Ave. consultation fee of physician (in pesos)	DOH-PIDS Outpatient Clinic Survey
CONS1TIM	Amount of time spent per consultation (in minutes)	DOH-PIDS Outpatient Clinic Survey
YRSPRACN	Number of years in medical practice	DOH-PIDS Outpatient Clinic Survey
SEX	Female	DOH-PIDS Outpatient Clinic Survey
MARRIED	Married	DOH-PIDS Outpatient Clinic Survey
MDSPEC	Physician is a specialist	DOH-PIDS Outpatient Clinic Survey
DIPFEL	Physician is a diplomate or fellow of any specialty organization	DOH-PIDS Outpatient Clinic Survey
PRIVPART	Physician is accredited in any private insurance or HMO	DOH-PIDS Outpatient Clinic Survey
MEDPART	Physician is accredited with Medicare	DOH-PIDS Outpatient Clinic Survey
DELEGATE	Physician delegates some tasks to assistants	DOH-PIDS Outpatient Clinic Survey
IOPC1	Independent outpatient clinic	DOH-PIDS Outpatient Clinic Survey
AIRCON	Aircon is present in clinic	DOH-PIDS Outpatient Clinic Survey
MEANFEE	Mean consultation fee in the province by specialty (in pesos)	DOH-PIDS Outpatient Clinic Survey
USXRYECG	Presence of an ultrasound/x-ray/ecg	DOH-PIDS Outpatient Clinic Survey
RENT2	Monthly rent per sq. meter	DOH-PIDS Outpatient Clinic Survey
AVEPCEXP	Ave. per capita expenditures in municipality of physician (in pesos)	DOH-PIDS Household Survey
POPNEED	% of population in need	Census of Population & Housing, NSO
MEANWARD	Mean inpatient visit fee in ward in the province by specialty (in pesos)	DOH-PIDS Outpatient Clinic Survey
TERBR	Tertiary hospital	Bureau of Licensing and Regulation, DOH
OWNPRIBR	Private hospital	Bureau of Licensing and Regulation, DOH

Table 2.12

Descriptive Statistics of Variables

Variable	Mean	Std. Dev.	Minimum	Maximum
Ave. consultation fee of physician in pesos	85.17751	46.00043	20	300
Amount of time spent per consultation in minutes	18.6213	7.85651	3	30
Number of years in medical practice	14.94675	9.21132	2	58
Female	0.59172	0.49298	0	1
Married	0.81065	0.39295	0	1
Physician is a specialist	0.88166	0.32397	0	1
Physician is a diplomate or fellow of any specialty organization	0.23077	0.42258	0	1
Physician is accredited in any private insurance	0.34911	0.47811	0	1
Physician is accredited with Medicare	0.76331	0.42631	0	1
Physician delegates some tasks to assistants	0.83432	0.3729	0	1
Independent outpatient clinic	0.38462	0.48795	0	1
Aircon is present in clinic	0.70414	0.45778	0	1
Mean consultation fee in the province by specialty (in pesos)	85.16831	27.51887	31.25	113.5
Presence of an ultrasound/x-ray/ecg	0.30769	0.46291	0	1
Monthly rent per sq. meter	63.0857	92.81323	0	929.36798
Ave. per capita expenditures in municipality of physician (in pesos)	1079.67756	395.99255	215.16266	1539.4739
% of population in need	22.06764	15.2992	2.08916	43.97541
Mean inpatient visit fee in ward in the province by specialty (in pesos)	388.3723	390.51447	18.75	1168.5136
Tertiary hospital	0.78107	0.41475	0	1
Private hospital	0.86982	0.3375	0	1

Number of observations: 169

patients, the specific incomes of particular patients and other patient characteristics such as stubbornness or inquisitiveness. To the extent that there are differences in the severity of illness of patients patronizing a specific physician, then using average consultation fees does not completely purge the data of effects of severity. Using average consultation fees as the dependent variable in the regression implies that the model cannot capture price discrimination on an individual patient basis. The mean consultation fee in the data set is about P 85.18, with a minimum of P 20.00 and a maximum of P 300.00.

To represent physician time input for outpatient service, average time per consultation is used. The choice of this variable is occasioned by the same reasons as the choice of average consultation fee. Average consultation time in minutes is about 18.62. This translates to about three consultations per hour. Anecdotal evidence suggests that this time may be on the high side. The minimum average consultation time that appears is 3 minutes, or 20 consultations per hour while the maximum is 30 minutes, or two patients an hour.

Physician characteristics included in the analysis are the actual years of practice, gender, civil status, specialty, board accreditation and accreditation with both Medicare and private financing schemes. The average years of practice in our sample is about 15 years. More female physicians are represented in our sample, and about 81 percent are married physicians. About 88 percent are medical specialists, 76 percent are accredited with Medicare and about 35 percent are accredited with private financing schemes such as HMOs and private insurance companies.

The average consultation fee in the province of the physician is included to represent the prices charged by other providers for outpatient services. These averages were computed excluding the fee of the particular sample physician. To the extent possible, these averages were average fees per specialty, i.e., they are average fees of physicians in the same specialty. The average consultation fee of other providers ranged from P 31.25 to P 113.5 with a mean of P 85.17.

To represent the prices of other providers for inpatient services, the average visit fee for a patient accommodated in wards in the province is used. This would tend to understate the visit fees of physicians since this is the most inexpensive room accommodation possible. This variable was constructed by converting the charge for a patient confined for the physician's top cause of hospitalization into their visit equivalents. For instance, the professional fee charged per episode was converted into visit equivalents by dividing the charge by the number of days confined and the number of physician visits per day. In cases where the top cause of hospitalization was a procedure, deliveries for obstetrician-gynecologists for instance, the fee for the procedure was also converted into visit equivalents by the same procedure. As in the case of outpatient fees, the averages were computed by specialty and excluding the particular sample physician. The descriptive statistics show that the mean average visit fee for a patient accommodated in wards is P 388.37 with a minimum of P 18.75 and a maximum of about P 1168.5.

Average monthly per household member household expenditure in the municipality of the physician is included in order to represent the levels of incomes of patients. This measure was used instead of household income since this is believed to capture the more ermanent aspects of the income of households. The data set yielded average per ousehold member income of about P 1080.00 with minimum income of P 215.00 and aximum of P 1540.00.

To serve as an indicator of the potential health service requirements and demands of e population, the proportions of the population belonging to certain population groups elieved to constitute the main clientele of physicians were included. For pediatricians, e population below 5 years old was considered while the proportion of females of productive age was considered for obstetrician-gynecologists. Due to the higher cidence of chronic diseases among the elderly population, the population group onsidered for internal medicine specialists is the proportion over 65 years of age. For eneral practitioners and surgeons, the sum of these three groups was assumed to represent e relevant population in need.

The category and ownership of the hospital where the physician admits the most umber of patients are considered to represent the hospital characteristics and inputs vailable to the physician. While more detailed hospital input measures like the ratio of ursing staff to physician or the number of beds to physician could have been used, the ata set was plagued with missing values for these variables. While the Hospital Survey ad more extensive hospital characteristics and input data, a lesser number of clinics and hysicians could be matched to them. The category and ownership variables were resorted o since they can be assumed to be correlated with the level of inputs and other hospital haracteristics anyway. About 78 percent of the physicians in the data set admit the most umber of their patients in tertiary hospitals. About 87 percent admit more of their patients n private hospitals.

The presence of airconditioners, ultrasound, x-ray and ecg machines, and whether e clinic is hospital-based or independent are the relevant clinic characteristics considered. he presence of an airconditioner can be considered as representing the level of amenities resent in the clinic. The presence of these specialized equipment may signify that the linic is offering diagnostic and laboratory services other than consultations. Whether the linic is a hospital or independent clinic may have different implications as far as access to he clinic and qualifications of the physicians practicing there are concerned. These could lso represent the intensity with which other clinic resources are utilized. About 70 percent f clinic in the data set have airconditioners, about one third have either an ultrasound, x-ay or ecg machine in their clinics, and about 38 percent of our sample are independent linics.

An additional variable is included to identify the average consultation time. This ariable is whether the physician delegates tasks to assistants. This additional variable can be considered as a clinic characteristic since it could be indicative of the quality of the outpatient service rendered. On the other hand, it can also be considered as a physician characteristic reflecting his/her relative preferences for supervision and control over auxiliaries.

2.5.2 Results

The three stage least squares estimates of the average consultation time and average consultation fee equations are presented in Table 2.13. The determinants of consultation time would be discussed first followed by those for fees. The latter shall include discussion of the interaction of variables determining both.

It would seem that on the whole, the set of regressors fit the data well. R-squared is .19 for consultation time and about .31 for average consultation fee. These are considered as reasonable for cross-section data.

Average consultation time decreases with increases in the years of practice of the physician. For every year of practice, average consultation time is slashed by about .12 of a minute. At the average years of practice, this translates to about 1.93 minutes. Considering physician preferences, clinical abilities, and demand for older physician services could serve to explain these effects.

Years of practice of physicians are correlated with physician age. Higher preferences of older physicians for more leisure time could serve to explain the lesser time spent per consultation. According to the framework forwarded, decreases in time per consultation could serve to increase leisure directly by reducing the total clinic time requirements for a particular patient load and indirectly by reducing the patient load.

On the other hand, the negative effect of years of practice on time may be due to increases in clinical abilities. As Eisenberg (1986) has pointed out, younger physicians, unlike older ones, have not yet had "time to mature clinically, to understand the limits of testing, and to gain experience in clinical judgement." The effect of experience on clinical abilities is important in ensuring that adverse health outcomes do not result from the reductions in the time spent per service by physicians in the clinic.

It could also be that older physicians have already established their practices and would therefore have relatively more stable patient loads than younger physicians. They may therefore have less need to attract more patients into their practices. Stability of patient loads of older physicians may also be an offshoot of the characterization of medical care as a reputation good, i.e., that consumers ask for recommendations of friends, relatives and associates in choosing their physicians. In this respect, older physicians may be better known to consumers than younger ones, and would therefore be able to attract patients despite lesser consultation time spent.

Older physicians with relatively more stable patient loads also have more extensive files on patient history. These files substitute for lengthy interviews, specially in the case of consultations/check-ups related to chronic illness, thereby reducing consultation time.[2]

The arguments of clinical abilities and medical care as a reputation good could also be invoked in the explanation of the negative effect of board certification of the physician

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[2]This was pointed out by Dr. Raul Fabella.

Table 2.13

Results of Estimation :
Average Consultation Time and Average Consultation Fee

VARIABLE	AVE. CONSULTATION TIME Coefficient	t-stat		AVE. CONSULTATION FEE Coefficient	t-stat	
Constant	26.3652	4.2793	**	34.6885	0.912954	
Number of years in medical practice	-0.129034	-1.98377	**	1.07575	3.05392	**
Female	-0.631104	-0.481787		-4.88261	-0.70202	
Married	0.557231	0.368967		16.9[illegible]	2.1361	**
Physician is a specialist	-2.13787	-0.858203		-6.65935	-0.49856	
Physician is a diplomate or fellow of any specialty organization	-3.11784	-2.14433	**	2.61873	0.323982	
Physician is accredited in any private insurance	-0.28682	-0.22532		4.61595	0.695435	
Physician is accredited with Medicare	2.22181	1.5661		9.48908	1.20534	
Independent outpatient clinic	-1.87576	-1.18542		-17.023	-2.13164	**
Aircon is present in clinic	2.53574	1.66774	*	22.5097	2.78406	**
Presence of an ultrasound/x-ray/ecg	2.76309	1.98558	**	21.3527	2.68038	**
Monthly rent per sq. meter	0.00345828	0.566871		0.067676	2.0998	**
Mean consultation fee in the province by specialty	0.00166082	0.042037		0.403913	1.96692	**
Mean inpatient visit fee in ward in the province by specialty	0.00609665	2.69299	**	0.021079	1.50033	
Ave. per capita expenditures in municipality of physician	-0.00454965	-2.01793	**	-0.00681728	-0.545369	
% of population in need	-0.130915	-1.96045	**	-0.315394	-0.831929	
Tertiary hospital	3.33416	2.14898	**	21.5068	2.61053	**
Private hospital	0.426207	0.228738		-7.7134	-0.790215	
Physician delegates some tasks to assistants	-5.61068	-3.34986	**			
Amount of time spent per consultation (in minutes)				-2.08127	-1.72306	*

** Significant at the 95% level
* Significant at the 90% level

	AVE. CONSULTATION TIME	AVE. CONSULTATION FEE
Mean of the dependent variable	18.6213	85.1775
Standard deviation of the dependent variable	7.85651	46.0004
Sum of squared residuals	8346.54	256220.
Variance of residuals	49.3878	1516.09
Standard error of regression	7.02765	38.9371
R-squared	0.195247	0.311504
Durbin-Watson Statistic	1.62387	1.46395

on the average consultation time. If board fellows and diplomates are better able to diagnose illness and to prescribe specific treatments than those that are not, then consultation time is expected to decrease. This is borne out by the evidence as about 3.12 minutes are removed from consultation time when the physician is a board fellow or diplomate.

As in years of practice, board certification of the physician may also be used by patients as a signal on the quality of the services that a particular physician provides. This reduces the need to use consultation time as a means to attract patients into the practice.

If it is supposed that board accredited physicians may be seeing sicker patients in general due to referrals, then it would seem that the severity of the illness of patients reduces the average consultation time. This could indicate that physicians confronted with more severely ill patients would substitute physician time in the clinic with physician time in the hospital and hospital inputs.

The presence of an x-ray, ecg or ultrasound machine in the clinic increases the average consultation time by about 2.76 minutes. If used as indicators on the intensity of the use of other resources in the clinic, then it can be argued that the sign of these coefficient should be negative. Since these machines are expected to facilitate diagnosis and monitoring of disease, they substitute for physician time in a way.

The positive effect of the presence of equipment in the results can be due to several factors. The physician may not be completely delegating the operation of the machines to clinic assistants. Some amount of physician time may therefore be spent operating the machine itself or supervising its operations. This is borne out by cross-tabulations which indicate that of the 101 physicians who have either one of these machines, only about 47.5 delegate laboratory and related tasks to assistants.

Increases in the time per consultation with the presence of equipment may also increase the time spent by the physician in interpreting the results of the tests and explaining the same to patients.

The presence of these special equipment in the clinic of the physician indicates that other higher value services aside from consultations can be offered by the physician. These services generate additional revenue for the physician aside from consultation fees. The greater the number of patients of the physician, the greater is the potential number of patients who can be prescribed the services of the equipment in the clinic. Greater use of these equipment do not only translate to greater revenues but to lesser average fixed costs as utilization rates of the equipment increase. Increases in the time spent by physicians in consultation may therefore be used as a tool to generate a sufficient patient base for these services.

The presence of an airconditioner was included in the analysis to represent the level of amenities present in the clinic. If the level of amenities substitutes for physician time in attracting patients, a negative sign is expected for the coefficient of the variable in the regression. The more than two-minute increase in consultation time with the presence of an airconditioner seems to indicate that the presence of amenities may not sufficiently ibstitute for physician time in attracting patients. On the other hand, the airconditioner an be considered as a fixed equipment. Increasing consultation time in order to increase the number of patients could be used, as in the presence of diagnostic machines, to increase tilization of the fixed equipment and therefore realize decreases in average fixed costs.

The delegation of tasks of physicians to assistants further decreases average onsultation time by about 5.61 minutes. This is supportive of the hypothesis that time nputs of aides and assistants could substitute for physician time in the performance of utpatient services. This is broadly consistent with findings in the US literature on roduction functions for physician services (Reinhardt 1972, Brown 1988, Frank and Taube 1987, Goldman and Grossman 1983) which found significant positive marginal roducts of assistants' time in the production of physician services. However, most of hese studies found that assistants were not utilized efficiently. i.e., that they were nderemployed relative to physician time. Unfortunately, the results cannot indicate whether assistants are being utilized in the most efficient manner. This has implications on whether further decreases in consultation time can occur as more tasks are delegated to assistants.

Sample physicians (about 229) who reported utilization and payment of assistants pay each of their assistants from P 120.00 to P 5000.00 in a month, an average of P 1242.39. These amount to P 120.00 to P 8000 total wage bill for clinic assistants or an average of P 1594.63 in a month. These figures, on average, represent about 27 percent of non-physician costs at the clinic. It would appear therefore that decreases in the time spent by physicians per consultation would entail some costs as far as the wage bill to assistants.

Average inpatient visit fees of other providers increase the average consultation time. At the average level of the variable, this translates to about 2.37 minutes increase in the average consultation time.

Some possible explanations for this trend would take off by some assumptions regarding inpatient visit fees of other providers and the inpatient visit fees charged by the particular physician. Higher levels of inpatient visit fees of other providers could mean that the particular physician could also charge higher inpatient visit fees. This could also be used by the practitioner as indicative of what the particular patients in a locality could bear in terms of inpatient visit fees.

Viewing the physician as someone taking into consideration the net welfare of the patient, it could be that physicians are substituting outpatient services for inpatient services when the costs of inpatient services to the patient are likely to be high. This substitution could take two forms. Some of the patients with marginal indications for hospitalizations may be treated on an outpatient basis. Likewise, hospitalized patients may be discharged sooner but made to visit the physician for post-confinement check-ups. These types of consultations may alter the case-mix of physicians at the clinic to those which require longer consultation time on the average.

On the other hand, higher inpatient visit fees imply that higher revenues could be earned by physicians by confining patients in hospitals. Longer consultation times could therefore be used as tools to attract patients from which a certain proportion would be hospitalized. This is similar to the argument on the effects of the presence of specialized equipment in clinics on consultation time outlined earlier. This argument assumes that the increase in revenues from increased hospitalizations would more than offset the decrease in leisure time that increases in the number of clinic and hospital patients would result in.

ıe decrease in leisure time occasioned by increases in hospitalizations may not be as great if the physician could substitute hospital inputs for his/her time in the production of inpatient services. Such hospital inputs include nursing staff, interns and residents and other medical personnel. In particular, interns and residents could substitute for physician time in care of hospitalized patients and could therefore increase his/her productivity, and reduce the time necessary for him/her to visit the patient. Pauly's (1982) results support the effects of hospital inputs on hospital visit productivity.

This seems to be borne by the effect of the category of the hospital on average consultation time. Physicians who primarily admit patients in tertiary hospitals have about 3.33 minutes longer consultation time. Tertiary hospitals in the Philippines usually have relatively more specialized medical personnel than secondary or primary hospitals. In particular, training hospitals for interns and residents are usually tertiary hospitals. In this respect, the availability of these personnel may encourage consultant physicians to delegate some of the patient management work, thereby reducing the time requirements for their services. Physicians with tertiary hospital affiliations could therefore increase average consultation time, increase the number of clinic and hospital patients without as much increase in the time requirements for the service.

Decreases in the average consultation time as average per member household expenditures and as the population in need increase imply that increases in demand reduce the average consultation time. A per peso increase in per capita household expenditures would tend to decrease consultation time by .004 of a minute, a decrease of 4.91 minutes at the mean level of expenditures. A percentage point increase in the potential population requiring care decreases average consultation time by .13 of a minute, a decrease of 2.89 minutes at the mean level of population in need.

These movements can be interpreted in several ways. According to the framework forwarded, physicians need not increase consultation time in order to attract more patients in the presence of sufficient demand. There would be sufficient number of patients even if physicians do not alter the time spent per consultation.

The decrease in the average consultation time could also be explained by the presence of queues in situations where demand is relatively high. A number of studies have noted that physicians substitute patient waiting time for increases in office visits, i.e., that patient delay enhances provider productivity (Sloan and Lorant 1977, Mueller 1985, Headen 1991, De Vany, House and Saving 1983). This increase in productivity occurs as the likelihood and length of breaks in the production process are reduced.

For instance, a physician with a queue of waiting patients can draw from this pool in order to minimize slack time due to late arrivals of patients with appointments or while waiting for some delegated procedures to be finished. Reduction in slack time may reduce the propensity of the physician to chat or get into lengthy explanations on the disease. The physician may also use the time patients wait in order for assistants to retrieve medical files and conduct routine physical examination tasks on the patient. As the results indicate, delegation of tasks to assistants reduces consultation time. This is therefore one avenue where a queue of patients due to higher demand could serve to reduce consultation time.

Another possible reason why physicians would reduce consultation time in the presence of a queue would be in consideration of the total time that patients spend in the clinic. This time includes waiting time and the consultation time itself. If it is assumed that patients would be unwilling to pay lower prices for longer time spent in clinics, then physicians could reduce consultation time in order to reduce total time and therefore prevent prices from falling. This is specially relevant if higher income patients have higher opportunity costs of time.

The results on the average consultation time of physicians therefore indicate that physician characteristics which may affect her clinical abilities and preferences for leisure affect the length of consultation. The way the practice is managed as proxied by task delegation also affects consultation time. The level of demand for outpatient services serves to decrease consultation time while the possibility of earning higher revenues from higher valued services may encourage the use of consultation time to increase the patient base.

In the interpretation of the effects of the exogenous variables on prices, direct effects as well as indirect effects working through consultation time would be considered. Table 2.37 presents the direct and indirect effects of variables on physician prices.

It was expected that increases in the time spent by physicians in a consultation would tend to increase the professional fees charged for the consultation. However, our results indicate the opposite, i.e., lesser time spent by physicians on average in a consultation tends to increase the average consultation fee of the physician. A minute decrease in consultation time increases average consultation fee by about P 2.08.

The effect of consultation time on prices may better be explained by resorting to the determinants of consultation time as estimated. Specifically, it was found that consultation time was negatively related with variables which proxied for incomes and therefore for demand for outpatient services. Translating the effects into prices, increases in demand brought about by increased income reduces consultation time and increases the level of outpatient professional fees. The less time that physicians needed to render in order to gain a particular patient load, the higher are the prices that he/she could charge for the same services. The effects of consultation time on prices could therefore be interpreted as reflecting the effects of demand on outpatient fees.

The average per member household expenditures therefore have upward effects on prices (Table 2.14). For every peso increase in expenditures, average consultation fees move by P .009. At the mean level of expenditures, this translates to about P 10.22. A percentage point increase in the proportions of population in need also increases prices by about P .27, or about P 6 at the mean level of the variable. The coverage of outpatient services in health care financing, which could technically be represented by an increase in

Table 2.14

Indirect and Direct Effects on Prices
(in pesos)

Variable	Indirect Effects* [1]	Value of effects at the mean [2]	Direct Effects** [3]	Value of effects at the mean [4]	Net Effects [5 = 1+3]	Value of effects at the mean [6 = 2+4]
Number of years in medical practice	0.26855	4.01	1.07575	16.08	1.3443	20.10
Married	-	-	16.9833	-	16.9833	-
Physician is a diplomate or fellow of any specialty organization	6.48907	-	-	-	6.48907	-
Independent outpatient clinic	-	-	-17.023	-	-17.023	-
Aircon is present in clinic	-5.27756	-	22.5097	-	17.23214	-
Presence of ultrasound/x-ray/ECG	-5.75074	-	21.3527	-	15.60196	-
Monthly rent per square meter	-	-	0.067676	4.30	0.067676	4.30
Average consultation fee in province by specialty	-	-	0.403913	34.40	0.403913	34.40
Average inpatient visit fee in ward by province by specialty	-0.012689	-4.90	-	-	-0.012689	-4.90
Average per capita expenditure in municipality of physician	0.0094691	10.22	-	-	0.009469	10.22
% of population in need	0.27247	6.00	-	-	0.27247	6.00
Physician is affiliated with a tertiary hospital	-6.93929	-	21.5068	-	14.56751	-
Physician delegates some tasks to assistants	11.677	-	-	-	11.677	-

* computed by multiplying coefficient of variable in consultation time equation by coefficient of consultation time in consultation fee equation

** coefficient of variable in consultation fee equation expenditures for the same could therefore lead to decreases in consultation time and increases in the professional fees paid for the consultation.

Higher demand for services of specific physicians could also explain the effects of physician characteristics on prices. For instance, board certified physicians, through the effects on consultation time, have higher prices. Board diplomates or fellows have about P 6.50 higher consultation fees. Aside from decreasing consultation time therefore, board certified physicians can charge higher fees. The reduction in the time needed in consulting a board certified physician could thus be indicative of the quality of the care that is provided. Higher prices that these physicians could charge may therefore be reflective of patients' willingness to pay for the services of such physicians. Increases in the severity of illness of patients treated by board certified physicians could also increase the prices charged by these physicians.

The hypothesis that older physicians may have greater preferences for leisure are borne by the effects of years of practice in their pricing decisions. As the years of practice increases, so do average consultation fees. Based on the coefficient of years of practice on prices, every year of practice brings about an additional peso to consultation fees. Greater willingness on the part of patients to pay for the services of more experienced physicians may enable these physicians to increases their prices without severely affecting their patient loads. Increases in prices could therefore be used by more experienced physicians to reduce their patient loads and increase their leisure time without drastically affecting the incomes that they receive from the practice.

Adding the indirect effects on prices of years of practice of about P .26855 increases the net effect on prices. Every year of practice now contributes about P 1.3443 to the consultation fee or about P 20.00 at the mean level of years of practice.

Married physicians charge about P 17 more. Greater financial responsibilities may be reflected on greater physician preferences for income relative to leisure and therefore lead to physicians charging higher prices. On the other hand, the value of leisure time may increase for married physicians, specially female married physicians with children, therefore leading them to increase prices in order to reduce patient loads and therefore to increase free time.

Although the average inpatient visit fees do not affect physician prices directly, its effects are felt through increases in consultation time that they cause. This translates to a decrease in outpatient consultation price of about P .013 for every peso increase in the average inpatient visit fees in the locality. At the means of the variables, this translates to about P 5 decrease in consultation fees.

Higher average inpatient fees in the locality could mean that the particular physician could charge higher prices. In much the same way that longer consultation time could be used to attract patients, lower average consultation fees could be used to generate a patient load base from which a certain proportion could be hospitalized. Longer consultation time and lower revenues that this move entails may be more than offset by the increased income from the provision of inpatient services.

Two contrasting effects are apparent upon considering the relationship between the hospital affiliation of physicians and consultation fees. It was noted earlier that physicians who admit the most number of patients to tertiary hospitals have longer consultation times. This was interpreted to mean that physicians could be using length of consultation in order to generate a patient base who can be hospitalized. This leads to a decrease in outpatient consultation fees by way of the increase in consultation time. The effect on professional fees is about P 6.40 reduction. This reduction in fees is consistent with patient generation.

On the other hand, the value of the coefficient of the tertiary affiliation of the physician on outpatient consultation fees is positive and significant. An additional P 21.5 is added to consultation fees when the physician admits patients in tertiary hospitals. The positive effect on prices could be explained by considering the levels of amenities that tertiary hospitals could have relative to other hospital categories, the quality signals that tertiary affiliation brings to the physician and the costs to the physician in gaining access to tertiary hospitals.

Tertiary hospitals, specially private tertiary hospitals, offer wider range of services and amenities than secondary or primary hospitals. These hospitals are usually equipped with relatively higher technology instruments and machines, with private rooms and suites containing various patient amenities such as television sets and refrigerators, and with fuller staff complements such as nurses and nurses aides. If patients value such amenities, then they tend to patronize physicians who can admit in these facilities. Patient loads of physicians with these affiliations may therefore increase, thereby reducing the necessity to reduce prices in order to generate patients.

The presence of these amenities would tend to increase the prices that such hospitals would charge for hospital inpatient services. These higher fees could only be afforded by relatively higher income patients. Greater proportions of the physician's patients belonging to the higher income groups may imply lesser responsiveness of these patients to movements in prices. This would enable the physician to charge relatively higher outpatient consultation fees without decreasing his patient load.

Physicians usually apply for admitting privileges in tertiary hospitals. In some cases, specifically for government tertiary hospitals, admitting privileges and consulting work are by invitation only and for tertiary teaching hospitals, physicians are required to teach. In such cases, some amount of screening would be undertaken by the medical staff of the hospital. The grant of admitting privileges therefore imparts a signal on the ability of the particular physician and the quality of his/her work.

In some instances, admitting privileges and the ability to hold clinics within the hospital or the medical arts building come with a price. Some form of investment in the hospital is required of physicians in order for them to have admitting privileges, such as shares of stock or bonds that must be paid for. Of the survey respondents who admitted patients in tertiary hospitals, this amount averages to slightly more than P 48,000 but could reach as high as P 720,000. In this respect, higher prices charged to outpatient consultations may be resorted to in order to recoup these investments.

Combining the decrease in fees due to increases in consultation time and the direct increase in fees of physicians admitting patients in tertiary hospitals, the net change in outpatient consultation fees is about P 14.57.

The effects of clinic characteristics on prices could be explained by the increases in costs that these clinic characteristics may entail and the increases in the demand for outpatient services in the presence of these characteristics.

Take for instance the presence of an x-ray, ultrasound or ecg machine in the clinic. While the effect on prices through increased consultation time is a reduction of about P 5.75, there is a direct addition of P 21.35. The net effect on physician prices is therefore an addition of about P 15.60. This increase could be on account of the non-physician costs that supplies and materials for these equipment entail. In the data set for instance, the average non-physician costs for those with these equipment amount to about P 6975.00 in a month while the same amount for those with no equipment is P 5550.00. However, the difference in costs may not be entirely due to the supplies and materials used.

On the other hand, this clinic characteristic may be considered by potential patients as an amenity. The presence of the equipment in the particular clinic reduces the need for them to go to the hospital or a separate laboratory to have the tests done if prescribed. This could save them time and money if such services are prescribed by the physician. It could also act as a signal that the particular physician practicing in the clinic is knowledgeable about the latest techniques and machines and could therefore be rendering better quality care. The presence of these equipment could also hint at the intensity of the use of technology in outpatient consultations with the physician.

Increases in non-physician costs in the clinic and patient considerations on amenities could also explain the positive coefficient of airconditioners in outpatient clinic prices. This direct effect is about P 22.50. Despite the increase in outpatient prices due to longer consultation time, there is still a net addition in prices.

Substitution of assistant time for physician time in the production of outpatient consultations increases the prices charged by physicians for outpatient consultations. It was shown earlier that about a third of non-physician costs can be accounted for by the wage bill of assistants. What the results indicate is that some of these costs are passed on to patients in the form of higher prices.

Passing some costs to patients is consistent with the sign of rent in outpatient consultation fees. An increases in the rent paid per square meter of clinic space increases the prices charged for consultations. Every peso increase in this measure of rent translates to a P .07 increase in outpatient fees. At the mean level of rent per square meter paid, this amount is an additional P 4.30.

Physicians practicing in independent outpatient clinics charge about P 17.0 lower than those in hospital-based clinics. Costs of the use of non-physician resources could account for these trends. Averages culled from the data set indicate that non-physician costs per consultation of independent clinics are lower than those of hospital-based clinics, about P 87.00 relative to about P 93.00, or a P 6.00 per consultation difference. While there were no noticeable differences in the amounts paid for particular cost items, it could be that independent clinics may not be incurring expenses for some cost items. For instance, independent clinics located in physician residences may not be incurring expenses for rent. Using these simple averages as representing the differences in cost on a per consultation basis, there remains an amount which may not be due to costs.

The variable type of clinic may then be capturing characteristics of particular patients patronizing these clinics. These characteristics may be related to the sensitivity of patients to changes in prices. Differences in prices may be due to differences in these sensitivities. One such candidate characteristic is the average incomes of patients patronizing one clinic relative to the other. Consumers with lower incomes are usually thought of as having higher price elasticities. If patients patronizing independent clinics have lower incomes, then physicians practicing in such clinics may tend to charge lower fees.

Table 2.15 presents average monthly per capita incomes of users of the outpatient clinics that were sampled in the survey. These results need to be qualified due to biases owing to refusals of physicians and the patients themselves to be interviewed. Be that as it may, it can be noticed that average incomes of users of hospital-based outpatient clinics are higher than average incomes of users of independent clinics. This is the trend in all provinces in our survey except for Region 2 where there were no hospital-based clinics which were sampled. It is coincidental that the lowest level of incomes are found in this region. This would tend to support the argument that there are income differences between patients patronizing hospital-based clinics and those patronizing independent clinics.

Given these data, the choice of the type of clinic of the physician could therefore be a form of price discrimination. By choosing to practice in a clinic which is patronized by higher income patients, physicians could charge higher prices.

However, another patient characteristic can be the severity of the illness of patients. More severely ill patients may prefer to patronize hospital-based clinics in possible anticipation of confinement due to their condition. Unfortunately, there are no available measures of differences in the severity of illness of hospital-based users versus those of clinic-based users. The effect of this characteristic of patients in hospital-based clinics needs to be investigated further.

The average consultation fee of other providers in the community is a positive and significant determinant of her prices. For every peso increase in the average consultation fee, the particular physician's fee increases by about P .40.

This suggests that physicians consider the prices charged by other providers in setting his fees. In particular, the level of fees of other providers may provide a bound which would limit the amount that a particular physician could charge. Charging higher level of fees than those currently prevailing would result in decreases in the number of patients patronizing the particular physician.

The use of the average consultation fees of other providers as a standard for setting prices conform with the hypothesis that prices could also be used as a signalling device for

Table 2.15

Average Income of Outpatient Clinic Users by Province and by Type of Clinic (in pesos)/1

Province	Independent Outpatient Clinic	Hospital-based Outpatient Clinic /2
Metro Manila	1,406.77	1,721.53
Cagayan	624.44	-
Quirino	253.87	-
Cebu	999.87	1,638.84
Bohol	808.24	-
Misamis Oriental	805.17	1,462.03
Surigao del Norte	766.87	1,536.24

/1 includes regular income. Income from other sources like gifts, donations, remittance etc. were not included. However, income from these sources constitutes only a small portion of the total household monthly income.
/2 no hospital-based clinics surveyed in the provinces of Cagayan, Quirino, and Bohol.

Source: DOH-PIDS Outpatient Clinic User Survey the quality of the care that a particular physician provides. Setting fees consistent with the other providers in the community could indicate that the particular physician could provide the same quality of services as the rest.

Significant determinants of physician prices include the potential effects of demand, the cost implications of various amenities and inputs used in the clinic, and market conditions.

2.5.3 Policy implications and issues

The questions that were raised in the appraisal of the possibility of including outpatient benefits in health care financing reforms focused on the possible effects of the reform on productivity and prices of the outpatient clinic.

The inclusion of outpatient benefits, specifically consultations, in health care financing reform could be simulated by considering that such a reform measure is akin to increasing the average per capita expenditures of households by the price of a consultation. Table 2.16 outlines an experiment using the assumption that at least one member of the household utilizes an outpatient consultation in a month. The amount can be varied depending on the assumptions on utilization rates.

The results indicate that there would be reductions in the average consultation time and increases in average consultation fees of physicians. On a per physician basis, the reduction in consultation time (and the implied increase in the number of patients that can be serviced per hour) is rather small. In the same way, the increase in average consultation fees per physician is less than a peso.

Using historical utilization rates from the DOH-PIDS Household Survey and assuming that a fee-based reimbursement is used, the increase in costs under certain assumptions on utilization would be from about P .37 million to P .76 million additional per month due to the increase in prices. These are rough estimates since amounts could be higher given the increases in utilization rates. Estimates of the amount that need to be budgeted for the implementation of the reform should therefore consider additional increases in professional fees.

As it was noted earlier, the effects of increases in expenditures in average consultation time are rather small. These point to the need to institute other policy measures to ensure that increases in demand would be met. A significant determinant in decreasing average consultation time is the delegation of tasks to assistants. Encouraging physicians to delegate tasks to assistants could therefore increase the number of patients that could possibly be accommodated by physicians per hour spent in the clinic. Increases in the complexity of the tasks delegated to assistants should also be encouraged.

However, encouraging task delegation could come at a cost as evidenced by the increase in the average consultation fees of physicians. This effect on average consultation fees should therefore be considered in setting reimbursement levels for outpatient consults if greater productivity of physician time is to be encouraged.

Table 2.16

Simulation of Increases in Expenditures

A. Assumptions to get increase in expenditures

1. Five household members
2. Increase in expenditures is equal to mean consultation fee
3. at least one member utilizing every month

B. Effect on consultation time

1. Increase in expenditures:
   = Average consultation fee / number of household members
   = P85.17751 / 5
   = 17.04

2. Decrease in consultation time:
   = Increase in expenditures x coefficient of expenditures in consultation time
   = P 17.04 X (-.00454965)
   = -.078 minutes

C. Effects on consultation fees:
   = Increase in expenditures x net effect on prices
   = P 17.04 X (.00946905)
   = P 0.16

D. Additional costs due to increase in consultation fee:

Scenario	Utilization Rate /1	Population (1990) /2	Increase in Fee (pesos)	Additional Cost (pesos)
1. Utilization rate of private clinics	0.038	60,684,887	0.16	368,964.11
2. Utilization rate of private clinics and RHU's	0.059	60,684,887	0.16	576,749.17
3. Utilization of private and gov't. clinics and hospital outpatient department	0.078	60,684,887	0.16	757,347.39

/1 utilization rate per month, DOH-PIDS Household Survey
/2 data from Census of Population and Housing, NSO

It was also noted that board certified physicians had lesser average consultation prices than other physicians. If it is assumed that less time spent for consultation by these physicians does not translate to adverse health outcomes, then an active policy to solicit their participation in the provision of financed services could be a policy handle in ensuring that patients gain access to outpatient consultations. Encouraging these physicians to participate may require that differential reimbursement be applied for their services.

Although the same argument could be applied for more experienced physicians, there are aspects to their prices which could be due to preferences for leisure time. If it is assumed that the effect of years of experience on time reflects the effects of clinical skill and the direct effect on prices reflects behavior due to preferences for leisure, then only a part of the price effect of years of experience could be considered in setting up reimbursement levels.

In addition to the aspects of consultation fees related to increases in productivity, other aspects of fees need to be considered in setting reimbursement levels. For instance, the impact of various clinic characteristics on prices reflect additional costs that are incurred by the physician in the clinic. However, a decision would have to be made on which characteristics would be considered in pricing. For instance, would reimbursement levels include additional outpatient fees due to clinic characteristics which can be considered as amenities? Would the increases in fees due to airconditioning of the clinic be considered in reimbursement?

This question also translates to increases in fees due to physician characteristics. A particular point to consider is the hospital affiliation of the physician. It would have to be decided whether the tertiary hospital affiliations of physicians truly reflect quality differences or if they just indicate an amenity to the patient. If it is the former, then there could be basis for considering these in setting reimbursement levels.

One particular clinic characteristic which spell some differences in the average outpatient consultation fees of physicians is whether the clinic is an independent or hospital based clinic. Several issues arise if the effect of this variable is considered in setting reimbursement levels. If the variable represents to a certain extent the intensity of the use of other resources in the clinic which affect the particular outpatient consultation itself, then it could be worthwhile to consider the cost differences between independent and hospital based clinics in reimbursement. The difference in the average consultation fees between hospital-based and independent clinics could also be fully reimbursed if it can be proven that these are due to differences in the severity of cases treated.

On the other hand, if all of the difference in average consultation fees due to the type of clinic is reimbursed, then there could be implications on the recipients of the subsidies from this measure. If higher income patients patronize hospital based clinics and the full difference in price between these clinics are reimbursed, then higher levels of subsidies would be granted to those with higher incomes. Of course, this assertion needs to be qualified in that the net subsidy would also have to consider the level of contributions. If patients patronizing hospital-based clinics are willing to pay for the difference in average consultation fees anyway, then it may be advisable to set reimbursement levels at the rates of independent outpatient clinics.

2.5.4 Limitations

The preceding analysis has tried to input into the discussion of factors which can affect productivity and prices in the outpatient clinic. Several policy implications were drawn from the analysis.

However, several limitations need to be enumerated which would qualify the results and policy recommendations. Hopefully, these limitations may serve to guide further studies in physician practice patterns.

While the average length of consultation and therefore the number of consultations per hour was tackled, the factors determining the number of hours worked were not included in the analysis. Total productivity may not increase despite decreases in consultation time if hours worked are reduced accordingly.

In studying the possible effects of including outpatient benefits in health care financing reform, only the effects on productivity and prices in the outpatient clinic were considered. Since the physician is also the decision-maker on other aspects of care of the patient, there could be indirect effects of this inclusion on other physician decisions like prescriptions, the use of technology and hospitalizations. These effects deserve further study.

Another area which deserves further investigation is a confirmation of the differentiation on the types of patients patronizing these clinics. This would help to point out decisions on which clinic characteristics should be considered in reimbursement.

Section 3

PHYSICIAN PARTICIPATION IN FINANCING SCHEMES

3.1 INTRODUCTION

This part of the paper seeks to describe the patterns in physician participation in financing schemes and to give indicators on the possible reasons why physicians choose to participate in such schemes. The first part describes the various schemes being participated in, the extent of participation as measured by the proportion of patients belonging to such schemes and the amounts that are received. The latter part of the discussion presents some hypotheses why physicians would participate. The second presents a conceptual and empirical model of physician participation. The third presents the data and results of estimates of the determinants of participation while the last discusses some policy issues, implications and limitations of the study.

3.1.1 Extent of participation

A physician can be said to be a participant in a health financing scheme if he/she accepts reimbursement from such schemes as payment for services rendered to patients. Some would strictly define participation as when a physician accepts the reimbursement as payment in full for the services rendered. In this paper, however, participation is defined as accreditation of the physician in any health financing scheme as well as acceptance of patients who are members of such schemes.

About 64 percent of the sampled physicians are accredited or belong to some sort of financing scheme (Table 3.1). The majority of those participating are in the more developed regions of the country. Only about 35 percent of physicians sampled in Region 2 belong to a scheme. Slightly less than two thirds of physicians in Regions 7 and NCR belong to financing schemes. This sample is less than the total physicians sampled because about thirty physicians belonging to financing schemes were purposively sampled. As would be noted later, most of the sample physicians belonging to financing schemes are accredited with Medicare. The additional sample physicians would therefore be included in the presentation of tables which compare Medicare with the other financing schemes in order to get sufficient variation.

Among the specialties covered in the sample, the highest proportion of physicians accredited are surgeons and obstetricians. More than three-fourths of surgeons and obstetricians while about two-thirds of pediatricians and internists are accredited with financing schemes. As will be seen later, majority of participants still rank Medicare as the top scheme in terms of amount received in a month. Limitation of Medicare benefits to inpatient care may be deterring more clinic-based practitioners from seeking accreditation.

This is also reflected in the proportion of physicians who are accredited by the type of clinic that he/she maintains. Those with hospital based clinics seem to be more likely to be accredited than those maintaining independent clinics.

Table 3.1

Accreditation with Financing Scheme

		% of accredited physicians	total sample
	REGION		
2	Cagayan Valley	35.00	20
7	Central Visayas	62.50	80
10	Northern Mindanao	71.15	52
	National Capital Region	65.97	191
	For entire sample	64.14	343
	SPECIALTY		
	General Practice	38.03	71
	Internal Medicine	63.16	76
	Ob-Gyne	77.46	71
	Pediatrics	68.92	74
	Surgery	76.00	50
	YEARS OF PRACTICE		
	5 years and below	50.00	40
	6 to 10 years	72.04	93
	11 to 15 years	71.83	71
	16 to 20 years	65.63	64
	21 to 25 years	68.18	22
	26 to 30 years	40.91	22
	31 to 35 years	45.00	20
	36 to 40 years	50.00	6
	SEX		
	Male	66.42	137
	Female	62.62	206
	NUMBER OF CLINICS		
	One	52.30	174
	Two	70.48	105
	Three	83.93	56
	Four	100.00	7
	NUMBER OF HOSPITALS		
	None	13.64	66
	One	64.86	74
	Two	70.27	74
	Three	85.47	117
	Four	100.00	7
	Five	66.67	3
	Eight	100.00	2
	TYPE OF CLINIC		
	Hospital-based clinic	83.03	165
	Independent Outpatient Clinic	46.20	171
	Company Clinic	100.00	1
	School Clinic	33.33	3

Source of data: DOH-PIDS Outpatient Clinic Survey

A greater proportion of younger physicians in the sample are accredited with financing schemes relative to older ones. A decline in the proportions accredited with financing schemes occurs specially after 21 to 25 years of experience. This trend could reflect a greater openness of younger physicians to more innovations in payment schemes or it can be a strategy employed in establishing their practice or maintaining a certain patient load. Physicians who have had less than five years experience may still be establishing their practice and may be in the process of fulfilling the requirements for accreditation.

If increased number of clinics and hospital affiliations maintained are indicators of increasing competitiveness in the physician services market, then accreditation in financing schemes seems to increase with rising competetiveness. As the number of clinics and hospital affiliations increases, so do the proportions of physicians who are accredited in financing schemes. In much the same way that physicians maintain more clinics and hospitals to maintain a certain patient load, participation in financing schemes could also be a strategy to be employed to gain more patients. On the other hand, other qualities associated with maintaining multiple clinics and hospital affiliations may also be correlated with those qualities which determine participation.

The types of financing schemes which have been mentioned by the respondents can be classified under Medicare, health maintenance organizations (HMOs)/ health insurance, life and non-life insurance, community financing schemes and business or employer provided schemes. Life and non-life insurance are differentiated from health insurance in that in the former, coverage is usually a rider to a life or non-life insurance policy. Business or employer-provided schemes cover those benefits which are over and above what are mandated by Medicare. The typology adopted for financing schemes is the typology adopted by HEWSPECS in their study of alternative forms of private insurance.

For participating physicians, multiple schemes can be participated in. The most common scheme participated in remains Medicare. More than 85 percent of participating physicians mention that they are accredited with Medicare.

Multiple affiliations prevail for physicians sampled in Regions 7, 10 and the NCR (Table 3.2). In Region 10 where all participating physicians were Medicare-accredited, about 19 percent were also accredited with HMOs, 5 percent were also part of employer-provided schemes and 22 percent in other financing schemes. Increasing proportions of participating physician were affiliated with HMOs as the relative income of the region increases.

Aside from indicating openness of a physician to participation, multiple affiliations could also reflect the variety of schemes existing in the area. For instance, low participation rates in Region 2 for HMOs may simply indicate that HMO activity in the region may still be limited. Participation in employer or business-provided schemes is found only in Regions 10, 7 and NCR. These could reflect the presence of big companies which maintains clinics or hire retainer physicians for their employees.

On the other hand, multiple affiliations could be indicative that participation in one scheme reduces the cost of participation in others. For instance, physicians may not need

Table 3.2

Type of Financing Scheme Participated in by Physicians (in percent)

	Medicare	HMO/Health Insurance	Insurance (Life and non-life)	Community Financing	Business/ Employer Provided	Others	Total Number of Participant
REGION							
ayan Valley	85.71	14.29	-	-	-	-	7
ral Visayas	96.00	38.00	8.00	2.00	12.00	2.00	50
hern Mindanao	100.00	18.92	2.70	-	5.41	21.62	37
onal Capital Re	95.28	55.12	0.79	-	3.94	11.02	127
SPECIALTY							
eral Practice	92.86	17.86	7.14	-	-	-	28
nal Medicine	95.83	39.58	4.17	2.08	10.42	20.83	48
Gyne	96.36	43.64	-	-	5.45	5.45	55
iatrics	94.12	41.18	1.96	-	3.92	9.80	51
gery	100.00	73.68	2.63	-	7.89	13.16	38
RS OF PRACTICE							
ears and below	90.00	30.00	-	-	5.00	10.00	20
o 10 years	92.54	50.75	1.49	1.49	5.97	13.43	67
to 15 years	100.00	45.10	3.92	-	7.84	9.80	51
to 20 years	97.62	33.33	4.76	-	7.14	7.14	42
to 25 years	100.00	53.33	6.67	-	-	20.00	15
to 30 years	100.00	40.00	-	-	10.00	-	10
to 35 years	88.89	22.22	-	-	-	-	9
to 40 years	100.00	100.00		-	-	33.33	3
SEX							
le	96.74	47.83	4.35	1.09	7.61	17.39	92
male	95.35	41.09	1.55	-	4.65	5.43	129

data: DOH-PIDS Outpatient Clinic Survey

to employ an additional assistant to fill in claim forms once one has been hired already. Familiarity with billing procedures and accreditation requirements may also facilitate participation in more than one scheme.

Almost all of participating physicians regardless of specialty were accredited with Medicare. All participating surgeons sampled are Medicare participating. On the other hand, differences in the proportions of physicians affiliated with HMOs and health insurance can be seen. Surgeons have the highest rate of participation in HMOS and health insurance while general practitioners have the lowest. Internists, obstetricians and pediatricians have similar participation rates.

It was noted earlier that some physicians have multiple affiliations. How important re these other affiliations relative to Medicare? Table 3.3 presents the proportion of articipating physicians by the scheme which they rank first in terms of the amount that hey receive from these institutions in a month. In terms of amount received, Medicare vas cited by more than two-thirds of participating physicians as first in rank. HMOs ollow with about 20 percent of participating physicians citing HMOs as top rank.

Only in Metro Manila and in Region 7 do we find participating physicians receiving more from HMOs and health insurance schemes in a month. In general, more participating physicians in NCR and Region 7 receive more from alternative schemes than from Medicare in a month.

For participating physicians, the importance of financing schemes in their respective practices can be gauged by counting the number of patients who are financed by such schemes and the amount received from them in a month (Table 3.4). On the average, patients financed by such schemes are about thirty to forty percent of patients. The highest mean proportion was registered in Region 10.

Surprisingly, general practitioners register the highest mean proportion of patients inanced by such schemes. This mean proportion is even higher than those of surgeons and obstetricians. Two possible events are being captured here. The proportion of patients who belong to financing schemes was not based on an actual count. The response of the physician is therefore based on his awareness or past experience with his patients. It could be that patients of general practitioners are more likely to claim from financing schemes, thus increasing the awareness of physicians that these patients are members. This is likely if patients of general practitioners belong to lower income classes and would therefore find it worthwhile to claim from financing schemes. On the other hand, it could be that the general practitioners in our sample perform inpatient services which are Medicare reimbursable.

On the average, sampled participating physicians in Region 2 receive about P 3,700 a month from financing schemes while those in Region 10 receive about P 1,800. As expected, surgeons and obstetricians receive higher amounts from financing schemes than the other specialties. No continuous decline or increases can be observed from the amounts received by participating physicians with different years of practice.

Comparing the proportion of patients covered by schemes and the amount received

Table 3.3

Top Financing Scheme in Terms of Amount Received per Month

Scheme	No. of Physicians	%
Medicare	77	70.64
HMO Health Insurance	22	20.18
Insurance (Life and Non-l	1	0.92
Business or Employer Pr	4	3.67
Others	5	4.59
Total	109	100.00

		Medicare	HMO/ Health Insurance	Insurance (Life and Non-life)	Business/ Employer Provided	Others	Total Number of Participant
	REGION						
2	Cagayan Valley	100.00	-	-	-	-	1
7	Central Visayas	77.27	18.18	4.55	-	-	22
10	Northern Mindanao	85.71	-	-	7.14	7.14	14
	National Capital Region -	65.28	25.00	-	4.17	5.56	72
	SPECIALTY						
	General Practice	66.67	22.22	11.11	-	-	9
	Internal Medicine	66.67	29.17	-	4.17	-	24
	Obstetrics-Gynecology	77.78	7.41	-	7.41	7.41	27
	Pediatrics	70.37	22.22	-	-	7.41	27
	Surgery	68.18	22.73	-	4.55	4.55	22
	YEARS OF PRACTICE						
	5 years and below	75.00	8.33	-	8.33	8.33	12
	6 to 10 years	70.27	24.32	-	2.70	2.70	37
	11 to 15 years	76.92	15.38	-	-	7.69	26
	16 to 20 years	50.00	28.57	7.14	14.29	-	14
	21 to 25 years	88.89	-	-	-	11.11	9
	26 to 30 years	80.00	20.00	-	-	-	5
	31 to 35 years	50.00	50.00	-	-	-	2
	36 to 40 years	50.00	50.00	-	-	-	2
	SEX						
	Male	68.89	20.00	-	4.44	6.67	45
	Female	71.88	20.31	1.56	3.13	3.13	64

Source of data: DOH-PIDS Outpatient Clinic Survey

Table 3.4

Extent of Participation in Health Financing Schemes

	Average Proportion of Patients w/ Financing Scheme (in %)	No. of cases	Average Amount Received from Scheme per Month (in Pesos)	No. of cases	Amount Received per Financed Patient /1 (in Pesos)	Average Consultation Fee (In Pesos)	Amount Received/ Consultation Fee
REGION							
Cagayan Valley	30.00	8	3,705.71	7	38.31	43.80	85
Cental Visayas	32.85	54	1,914.08	36	19.40	59.90	32
Northern Mindanao	38.88	43	1,795.72	32	21.30	63.10	28
National Capital Regio	30.60	138	2,731.26	94	45.20	101.60	27
For entire sample	32.55	243	2,420.41	169	32.10	-	-
SPECIALTY							
General Medicine	44.16	43	2,190.48	21	17.38	45.10	49
Internal Medicine	31.22	49	1,734.57	37	14.00	98.30	18
Ob-Gyne	30.33	55	2,787.57	37	45.00	92.40	30
Pediatrics	25.17	54	1,882.84	39	27.53	84.30	22
Surgery	35.32	41	3,494.26	35	48.60	91.30	38
YEARS OF PRACTICE							
5 years and below	33.04	26	1,359.80	15	17.60	62.10	22
6 to 10 years	29.88	73	3,075.55	56	54.10	89.40	34
11 to 15 years	30.43	56	2,417.32	33	34.10	83.50	29
16 to 20 years	38.12	43	2,007.58	33	19.60	83.30	24
21 to 25 years	29.00	14	1,019.90	10	13.40	76.50	13
26 to 30 years	33.67	12	1,840.00	10	32.80	62.50	29
31 to 35 years	30.11	9	4,250.00	6	40.70	97.28	44
36 to 40 years	44.00	5	2,150.00	2	26.40	86.20	25
SEX							
Male	36.03	109	2,730.63	76	-	-	-
Female	29.72	134	2,166.89	93	-	-	-

/1 Computed by dividing the average amount received by the estimated number of patients financed. The latter was estimated by multiplying the proportion of patients financed by schemes and the average total patients in clinics in a month.

Source of data: DOH-PIDS Outpatient Clinic Survey

in a month gives us an idea how much is received per patient. This measure can also indicate the relative value or content of the service that is compensated by the financing scheme. Column 5 of Table 3.4 indicates the average amount received divided by an estimate of the number of patients who are financed by such schemes. This measure was estimated by multiplying the monthly average number of all patients in clinics by the average proportion of patients in column 1.

It can be noted that participating physicians in Regions 2 and the NCR receive relatively more per patient than those in Regions 7 and 10. Just looking at Regions 2 and 10, it can be noted that physicians in the more developed regions receive less per patient. However, there could be possible biases in the estimate because of some possible understatement in patient loads in the NCR. On the average, the equivalent of the amount received from financing scheme comprises only about P 19 to 45 pesos per patient.

Looking at the amount received per patient by specialization, it can be noted that surgeons and obstetricians-gynecologists receive the highest amounts per patient. Although pediatricians seemingly receive lower total amounts in a month and see only 25 percent of total patients as members, they receive more per financed patient than general practitioners and internists.

For physicians with up to 25 years of experience, there seems to be a decline in the amounts received per patient. However, these amounts increase for physicians who have had up to 40 years of practice. This could imply that physicians in their peak working years, although participating in financing schemes, receive lower amounts per patient financed or choose to serve a limited number of patients who are financed. Higher patient loads may mean that physicians in those years may be better able to choose from among financed and non-financed patients.

Dividing the amounts received from financing schemes by the total earnings of physicians would also give a better indicator of the extent of participation. However, data on total physicians earnings is mostly unavailable for the physicians in the sample. To standardize the amounts therefore, the amounts received are divided by the average consultation fee of the physician. The resulting figure is therefore the number of consultation equivalents of the amount received from financing schemes.

The last column of Table 3.4 indicates that participation as measured by this indicator is highest in Region 2. The amount received by physicians in a month is equivalent to what they earn from 85 consultations. On the other hand, those for Regions 7, 10 and the NCR range from 27 to 32 only. Using this measure, the extent of participation therefore seems to be higher in the lesser income regions than in the more developed regions.

Looking at the figure across specialties, it can be noted that the extent of participation is consistent whether measured by amounts received and consultation equivalents.

3.1.2 Determinants of participation: some indications

In the literature on physician participation decisions, the decision to participate in a financing scheme and the extent of participation are hypothesized to be affected by several factors. These factors include those that are related to the characteristics of the physicians, the level of demand for services of the physicians, and the characteristics of the financing schemes.

A tabulation of the reasons for physician non-participation in financing schemes seems to support some of the factors that are reviewed in the literature (Table 3.5). For instance, about 45 percent of non-participating physicians indicated that they were not interested or that there was no need to participate. This could be indicative that the patients they see are able to pay for their services. This could also imply that there are no regulations requiring them to participate in financing schemes. The response that most patients do not have Medicare or are not members of Medicare may also be indicative that patient characteristics do affect their decisions to join financing schemes.

Another reason for non-participation seems to be the non-availability of financing schemes in their areas. The response that there is no offer may be interpreted as indicative of non-availability. On the other hand, this response could also indicate the significance of insurance or HMO marketing and recruitment policies in the participation decisions of physicians.

Recognition of the administrative and collection costs of joining schemes is manifest in the oft cited reason that there are too many requirements.

The influence of physician characteristics on the physicians' decision for participation was apparent in tables presented earlier. Age was hypothesized as representing the openness of physicians to innovations in financing and the use of participation to increase the patient load. The specialty of the physician has been hypothesized as affecting participation to the extent that services performed by these physicians are covered by financing schemes.

The level of demand for physician services and the characteristics of her market have been likewise forwarded as explaining participation. If majority of her patients are able to pay for services, then physicians may decide not to participate in financing schemes. Increasingly competitive markets may also encourage physicians to participate in order to gain a certain number of patients. Since financing schemes reduce the net burden of illness on patients, physicians who derive some satisfaction from patient benefits for particular patient groups would therefore participate.

Table 3.6 presents the proportion of physicians accredited across different proportions of patients belonging to different income groups. These proportions represent the distribution of patients across income groups as perceived by the physician. Trends from the table indicate that higher proportions of patients belonging to low income groups coincide with lower participation rates. The table results also indicate that the greater the proportion of patients belonging to the higher income groups, the lower is the proportion of participating physicians.

Table 3.5

Reasons for Not Joining Any Financing Scheme

		Number of Respondents	(in %)
1.	no need/not interested	54	45.00
2.	too many requirements	22	18.33
3.	no offer	20	16.67
4.	clinic only recently completed/ still applying	11	9.17
5.	no available financing scheme in the area	6	5.00
6.	most patients don't have medicare health insurance	4	3.33
7.	illness	2	1.67
8.	inefficient paying scheme/pay is low	1	0.83
	Total	120	100.00

Source of data: DOH-PIDS Outpatient Clinic Survey

Table 3.6

Accreditation of Physicians by Proportions of Patients Belonging to Various Income Groups

	ACCREDITED PHYSICIANS (in %)	Total sample
Low Income Group		
0-25% of total patients	75.65	115
26-50% of total patients	69.57	115
51-75% of total patients	52.08	48
75-100% of total patients	40.35	57
Middle Income Group		
0-25% of total patients	44.05	84
26-50% of total patients	69.28	153
51-75% of total patients	72.00	50
75-100% of total patients	74.47	47
High Income Group		
0-25% of total patients	62.13	301
26-50% of total patients	81.82	33
51-75% of total patients		0
75-100% of total patients	100.00	1

Source of data: DOH-PIDS Outpatient Clinic Survey

These trends in the data could reflect both the characteristics of financing schemes 'ently available and the abilities to pay of patients. Increases in the proportion of ents belonging to middle income groups increases the probability that they are)loyed in the formal sector. This could therefore increase the likelihood of coverage by licare. On the other hand, patients belonging to lower income groups and non-licare members may not have sufficient means to purchase coverage by private insurers IMOs.

Although preferences of physicians to alleviate the financial burden of illness to ents may be present, the non- existence or limited coverage of financing schemes ering that part of the population may be hampering physicians from joining.

The characteristics of financing schemes that have been mentioned as affecting the ticipation decisions include the coverage of services, level and mode of reimbursement services and the administrative costs that physicians have to incur in order to get nbursed.

The extent of physician participation is likely to be affected by the services that are nbursable from such schemes. Of participating physicians who ranked Medicare as ir top scheme, more than 80 percent responded that inpatient visits and procedures are /ered (Table 3.7). One notes, however, that for physicians who responded that :dicare is their top scheme, outpatient procedures and consultations are covered. though this fact could be attributed to physician confusion or errors in the field erviews, these could reflect certain elements of fraud where outpatient services are ssified as inpatient services. This enables the procedure performed to be reimbursed.

Of those who ranked HMOs and health insurance as the top scheme in terms of the iount received per month, more than 80 percent of physicians who responded to the estion stated that outpatient and inpatient procedures are covered by the schemes.

The higher the proportion of fees reimbursed, the more likely the physician is to rticipate. The same table presents the proportion of fees reimbursed by the different hemes for certain physician services.

It can be noted that for participating physicians, the reimbursement, more often than it, does not fully cover the full fee for the visit. Exceptions to these cases are for surance (life and non-life) and other financing schemes. However, due to the limited imber of respondents for these types of schemes, the data need further confirmation.)mparing HMOs and Medicare, it can be noted that HMOs compensate physicians for patient and outpatient services at a higher rate than Medicare. The level of coverage of es for HMOs reaches about 70-85 percent of fees while those for Medicare reach about i-75 percent of fees.

Appendix B contains detailed tables and discussion comparing the amount that ledicare usually reimburses for physician fees and the fees that are actually prevailing. igures from the tables indicate that:

a) for some regions and for some room accommodations, reimbursable amounts

Table 3.7

Extent of Financing

TYPE OF SCHEME *	Common Out-patient Procedure (in %)	n	Difficult Out-patient Procedure (in %)	n	Common In-patient Procedure (in %)	n	Difficult In-patient Procedure (in %)	n	Out-patient Consultation (in %)	n	In-patient Visits (in %)	n
A. Proportions of physicians with top financing schemes covering the procedures:												
Medicare	40.0	50	47.8	23	88.9	45	84.6	39	55.0	20	82.1	28
HMO Health Insurance	82.4	17	87.5	8	84.6	13	91.7	12	85.7	14	100.0	13
Insurance (Life and Non-life)	100.0	2	-	-	100.0	1	-	-	-	-	100.0	1
Community Financing	-	1	-	1	100.0	1	100.0	1	0.0	1	100.0	1
Business or Employer Provide	40.0	5	100.0	1	75.0	4	75.0	4	100.0	1	-	-
Others	50.0	6	50.0	2	75.0	4	66.7	3	-	-	100.0	2
B. Average proportion of fees reimbursed by the top financing schemes:												
Medicare	68.95	19	74.62	13	57.56	32	66.30	27	67.00	10	70.00	18
HMO Health Insurance	85.83	12	78.75	8	70.00	10	69.44	9	81.25	8	83.00	10
Insurance (Life and Non-life)	100.00	2	-	-	100.00	1	-	-	100.00	1	100.00	1
Business or Employer Provide	-	-	-	-	33.33	3	33.33	3	100.00	1	-	-
Others	100.00	2	100.00	1	40.00	3	100.00	1	100.00	2	100.00	1
For entire sample	78.29	35	77.27	22	58.41	49	65.38	40	78.18	22	76.33	30

* Typology used was constructed by HEWSPECS in their study of Alternative Health Financing Schemes.
n - number of respondents

Source of data: DOH-PIDS Outpatient Clinic Survey

for inpatient visit fees from Medicare are greater than the usual fees prevailing,

b) there is a widening gap between Medicare reimbursable fees and actual inpatient consultation fees as room accommodation becomes more expensive,

c) as the category of the hospital increases, the gap between Medicare reimbursable amounts and actual fees widens. However, for primary and secondary hospitals, professional fees for ward and payward patients are almost always fully covered by Medicare,

d) coverage of professional fees for physicians stationed in public hospitals is greater than for private hospitals,

e) in Metro Manila, average charges for the four selected procedures (tonsillectomies, appendectomies, ceasarean sections and cholycestectomies) are never fully covered by Medicare reimbursable amounts even for patients in wards. This is not the case in the regions where some of the procedures are fully covered,

f) the average ratios of Medicare reimbursable amount to the fees prevailing also differ depending on the specialty of the provider of the service.

Although only a proportion of fees is covered by financing schemes, physicians may still be willing to participate if they are able to charge the difference between reimbursement and the fee to their patients. Anecdotal evidence even purports that some physicians charge the full amount of the fee to their patients and consider the Medicare reimbursement as some sort of `bonus'. In these cases therefore, coverage of the total price may even be lower.

Table 3.8 states the proportion of physicians who does not accept reimbursed amounts as payment in full. About three-fourths of physicians in Region 2 require patients to pay on top of the reimbursed amounts. However, only one-third of participating physicians in the NCR seem to require patients to pay on top of reimbursed fees.

The trends in the responses are contrary to what one might expect given the low levels of amounts received per patient in the more developed regions of the country. It is expected that the lower the reimbursement rates, the more likely physicians would require patients to pay on top of reimbursed amounts.

Several explanations may account for these trends. The first is that physicians may not have answered this question honestly enough, i.e., they do not consider reimbursement from health financing schemes as `bonus' and therefore charge the full amount to patients. On the other hand, participating physicians may just limit the number of patients that they accept for financing but accept reimbursement as payment in full, instead of charging patients on top of reimbursed fees. This means that although physicians claim that a certain proportion of patients may be members of schemes, the actual number of patients who are supported fully may be less.

Table 3.8

Proportions of Physicians Requiring Patients to Pay on Top of Reimbursed Fees

	% of sample	Total sample
REGION		
Cagayan Valley	71.43	7
Central Visayas	48.00	50
Northern Mindanao	51.43	35
National Capital Region	30.71	127
For entire sample	39.27	219
SPECIALTY		
General Practice	37.04	27
Internal Medicine	35.42	48
Ob-Gyne	50.00	54
Pediatrics	37.25	51
Surgery	34.21	38
YEARS OF PRACTICE		
5 years and below	50.00	20
6 to 10 years	34.33	67
11 to 15 years	41.18	51
16 to 20 years	39.02	41
21 to 25 years	46.67	15
26 to 30 years	33.33	9
31 to 35 years	44.44	9
36 to 40 years	33.33	3
SEX		
Male	33.33	93
Female	43.65	126

Source of data: DOH-PIDS Outpatient Clinic Survey

The decision to participate and the extent of participation also depends on the mode of reimbursement followed and the time elapsed before reimbursement. Delays in reimbursement represent opportunity costs of money for the physicians such that longer time lags may discourage the physician from participating.

The number of days it takes to be reimbursed are given in Table 3.9. Note that this measure of delay probably indicates the time it takes from the delivery of the service to the time it takes for the payment to be received. This measure may overstate the delay in reimbursement if the time spent in filling up and filing claims is considered. For those affiliated with Medicare, average number of days it takes to reimburse reaches about 115 to 150 days. This translates to about four to five months. The average number of days is lower for those in the NCR but this is only marginally so.

There seems to be shorter reimbursement time for general practitioners, internists and pediatricians than surgeons and obstetrician-gynecologists. This may be related to the level of complexity of the services rendered and the amounts required for these services. More complex surgical services may require stricter screening than relatively less complicated confinements.

On the other hand, reimbursement time for schemes other than Medicare is significantly shorter. Reimbursement time on average takes about two and a half to three months.

Considering that schemes other than Medicare reimburse higher proportion of fees and take a shorter time for reimbursement mean that indirect costs to the physician from participating in such schemes are lower.

Certain administrative costs could also be captured by looking at the modalities of reimbursing the physician for his services. The mode which is expected to have the fastest reimbursement time is when patients pay physicians directly and then gets the amount reimbursed from the financing organization. This entails no collection cost and delay on the part of the physician. On the other hand, claims filed through hospitals and physicians being directly reimbursed for services may entail some delay and administrative costs.

Table 3.10 lists down the modes of reimbursement currently prevailing for reimbursement of outpatient and inpatient procedures and visits. The same confusion or fraud is captured here since some participating physicians claim that outpatient procedures and consultations are reimbursed by Medicare and these are filed through hospitals. Another potential indicator of confusion or fraud is the fact that Medicare accredited physicians are paid by patients directly and patients claim from financing institutions.

Most of Medicare participating physicians get reimbursed by claims filed through hospitals. For inpatient procedures and visits, about two-thirds of responding physicians get reimbursed through claims filed through hospitals.

Greater proportions of physicians participating in HMOs and health insurance schemes get paid directly for outpatient and inpatient visits and procedures. It is not clear what the administrative cost implications of these mode are. It could represent higher

Table 3.9

Time Elapsed Before Reimbursement

	AVERAGE NO. OF DAYS	No. of casos
A. MEDICARE		
1. REGION		
Cagayan Valley	126.75	8
Central Visayas	120.59	51
Northern Mindanao	152.50	36
National Capital Region	115.13	120
For entire sample	123.12	215
2. SPECIALTY		
General Practice	106.65	31
Internal Medicine	104.74	46
Obstetrics-Gynecology	133.53	53
Pediatrics	125.89	44
Surgery	142.50	40
B. OTHER SCHEMES		
TYPE OF SCHEME		
HMO Health Insurance	75.60	25
Insurance (Life and Non-life)	90.00	2
Community Financing	30.00	1
Business or Employer Provided	72.00	5
Others	120.00	1

Source of data: DOH-PIDS Outpatient Clinic Survey

Table 3.10

Mode of Payment for Procedures Covered by Top Schemes (percent of respondents)

	MODE OF PAYMENT * 1	2	3	4	Total sample
A. COMMON OUT-PATIENT PROCEDURE					
Medicare	10.0	30.0	30.0	30.00	20
HMO Health Insurance	-	15.4	23.1	61.54	13
Insurance (Life and Non-life)	-	-	100.0	-	1
Business or Employer Provided	-	-	-	100.00	1
Others	50.0	50.0	-	-	2
B. DIFFICULT OUT-PATIENT PROCEDURE					
Medicare	23.1	30.8	23.1	23.08	13
HMO Health Insurance	-	11.1	22.2	66.67	9
Business or Employer Provided	-	-	-	100.00	1
Others	100.0	-	-	-	1
C. COMMON IN-PATIENT PROCEDURE					
Medicare	10.3	66.7	12.8	10.26	39
HMO Health Insurance	-	16.7	25.0	58.33	12
Insurance (Life and Non-life)	-	-	100.0	-	1
Business or Employer Provided	-	33.3	66.7	-	3
Others	-	100.0	-	-	3
D. DIFFICULT IN-PATIENT PROCEDURE					
Medicare	3.1	62.5	15.6	18.75	32
HMO Health Insurance	-	18.2	27.3	54.55	11
Business or Employer Provided	-	33.3	66.7	-	3
Others	-	100.0	-	-	1
E. OUT-PATIENT CONSULTATION					
Medicare	-	36.4	63.6	-	11
HMO Health Insurance	-	20.0	50.0	30.00	10
Business or Employer Provided	-	-	100.0	-	1
Others	-	50.0	50.0	-	2
F. IN-PATIENT VISITS					
Medicare	4.3	65.2	30.4	-	23
HMO Health Insurance	-	33.3	41.7	25.00	12
Others	-	100.0	-	-	1

* 1 - Patient pays physician and then claims from financing institution
2 - claims filed thru hospitals
3 - company/Health Financing Institution pays physician directly
4 - others and combinations of 1, 2, & 3

Source of data: DOH-PIDS Outpatient Clinic Survey

administrative costs since physicians may have to fill many claim forms for patients. On the other hand, physicians may find it easier to contract and negotiate with HMOs directly.

3.2 PHYSICIAN PARTICIPATION: A MODEL

3.2.1 Conceptual model

The determinants of utility levels from participation and non-participation outlined in the previous section can be accommodated in a model of a physician maximizing utility over income and leisure. It is assumed that the physician derives different utility levels when he/she is participating in a financing scheme and when he/she is not. The physician would therefore participate in a financing scheme if the utility garnered from participation is greater than the utility garnered from non-participation. Therefore:

$$U^{*} = \mathrm{Max}\,(U^{f}, U^{nf}) \qquad (3\text{-}1)$$

where:

U^{*} = Optimal utility

U^{f} = Physician utility when participating in financing scheme

U^{nf} = Physician utility when not participating in financing scheme.

Physician utilities conditional on choosing the two alternative choices are still determined by income and leisure, i.e.,

$$U^{f} = U^{f}(Y^{MDf}, L^{f}; \mathrm{MDCHAR}) \qquad (3\text{-}2)$$

$$U^{nf} = U^{nf}(Y^{MDnf}, L^{nf}; \mathrm{MDCHAR})$$

where the subscripts f and nf modify income, Y^{MD} and leisure, L, from participation and non-participation, respectively.

Income and leisure when the physician is non-participating are as follows:

$Y^{MDnf} = P^{c}N^{nf}(t^{c}, t^{h}, P^{c}, P^{h}, a$, CLNCHAR, HOSCHAR, MDCHAR, PATCHAR, P^{c}, P^{h})

$+ P^{h}aN^{nf}(t^{c}, t^{h}, P^{c}, P^{h}, a$, CLNCHAR, HOSCHAR, MDCHAR, PATCHAR, P^{c}, P^{h})

$- C^{c}(N^{nf}(t^{c}, t^{h}, P^{c}, P^{h}, a$, CLNCHAR, HOSCHAR, MDCHAR, PATCHAR, P^{c}, P^{h}), W^{INP}, CLNCHAR)

$- C^{h}(aN^{nf}(t^{c}, t^{h}, P^{c}, P^{h}, a$, CLNCHAR, HOSCHAR, MDCHAR,

$$\text{PATCHAR}, \underline{P}^c, \underline{P}^h), \text{HOSCHAR}), \quad (3\text{-}3)$$

$$L^{nf} \quad = \quad T - (t^c N^{nf}(t^c, t^h, P^c, P^h, a, \text{CLNCHAR}, \text{HOSCHAR}, \text{MDCHAR}, \text{PATCHAR}, \underline{P}^c, \underline{P}^h)$$

$$+ t^h a N^{nf}(t^c, t^h, P^c, P^h, a, \text{CLNCHAR}, \text{HOSCHAR}, \text{MDCHAR}, \text{PATCHAR}, \underline{P}^c, \underline{P}^h)). \quad (3\text{-}4)$$

where :

t^c	=	quantity of physician time per service at the outpatient setting or clinic,
t^h	=	quantity of physician time per service at the inpatient setting or hospital,
N^{nf}	=	practice size or patient load of non-financed patients of the physician at the clinic,
a	=	proportion of patients hospitalized,
T	=	total time available to the physician,
P^c	=	unit price of physician outpatient service,
P^h	=	unit price of physician inpatient service,
C^c	=	non-physician costs of producing physician outpatient services,
W^{INP}	=	vector of prices for clinic inputs,
CLNCHAR	=	vector of clinic characteristics,
C^h	=	costs to physician in accessing hospital inputs,
HOSCHAR	=	vector of hospital characteristics including ownership and hospital inputs,
MDCHAR	=	vector of physician characteristics,
PATCHAR	=	vector of patient characteristics,
$\underline{P}^c$	=	vector of prices charged for outpatient services by other providers,
$\underline{P}^h$	=	vector of prices charged for inpatient services by other providers.

In the formulation of physician income and leisure, the time spent and the prices charged by the physician for non-financed patients affect the number of non-financed patients patronizing her. The patient load is also affected by other clinic, hospital and patient characteristics as well as the prices charged by other providers. Costs at the clinic are affected by the number of patients, clinic characteristics and prices of clinic inputs. Physicians maximize utility over time spent, the rate of hospitalization and prices charged.

On the other hand, income and leisure conditional on the physician participating in a financing scheme could be represented by the following:

$$Y^{MDf} = P^c N^{nf}(\,.\,) + P^h a N^{nf}(\,.\,)$$

$$+ F^c N^f + F^h a N^f$$

$$- C^c(N^{nf}(\,.\,) + N^f, W^{INP}, \text{CLNCHAR})$$

$$- C^h(a(N^{nf}(.)+N^f), HOSCHAR)$$

$$- C^f(N^f) \qquad (3\text{-}5)$$

$$L^{nf} = T - (t^c(N^{nf}(.)+N^f) + t^h a(N^{nf}(.)+N^f)) \qquad (3\text{-}6)$$

where:

N^f = practice size or patient load of financed patients of the physician at the clinic,
F^c = fixed reimbursement for physician outpatient services,
F^h = fixed reimbursement for physician inpatient services,
C^f = costs of billing and collection including delays in payment.

Participation in a financing scheme is an additional source of revenue for the physician to the extent that financed patients constitute additional patient loads. However, the revenues that physicians receive from delivering services to these patients are determined by the reimbursement rates set by financing companies. These fees may be greater or less than fees charged to non-members of health care financing schemes. It is to be expected that the higher these reimbursement rates, the higher are the revenues that physicians gain from serving covered patients, and the higher the potential physician income. Aside from covering the increase in costs due to higher number of patients, the additional revenue should also cover the additional cost physicians incur in their participation in financing schemes. These represent the costs of billings and collection plus the delays in payment from the third-party payor. It is assumed that these costs increase as the number of covered patients increase.

Although participation in financing schemes constitutes additional revenues to physicians, there are added costs to the physician in terms of leisure foregone due to higher patient loads. Physician preferences for greater leisure may therefore prevent him/her from participating in financing schemes.

The benefits of participation to the physician is also dependent on physician decisions on the prices charged and time per service for patients in the non-financed market. Higher revenues due to either greater patient loads or higher prices charged to non-financed patients may dissuade the physician from participating in a financing scheme. Greater preferences for leisure may also dissuade physicians from joining since financed patients constitute additional requirements on the physician's working hours.

The formulation of the income and leisure of a participating physician as in (3-5) and (3-6) above assumes that there are no differences in the intensity of the care that physicians provide to financed and non-financed patients. For instance, consultation time, inpatient visit time and rate of hospitalization have been assumed to be constant for the two groups of patients.

This assumption could be questioned on the grounds that there could be incentives for the physician to increase the intensity of services provided to financed patients. This is related to the assumption that the pricing and treatment decisions of physicians also affect the number of financed patients approaching him/her for care. Since financed patients do not completely bear the costs of care, their sensitivity to the prices charged and the number of services prescribed may be less than non-financed patients. Provision of more services to these patients may not result in a large diminution of a physician's patient load.

The following analysis simplifies in that there is a pool of financed patients that patronize a certain physician. This is similar to the assumption in several studies in the US which assumed that the physician is a price-taker in the market for patients covered by health financing (Sloan and Steinwald 1978, Sloan, Mitchell and Cromwell 1978, Mitchell and Cromwell 1982).

3.2.2 Empirical model

Given this conceptual model, the physician can therefore be observed to be participating if $U^f > U^{nf}$ and not participating when $U^f < U^{nf}$. This can be represented by an indicator, y_i for each physician i, wherein:

$$y_i = 1 \text{ if } U^f_i - U^{nf}_i > 0, \quad 0, \text{ otherwise} \qquad (3\text{-}7)$$

The difference between the utilities can be represented as a function:

$$y_i = B'X_i + e_i, \qquad (3\text{-}8)$$

where X = (W^{INP}, CLNCHAR, HOSCHAR, MDCHAR, PATCHAR, P^c, P^h, F^c, F^h, N^f, C^f) and e - N (0,1).

This is the probit model which is to be estimated. The right hand side variables are exogenous models which affect the time input and pricing decisions of the physicians as well as the features of financing schemes which affect income and leisure from participation. The dependent variable can be interpreted as the probability of participation in a financing scheme given the values of the exogenous variables.

Physician participation in both the Medicare program and in private financing schemes would be estimated separately. This is to allow for differences in the coverage and scope of the financing schemes. For instance, Medicare covers only inpatient services while most private financing schemes cover both inpatient and outpatient services. Estimating the determinants of participation for private insurance could therefore give indications on behavior when outpatient consultations are covered. Likewise, only one schedule of reimbursement is followed by Medicare while individual private HMOs and health insurance companies have their own schedules of reimbursement.

3.3 DATA AND RESULTS

3.3.1 Data

Table 3.11 presents the description of the data sets used for estimating (3-8) above for Medicare participation while Table 3.12 describes the same for participation in private insurance. The two estimates share a common set of variables save for different data on reimbursement rates and time elapsed before payment. These differences would be discussed shortly. About 167 physicians have complete information for Medicare participation while about 159 physicians were used in the sample for private participation.

The dependent variables are indicators which take the value one when the physician is accredited with Medicare or is accredited with a private insurance company or HMO. These two variables are called MEDPART and PRIVPART. These measures may tend to overstate participation specially in the case of Medicare since some physicians may not actually claim from Medicare. About 75 percent of the physicians in the complete sample are accredited with Medicare while only about 34 percent of the sample are accredited with private insurance or HMOs.

Whether the physician was practicing in a hospital based clinic was used to proxy for prices of clinic inputs as well as to serve as a proxy for clinic characteristics. In the previous section of the paper, it was found that there were significant differences in non-physician costs per patient between independent clinics and hospital-based clinics. These could indicate different intensities of resource use and prices of inputs which are used in these clinics. About 61 percent of the sample for Medicare practiced in hospital-based clinics while the number for private participation is 63 percent.

Whether the physician admits the most number of patients in a tertiary hospital and/or a private hospital is the included hospital characteristic. It is assumed that the amount of beds, nurses, residents and other medical personnel and equipment which reduce the costs to physician of confining patients is greater with a tertiary hospital. On the other hand, the ability of the physician to control these resources may be greater if the hospital is privately owned. About 78 percent of the Medicare sample are affiliated with tertiary hospitals and 88 percent are affiliated with private hospitals. About 80.5 percent of the private sample are affiliated with tertiary hospitals while 88.7 percent admit the most number of patients in private hospitals.

Included physician characteristics are years of practice, sex, civil status, specialty, and board accreditation. The mean years of practice in the Medicare sample is about 14.5 years which is near the 14.7 years for the private sample. About 60.5 percent are female, 15 percent are single, 12.6 percent are general practitioners and 23.4 percent are board certified in the Medicare sample. The proportions of these variables are not much different for the private sample.

Patient characteristics which could partially represent the level of demand for physician services are the average per household member monthly expenditures in the municipality where the physician is practicing. Expenditures were used to the extent that they represent a more permanent measure of income. Average expenditures for the

Table 3.11

Descriptive Statistics of Data : Medicare Participation

Variable	Source	Mean	Std.Dev	Minimum	Maximum
Physician is accredited with Medicare	DOH-PIDS Outpatient Clinic Survey	0.7485	0.43518	0	1
Number of years in medical practice	DOH-PIDS Outpatient Clinic Survey	14.479	9.0128	0.05	58
Female	DOH-PIDS Outpatient Clinic Survey	0.60479	0.49037	0	1
Physician is a general practitioner	DOH-PIDS Outpatient Clinic Survey	0.12575	0.33256	0	1
Single	DOH-PIDS Outpatient Clinic Survey	0.1497	0.35785	0	1
Physician is a diplomate or fellow of any specialty organization	DOH-PIDS Outpatient Clinic Survey	0.23353	0.42435	0	1
Ave. per capita expenditures in municipality of physician (in pesos)	DOH-PIDS Household Survey	1124.60	376.70	101.10	1539.00
Percent of population in the municipality which is covered by Medicare	DOH-PIDS Household Survey	50.256	9.0157	8.571	63.44
Mean consultation fee in the province by specialty (in pesos)	DOH-PIDS Outpatient Clinic Survey	88.05	27.29	31.25	113.50
Mean inpatient visit fee in ward in the province by specialty (in pesos)	DOH-PIDS Outpatient Clinic Survey	425.34	400.85	18.75	1169.00
Medicare reimbursable prof. fee / visit fee in ward per episode	DOH-PIDS OPC Survey & Medicare Primer	0.62924	0.357	0.045	1
Time elapsed before medicare reimbursement (no. of days: ave. by province if physician is not accredited or actual time if physician is accredited)	DOH-PIDS Outpatient Clinic Survey	118.44	49.098	6	360
Private hospital	Bureau of Licensing and Regulation, DOH	0.88024	0.32566	0	1
Tertiary hospital	Bureau of Licensing and Regulation, DOH	0.78443	0.41245	0	1
City/municipality is urban	DOH-PIDS Outpatient Clinic Survey	0.95808	0.201	0	1
Hospital-based clinic	DOH-PIDS Outpatient Clinic Survey	0.61078	0.48904	0	1

No. of observations: 167

Table 3.12

Descriptive Statistics of Data : Private Insurance Participation

Variable	Source	Mean	Std.Dev.	Minimum	Maximum
Physician is accredited in any private insurance or HMO	DOH-PIDS Outpatient Clinic Survey	0.33962	0.47508	0	1
Number of years in medical practice	DOH-PIDS Outpatient Clinic Survey	14.686	8.8755	2	58
Single	DOH-PIDS Outpatient Clinic Survey	0.14465	0.35286	0	1
Female	DOH-PIDS Outpatient Clinic Survey	0.60377	0.49066	0	1
Physician is a diplomate or fellow of any specialty organization	DOH-PIDS Outpatient Clinic Survey	0.2327	0.42389	0	1
Physician is a general practitioner	DOH-PIDS Outpatient Clinic Survey	0.1195	0.3254	0	1
Ave. per capita expenditures in municipality of physician (in pesos)	DOH-PIDS Household Survey	1128.4	380.27	101.1	1539
Percent of population in the municipality which is covered by HMO	DOH-PIDS Household Survey	4.7073	3.152	0	13.04
Mean consultation fee in the province by specialty (in pesos)	DOH-PIDS Outpatient Clinic Survey	88.304	26.885	37	113.5
Mean inpatient visit fee in private room in the province by specialty (in pesos)	DOH-PIDS Outpatient Clinic Survey	660.8	563.85	37.5	1691
(Average proportion of inpatient visit fee reimbursed * Average Inpatient visit fee) / Inpatient visit fee of physician	DOH-PIDS Outpatient Clinic Survey	3.2731	3.0404	0.04571	10
Average proportion of inpatient visit fee reimbursed * Inpatient visit fee of physician	DOH-PIDS Outpatient Clinic Survey	1274.3	1315.5	27	8650
Time elapsed before reimbursement by top scheme (no. of days: ave. by by province physician is not accredited or actual time if physician is accredited)	DOH-PIDS Outpatient Clinic Survey	94.735	44.707	30	360
Private hospital	Bureau of Licensing and Regulation, DOH	0.88679	0.31785	0	1
Tertiary hospital	Bureau of Licensing and Regulation, DOH	0.80503	0.39743	0	1
City/municipality is urban	DOH-PIDS Outpatient Clinic Survey	0.96226	0.19116	0	1
Hospital-based clinic	DOH-PIDS Outpatient Clinic Survey	0.62893	0.48462	0	1

No. of observations: 159

Medicare sample and the private sample are P 1125 and P 1128, respectively.

Whether the physician's clinic is located in a rural or urban area is also included to proxy for the characteristics of patients in the area. It was likewise included in order to capture the differences in the availability of financing schemes and the types of financing schemes available. It has often been noted that some private HMOs and health insurance schemes are not yet available in some rural areas. The more likely private financing schemes available there would either be employer-provided or community-based schemes. Most of the physicians included in the Medicare and private sample practice in the urban areas.

Fees of other providers are measured by the average consultation fee and the average ward or private room visit fee in the municipality or the province of the provider. These averages were computed by specialty of the physician. In the event that there were less than three physicians of the same specialty sampled in the municipality, the average was obtained using the provincial sample. For the inpatient visit fees, these were obtained from the fees for the top cause of hospitalization of the physician or the most common inpatient procedure performed. These were converted to visit equivalents by considering the number of days confined and the number of visits made in a day. Average consultation fee for the Medicare sample and the private sample were about P 88.00. Mean inpatient visit fee for wards for the Medicare sample was P 425.30 while mean inpatient visit fee for private rooms used in the private insurance sample was P 660.80.

To represent the number of members of financing schemes which is potential patients of the provider, the number of households which had at least one member covered by a financing scheme over all the households in the sample for each municipality was used. This therefore measures the proportion of households which had at least one member covered. For determining participation rates in Medicare, the proportion of household which had at least a member as a Medicare member was used while for determining participation in private insurance, the proportion of households which had at least one member covered by HMOs or private health insurance was used.

These measures may have some shortcomings as far as representing the potential number of patients. This limitation depends on whether the particular financing scheme covers just individuals or dependents as well. For Medicare where the individual and his dependents are covered, the measure may not overstate nor understate the potential number of patients. On the other hand, membership in private insurance schemes may, like life insurance, be on an individual basis. This would tend to overstate the measure of the number of potential patients since not all members of the household are actually covered. Another bias that this measure may fail to capture is the actual propensity of the members to use or claim from the financing scheme. To the extent that members do not utilize or claim from these schemes, then the potential number of patients may actually be less.

The percentage of households who had at least one member covered by Medicare ranged from 8.6 to 63.4 percent in our sample. This averaged to about 50.3 percent. On the other hand, those covered by private insurance or HMOs ranged from 0 to 13.04 percent, or an average of 4.7 percent. The proportion of households covered by HMOs and other private insurance is way below the proportion of households which had at least one member covered by Medicare. However, there were still municipalities which had less than ten percent of households who had at least one member covered by Medicare.

To represent the costs to the providers of participating in a financing scheme, the number of days it takes to be reimbursed is included in the analysis. For explaining participation in Medicare, this variable is the number of days it takes to be reimbursed by Medicare while it is the number of days it takes to be reimbursed by private schemes for explaining private participation. For participants in financing schemes, the actual time it took to be reimbursed was used. For non-participants, the average time it took for participating physicians in the province was used. This assumes that non-participating physicians were basing their decisions on the time delays that they observe from their fellow physicians in the province.

These measures give an indication on the foregone interest on physician revenues that delays in reimbursement entail. This can also be considered as the collection cost for the particular provider.

To a certain extent, the time it takes to be reimbursed also reflects the costs of having different institutional arrangements for reimbursement. For instance, it may take longer to be reimbursed if physicians contract on an individual basis than if reimbursements are coursed through the hospital. On the other hand, these time costs may not be able to capture increases in the salaries and time involvement of physicians and assistants in filling out billing forms.

To a certain extent, these measures may also be overstated since the perception of the physician may be from the time that care was provided until the time that payment was received. The more relevant measure of the delay may be from the time that the billing was submitted until the time that payment was received.

The average number of days it takes to get reimbursement from Medicare is about 118 days, while that for private insurance is about 95 days. Although average reimbursement time for private participants are less than those for Medicare, this is still quite long.

To represent the fee that Medicare reimburses physicians for inpatient visits and procedures, the ratio of the amount that Medicare reimburses for an inpatient episode was divided by the actual amount that the physician charges were constructed. These amounts corresponded to the top cause of hospitalization of the physician or the most common inpatient procedure performed. The schedule of reimbursable fees of Medicare was used, with the corresponding applicable ceilings and relative value units of the procedures. There were instances when the Medicare reimbursable amount exceeded the actual fees of the physicians. In these instances, it was assumed that Medicare only reimbursed the lower amounts. The maximum value of this variable was therefore one. In the sample, the average ratio of Medicare reimbursable amount to the actual fees of the physician was about 63 percent.

Constructing reimbursement rates for private financing schemes were more involved because there were no set standards by which private firms reimbursed their accredited physicians[1]. Reimbursed fees were combinations of standard fees set by companies, prevailing professional fees and negotiation between the providers and the company. For instance, although some private firms would reimburse procedures based on relative value units of the Philippine College of Surgeons, the peso values attached to these units may differ from company to company. There are no set standards which are imposed by the different aggrupations of HMOs. The average prevailing fee in the area can also be used as standard. In some instances, 2-3 times the amount of fees that are reimbursed by Medicare are adopted.

In some instances, specially when physicians are considered as top-level ones, negotiations between the provider and the financing company usually takes place. These occur if the inclusion of the particular physician among the roster of participating physicians is included as part of the marketing strategy of the HMO. Sometimes, there are also incentives to physicians participating in private financing schemes, especially HMOs on top of reimbursed fees. These operate on a sort of profit-sharing basis where HMO earnings net of expenses for hospital services and diagnostics are distributed to participating physicians. These schemes are supposedly meant to reduce hospitalizations and usage of diagnostic procedures.

Given these multiple modes and standards, it was decided to just use information on the average proportion of fees reimbursed for inpatient visits by private financing schemes in a province culled from responses in the questionnaire. Two reimbursement variables were constructed and tried out.

One was constructed by multiplying the average proportion reimbursed for inpatient visit fees by the average inpatient visit fee for private room accommodation in the province and then dividing this by the actual inpatient visit fee for a private room of the physician. This measure assumes that private financing firms take the average prevailing fee in the province as the standard and applies a discount to this standard. This therefore is the standard reimbursement applied to participating physicians. Using this measure, the ratio of reimbursement to actual fee ranged from less than a percent to more than one. It was assumed that like Medicare reimbursement, actual fees of the physicians provided the ceilings when the reimbursable amount exceeded the fees. On the average, this ratio stood at about 32.7 percent. This may be a bit low considering that private financing schemes were believed to reimburse higher amounts than Medicare. Using this reimbursement rate could therefore introduce some downward biases in the reimbursement rates.

The other measure was constructed by directly applying the average proportion of fees reimbursed to the inpatient fee of the physician for a patient accommodated in a private room. The result is therefore a peso amount received per inpatient hospitalization episode. The assumption of this measure is that HMOs just apply a discount to the fees that physicians usually charge and reimburse physicians by this amount. In the sample used, this amount ranged from P 27 to about P 8650, with an average of P 1274. These

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1 I would like to acknowledge the inputs of Dr. Benito Reverente of Philamcare and Ms. Elynn Gorra of Hewspecs for their descriptions of various reimbursement modes for physician services for private HMOs.

are reasonable since they capture the amounts received for an episode of illness. However, these may overstate the amounts reimbursed specially for physicians who have relatively high levels of fees and understate reimbursement for those with lower level of fees. The bias may not be so great in the case of physicians with higher levels of inpatient visit fees to the extent that HMOs may negotiate fees with higher priced (as indicators of better quality) physicians if recruiting them is part of the marketing strategy of the particular HMO.

The estimates for private participation would therefore be tried using these two reimbursement variables.

3.3.2 Results

The estimated equation for Medicare participation is listed in Table 3.13. A measure of the goodness of fit of the equation is the percent of the sample predicted correctly by the model. The estimated equation correctly predicts 77 percent of the sample observations.

General practitioners are 32 percent less likely to participate in Medicare than specialists. As outlined earlier, these may be due to the more clinic-oriented practices of general practitioners. They may therefore have less need of Medicare which only covers inpatient services. Although greater demand for the services of specialists from non-financed patients may discourage them from participating in financing schemes, the higher probability of participation among specialists in the sample may reflect the relative financial burden that specialist care entails. More complicated services performed by specialists and more difficult cases also entail higher costs than cases treated by general practitioners. These may then encourage specialists to participate in Medicare in order to ensure at least partial payment for services rendered.

Single physicians are about 19 percent less likely to participate in Medicare than married physicians. Added financial responsibility of married physicians may be encouraging them to participate in order to gain additional revenues.

A physician practicing in a hospital-based clinic is 20 percent more likely to be accredited in Medicare than those who are not. When financing schemes cover outpatient consults, higher costs in outpatient clinics may discourage physicians from accepting more patients from financing schemes since they may be receiving discounted fees while incurring the same level of costs. When only inpatient services are covered as in Medicare, higher costs in the clinic may encourage physicians to substitute inpatient care for outpatient consults. Substitution of inpatient care for outpatient care may also be encouraged by the fact that coverage by Medicare may mean lesser financial burden on inpatients.

Greater propensity of physicians in hospital-based clinics to participate in Medicare may also reflect lesser costs in collection and billing. Assistants in hospital-based clinics may have easier time coordinating with hospital administrative staff involved with billing Medicare.

Probit Estimates of Physicians' Participation in Medicare

Log-Likelihood............. -80.08476
Restricted (Slopes=0) Log-L. -94.18363
Chi-Squared (15)............ 28.19773
Significance Level.......... 0.2036357E-01

Variable	Coefficient	t-ratio	Marginal Effects /1
Constant	1.6288	1.541	
Number of years in medical practice	0.01825	1.159	
Female	-0.14528	-0.586	
Physician is a general practitioner	-0.92449	-1.924 *	-0.326567
Single	-0.56595	-1.891 *	-0.189256
Physician is a diplomate or fellow of any specialty organization	0.34862	1.185	
Ave. per capita expenditures in municipality of physician (in pesos)	0.010288	1.775 *	0.00030058
Percent of population in the municipality which is covered by Medicare	-0.032897	-1.534	
Mean consultation fee in the province by specialty (in pesos)	-0.2307	-2.83 **	-0.00674006
Mean inpatient visit fee in ward in the province by specialty (in pesos)	0.0037672	1.065	
Medicare reimbursable prof. fee / visit fee in ward per episode	0.39381	1.004	
Time elapsed before medicare reimbursement (no. of days: ave. by province if physician is not accredited or actual time if physician is accredited	-0.0010152	-0.374	
Private hospital	-0.16867	-0.424	
Tertiary hospital	-0.073347	-0.234	
City/municipality is urban	1.1956	1.549	
Hospital-based clinic	0.66156	2.631 **	0.2041128
Proportion of correct predictions	77%		

** significant at the 95% level
* significant at the 90% level
/1 - Marginal effects of dummy variables computed as the difference in probabilities at mean values of the variables given that value of dummy is 1 or 0. Marginal effects are interpreted as the change in probability that the physician will participate given the values of the independent variable.

Increases in the average per capita household expenditures in the municipality increase the likelihood of participation by the physician in a financing scheme. Every peso increase in expenditure results in a 0.03 increase in the likelihood of participation. A P 100 peso increase in average per capita expenditures would therefore increase the probability of participation by 3 percent. At the mean level of the variable, this translates to about 33 percent increase in the probability of participation.

This variable was intended to capture the extent of the demand for physician services from the non-financed market. To the extent that higher levels of expenditures may mean sufficient patient load for the physician, this variable may then have a negative effect on the decision to be accredited in a financing scheme. However, to the extent that higher income households may be correlated with formal sector employment, this variable may therefore be correlated with the variable percent of households who had at least one member covered by Medicare. This correlation could partly explain the insignificance of the variable representing the proportion of households covered by Medicare. In this respect, it may also be capturing the potential market of Medicare. If so, then this partly supports the hypothesis, the likelihood of participation increases as the potential market of financed patients increases.

Higher per capita expenditures and higher demand for physician services translate to higher patient loads. The pool of patients who can therefore be confined increases. If these patients are members of Medicare, then physicians can garner additional revenue by claiming from Medicare. This is likely as higher per capita expenditures may mean some sort of formal sector employment. This may be true in the wake of stories that physicians charge Medicare members the full amount of his/her professional fee and claims from Medicare the allowed reimbursement just the same. In this respect, the reimbursement from Medicare is a bonus which physicians access by being accredited with Medicare. Although the amount of the professional fee that should be charged to patients should ideally be `net of Medicare,' there is little control that this happens since patient billings for professional fees are not usually coursed through the hospital which makes the claim, but through the physician's clinic.

This practice could partly explain the insignificance of both the proportion of fees of the physicians that is reimbursed by Medicare and the time elapsed before reimbursement in explaining participation. Since the full amount of professional fees is charged to patients, there is less incentive to care about how much the additional revenues are. Since the additional amount is a bonus, physicians may not care too much about how long it takes for it to be reimbursed since there are no opportunity costs to the full professional fee anyway.

On the other hand, it could be that this practice may have stemmed precisely from the low level of and the long delays in reimbursement.

The higher the average consultation fee prevailing in the municipality, the less likely the physician is to participate in a financing scheme. For every peso increase in the average, the probability of participation decreases by .67 percent.

Several explanations could be related to this result. Higher average consultation fees prevailing in the municipality can be indicative of the patient's abilities to pay for physician services. The higher the fees, the higher the particular consultation fee that can be charged by the particular physician. This would therefore decrease the necessity for him/her to participate in a financing scheme in order to increase his/her patient load and income.

If higher levels of consultation fees encourage physicians to spend more time and see more patients in clinics, then they would see less need to participate in Medicare which covers only inpatient services.

Although the amount reimbursed and the time delays in reimbursement do not seem to figure prominently in the decision to participate, it cannot be said that physicians do not base their participation decisions on non-financial incentives. The opportunity to increase revenues or decrease clinic costs by increasing hospitalizations and claiming extra payments from Medicare from such hospitalizations could be driving the physicians to decide on participating in the scheme.

The factors affecting participation in private health financing schemes are outlined in Table 3.14. The two equations estimated under different assumptions on the rate of reimbursement are also given. The first equation which uses the average proportion reimbursed multiplied by the inpatient visit fee of the physician yields a 75 percent correct prediction. The second equation which uses a standard fee computed by multiplying the average proportion of inpatient visit fees reimbursed by the average inpatient visit fee in the municipality yields a 73 percent correct prediction.

Common variables which are significant factors in both equations are whether physicians are specialists or not and whether physicians are diplomates or fellows of specialty organizations. General practitioners are 38 percent less likely to accredit with private health financing companies while board-certified physicians are 28 percent more likely to join the schemes.

The significance of these variables in explaining accreditation in private insurance or HMOs may be offshoots of the accreditation requirements of HMOs and commercial indemnity firms. Some specifically require that accredited physicians be board certified, be hospital-based or have clinics within hospital premises. This therefore predisposes them to recruiting specialists and board certified physicians.

These participation rates may be reflective of the specialist care that HMOs and health insurance schemes may provide. In addition, if demand for these schemes are in addition to the basic coverage of Medicare and HMOs capitalize on these aspects, then specialists would be more likely targets of recruitment for HMOs and health insurance companies.

On the other hand, propensity of specialists and board certified physicians to join private financing schemes may be related to the nature of the services that they offer. More complex and higher priced services offered by specialists and board certified physicians may encourage them to join in order to ensure at least partial payment for services. This would also apply to more severe cases handled by these physicians which

Table 3.14

Probit Estimates of Physicians' Participation in Private Insurance or HMO

	REIMBURSEMENT 1 /a			REIMBURSEMENT 2 /b		
Log-Likelihood....................	-81.25378			-82.62273		
Restricted (Slopes=0) Log-L........	-101.8848			-101.8848		
Chi-Squared (15)..................	41.26203			38.52412		
Significance Level................	0.2916569E-03			0.7545225E-03		
Variable	**Coefficient**	**t-ratio**	**Marginal effects**	**Coefficient**	**t-ratio**	**Marginal effects**
	0.03441	0.034		0.32248	0.322	
Number of years in medical practice	-0.017801	-1.322		-0.018192	-1.341	
Single	0.37657	1.115		0.32647	0.965	
Female	-0.097354	-0.398		-0.20084	-0.857	
Physician is a diplomate or fellow of any specialty organization	0.77143	2.865 **	0.2830097	0.77933	2.88 **	0.2865766
Physician is a general practitioner	-2.2079	-3.166 **	-0.3777089	-2.241	-3.119 **	-0.3820029
Ave. per capita expenditures in municipality of physician	0.002381	0.437		0.00293	0.54	
Percent of population in the municipality which is covered by HMO	0.020948	0.385		0.016482	0.304	
Mean consultation fee in the province by specialty	-0.20556	-2.316 **	-0.00701374	-0.20833	-2.329 **	-0.0071343
Mean inpatient visit fee in private room in the province by specialty	0.0001347	0.053		0.0017459	0.719	
(Average proportion of inpatient visit fee reimbursed * Average inpatient visit fee) / Inpatient visit fee of physician	-	-	-	-0.29565	-0.693	
Average proportion of inpatient visit fee reimbursed * Inpatient visit fee of physician	0.0017445	1.761 *	5.9521E-05	-	-	
Time elapsed before reimbursement by top scheme (no. of days: ave. by province if physician is not accredited or actual time if physician is accredited)	0.0011836	0.426		0.0004693	0.173	
Private hospital	1.1046	2.113 **	0.270158	0.97324	2.038 **	0.2505825
Tertiary hospital	0.57822	1.568		0.6763	1.863 *	0.2006107
City/municipality is urban	-0.67626	-0.815		-0.5892	-0.698	
Hospital-based clinic	0.10605	0.368		0.12779	0.447	
Proportion of correct predictions	75%			73%		

** significant at the 95% level
* significant at the 90% level
/a Average proportion of inpatient visit fee reimbursed * Inpatient visit fee of physician
/b (Average proportion of Inpatient visit fee reimbursed * Average inpatient visit fee) / Inpatient visit fee of physician

quire hospitalization. This is similar to the incentive of specialists to join Medicare.

Physicians who admit most of their patients in private hospitals are about 25-27 rcent more likely to be participating in private health financing schemes. This result may so be related to the accreditation requirements of these schemes. It was noted earlier that me financing schemes require that the physician should preferably have a clinic within e hospital premises. In this regard, only private hospitals would have such facilities. cept for the government specialty hospitals, hospitals accredited by financing companies e mostly private hospitals. Physicians who are affiliated in these hospitals may therefore more likely targets for recruitment.

Similar to participation in Medicare, the higher the average mean consultation fee in e municipality or province, the less likely the physician is to participate in a private nancing scheme. Every peso increase brings about a .7 percent decrease in the likelihood f participation. At the mean level of the variable, this translates to about 61.8 percent ecrease.

These results, similar to the effects on Medicare participation could be interpreted s signifying that physicians could charge higher fees and therefore earn more from non-inanced patients. This would lessen the need to participate in financing schemes to enerate additional revenue from outpatient consultations. This is especially relevant for rivate health financing schemes since outpatient consultations are usually included among he covered services. Since higher fees could be paid by non-financed patients while HMOs are only paying physicians a discounted rate, then participation would be less likely. This is more likely so since in the case of HMOs, services rendered by accredited providers re billed directly to the HMO following standard procedures. The participating physician loes not get to bill the patients the excess of his/her usual fee over the fee that the HMO eimburses.

The indicator of potential number of patients from financing schemes did not appear o be a significant determinant. It could be that the number of covered patients is still quite mall for it to be a significant consideration.

Only one formulation of the reimbursement rate turned out to be significant in the egression. This is when the average proportion of fees reimbursed for inpatient visits was multiplied by the inpatient visit fee of the physician. The higher this amount, the more likely that a physician would participate in private financing schemes. For every peso ncrease in the amount reimbursed per visit of a physician, the probability of participation ncreases by .006 percent. In order to increase participation by physicians by one percentage point, the reimbursement would have to be increased by about P 167.00. At the nean level of this variable, P 1274, the probability of accreditation increases by 7.6 percent.

This implies that when private financing schemes reimbursement increases as the npatient visit fee of the physician increases, participation in private financing schemes thus ecomes more likely. A crucial assumption is that this measure closely resembles the attern that private financing reimbursement followed. A more precise measure of eimbursement may need to be tried out.

Delays in reimbursement do not appear to be significant determinants of the decision to participate in private financing schemes.

The results for physician participation in private financing schemes point to variables which are related to the recruitment policies of financing schemes and reimbursement levels as significant factors in physician participation.

3.4 POLICY ISSUES, IMPLICATIONS AND LIMITATIONS

In considering accreditation and reimbursement policies in order to encourage participation of physicians in health care financing schemes, several implications stem from the results of our estimates.

It was noted that physicians practicing in hospital-based clinics were more likely to participate in Medicare. In this respect, efforts to accredit physicians in independent clinics may need to be stepped up. If rates of hospitalizations of physicians in hospital-based clinics are higher than those in independent clinics, then efforts to accredit those in independent clinics could reduce the costs to the system if the rate of hospitalization of these physicians remains below those practicing in hospital-based clinics.

Efforts to step up accreditation of general practitioners may also need to be undertaken in the light of reduced probability of participation of these practitioners. To the extent that general practitioners tend to practice in independent clinics, then the above recommendation could partially address this issue.

It would seem that in order to increase participation by physicians in Medicare, varying reimbursement rates and reducing the delay in reimbursement may not be the more effective measures. It may be more fruitful to increase the number of patients covered by and claiming from Medicare. Policies which would increase utilization of medical services by Medicare members and claiming from Medicare may need to be resorted to.

However, this proposition is premised on the practice that physicians bill patients the full professional fee and claim the additional from Medicare. The amount received is therefore partially dependent on the number of patients who claim from Medicare. If this practice is due to the low reimbursement rates and the long delays in reimbursement, then substantial increases in reimbursements and substantial reductions in reimbursement time may need to be undertaken in order to reverse the practice. Policies which could check this practice could also serve to reduce the out-of-pocket costs to patients.

That amounts reimbursed matters in a regime where only the financing scheme reimburses the physician for the care of the patient is seen in the results of participation in private financing schemes. Increases in the amounts paid by private financing schemes to physicians increase the probability of participation. It could be argued that reimbursements from private financing schemes may be high enough that it is worthwhile for the physician to consider the reimbursement as payment in full.

The conclusions to the amount of reimbursement's effect on participation in private financing schemes have to be qualified. Better measures of reimbursement may need to be used. Likewise, there may be a need to find a better measure of the number of covered patients in order to better estimate its effects on participation.

Section 4

PHYSICIAN CAREER DECISIONS

Included among physician career decisions are the choice of practice location and choice of specialty. These choices can be considered as physician long-run decisions as opposed to short-run decisions like using resources (physician time and other inputs), prescription of diagnostic and other services and pharmaceuticals and prices to charge patients. Physician long-run decisions input into the aggregate supply of physicians which in turn affect the supply of physician services in a particular location or the supply of specialty-specific physician services.

In the succeeding part of the paper, some of the factors which affect these long-run decisions would be explored. Focus would be on physician location choices, although some hypotheses on physician specialty choice may be forwarded.

4.1 PHYSICIAN LOCATION CHOICES

Several studies (Reyes and Picazo 1991, and Development Academy of the Philippines 1993) have noted the concentration of physicians in the relatively urbanized regions of the country, specifically in the National Capital Region. A program of the Department of Health called "Doctors to the Barrios" has even targeted to encourage physicians to locate in the more than 271 municipalities which have no physicians in order to address the perceived maldistribution problem.

To achieve these goals, the DOH has offered an incentive package containing features that are supposed to answer the basic requirements that physicians consider in locating in an area. These include higher salary levels, three-month supply of drugs and medicines, and other support services such as training and transportation. Physicians working in the most difficult towns (Class III) receive a total monthly compensation of P [illegible],000, while those working in Class I and II receive P 16,000 and P 20,000, respectively. As of December 15, 1993, the DOH has spent at least P 40,000 worth of drugs and medicines per town. The average cost of subsidizing one doctor for support services in a year is P 180,000 or about P 15,000 a month. That the cost of sustaining these services is rather steep is evidenced by appeals of the DOH for assistance in terms of financial and professional incentive, transportation expenses, medical publications and fellowships.

4.1.1 Physician location: A review of hypotheses

Are the features of the incentive package consistent with the supposed reasons why physicians choose a particular location to practice in? Table 4.1 give an idea of the top reasons why physicians choose to practice in a particular location. Nearly half of the physicians sampled cite proximity to friends and relatives as the main reason for their location choices. This reason can also be related to the response that physicians choose a main location for sentimental reasons (about 4.5 percent) and due to its proximity to the family business (about 2.6 percent).

Table 4.1

Top Reasons for Choosing a Practice Location

	No. of Respondent	(%)
Proximity to friends and relatives	163	42.89
Need for doctors	67	17.63
Professional growth	44	11.58
Ability to obtain hospital privileges	40	10.53
Sentimental reasons	17	4.47
Characteristics of province/city	13	3.42
Proximity to family business	10	2.63
Employment opportunity for spouse	9	2.37
Expected Income	7	1.84
Proximity to medical school	4	1.05
Others	6	1.58
	380	100.00

Source: DOH-PIDS Outpatient Clinic Survey

These reasons can be related to physician location literature which have ypothesized that physicians locate in areas where they have had prior contact. Physicians ave tended to practice in the places where they were born or in an areas of the same size s those of the places where they have grown (Cooper et al. 1972, Hurley 1991, Rosko and royles 1988, Wilensky 1979).

About 18 percent cited the need for doctors in the area as their main reason for cating there and the ability to obtain hospital privileges. In addition, about a percent of ose who responded cited proximity to a medical school as a reason for locating in a rovince.

These reasons are consistent with literature which have hypothesized that physicians ave generally been attracted to areas with better medical facilities and personnel support. leasures used include the number of hospitals in the area, number of hospital beds, umber of medical classes or dummy variable indicating presence or absence of medical chool and number of residents and interns (Fuchs 1986, Marden 1966, Wilensky 1979).

A number of studies have cited some reasons why physicians tended to locate in areas here there is an abundant supply of medical facilities and support from other personnel. irst, the cost of medical practice is becoming more expensive that individual physicians nd it difficult to establish their own practice. Hence, physicians tend to be dependent on ther private and public investments for technical and personnel support (Charles 1972). osko and Broyles (1988) have mentioned economies of scale as the theoretical basis for e expected positive relationship between physicians and availability of hospital resources. econd, medical practice has become highly specialized and has required more elaborate chnology that physicians have increasingly become more dependent on institutional cilities, support services and other practitioners for technical assistance and referrals Marden 1966, Charles 1972, Rosko and Broyles 1988, Cooper et al 1972, Fuchs 1986).

Citing professional growth as the top reason for locating in an area is consistent ith Hurley (1991) where variables representing physician's attitudes, such as physician's esire to work with other physicians and physician's desire for intellectual stimulation were cluded among the factors explaining location.

The characteristic of the province or city and employment opportunities for the pouse can be considered as area characteristics. Urban or metropolitan rather than rural nvironment has had a drawing effect on physicians. This has reflected physician reference for attractive areas and better recreational, cultural and educational facilities Rimlinger and Steele 1965, Fuchs 1986). Physicians have been expected to locate in rban areas or at least in areas which were accessible to the urban centers.

Only about 1 percent cited expected income as the main reason for their location ecisions, although most of the physician location literature have used this as their main rgument determining location.

Physicians are expected to locate in areas where their earnings are relatively high Rosko and Broyles, 1988). To estimate differences in earnings between alternative areas, physicians in their practice location as compared to either mean income of physicians in their alternative location or area of most recent contact. Similarly, Langwell (1980) used mean income to compute for the net present values associated with the choice of urban or rural practice.

The demand for physician services largely determines the physician's potential income. Several authors have sought to measure this variable by the potential demand for the services of the physician. In turn, these variables were measured by size and composition of the population, education level of residents, and income of population.

Population has been hypothesized to have a positive effect on the number of physicians in the area. It is considered to be an important determinant of the number of physicians in a state (Benham 1968), within U.S. Standard Metropolitan Statistical Areas (Marden 1966), and among towns (Foltz et al. 1977). Likewise, population shift has been hypothesized to affect location trends of physicians since it will give them opportunity to open new practices (Steele and Rimlinger 1965).

In more recent studies, the probability of towns having a physician in a given specialty was analyzed. Newhouse et al. (1982) studied towns in the U.S. and tested the hypothesis that the probability of a town having a given type of physician was a function of its population. The same hypothesis was tested by Dionne et al. (1987) using data for the province of Quebec. The probability that a town had one physician was assumed to increase at a decreasing rate when population increases.

A relatively large population at risk generally attracts physicians because this may mean greater number of people needing medical attention. Some measures used to represent population at risk include large proportion of the elderly and very young population (Rosko and Broyles 1988). Marden (1966) used variables such as percentage of population aged 65 and older and children under 5 years. Areas which had greater numbers of people falling under these two categories were predicted to have more physicians serving them than in those areas with population mostly classified under the other age groups. However, for certain specialties, e.g., pediatrics, the expected effects may be different. Towns with high percentage of population over 65 years and/or low percentage of population under 15 were expected to have less pediatricians (Foltz et al. 1977).

In addition to age, health status measures such as infant mortality rate and neonatal mortality rate have also been used as indicators for need of medical services (Foltz et al 1977). Moreover, race as commonly operationalized by variable percentage of population that is non-white was even included in some studies in the U.S. Large percentage of non-white population was hypothesized to have negative effect on the number of population because non-white population usually demand less of medical care (Marden 1966, Knaap and Blohowiak 1989).

To translate need into demand, both awareness of need for medical care and capability to finance health care cost are equally important. A common measure of the level of awareness of population has been median school years completed (Marden 1966, Foltz et al. 1977) The number of physicians in an area was expected to be directly related to the educational level of its population. On the other hand, capability of population to shoulder out-of-pocket cost of medical care has been measured by the income of its population. Variables which included total personal income of the state (Benham 1968), per capita income of population (Foltz et al. 1977, Rimlinger and Steele 1963, Steele and Rimlinger 1975), median income (Lankford 1974, Knaap and Blohowiak 1989) and average income (Dionne 1987) have been hypothesized to have a positive effect on the number of physicians locating in an area.

In addition to the reasons reviewed, the location of a physician's medical school, residency and internship training have likewise been hypothesized to affect choice of practice location. The size of the community in which the physician's medical school was located was also included by Hurley (1991) in his location model. Another hypothesis has been that urban-trained physicians tended to locate their practice in urban areas (Cooper et al. 1972).

In addition to the prior contact hypothesis, other physician attributes which have been posited to affect location choice include physician's attitudes and age at the time of graduation. Age at the time of graduation was considered since older physicians were hypothesized to be more likely to practice in small communities.

4.1.2 Physician location: attempt at empirical verification

In an attempt to verify empirically the determinants of physician location, the probability of locating in an urban area is posited to be affected by some of the considerations outlined in the previous section. Given this concepts , the physician can therefore be observed to be locating in an urban municipality if $U^u > U^r$, where U^u is physician utility when she locates in an urban municipality and U^r is physician utility when he/she locates in a rural municipality. This can be represented by an indicator, y_i for each physician i, wherein:

$$y_i = 1 \text{ if } U^u - U^r > 0,$$
$$0, \text{ otherwise}$$

The difference between the utilities can be represented as a function:

$$y_i \quad = B'X_i + e_i,$$

where X is a vector of variables representing the physician's prior contact with a community, characteristics of the area, presence of medical support and facilities, potential income or demand for the physician's services and some other physician characteristics such as age at time of graduation. It is assumed that e - N (0,1) which yields the probit model to be estimated.

However, the empirical verification that would be attempted may be limited in the sense that some variables may be unobserved or not accurately measured. In this respect, what the analysis will yield are general indications on the importance of a group of variables relative to another.

Table 4.2 details the descriptive statistics of the variables used in the estimation. Of

Table 4.2

Descriptive Statistics of Location Choice Data

Variable	Source	Mean	Std. Dev.	Minimum	Maximum
City/municipality is urban	DOH-PIDS OPC Survey	0.88	0.33	0.00	1.00
Age of MD at the time of graduation from medical school	DOH-PIDS OPC Survey	27.01	2.88	22.00	39.00
Female	DOH-PIDS OPC Survey	0.55	0.50	0.00	1.00
Number of other provinces where physician practiced	DOH-PIDS OPC Survey	0.47	0.98	0.00	8.00
MD born in the same province as his practice location	DOH-PIDS OPC Survey	0.44	0.50	0.00	1.00
Ave. per capita expenditures in municipality of MD (in pesos)	DOH-PIDS Household Survey	1033.15	423.20	90.54	1539.47
Mean consultation fee in the province by specialty (in pesos)	DOH-PIDS OPC Survey	80.58	29.08	25.00	113.50
Ave. salary paid to each assistant by province or city/municipality	DOH-PIDS OPC Survey	1318.23	343.35	466.67	1916.67
Percent of population in need	Census of Population and Housing NSO	24.74	15.92	2.09	43.98
Number of primary and secondary hospitals in the municipality	DOH-PIDS Community Survey	6.71	6.14	0.00	17.00

the 340 observations with complete information in the sample, about 88 percent of the sample physicians are located in urban cities and municipalities. This confirms the finding that physicians tend to locate in the relatively urbanized municipalities in the country. These may not be an overstatement since in the sample rural municipalities in the survey, almost a census of the available physicians was made.

Age at the time of graduation is also included as one of the determinants. Average age at the time of graduation is 27 years.

To capture the physician's prior contact with the community, a variable which idicates whether the physician was born in the same province is included. About 44 ercent of the sample physicians were born in the same province as the municipality where e/she is currently practicing. The variable may be limited to the extent that a more elevant variable may be whether the physician was born in the same municipality. To the xtent that affinity with the community is developed in the formative years of the hysicians, another variable which could be a better measure is whether he/she spent is/her childhood in the particular municipality. Unfortunately, the data for these are navailable.

Even if a physician is not born in the same province, prior contact with other ommunities may help explain his/her decision to practice in another province. To capture iis possibility, the number of other provinces where the physician practiced for more than year is included. The number of these provinces ranged from 0 to 8 provinces, with a iean of less than one. This could indicate that the physicians in our sample were not redisposed to setting up practices in different locations. This may be related to the bservation that it takes years to set up a practice so that movements to other provinces are ot usually done.

Female physicians constituted about 55 percent of the sample. Gender of the hysician is included in order to capture differences in preferences for styles of practice. It ould be that physician practice in rural municipalities is conducted at a less hectic pace ian those in urban areas. Increasing responsibilities in the home specially for married emales may induce them to prefer a less hectic pace of practice.

The variable percent of population in need was included to represent the potential emand for the services of the physician. This variable was constructed by specifying the articular age groups which are most likely to require the services of physicians. These iclude children under 5 for pediatricians, women of reproductive ages for obstetrician-ynecologists, population aged 65 and over for internal medical specialists and the sum of hese age groups for general practitioners and surgeons.

To translate these needs into demand, the variable average monthly per capita ousehold expenditures in the municipality is included. Lacking more specific community haracteristics representing the quality of recreational, educational and cultural facilities, ousehold per capita expenditures may therefore be capturing these effects.

The average consultation fee in the province by specialty is intended to capture the mits to the amount of fees that the physician can charge in the particular municipality.

This is based on the observation that physicians base level of fees that they charge on the levels of fees that other physicians in the community charge. This therefore gives a partial indication on the potential revenues that the physician can generate from the community. The mean value of this variable for the sample is about P 80. However, fees could go as low as P 25 and as high as P 114.

The income that a particular physician generates depends not only on his/her revenues but on the costs of practice. Physicians may decide to locate in areas where although the revenues from practice are not that high, the costs to the same are also low. To represent costs of practice, the average wage paid to assistants is included in the analysis. This variable, to the extent that it is only a part of non-physician costs, may tend to understate costs of practice. The average level of wages is about P 1318 per month.

The number of primary and secondary hospitals in the community where the physician practices was included to represent the presence of medical support and facilities. The number of primary and secondary hospitals was chosen in order to indicate a sort of minimum available facility where physicians can refer more complicated cases. The average number for these hospitals is about 6, although some communities do not have any.

Estimates of the probit model indicate that the set of variables which explains potential demand and physician income is a significant determinant of the decision to locate in an urban municipality (Table 4.3). The number of primary and secondary hospitals also explains the decision well.

The set of variables which represents the physician's prior contact with the community, age at the time of graduation and gender does not seem to affect the decision to locate in the community to a significant extent. Although better measures of the physician's prior contact with the community may change the results, it would seem from the current results that income factors override personal characteristics of the physician and considerations of affinity with the community.

Every peso increase in the average expenditures in the municipality increases the probability of the physician locating in the urban municipality by .047 percent. A P 100 peso increase in per capita income therefore increases the probability of locating there by about 4.7 percent. In order to increase the probability to reach 50 percent requires average per capita expenditures of about P 1044, and about P 2089 to reach 100 percent using these results. This is a long way off the average per capita expenditures in the rural municipalities of P 389.32. However, to the extent that this variable is proxying for other area characteristics may tend to overstate its effects on the probabilities.

On the other hand, a peso increase in the mean consultation fee translates to a .13 increase in the probability. In order to increase the probability by 50 percent means that the average consultation fee be about P 376, and to reach 100 percent by P 751. This is far greater than the average consultation fees prevailing in the urban areas.

A peso increase in the wages paid to assistants decreases the probability by .015, which is about 1.5 percent for every P 100. To encourage location in the area by 50

Table 4.3

Results of Probit Model of Location Choice

endent variable: Urban
ber of observations = 340
ber of positive observations = 298
ent correct predictions = .95

Variable	Coefficient	t-stat	Marginal effects
stant	-1.7639	-0.8731	
of MD at the time of graduation from medical school	-0.0119	-0.1925	
ale	-0.4045	-1.2208	
of other provinces where physician practiced	0.2736	0.1699	
born in the same province as his practice location	0.0593	0.1791	
per capita expenditures in municipality of MD	0.0065	6.0413 **	0.000479
n consultation fee in the province by specialty	0.0180	1.6909 *	0.001330
salary paid to each assistant	-0.0021	-2.4559 **	-0.000153
ent of population in need	-0.0008	-0.0650	
of primary and secondary hospitals in mun.	0.3572	2.9116 **	0.026388

ignificant at the 95% level
ignificant at the 90% level

percent requires a decrease in average wages by about P 3265. To increase it to 100 percent requires P 6530 reduction.

An additional primary or secondary hospital increases the probability by 2.6 percent. This supports the hypothesis that physicians tend to locate in areas where there are more medical facilities and support.

These rough results indicate that income factors do influence the decisions of physicians to locate in an area. As recognized by the DOH program, increasing the salaries and subsidizing the costs to physicians are steps to encourage physician location in a rural area. As an illustration of determining the effectivity of these policies, a rough simulation experiment can be performed using the policy variables and the results of the probit estimates. The policy variables can be tested for the effects on the probability of influencing a physician to locate in a rural area.

Table 4.4 details the steps involved in testing the effects of increasing compensation levels and subsidizing costs. To test the increase in compensation levels, the salary levels would need to be converted to consultation fee equivalents. Since the rural physician is expected to be the only one in the particular municipality, the consultation fee equivalent of his/her pay is the average for the municipality. In order to do this, an estimate of the number of consultations in a month is necessary. Two assumptions were used; one derived by multiplying utilization rates of private clinics, RHUs and outpatient departments of hospitals of the households in the DOH-PIDS project by an assumed rural population, and another derived from the average number of patients in a month of physicians located in rural municipalities from the DOH-PIDS Outpatient Clinic Survey. These assume that the resulting utilization rates of the municipality upon the presence of a physician would approximate those of the sample households. Estimates obtained from the household data are higher than those from the outpatient clinic survey.

The compensation levels in the package influence positively the probabilities of physicians locating in a rural area. Depending on the expected number of patients, the probability increases corresponding to salary rates for Class III municipalities range from [illegible].3 to 13.1 percent.

The policy package also includes a subsidy to defray the costs of the practice. The probit estimates only have a variable for the average wage of assistants. To convert the subsidy into the salary of assistant equivalent, the subsidy is multiplied by the average proportion of personnel costs to the total costs of practice of rural physicians. Using this salary equivalent, the increase in probability due to the cost subsidy is about 68.2 percent.

The combination of cost subsidy and salary levels from the policy package, by the results of the simulation experiment, is expected to increase the probability by more than 70 percent already. This could indicate that the policy package may be sufficient to attract physicians to participate in the program. Additional incentives may only increase costs of the program without substantially gaining adherents.

Note that the preceding experiment was only used to illustrate the probable effects since the probit model was not able to control for some of the factors which could affect

Table 4.4

Simulation Experiment of Indicative Effects of Current Policies on Probabilities of Location Using Results of Probit Estimates

A. Increase in Compensation Levels				
1. Salary levels for Class III, II and I municipalities		24,000	20,000	16,000
2. Estimates of number of patients in a month				
a. Using household data				
	Utilization rates of private clinics, RHU's and hospital outpatient departments/	7.8	7.8	7.8
x	Population in a rural municipality/2	9,460	9,460	9,460
=	No. of Consultations	738	738	738
b. Using average number of patients of physicians in rural municipalities/3		244	244	244
3. Consultation Fee Equivalent				
a. Using household data (1/2a.)		32.52	27.10	21.68
b. Using outpatient data (1/2b)		98.36	81.97	65.57
4. Change in probability (Consultation fee equivalent x increase in probability per peso increase in average consultation fee)				
a. Using 3a		4.33	3.60	2.88
b. Using 3b		13.08	10.90	8.72
B. Decrease in Costs				
	1. Monthly subsidy in costs		15,000	
x	2. Average proportion of costs of rural physicians due to salaries of assistants/ 4		0.297	
=	3. Salary equivalent		4455	
x	4. Per peso increase in probability due to decrease in assistant wage		0.00015	
=	5. Increase in probability		68.22	

/1 Source: Percent of population who consulted a private clinic, RHU or outpatient department of a hospital in a month from the DOH-PIDS Household Survey

/2 The population of Nagtipunan in the province of Quirino was assumed. Quirino was a sample province representing the lowest income region. Nagtipunan is the municipality with the least population in Quirino.

/3 This is the average number of patients in a month of physicians practicing in rural municipalities from the Outpatient Clinic Survey.

physician location decisions. Improvements in the model and measurement of variables may be necessary in order to further refine the estimates and make it more useful for policy analysis.

4.2 PHYSICIAN SPECIALTY CHOICES

In this section, the analysis is limited to a review of the possible reasons for choosing a particular specialty and some trends of the probable reasons from the data set. A full-blown choice model was not attempted due to lack of data particularly on physician abilities.

The physicians in our sample have belonged to five general specialties; general medicine, pediatrics, obstetrician-gynecology, surgery and internal medicine. Physician responses to the question of what was the top reason for choosing a particular specialty are presented in Table 4.5.

Interest and intellectual challenge was cited by about 88 percent of the physicians in the sample. These response can be related to studies which have hypothesized that ability and attitudes have played a role in specialty decisions. U.S. studies used the rankings from the Career Attitudes Inventory Test as indicators for physician preference about various aspects of medical practice which have included prestige, intellectual challenge, patient contact, pressure and teamwork. Physicians who preferred prestige and intellectual stimulation were expected to select specialization rather than general practice. On the other hand, those who preferred patient contact were expected to choose general practice or primary care specialties like pediatrics than technical specialties like pathology or radiology which require less direct patient contact (Hadley 1979, Hurley 1991).

Based on the assumption that specialty choices of physicians were developed during the educational process (Rosko and Broyles 1988), the effect of institutional factors on physician's choice of medical specialty has also been investigated.

One of the factors considered has been the quality of physician's medical school. One measure of quality that has been used is the average MCAT scores of students in a medical school. This has been expected to be positively related to specialization (Hurley 1991, Hadley 1979). Another factor has been the involvement of the medical school in research. It has been hypothesized that medical school's research involvement is positively related to choice of career in research and negatively related to choice of general practice since the latter offers less research opportunities (Hurley 1991, Rosko and Broyles 1988). Other medical school variables which may have had effects on specialty choice have included type of medical school (whether it is private or public), budget per student, ratio of PhD to MD faculty, ratio of basic science to clinical science faculty (Hadley 1979).

To give an indication of the effects of the quality of medical school on the choice of specialization, the distribution of specialists in our sample by the location of their medical school is given in Table 4.6. Although it remains to be affirmed through other measures of quality whether Metro Manila medical schools are better than their counterparts in the other regions, an indicator of the quality of the medical school is the average passing rate of its students in the board examinations. In this respect, Metro Manila schools have a higher

Table 4.5

Top Reasons for Choosing a Particular Specialty

	No. of Respondents	(%)
Line of interest	245	80.86
Intellectually challenging	23	7.59
Availability of accredited residency slots	21	6.93
Parent's choice	5	1.65
Most lucrative	4	1.32
Advice of colleagues/friends	3	0.99
shorter training period	2	0.66
	303	100.00

Source: DOH-PIDS Outpatient Clinic Survey

Table 4.6

Specialists by Location of Medical School

	Non-Metro Manila	Metro Manila	Total
General Medicine	42	48	90
	46.67	53.33	
Internal Medicine	25	60	85
	29.41	70.59	
Obstetrician-Gynecologist	23	52	75
	30.67	69.33	
Pediatrician	29	50	79
	36.71	63.29	
Surgeon	19	34	53
	35.85	64.15	

Source: DOH-PIDS Outpatient Clinic Survey

average passing rate in the board examinations from 1985-1992, 86.14 percent, than medical schools in the regions, 65.2 percent[1]. Higher proportions of specialists in our sample graduated from schools in Metro Manila, relative to the proportion of general practitioners. These could indicate that physicians graduating from Metro Manila schools choose to specialize rather than stay as general practitioners. These could be related to the training and emphasis in Metro Manila schools which could emphasize more specialized care and research.

In some studies in the U.S., variables which have been commonly used to measure ability include rankings in Medical College Admission Test (MCAT), scores from the National Board of Medical Examiners (NMBE) test and college grade point average (GPA). Physicians with low performance in these tests or have a low GPA have tended to enter general practice while those who had better ability were more likely to specialize. Moreover, the choice of a particular field of specialization may also be influenced by the physicians' specific clinical skills as determined by their respective scores in the NBME subtest (Rosko and Broyles 1988, Hadley 1979, Hurley 1991).

The availability of residency slots was cited by about 7 percent of respondents as the main reason for choosing a particular specialty. The availability of residency slots is determined partly by the number of accredited residency training programs in the particular specialties. Accreditation of hospital residency training programs is vested in the specialty boards and the specialty societies.

Requirements for accreditation usually include the following provisions:

a) Minimum number of and credentials (board certification) of the medical staff, training director, and staff consultants in the hospital,

b) Minimum number of patients, cases or procedures or types of procedures performed in the hospital,

c) Minimum number of facilities in the hospitals like beds, beds allocated to the particular department, equipment, departments and textbooks and journal subscriptions, and

d) Duties and responsibilities of resident trainees, expected accomplishments, activities or tasks performed.

Due to these requirements, accredited residency training programs is limited. Most of these programs are concentrated in Metro Manila. For general surgery in 1991, 31 hospitals in Metro Manila had accredited residency programs while only 24 hospitals were in areas outside Metro Manila. For internal medicine in 1990, there were 29 hospitals accredited in Metro Manila and 36 in areas outside. For pediatrics, there were 42

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[1] This was computed as simple averages of the passing rates of students from these schools. Better indicators would weigh the schools by the number of graduates. Source of basic data is the Professional Regulatory Commission.

accredited hospitals in Metro Manila and 33 in areas outside in 1991. Assuming that only a handful of residents is accommodated in these hospitals for the first year, then only a limited number of new board passers can get into residency slots.

As in location choice, only about a percent of physicians cited income considerations in their choice of specialty. However, income considerations have figured prominently in findings on physician specialty choice studies. Physicians' choice between general and specialty practice as well as choice among various specialties have been considered based on physicians' expected income or relative returns to particular choice made. To measure relative returns, studies used a number of variables, among them the ratio of mean net income of two specialties (Hadley 1979) and discounted present value of expected lifetime earnings (Hurley 1991, Bazzoli 1985). It has been hypothesized that these income variables are positively related to the choice of a particular specialty.

Most of the measures of economic returns to specialty, however, have been criticized for failing to adjust income according to hours worked which greatly vary among specialties. Hence, Langwell (1980) used mean incomes which have been adjusted for total annual hours worked for each type of physician.

Estimates of differences in physician earnings by specialty from the survey data are presented in Table 4.7. These estimates have been standardized for hours worked, although it can be argued that there may be different intensities in the hours worked by general practitioners and specialists. Earnings have further been divided into earnings from both patient care in hospitals and clinics. Total earnings for every patient care hour for physicians in the sample are highest for surgeons and obstetrician-gynecologists. These are followed by internists and pediatricians. Earnings of general practitioners are less than half of the amounts earned by surgeons. These trends confirm the observation that general practitioners earn low incomes, and surgical specialties earn higher incomes than primary care specialties.

These trends are repeated even as earnings in clinics and hospitals are observed. Pediatricians and surgeons seem to earn the highest incomes per hour spent in clinics. These trends may be due to services which pediatricians and surgeons perform like immunizations, ear holings and minor surgical procedures. Internists and obstetrician-gynecologists earn less than pediatricians and surgeons but more than general practitioners.

Looking at incomes from patient care in hospitals, it would seem that the obstetricians in the sample earn the most from hours spent in hospitals. Opposite the trend in the clinic, pediatricians earn the least among the specialties from patient care hours in hospitals. General practitioners earn nearly half or two-thirds the earnings of specialists.

These figures indicate that there are earnings differences between and among specialists and general practitioners. The extent to which these earnings differences affect specialty choice could be investigated further. These would require finer measures of income preferably considering the life cycle and years of practice of specialists and general practitioners.

Another reason cited has been the length of the training period (.7 percent of

Table 4.7

Total Earnings per Hour, Earnings from Clinics per Hour and Earnings from Hospital per Hour by Region and Specialty

Specialty	Region 2	7	10	NCR	All
A. Total Earnings/Total Patient Care Hours					
General Medicine	22.49	66.03	48.91	130.56	70.51
Internal Medicine	65.79	40.53	141.18	169.11	128.77
Obstetrician-Gynecologist	46.45	111.03	106.33	188.98	157.02
Pediatrician	27.66	98.71	144.78	154.21	131.48
Surgeon	-	80.09	74.88	246.27	184.45
B. Earnings in Clinics/Total Clinic Hours					
General Medicine	22.99	36.29	68.90	260.77	86.38
Internal Medicine	49.34	61.06	179.79	146.10	128.11
Obstetrician-Gynecologist	39.06	154.30	104.84	139.91	129.60
Pediatrician	35.71	105.68	476.59	229.60	242.80
Surgeon	-	51.56	59.66	207.77	181.31
C. Earnings in Hospitals/Total Hospital Hours					
General Medicine	84.82	254.27	-	567.74	299.29
Internal Medicine	-	137.90	625.23	626.95	475.29
Obstetrician-Gynecologist	-	348.14	465.35	732.86	604.79
Pediatrician	156.99	331.41	236.07	397.89	335.89
Surgeon	-	297.51	266.41	573.05	452.27

Source: DOH-PIDS Outpatient Clinic Survey

spondents). Considering the opportunity cost and forgone earnings involved in taking ecialty training, physicians' choice of specialty has been expected to be negatively related the length of training required of a specialization (Hurley 1991, Hadley 1979).

In addition to the reasons cited above, other hypothesized determinants of physician ecialty choice include age, gender, marital and family status and socioeconomic status.

Older physicians were expected to choose general practice rather than select a ecialization. Physicians who were older at the time of graduation or at the end of first ar of residency training may expect shorter working years and relatively lower lifetime rnings. Hence, general practice has been chosen over prolonged specialty training when pected lifetime earnings in specialty practice may not exceed the cost of specialization id lifetime earnings if he/she were to enter medical practice immediately as a general iysician. (Hurley 1991, Hadley 1979).

Female physicians have tended to choose specialties which require shorter training eriod, offer regular working hours and allow greater scheduling of time. This may be ecause of the demands of childbearing and rearing. In addition, female physicians have nded to avoid traditionally male-dominated specialties. Hence, specialties like sychiatry, radiology, or pathology, anesthesiology have been more attractive to female hysicians than other specialties like surgery (Hadley 1979, Hurley 1991).

Marital status has been usually used as proxy for marginal rate of time preference. hysicians who are married and had children have generally preferred present consumption an undertake longer specialty training. Therefore, it has been expected that these hysicians were more likely to choose general practice rather than specialize as compared) single physicians or even married physicians with no children at the time of graduation Hadley 1979, Hurley 1991)

Physicians who have come from higher socioeconomic status have had higher endencies to specialize relative to those from lower classes since (a) physicians with good conomic background have the available financial resources needed for longer specialty raining, and (b) physicians from higher socioeconomic origin may have a different rate of ime preference (i.e. forego current consumption to increase future consumption) (Rosko nd Broyles 1988, Bazzoli 1985).

Bazzoli (1985) used educational attainment of parents while Hadley (1979) used ccupation of father as measures of socioeconomic background. The higher the level of ducation the parents acquired, the more likely that the physician received non-primary are training. On the other hand, it was expected that physicians whose fathers were also n the medical profession or hold other professional or managerial positions, were more ikely to choose specialties with longer training periods than those whose fathers were blue-collar workers or unemployed.

Table 4.8 divides the sample of physicians into those whose parents are medical octors and those in other professions. Although there are no significant differences in the roportions of general practitioners and internists, obstetricians and pediatricians whose arents are physicians, the proportion of surgeons with parents who are doctors is higher

Table 4.8

Specialists by Occupation of Parents

	Non-MD	MD	Total
General Medicine	79 89.77	9 10.23	88
Internal Medicine	77 89.53	9 10.47	86
Obstetrician-Gynecologis	68 90.67	7 9.33	75
Pediatrician	72 91.14	7 8.86	79
Surgeon	45 84.91	8 15.09	53

Source: DOH-PIDS Outpatient Clinic Survey

an the rest of the other specialties. Specialization in surgery takes the longest time, 5 ears compared to three years for the other specialties. The effect of parent's education nd occupation could therefore have some effects on the choice of specialization of their octor children.

Physicians who came from small communities or non-metropolitan areas were ypothesized to choose general practice. This may have reflected physicians' exposure to eneral practice as a model of medical practice or a higher probability that he will be racticing in a similar community size (Hadley 1979).

1.3 CONCLUDING NOTES

The preceding analyses on physician location and specialty choice have tried to indicate whether these choices are affected by financial incentives. In the case of physician location, results of the probit model indicate that potential demand, income and cost of practice considerations are significant factors. In the case of specialty choices, earnings differences point to incentives to specialize.

Altering the financial incentives associated with particular locations or specialty choices could therefore influence the geographical and specialty distribution of physicians. However, careful evaluation of the design of such incentives is needed to ensure their cost-effectiveness.

The results presented in this section are limited. Finer estimates could be made with better data, more refined measures and the inclusion of omitted variables.

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APPENDIX A

PHYSICIAN SERVICES PRICES: TRENDS AND STRUCTURE

The following notes attempt to provide a description of the trends and structure of physician services prices in the Philippines. Some description of the levels of prices across regions, across room accommodation, and across hospital stations of physicians shall be presented.

Unlike other price statistics, data on physician prices are rather hard to come by inasmuch as the Department of Health does not monitor prices of private physician services. What are publicly available are data from the National Statistics Office (NSO) on fees for first consultation with a general practitioner. This is gathered as part of the construction of the price index for medical services. These data provide a rough indication of the levels and growth rates of physician prices across regions and across years. It may be noted however, that there are some years for which data for some regions are unavailable, or if not unreliable. This is understandable due to the difficulty in procuring realistic and reliable responses to queries on physician prices.

The NSO data are rather limited in that they only consider the price of initial outpatient consultations. However, there are other physician services such as inpatient visits and procedures which are performed in a hospital or outpatient setting. Unfortunately, data on these services are virtually unavailable or available only for limited time. To have an idea on the prices of these services, two other sources of data are resorted to. These are the WYATT Survey of Physician Fees for 1990-1992 and the Physician Rider to the Support Value Survey of 1990 of the Philippine Medical Care Commission.

The Wyatt Survey of Physician Fees has been conducted for three years now for the purpose of providing employers and employees with data with which to assess their health insurance benefits. The survey contains questions on current charges for outpatient visits, inpatient visits, and fees for selected procedures. However, the survey is limited to the Metro Manila area. During the first year of the survey, the sampling was concentrated on members of the Philippine College of Surgeons and the accredited physicians of HMOs. The second year survey included respondents from the first year, a sample from members of the Philippine College of Surgeons and affiliated physicians from leading private tertiary hospitals in Metro Manila. On the third year however, sampling was from respondents from the first two years, a sample from the Philippine Medical Association and physicians from five leading private tertiary hospitals.

The sampling procedure followed and the response rates resulted in differences in the number of respondents for each year. The first survey yielded 108 respondents, the second, 142 and the third, 165. The differences in the sampling procedure and composition have had significant implications on the results as will be shown later. While the respondents for the first two years can be considered as at the higher end of the market, respondents of the last year can be considered as being more varied.

The Physician Rider was part of the Support Value Survey that was conducted in 1990. The whole survey was aimed at assessing and monitoring the recent support value of the Medicare program. Physicians included in the sample were those who were stationed in the 316 sample hospitals of the survey. The department heads of the various departments of the hospital as well as randomly picked additional respondents per department were the sample points of the survey. These physicians were asked about their current charges for inpatient visits, outpatient consultations and a set of selected procedures. These resulted in encoded responses for 781 physicians. The total number of respondents was greater than those encoded. Some respondents did not substantially complete the questionnaire and these sample points were excluded. This is probably one of the reasons why there are only nine valid sample points from Metro Manila. The survey also suffered from a low response rate from the Metro Manila area.

For purposes of study, therefore, it was decided that the results of the PMCC for Metro Manila in considering the regional breakdown of prices would not be reported. The Wyatt Survey may therefore be considered as providing the information from Metro Manila subject to the considerations outlined earlier.

Several dimensions of physician prices can be considered in the analysis: levels, growth and structure. Structure in this context refers to the relationship of fees with fees for other services and with different fees charged for the same service at different room accommodation. What would follow is a descriptive analyses of some of the numbers. It is not the purpose of this note to make statements on the correctness of the levels since a lot of factors like disease mix, severity levels and difficulty of the case are not controlled for.

The 1980 NSO data show that the range of prices for an initial consultation with a general practitioner was P 10-15 excluding the NCR (Table A1 and Fig. A1). This reached about P 22-43 (without NCR) and P 22-70 (with NCR) in 1985, and P 35-97 in 1991. Of note is the relatively flat distribution of prices across the regions, save for the NCR which has the highest level of prices in all the years and among the regions. Higher levels of consultation fees are found in the relatively more prosperous regions of the country.

Table A2 shows the average inflation rates for 1981-85, 1986-91 and for the whole period for the same data. The first period was marked by double digit inflation rates followed by decelerated single-digit inflation rates in the second period. Save for regions 5-10, the rest of the Philippines experienced medical inflation rates which were greater than the average inflation rates for consumer prices. On the other hand for the second period, inflation rates for Metro Manila, regions 1, 3-6 and 9-12 fell below the general rate of inflation. Of note is the slower rate of inflation in areas with higher levels of fees (Fig. B2). While price movements in other areas seem to approximate the general increase in prices, movements of prices in the NCR may be due to factors other than increases in the cost of living.

A closer look at fees in Metro Manila can be had with Table 2.10 which shows minimum, maximum and average levels of initial, succeeding and post-confinement consultation fees. One notes the wide range of prices that can be charged for outpatient visits, i.e., from P 50 to about P 600 per initial visit, from P 20 to P 500 for succeeding visits and from P 25-200 for post-confinement visits for all practitioners in 1990.

According to physicians included in the Wyatt Survey, levels of fees have been varied in response to the patient's capacity to pay, the severity of the illness, and whether the patient is a regular patient or referred. In areas outside Metro Manila, fees for initial consultation have ranged from P 36 in Region 11 to P 65 in Region 8 in 1990 (Table A4). Maximum charges seem to vary by a larger extent than minimum charges.

Whether based on minimum, maximum or average fees, trends in Metro Manila and the other regions show that specialists charge higher fees than general practitioners and among specialists, primary care specialists such as pediatricians and obstetrician-gynecologists charge lower than other specialists like EENTs and opthalmologists (Table A5). Physicians who have sub-specialties also charge higher than those with none. See for instance the levels of fees of internists versus cardiologists.

Table A6 shows average consultation fees of physicians who have been stationed in different types and categories of hospitals. Average consultation fees increase with the category of the hospital where the physician is stationed or where he admits patients. Differences in the ownership of the hospital do not seem to cause significant variations in outpatient initial fees.

Trends in succeeding and post-confinement fees essentially follow the trends in initial fees.

Table A7 shows the growth of outpatient consultation fees of practitioners in Metro Manila. Initially, this table was supposed to show the rate of inflation of professional fees. It would seem that minimum, maximum and average professional fees for outpatient consultations for some professionals have decreased in 1992, and the rate of growth for some professionals has decreased. These movements are specially apparent in the case of pediatricians and internists.

However, these observations should be qualified by the fact that there have been significant changes in the profile of participants in the survey. For instance, the average years of experience of all respondents were 26, 26 and 22 years for the 1990, 1991 and 1992 surveys, respectively. For pediatricians, the average age of respondents were 39, 29 and 20 years, respectively. Not only were there changes in the average years of experience; latter surveys included physicians affiliated with hospitals other than the bigger tertiary hospitals, and included physicians from public as well as private hospitals. Therefore the movements in average prices may therefore be a combination of pure price increases as well as changes in the characteristics of the respondents.

Tables A8 and A4-A6 show the structure of outpatient consultation fees. Succeeding and post-confinement fees are usually smaller than initial fees. From the PMCC data, subsequent fees are about 80% of initial fees. General practitioner subsequent fees are about three-fourths of initial fees while those of specialists are higher. There seems to be no pattern of variation with respect to the proportion of initial to subsequent fees across regions and hospital type. Subsequent to initial fees are higher as the category of the hospital increases.

Different kinds of modalities apply in the determination of inpatient visit rates.

Some practitioners do not charge separate visit fees from the professional fees of a procedure while some charge for visits and procedures separately. Some practitioners apply the same rate for visits regardless of room accommodation of the patient while the more common mode is for practitioners to charge according to the room accommodation of the patient. In fact some practitioners determine their charges as a percentage of the room rate.

Tables A9 and A10 show levels of inpatient consultation fees for Metro Manila and for the regions by room accommodation, respectively. Inpatient visits are on average P 144-185 in 1990-92 for ward patients, P 209-254 for semi-private patients, P 254-304 for private room patients and P 563-751 for large suite patients in Metro Manila. Minimum fees for ward visits are approximately the same as initial outpatient consultation fees.

In the other regions, inpatient consultation fees range from about P 30-87 for wards and by about P 120-490 for suites in 1990. Highest fees for private rooms are found in Regions 3 to 7 (Figure A3). However, it can be noted that highest fees in private rooms do not necessarily translate to higher fees in wards. This is particularly apparent in Region 7 where ward fees are relatively low and yet private room fees are higher.

Looking at inpatient consultation fees by specialty, the same pattern of increasing fees as specialization increases is apparent (Table A11). These trends are more noticeable among Metro Manila physicians. Furthermore, the differences between specialties are more obvious as the room accommodation goes from ward to suite. Figure A4 which has inpatient consultation fees for ward and private room by specialty shows that fees seem to increase by a certain multiple, and this does not seem to differ by much from specialty to specialty.

Inpatient consultation fees increase with increases in the hospital station of the physician (Table A12). However, charges for suite are relatively similar across primary and tertiary hospitals while the sample physicians stationed in secondary hospitals charged relatively lower. Physicians in private hospitals charged higher than those in public hospitals, with the difference in the fees being magnified as one goes from ward to suite.

Average inpatient consultation fees for private room range from about twice to about thrice of ward consultation fees (Table A13) in the regions of the country in 1990. In Metro Manila, the multiples are slightly lower, ranging from about one to about two times the ward fees (Table A14). The same lower trends in multiples of ward fees can be observed for inpatient consultation fees for suites. On average, fees for suites range from about twice to six times those of ward fees in the other regions of the country. On the other hand, these are from about one to four times in Metro Manila. Looking at Metro Manila multiples, maximum fees for suites can go as high as four to about eight times maximum ward fees.

There does not seem to be any systematic variation in the multiple of inpatient consultation fees for private and suite across specialties (Figure A5 and Table A15). Across hospital categories and types, the multiplier of ward fees to private room fees increases as the category of the hospital increases (Table A16). However, the same is r true for the multiplier of ward to suite consultation fees. The multiple of ward to private room consultation fee is lower for private hospitals than for public hospitals although the corresponding multiple of ward to suite are relatively equal for the two types of hospitals.

Aside from outpatient and inpatient consultations, physicians also perform special procedures either in an outpatient or inpatient setting. For these services, physicians also charge professional fees. More often than not, inpatient consultations are linked to or follow the performance of these procedures. For some physicians therefore, fees for inpatient consultations and outpatient post-confinement consultations are usually included in the total price of the procedure. For some physicians however, there are separate charges for consultation fees and for the procedures.

To have an idea of the trends in prices of physician procedures, four procedures were selected. There are three surgical procedures as well as an obstetric procedure. These are tonsillectomy (surgical excision of the tonsil), appendectomy (surgical removal of the vermiform appendix), cholecystectomy (surgical removal of the gall bladder) and caesarean section (abdominal operation to remove an infant from the womb). The bases for choosing the four include availability of data and their relatively common occurrence.

Tables A18 and A19 show the fees and the structure for selected procedures in Metro Manila for 1990-1992 by room accommodation. Average fees of sample physicians for tonsillectomy ranged from P 2,500 (ward) to about P 5,000 (large suite) in 1990, P 3,200 to P 7,000 in 1991 and P 3,800 to about P 6,500 in 1992. Average fees for appendectomy ranged from P 3,600 (ward) to P 8,000 (suite) in 1990, P 4,000 to P 9,000 in 1991 and P 4,500 to P 9,700 in 1992. For cholecystectomy, average fees ranged from P 6,000 to P 14,000 in 1990, from P 7,000 to P 16,700 in 1991 and from P 8,200 to P 19,000 in 1992, from ward accommodation to suite accommodation. For caesarean section, average fees were P 5,200 to 11,400 in 1990, from P 6,400 to P 13,300 in 1991 and P 6,500 to P 13,00 in 1992.

Of note is the similarity in the structure of these fees with respect to patient accommodation. For patients accommodated in private rooms, professional fees are usually 1.25 to 1.5 times those of patients in wards. For patients in suites, average fees are usually twice those of wards.

It was noted earlier that data from the Wyatt Surveys are poor indicators of inflation in medical prices due to a change in the sample composition. Looking at selected procedures, however, it is apparent that despite the change in physician composition, there are increases in the average fees of selected procedures for 1990-1992 (Table A20). The rates of change are lower in 1992 than in 1991, though.

Regional data from the PMCC do not differentiate fees by room accommodation. Reported fees may therefore be average fees already. Table A21 and Figure A6 are fees for selected procedures in 1990. Fees for selected procedures in the regions are lower than those in Metro Manila for the same year. Fees for tonsillectomy ranged from P 530 to P 3,750, P 1,000 to about P 3,000 for appendectomy, P 1,300 to 8,000 for cholecystectomy and P 1,600 to 4,000 for caesarean section. Regions 6, 7, and 12 have relatively higher fees than the other regions. Regions 2, 8 and 10 have lowest fees relative to the rest.

Table A22 details fees for selected procedures according to the specialty of the provider. A tonsillectomy performed by an EENT is priced higher than that performed by a surgeon. Appendectomies performed by general practitioners are priced lower than those of OB-Gynes, which are in turn lower than those performed by surgeons. This is the opposite of caesarean sections for which those performed by OB-Gynes are priced higher than those of surgeons and general practitioners.

Table A23 presents fees for selected procedures according to the hospital station of the providers. As the category of the hospital increases, so do the fees charged for selected procedures. Physicians in private hospitals charge higher for procedures than those in public hospitals.

Table A1

Medical Charge, First Consultation, General Practitioner
(in pesos)

	REGION	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
NCR	Metro Manila	n.d.	n.d.	n.d.	n.d.	n.d.	70.00	81.88	82.50	82.50	82.50	82.50	96.72
1	Ilocos	10.90	13.39	18.99	22.68	33.10	43.33	41.67	41.49	42.68	43.49	44.50	47.30
2	Cagayan Valley	10.80	11.94	15.88	18.33	23.65	26.88	27.13	27.94	30.68	35.36	42.85	47.99
3	Central Luzon	15.83	19.03	25.50	27.80	34.33	41.04	46.04	47.50	50.25	49.70	51.57	59.64
4	Southern Tagalog	13.75	14.11	18.88	21.88	28.83	31.21	32.46	33.83	36.03	38.06	42.80	50.83
5	Bicol	10.63	15.65	16.35	19.90	24.17	29.35	30.87	33.18	35.02	36.31	39.23	45.90
6	Western Visayas	15.18	16.66	17.02	18.58	23.75	32.25	34.25	34.50	36.88	35.85	44.37	59.32
7	Central Visayas	13.25	13.42	18.75	19.50	25.13	26.38	28.06	29.63	29.63	31.99	36.45	43.94
8	Eastern Visayas	10.40	12.50	15.05	15.60	18.93	22.93	25.05	25.20	27.00	29.07	31.46	39.90
9	Western Mindanao	12.33	16.00	15.00	15.31	16.67	22.22	25.25	26.86	27.65	27.62	30.85	36.64
10	Northern Mindanao	12.11	14.00	14.76	17.29	21.54	22.51	23.61	24.45	24.70	26.12	28.49	35.97
11	Southern Mindanao	11.75	12.83	16.08	18.13	29.58	31.03	31.00	32.50	32.58	33.20	35.12	40.93
12	Central Mindanao	12.90	14.38	13.75	16.62	27.50	31.00	32.75	35.83	38.60	39.55	44.63	50.25

Notes: n.d. - no data
U/D - Unreliable data

Sources: Figures for years 1980-1988, CRC Factbook
Figures for years 1989-1991, Prices Division, National Statistics Office

Table A2

Average Inflation Rates
Medical Charge, First Consultation, General Practitioner

	REGION	AVERAG 1981-85	AVERAG 1986-91	AVERAG 1981-91
NCR	Metro Manila	-	5.83	5.83 /1
1	Ilocos	32.18	1.52	15.46
2	Cagayan Valley	20.33	10.36	14.89
3	Central Luzon	21.25	6.58	13.25
4	Southern Tagalog	18.47	8.60	13.08
5	Bicol	23.28	7.82	14.85
6	Western Visayas	16.93	11.41	13.92
7	Central Visayas	15.77	9.07	12.12
8	Eastern Visayas	17.35	9.95	13.31
9	Western Mindanao	13.55	8.88	11.01
10	Northern Mindanao	13.45	8.43	10.71
11	Southern Mindanao	23.07	4.87	13.14
12	Central Mindanao	21.23	8.45	14.26
Consumer Price Index				
Philippines		18.2	9.4	13.4
Metro Manila		20.4	11.6	15.6
Areas Outside Metro Manila		18.2	9.3	13.3

/1 1986-1991 only

Sources: 1980-1988, CRC Health Care Factbook
1989-1991, National Statistics Office

Table A3

Outpatient Consultation Fees of Medical Practitioners in Metro Manila, 1990-1992
(Pesos per visit)

SPECIALTY	INITIAL			SUCCEEDING			POST-CONFINEMENT		
	Min.	Max.	Ave.	Min.	Max.	Ave.	Min.	Max.	Ave.
1. All practitioners									
1990	50	600	131	20	500	96	25	200	95
1991	50	600	168	25	600	126	50	400	124
1992	20	600	160	20	600	120	20	500	119
2. General Surgery									
1990	50	250	121	50	150	86	50	150	87
1991	50	300	138	25	250	106	50	250	110
1992	50	400	144	25	200	114	50	200	107
3. Obstetrics-Gynecology									
1990	50	300	113	20	150	76	30	150	78
1991	50	300	134	50	200	95	50	200	100
1992	50	350	134	30	250	95	50	250	101
4. Opthalmology									
1990	50	600	152	40	500	114	100	120	103
1991	100	600	188	80	600	151	80	400	140
1992	100	600	228	100	600	188	130	250	182
5. Orthopedics									
1990	100	200	150	100	150	114	50	120	93
1991	150	200	195	100	150	130	100	150	125
1992	-	-	-	-	-	-	-	-	-
6. Otorhinolaryngology (ENT)									
1990	100	200	131	100	150	118	100	150	118
1991	100	300	178	100	200	146	120	200	161
1992	120	200	168	100	200	142	-	-	-
7. Pediatrics									
1990	100	250	138	100	250	140	100	250	130
1991	80	300	175	70	300	135	70	300	139
1992	60	500	139	30	500	113	30	500	110
8. General Medicine									
1990	-	-	-	-	-	-	-	-	-
1991	-	-	-	-	-	-	-	-	-
1992	20	300	97	20	150	72	20	100	77
9. Internal medicine									
1990	-	-	-	-	-	-	-	-	-
1991	150	300	212	100	250	161	100	250	161
1992	50	300	151	50	250	123	50	250	119

urce: Wyatt Survey of Physician Fees, 1990, 1991 and 1992

Table A4

Average Outpatient Consultation Fees, 1990
By Region (in Pesos)

Region / 1	Initial Consultation	Subsequent Consultation	Subsequent / Initial (Ave.)
1 Ilocos Region	47.75	35.98	0.88
2 Cagayan Valley	45.56	32.08	0.71
3 Central Luzon	59.23	48.50	0.83
4 Southern Tagalog	50.33	45.75	0.88
5 Bicol Region	51.03	33.75	0.66
6 Western Visayas	61.92	39.58	0.69
7 Central Visayas	54.76	35.83	0.66
8 Eastern Visayas	65.33	66.79	0.97
9 Western Mindanao	47.67	33.89	0.64
10 Northern Mindanao	37.35	25.00	0.68
11 Southern Mindanao	36.47	31.69	0.91
12 Central Mindanao	61.57	40.74	0.68

/ 1 Results for NCR were not included due to only eight sample points.

Source: PMCC, Physician Rider of the 1990 Support Value Survey

Table A5

Average Outpatient Consultation Fees, 1990
By Specialty (in Pesos)

Specialty	Initial Consultation	Subsequent Consultation	Subsequent / Initial (Ave.)
Anesthesiology	42.08	39.09	1.03
Cardiology	78.18	53.75	0.71
General Practice	41.16	29.19	0.75
Internal Medicine	61.16	52.86	0.85
EENT	59.00	56.43	1.01
Obstetrics-Gynecology	51.21	42.89	0.83
Pediatrics	49.40	40.94	0.85
Surgery	53.18	38.90	0.78
Traumatology	56.67	36.67	0.67

Source: PMCC, Physician Rider of the 1990 Support Value Survey

Table A6

Average Outpatient Consultation Fees, 1990
By Hospital Category and Type (in Pesos)

	Initial Consultation	Subsequent Consultation	Subsequent / Initial (Ave.)
Hospital Category			
Primary	40.76	28.97	0.73
Secondary	47.17	36.32	0.79
Tertiary	59.60	49.51	0.89
Type of Hospital			
Public	48.10	40.91	0.88
Private	49.37	38.47	0.80

Source: PMCC, Physician Rider of the 1990 Support Value Survey

Table A7

Growth of Outpatient Consultation Fees of Medical Practitioners in Metro Manila, 1991-92
(In percent)

SPECIALTY	INITIAL			SUCCEEDING			POST-CONFINEMENT		
	Min.	Max.	Ave.	Min.	Max.	Ave.	Min.	Max.	Ave.
1. All practitioners									
1991	0.00	0.00	28.24	25.00	20.00	31.25	100.00	100.00	30.53
1992	-60.00	0.00	-4.76	-20.00	0.00	-4.76	-60.00	25.00	-4.03
2. General Surgery									
1991	0.00	20.00	14.05	-50.00	66.67	23.26	0.00	66.67	26.44
1992	0.00	33.33	4.35	0.00	-20.00	7.55	0.00	-20.00	-2.73
3. Obstetrics-Gynecology									
1991	0.00	0.00	18.58	150.00	33.33	25.00	66.67	33.33	28.21
1992	0.00	16.67	0.00	-40.00	25.00	0.00	0.00	25.00	1.00
4. Opthalmology									
1991	100.00	0.00	23.68	100.00	20.00	32.46	-20.00	233.33	35.92
1992	0.00	0.00	21.28	25.00	0.00	24.50	62.50	-37.50	30.00
5. Orthopedics									
1991	50.00	0.00	30.00	0.00	0.00	14.04	100.00	25.00	34.41
1992	-	-	-	-	-	-	-	-	-
6. Otorhinolaryngology (ENT)									
1991	0.00	50.00	35.88	0.00	33.33	23.73	20.00	33.33	36.44
1992	20.00	-33.33	-5.62	0.00	0.00	-2.74	-	-	-
7. Pediatrics									
1991	-20.00	20.00	26.81	-30.00	20.00	-3.57	-30.00	20.00	6.92
1992	-25.00	66.67	-20.57	-57.14	66.67	-16.30	-57.14	66.67	-20.86
8. General Medicine									
1991	-	-	-	-	-	-	-	-	-
1992	-	-	-	-	-	-	-	-	-
9. Internal medicine									
1991									
1992	-66.67	0.00	-28.77	-50.00	0.00	-23.60	-50.00	0.00	-26.09

Source: Wyatt Survey of Physician Fees, 1990, 1991 and 1992

Table A8

Structure of Outpatient Consultation Fees of Medical Practitioners in Metro Manila, 1990-92

SPECIALTY	SUCCEEDING / INITIAL			POST-CONFINEMENT / INITIAL		
	Minimum	Maximum	Average	Minimum	Maximum	Average
1. All practitioners						
1990	0.40	0.83	0.73	0.50	0.33	0.73
1991	0.50	1.00	0.75	1.00	0.67	0.74
1992	1.00	1.00	0.75	1.00	0.83	0.99
2. General Surgery						
1990	1.00	0.60	0.71	1.00	0.60	0.72
1991	0.50	0.83	0.77	1.00	0.83	0.80
1992	0.50	0.50	0.79	2.00	1.00	0.94
3. Obstetrics-Gynecology						
1990	0.40	0.50	0.67	0.60	0.50	0.69
1991	1.00	0.67	0.71	1.00	0.67	0.75
1992	0.60	0.71	0.71	1.67	1.00	1.06
4. Opthalmology						
1990	0.80	0.83	0.75	2.00	0.20	0.68
1991	0.80	1.00	0.80	0.80	0.67	0.74
1992	1.00	1.00	0.82	1.30	0.42	0.97
5. Orthopedics						
1990	1.00	0.75	0.76	0.50	0.60	0.62
1991	0.67	0.75	0.67	0.67	0.75	0.64
1992	-	-	-	-	-	-
6. Otorhinolaryngology (ENT)						
1990	1.00	0.75	0.90	1.00	0.75	0.90
1991	1.00	0.67	0.82	1.20	0.67	0.90
1992	0.83	1.00	0.85			
7. Pediatrics						
1990	1.00	1.00	1.01	1.00	1.00	0.94
1991	0.88	1.00	0.77	0.88	1.00	0.79
1992	0.50	1.00	0.81	1.00	1.00	0.97
8. General Medicine						
1990	-	-	-	-	-	-
1991	-	-	-	-	-	-
1992	1.00	0.50	0.74	1.00	0.67	1.07
9. Internal Medicine						
1990	-	-	-	-	-	-
1991	0.67	0.83	0.76	0.67	0.83	0.76
1992	1.00	0.83	0.81	1.00	1.00	0.97

Source: Wyatt Survey of Physician Fees, 1990, 1991 and 1992

(Pesos per Visit)

SPECIALTY	WARD			SEMI-PRIVATE ROOM			PRIVATE ROOM			SMALL (REGULAR) SUITE			LARGE (EXECUTIVE) SUITE		
	Min.	Max.	Ave.	Min.	Max.	Ave.	Min.	Max.	Ave.	Min.	Max.	Ave.	Min.	Max.	Ave.
1. All practitioners															
1990	50	300	144	50	500	209	100	750	304	100	1500	437	100	1950	563
1991	80	500	183	100	500	252	100	900	357	100	1450	502	100	4000	661
1992	30	600	185	30	800	254	50	1000	254	50	2000	546	50	3300	751
2. General Surgery															
1990	50	250	139	70	380	201	100	610	294	140	1500	436	200	1500	520
1991	100	350	156	100	450	219	100	600	322	200	1000	450	200	1500	54[illegible]
1992	50	500	198	100	800	280	100	1000	411	100	1500	599	100	2475	820
3. Obstetrics-Gynecology															
1990	50	210	122	75	300	168	100	400	227	100	700	302	100	800	335
1991	80	300	145	100	380	201	100	590	267	150	745	361	200	1400	461
1992	80	250	157	100	380	221	150	750	315	200	1100	417	200	1400	524
4. Opthalmology															
1990	50	300	178	100	400	253	150	500	343	200	1000	510	200	1500	590
1991	150	500	270	200	500	350	200	900	470	200	1000	610	200	4000	1010
1992	100	400	284	300	500	381	350	700	531	400	1000	692	400	2000	1150
5. Orthopedics															
1990	50	250	150	50	250	175	100	350	238	150	400	300	150	400	300
1991	100	250	169	100	320	224	100	520	287	100	1450	530	100	1950	640
1992	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
6. Otorhinolaryngology (ENT)															
1990	100	202	152	200	261	210	250	410	346	250	800	536	250	860	580
1991	100	300	224	150	400	281	150	590	382	150	825	488	200	990	583
1992	100	300	200	150	300	250	150	400	312	150	500	388	200	500	425
7. Pediatrics															
1990	150	195	163	200	350	281	250	602	455	300	840	658	300	1950	1212
1991	100	350	200	150	500	280	200	535	388	300	800	534	400	1000	615
1992	100	300	168	100	400	224	150	700	347	200	1000	500	200	3300	680
8. General Medicine															
1990	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1991	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1992	30	400	139	30	400	148	50	440	202	50	990	306	50	3300	464
9. Internal Medicine															
1990	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1991	150	300	212	200	400	299	300	520	402	300	1450	688	400	1950	1062
1992	80	300	174	100	400	223	100	600	346	100	1450	573	100	1950	727

Source: Wyatt Survey of Physician Fees, 1990, 1991 and 1992

Table A10

Average Inpatient Consultation Fees, 1990
By Region (in Pesos)

Region / 1	Ward	Payward	Private	Suite
1 Ilocos Region	87.50	66.62	122.81	190.31
2 Cagayan Valley	36.94	58.33	119.67	170.00
3 Central Luzon	79.17	79.34	145.25	227.08
4 Southern Tagalog	72.36	86.29	166.35	254.27
5 Bicol Region	49.22	69.10	156.49	483.95
6 Western Visayas	40.00	75.87	160.00	288.89
7 Central Visayas	56.47	71.40	173.20	332.31
8 Eastern Visayas	28.96	30.27	106.20	120.00
9 Western Mindanao	46.25	49.67	85.63	120.00
10 Northern Mindanao	36.88	42.63	75.00	129.00
11 Southern Mindanao	42.38	55.82	102.37	208.33
12 Central Mindanao	70.83	87.65	135.34	193.75

/ 1 Results for NCR were not included due to only eight sample points.

Source: PMCC, Physician Rider of the 1990 Support Value Survey

Table A11

Average Inpatient Consultation Fees, 1990
By Specialty (in Pesos)

Specialty	Ward	Payward	Private	Suite
Anesthesiology	42.89	44.45	68.24	214.00
Cardiology	59.00	90.45	198.00	290.00
General Practice	47.65	58.32	116.57	209.65
Internal Medicine	56.67	75.27	149.72	223.33
EENT	61.50	72.14	130.63	816.00
Obstetrics-Gynecology	64.11	79.54	139.30	209.75
Pediatrics	65.45	80.48	134.67	222.10
Surgery	62.45	63.68	134.38	229.17
Traumatology	42.50	56.67	133.33	183.33

Source: PMCC, Physician Rider of the 1990 Support Value Survey

Table A12

Average Inpatient Consultation Fees, 1990
By Hospital Category and Type (in Pesos)

	Ward	Payward	Private	Suite
Hospital Category				
Primary	46.51	61.07	105.71	257.73
Secondary	59.17	62.61	116.25	207.59
Tertiary	63.31	77.13	167.08	252.05
Type of Hospital				
Public	41.13	45.26	78.54	165.50
Private	60.78	73.64	140.35	243.88

Source: PMCC, Physician Rider of the 1990 Support Value Survey

Table A13

Structure of Average Inpatient Consultation Fees, 1990
By Region

Region / 1	Private / Ward	Suite / Ward
1 Ilocos Region	1.98	2.03
2 Cagayan Valley	2.84	3.84
3 Central Luzon	2.22	2.81
4 Southern Tagalog	2.63	4.29
5 Bicol Region	2.95	6.24
6 Western Visayas	2.79	3.47
7 Central Visayas	2.80	5.33
8 Eastern Visayas	3.84	3.43
9 Western Mindanao	1.90	-
10 Northern Mindanao	2.08	4.03
11 Southern Mindanao	2.03	4.09
12 Central Mindanao	2.01	2.35

/ 1 Results for NCR were not included due to only eight sample poin

Source: PMCC, Physician Rider of the 1990 Support Value Survey

Table A14

Structure of Inpatient Consultation Fees of Medical Practitioners in Metro Manila, 1990-1992

	SEMI-PRIVATE ROOM / WARD			PRIVATE ROOM / WARD			SMALL (REGULAR) SUITE / WARD			LARGE (EXECUTIVE) SUITE/ WARD		
PECIALTY	Minimum	Maximum	Average	Minimum	Maximum	Average	Minimum	Maximum	Average	Minimum	Maximum	Average
actioners												
1990	1.00	1.67	1.45	2.00	2.50	2.11	2.00	5.00	3.03	2.00	6.50	3.91
1991	1.25	1.00	1.38	1.25	1.80	1.95	1.25	2.90	2.74	1.25	8.00	3.61
1992	1.00	1.33	1.37	1.67	1.25	1.00	1.00	2.00	2.15	1.00	1.65	1.38
al Surgery												
1990	1.40	1.52	1.45	2.00	2.44	2.12	2.80	6.00	3.14	4.00	6.00	3.74
1991	1.00	1.29	1.40	1.00	1.71	2.06	2.00	2.86	2.88	2.00	4.29	3.47
1992	2.00	1.60	1.41	1.00	1.25	1.47	1.00	1.50	1.46	1.00	1.65	1.37
trics-Gynecology												
1990	1.50	1.43	1.38	2.00	1.90	1.86	2.00	3.33	2.48	2.00	3.81	2.75
1991	1.25	1.27	1.39	1.25	1.97	1.84	1.88	2.48	2.49	2.50	4.67	3.18
1992	1.25	1.52	1.41	1.50	1.97	1.43	1.33	1.47	1.32	1.00	1.27	1.26
thology												
1990	2.00	1.33	1.42	3.00	1.67	1.93	4.00	3.33	2.87	4.00	5.00	3.31
1991	1.33	1.00	1.30	1.33	1.80	1.74	1.33	2.00	2.26	1.33	8.00	3.74
1992	3.00	1.25	1.34	1.17	1.40	1.39	1.14	1.43	1.30	1.00	2.00	1.66
pedics												
1990	1.00	1.00	1.17	2.00	1.40	1.59	3.00	1.60	2.00	3.00	1.60	2.00
1991	1.00	1.28	1.33	1.00	2.08	1.70	1.00	5.80	3.14	1.00	7.80	3.79
1992	-	-	-	-	-	-	-	-	-	-	-	-
inolaryngology (ENT)												
1990	2.00	1.29	1.44	2.50	2.03	2.28	2.50	3.96	3.54	2.50	4.26	3.88
1991	1.50	1.33	1.25	1.50	1.97	1.71	1.50	2.75	2.18	2.00	3.30	2.51
1992	1.50	1.00	1.25	1.00	1.33	1.25	1.00	1.25	1.24	1.33	1.00	1.10
trics												
1990	1.33	1.79	1.72	1.67	3.09	2.79	2.00	4.31	4.04	2.00	10.00	7.44
1991	1.50	1.43	1.40	2.00	1.53	1.94	3.00	2.29	2.67	4.00	2.86	3.08
1992	1.00	1.33	1.33	1.50	1.75	1.55	1.33	1.43	1.44	1.00	3.30	1.36
al Medicine												
1990	-	-	-	-	-	-	-	-	-	-	-	-
1991	-	-	-	-	-	-	-	-	-	-	-	-
1992	1.06	1.00	1.06	1.67	1.10	1.36	1.00	2.25	1.51	1.00	3.33	1.58
Medicine												
1990	-	-	-	-	-	-	-	-	-	-	-	-
1991	1.33	1.33	1.41	2.00	1.73	1.90	2.00	4.83	3.25	2.67	6.50	5.01
1992	1.25	1.33	1.28	1.00	1.50	1.55	1.00	2.42	1.66	1.00	1.34	1.27

Wyatt Survey of Physician Fees, 1990, 1991 and 1992

Table A15

Structure of Average Inpatient Consultation Fees, 1990
By Specialty

Specialty	Private / Ward	Suite / Ward
Anesthesiology	1.64	3.83
Cardiology	2.94	4.86
General Practice	2.40	3.52
Internal Med.	2.77	3.39
EENT	1.85	9.36
Ob-Gyne	2.37	3.25
Pediatrics	1.97	3.59
Surgery	2.73	3.74
Traumatology	2.21	3.43

Source: PMCC, Physician Rider of the 1990 Support Value Survey

Table A16

Structure of Average Inpatient Consultation Fees, 1990
By Hospital Category and Type

	Private / Ward	Suite / Ward
Hospital Category		
Primary	1.98	4.27
Secondary	2.47	3.02
Tertiary	2.76	4.10
Type of Hospital		
Public	2.96	3.76
Private	2.35	3.75

Source: PMCC,
Physician Rider of the 1990 Support Value Survey

Growth of Inpatient Consultation Fees of Medical Practitioners in Metro Manila, 1990-1992
(In percent)

SPECIALTY	WARD			SEMI-PRIVATE ROOM			PRIVATE ROOM			SMALL (REGULAR) SUITE			LARGE (EXECUTIVE) SUITE		
	Min.	Max.	Ave.	Min.	Max.	Ave.	Min.	Max.	Ave.	Min.	Max.	Ave.	Min.	Max.	Ave.
1. All practitioners															
1991	60.00	66.67	27.08	100.00	0.00	20.57	0.00	20.00	17.43	0.00	-3.33	14.87	0.00	105.13	17.41
1992	-62.50	20.00	1.09	-70.00	60.00	0.79	-50.00	11.11	-28.85	-50.00	37.93	8.76	-50.00	-17.50	13.62
2. General Surgery															
1991	100.00	40.00	12.23	42.86	18.42	8.96	0.00	-1.64	9.52	42.86	-33.33	3.21	0.00	0.00	4.04
1992	-50.00	42.86	26.92	0.00	77.78	27.85	0.00	66.67	27.64	-50.00	50.00	33.11	-50.00	65.00	51.57
3. Obstetrics-Gynecology															
1991	60.00	42.86	18.85	33.33	26.67	19.64	0.00	47.50	17.62	50.00	6.43	19.54	100.00	75.00	37.61
1992	0.00	-16.67	8.28	0.00	0.00	9.95	50.00	27.12	17.98	33.33	47.65	15.51	0.00	0.00	13.67
4. Opthalmology															
1991	200.00	66.67	51.69	100.00	25.00	38.34	33.33	80.00	37.03	0.00	0.00	19.61	0.00	166.67	71.19
1992	-33.33	-20.00	5.19	50.00	0.00	8.86	75.00	-22.22	12.98	100.00	0.00	13.44	100.00	-50.00	13.86
5. Orthopedics															
1991	100.00	0.00	12.67	100.00	28.00	28.00	0.00	48.57	20.59	-33.33	262.50	76.67	-33.33	387.50	113.33
1992	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
6. Otorhinolaryngology (ENT)															
1991	0.00	48.51	47.37	-25.00	53.26	28.31	-40.00	43.90	10.40	-40.00	3.13	-9.29	-20.00	15.12	-4.41
1992	0.00	0.00	-10.71	0.00	-25.00	-11.03	0.00	-32.20	-18.32	0.00	-39.39	-20.49	0.00	-49.49	-24.51
7. Pediatrics															
1991	-33.33	79.49	22.70	-25.00	42.86	-0.36	-20.00	-11.13	-14.73	0.00	-4.76	-18.84	33.33	-48.72	-49.26
1992	0.00	-14.29	-16.00	-33.33	-20.00	-20.00	-25.00	30.84	-10.57	-33.33	25.00	-6.37	-50.00	230.00	10.57
8. General Medicine															
1991	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1992	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
9. Internal Medicine															
1991	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1992	-46.67	0.00	-17.92	-50.00	0.00	-25.42	-66.67	15.38	-13.93	-66.67	0.00	-16.72	-75.00	0.00	-31.54

Table A18

Fees for Selected Procedures of Medical Practitioners In Metro Manila, 1990-1992 /1
(Pesos per Procedure)

PROCEDURE	WARD			SEMI-PRIVATE ROOM			PRIVATE ROOM			SMALL (REGULAR) SUITE			LARGE (EXECUTIVE) SUITE		
	Min.	Max.	Ave.	Min.	Max.	Ave.	Min.	Max.	Ave.	Min.	Max.	Ave.	Min.	Max.	Ave.
TONSILLECTOMY															
1990	800	4,000	2,521	1,000	4,000	2,813	1,500	5,000	3,583	2,200	6,000	4,225	3,000	10,000	5,333
1991	1,500	5,000	3,231	2,000	7,000	3,846	3,000	8,000	5,038	3,000	10,000	5,885	4,000	15,000	7,077
1992	2,000	6,000	3,875	1,000	6,000	3,889	1,500	7,000	4,778	2,000	8,000	5,611	3,000	10,000	6,500
APPENDECTOMY															
1990	1,000	6,000	3,664	1,300	8,000	4,228	2,000	10,000	5,409	2,000	12,000	6,712	2,000	15,000	8,230
1991	1,000	7,000	4,154	1,500	10,000	5,223	2,500	10,000	6,339	2,500	15,000	7,726	2,500	20,000	9,167
1992	1,500	10,000	4,593	1,500	10,000	5,473	1,500	10,000	6,732	1,500	15,000	8,348	1,500	20,000	9,705
CHOLECYSTECTOMY															
1990	3,000	15,000	6,242	3,200	15,000	7,195	4,500	20,000	8,875	5,000	25,000	11,132	5,000	30,000	14,146
1991	1,500	15,000	7,240	2,000	17,000	8,649	3,000	25,000	10,923	3,000	30,000	13,637	3,000	30,000	16,762
1992	5,000	20,000	8,278	2,500	20,000	9,804	5,000	23,000	12,446	5,000	35,000	15,429	5,000	40,000	19,018
CAESAREAN SECTION															
1990	2,000	9,000	5,246	3,000	10,000	6,323	3,500	15,000	7,902	4,000	20,000	9,661	4,000	20,000	11,429
1991	3,000	10,000	6,430	4,000	15,000	7,477	5,000	15,000	8,809	5,500	20,000	10,789	6,000	20,000	13,344
1992	3,000	15,000	6,538	3,500	15,000	7,493	4,500	20,000	9,229	5,500	20,000	11,271	6,500	25,000	13,329

/1 Quoted fees are for all practitioners who responded to the particular question
Source: Wyatt Survey of Physician Fees, 1990, 1991 and 1992

Table A19

Structure of Fees for Selected Procedures of Medical Practitioners in Metro Manila, 1990-1992 /1

PROCEDURE	SEMI-PRIVATE ROOM / WARD			PRIVATE ROOM / WARD			SMALL (REGULAR) SUITE/ WARD			LARGE (EXECUTIVE) SUITE/ WARD		
	Min.	Max.	Ave.	Min.	Max.	Ave.	Min.	Max.	Ave.	Min.	Max.	Ave.
TONSILLECTOMY												
1990	1.25	1.00	1.12	1.88	1.25	1.42	2.75	1.50	1.68	3.75	2.50	2.12
1991	1.33	1.40	1.19	2.00	1.60	1.56	2.00	2.00	1.82	2.67	3.00	2.19
1992	0.50	1.00	1.00	1.50	1.17	1.23	1.33	1.14	1.17	1.50	1.25	1.16
APPENDECTOMY												
1990	1.30	1.33	1.15	2.00	1.67	1.48	2.00	2.00	1.83	2.00	2.50	2.25
1991	1.50	1.43	1.26	2.50	1.43	1.53	2.50	2.14	1.86	2.50	2.86	2.21
1992	1.00	1.00	1.19	1.00	1.00	1.23	1.00	1.50	1.24	1.00	1.33	1.16
CHOLECYSTECTOMY												
1990	1.07	1.00	1.15	1.50	1.33	1.42	1.67	1.67	1.78	1.67	2.00	2.27
1991	1.33	1.13	1.19	2.00	1.67	1.51	2.00	2.00	1.88	2.00	2.00	2.32
1992	0.50	1.00	1.18	2.00	1.15	1.27	1.00	1.52	1.24	1.00	1.14	1.23
CAESAREAN SECTION												
1990	1.50	1.11	1.21	1.75	1.67	1.51	2.00	2.22	1.84	2.00	2.22	2.18
1991	1.33	1.50	1.16	1.67	1.50	1.37	1.83	2.00	1.68	2.00	2.00	2.08
1992	1.17	1.00	1.15	1.29	1.33	1.23	1.22	1.00	1.22	1.18	1.25	1.18

/1 Quoted fees are for all practitioners who responded to the particular question

Table A20

Growth of Fees for Selected Procedures of Medical Practitioners in Metro Manila, 1990-1992 /1
(in percent)

PROCEDURE	WARD			SEMI-PRIVATE ROOM			PRIVATE ROOM			SMALL (REGULAR) SUITE			LARGE (EXECUTIVE) SUITE		
	Min.	Max.	Ave.	Min.	Max.	Ave.	Min.	Max.	Ave.	Min.	Max.	Ave.	Min.	Max.	Ave.
TONSILLECTOMY															
1991	87.50	25.00	28.16	100.00	75.00	36.72	100.00	60.00	40.61	36.36	66.67	39.29	33.33	50.00	32.70
1992	33.33	20.00	19.93	-50.00	-14.29	1.12	-50.00	-12.50	-5.16	-33.33	-20.00	-4.66	-25.00	-33.33	-8.15
APPENDECTOMY															
1991	0.00	16.67	13.37	15.38	25.00	23.53	25.00	0.00	17.19	25.00	25.00	15.11	25.00	33.33	11.39
1992	50.00	42.86	10.57	0.00	0.00	4.79	-40.00	0.00	6.20	-40.00	0.00	8.05	-40.00	0.00	5.87
CHOLECYSTECTOMY															
1991	-50.00	0.00	15.99	-37.50	13.33	20.21	-33.33	25.00	23.08	-40.00	20.00	22.50	-40.00	0.00	18.49
1992	233.33	33.33	14.34	25.00	17.65	13.35	66.67	-8.00	13.94	66.67	16.67	13.14	66.67	33.33	13.46
CAESAREAN SECTION															
1991	50.00	11.11	22.57	33.33	50.00	18.25	42.86	0.00	11.48	37.50	0.00	11.68	50.00	0.00	16.76
1992	0.00	50.00	1.68	-12.50	0.00	0.21	-10.00	33.33	4.77	0.00	0.00	4.47	8.33	25.00	-0.11

/1 Quoted fees are for all practitioners who responded to the particular question
Source: Wyatt Survey of Physician Fees, 1990, 1991 and 1992

Table A21

Average Fees for Selected Procedures, 1990
By Region (Pesos per Procedure)

REGION / 1	TONSILLECTOM	APPENDECTOM	CHOLECYSTECTOMY	CAESAREAN SECTION
1 Ilocos Region	1,906.00	2,045.05	2,956.15	3,398.61
2 Cagayan Valley	1,216.67	1,525.00	1,883.33	2,143.75
3 Central Luzon	1,955.29	2,256.54	3,721.00	3,571.59
4 Southern Tagalog	1,900.00	2,607.14	3,933.33	3,593.55
5 Bicol Region	1,392.50	2,539.54	4,288.89	2,614.43
6 Western Visayas	3,750.00	2,908.33	7,875.00	2,412.00
7 Central Visayas	1,685.14	2,425.67	5,894.00	3,110.00
8 Eastern Visayas	530.00	1,321.04	1,383.75	1,616.03
9 Western Mindanao	-	2,500.00	-	2,050.00
10 Northern Mindanao	856.25	1,042.65	1,666.67	1,835.71
11 Southern Mindanao	1,628.50	1,742.73	4,066.43	2,302.71
12 Central Mindanao	2,441.67	3,195.24	5,600.00	3,990.48

/ 1 Results for NCR were not included due to only eight sample points.

Source: PMCC, Physician Rider of the 1990 Support Value Survey

Table A22

Average Fees for Selected Procedures, 1990
By Specialty (Pesos per Procedure)

SPECIALTY	TONSILLECTOMY	APPENDECTOMY	CHOLECYSTECTOMY	CAESAREAN SECTION
Anesthesiology	836.13	1,018.66	2,069.66	1,144.81
General Practice	-	1,867.94	-	1,800.24
EENT	3,000.00	-	-	-
Obstetrics-Gynecology	-	2,548.07	-	3,973.54
Pediatrics	-	893.33	-	-
Surgery	2,275.78	2,686.52	5,420.62	3,379.38

Source: PMCC, Physician Rider of the 1990 Support Value Survey

Table A23

Average Fees for Selected Procedures, 1990
By Hospital Type and Category (Pesos per Procedure)

	TONSILLECTOMY	APPENDECTOMY	CHOLECYSTECTOMY	CAESAREAN SECTION
Hospital Category				
Primary	640.33	1,578.04	3,615.83	1,661.02
Secondary	1,683.22	1,985.80	3,578.37	2,992.72
Tertiary	2,001.23	2,642.18	5,017.12	3,223.49
Type of Hospital				
Public	1,081.59	1,031.46	1,805.43	1,413.07
Private	2,193.48	2,660.22	5,805.63	3,409.96

Source: PMCC, Physician Rider of the 1990 Support Value Survey

Figure A.1

Charges for First Consultation, GP
by Region

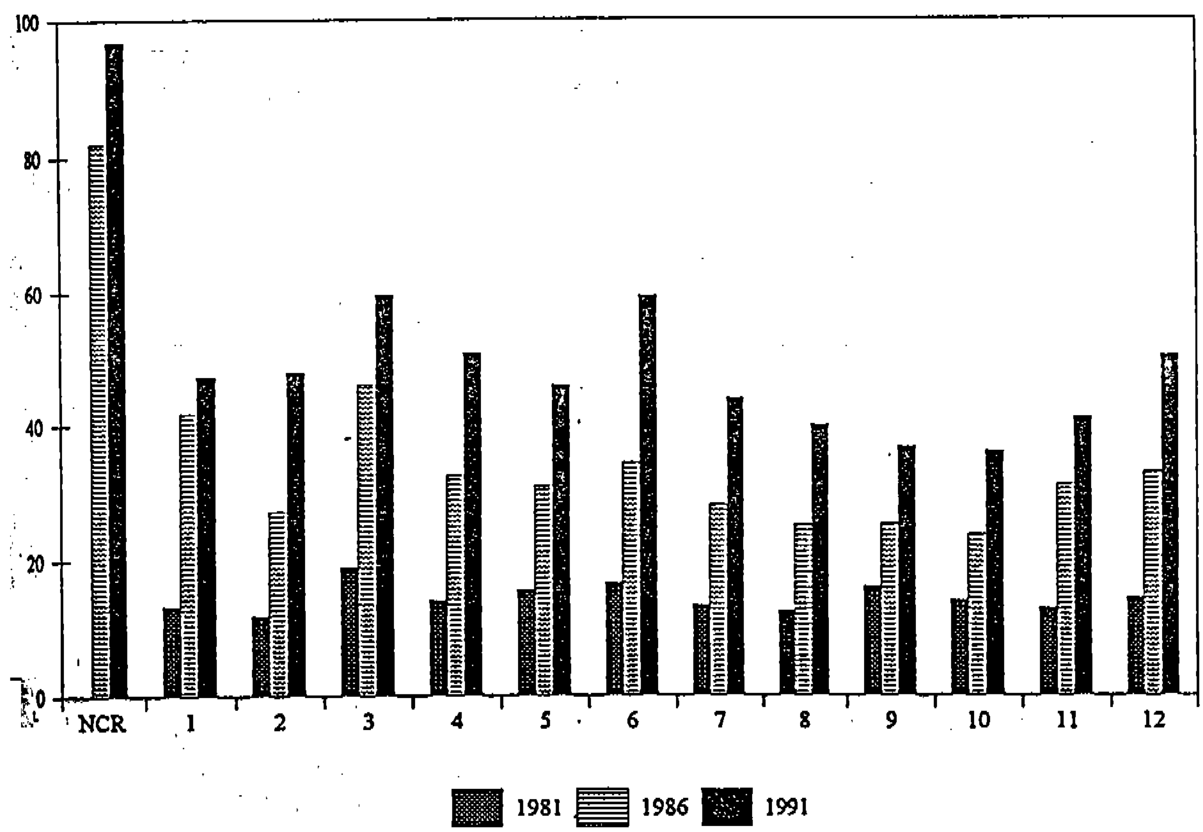


Figure A.2

Average Inflation Rates of GP Fees

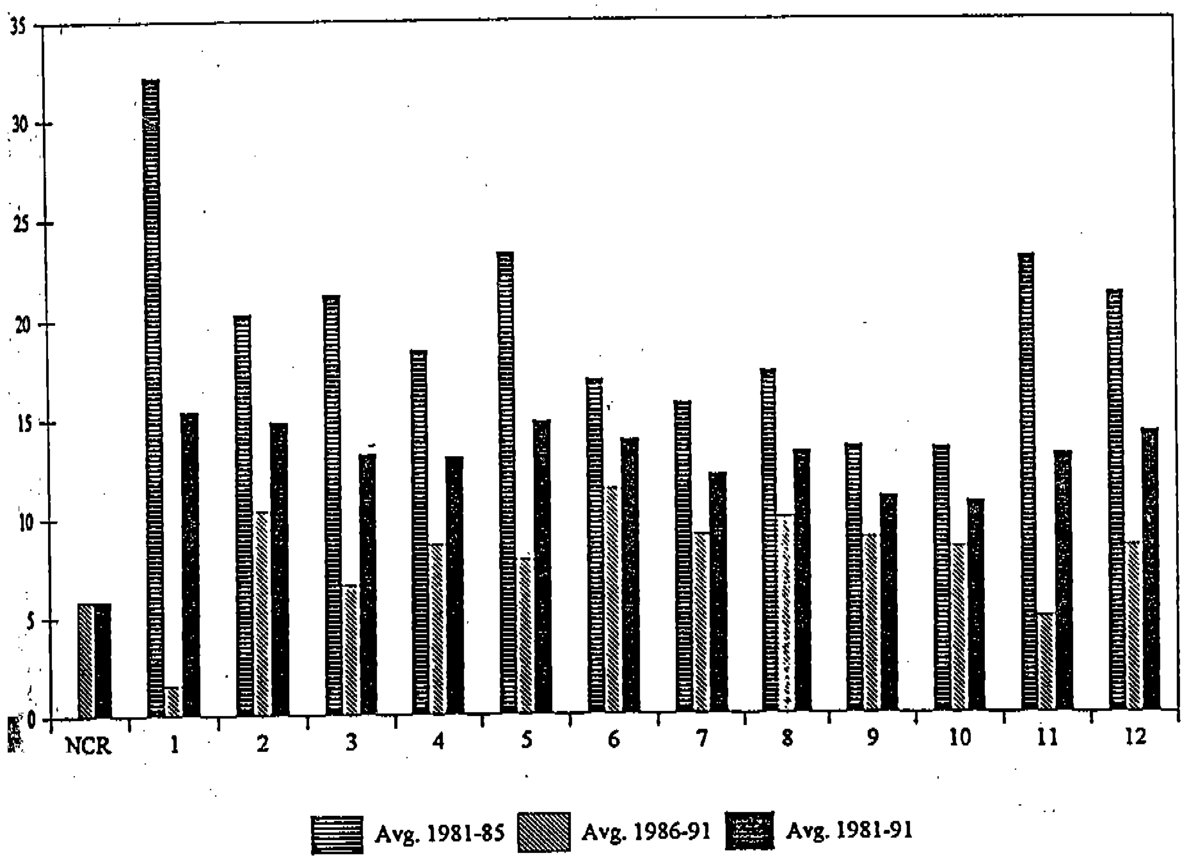


Figure A.3

INPATIENT CONSULTATION FEES BY ROOM

1990

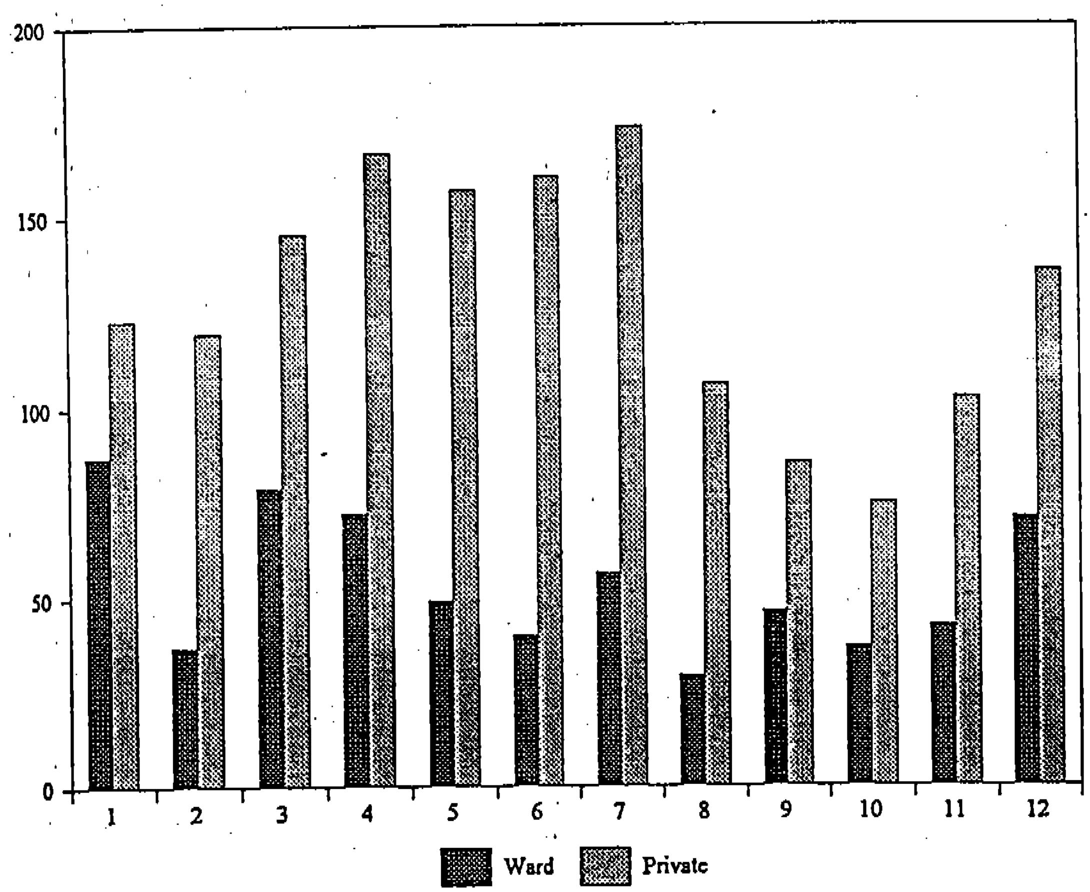


Figure A.4

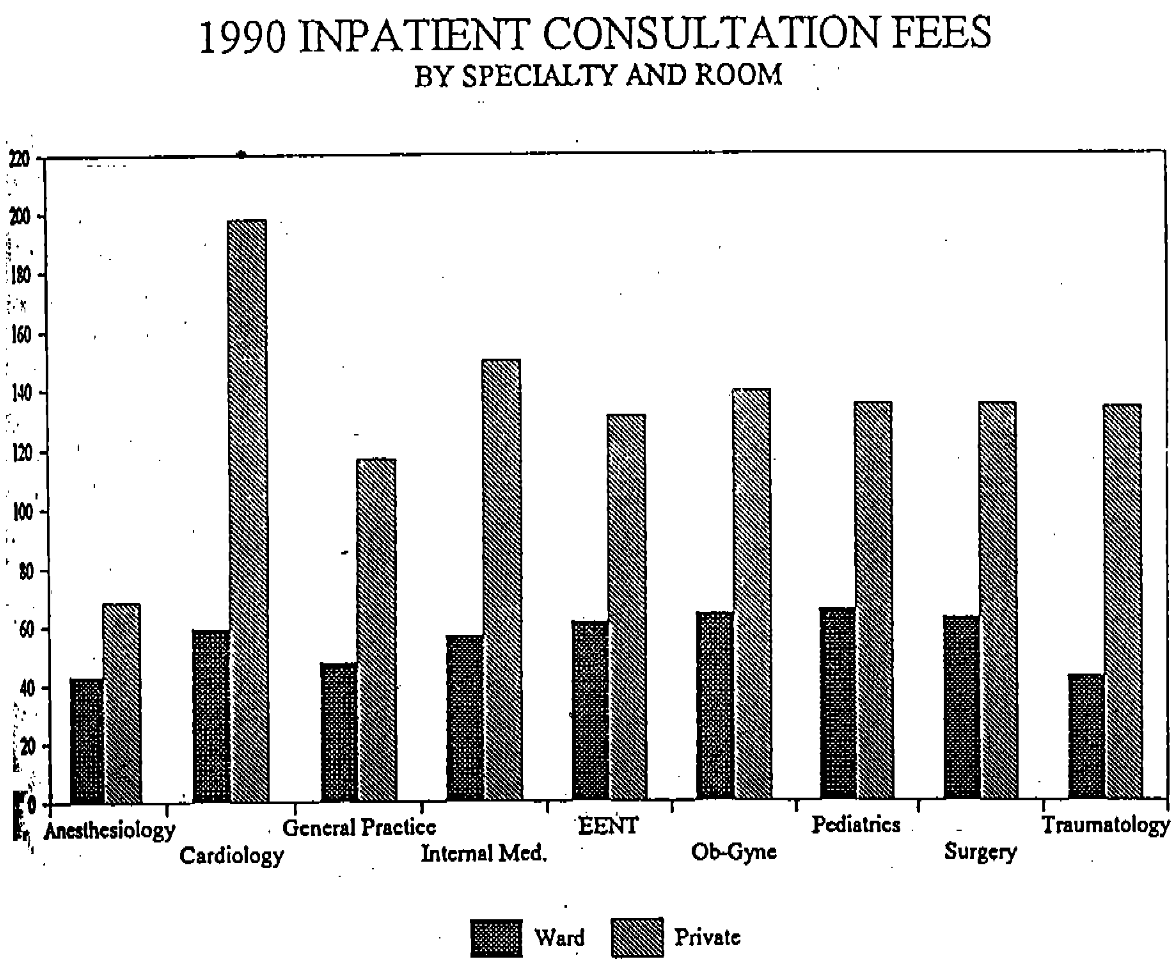

1990 INPATIENT CONSULTATION FEES
BY SPECIALTY AND ROOM
220
200
180
160
140
120
100
80
60
40
20
0
Anesthesiology
Cardiology
General Practice
Internal Med.
EENT
Ob-Gyne
Pediatrics
Surgery
Traumatology
Ward
Private

Figure A.5

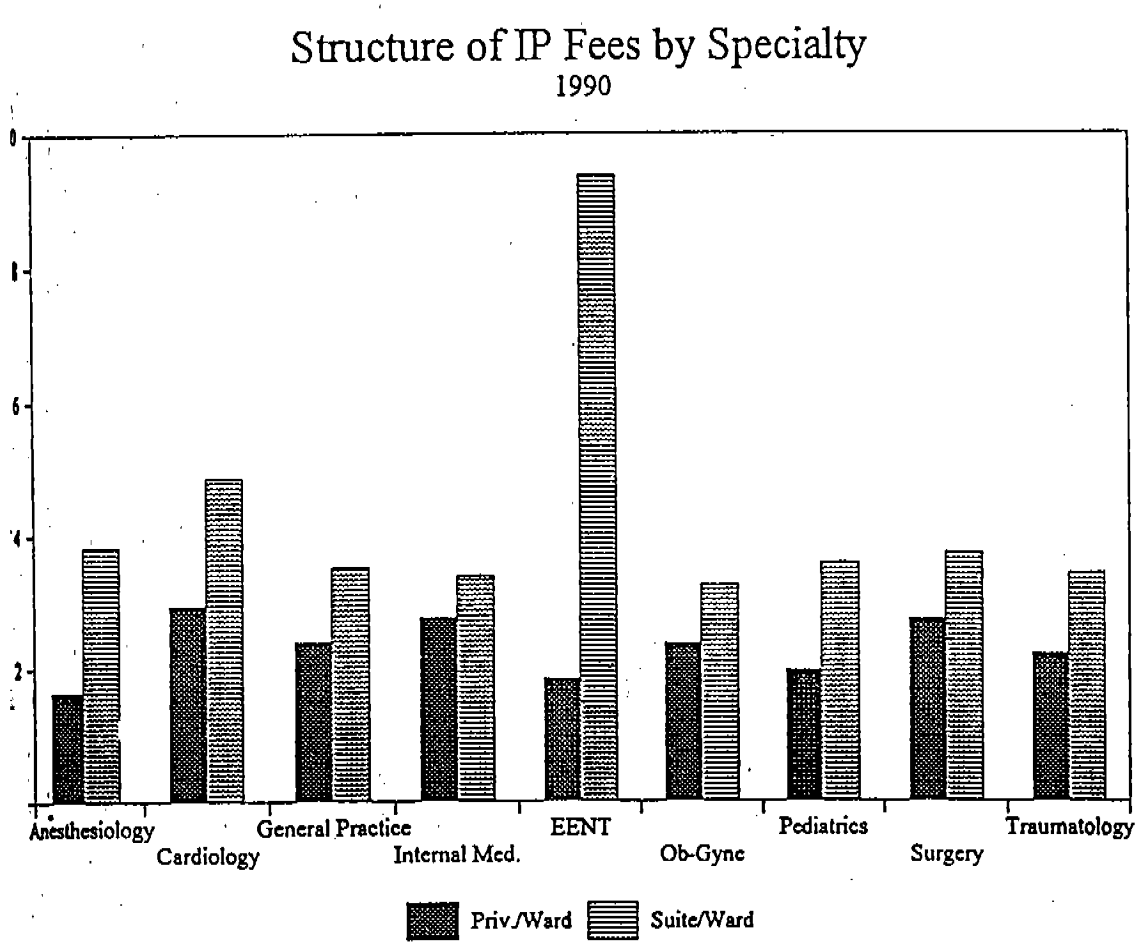
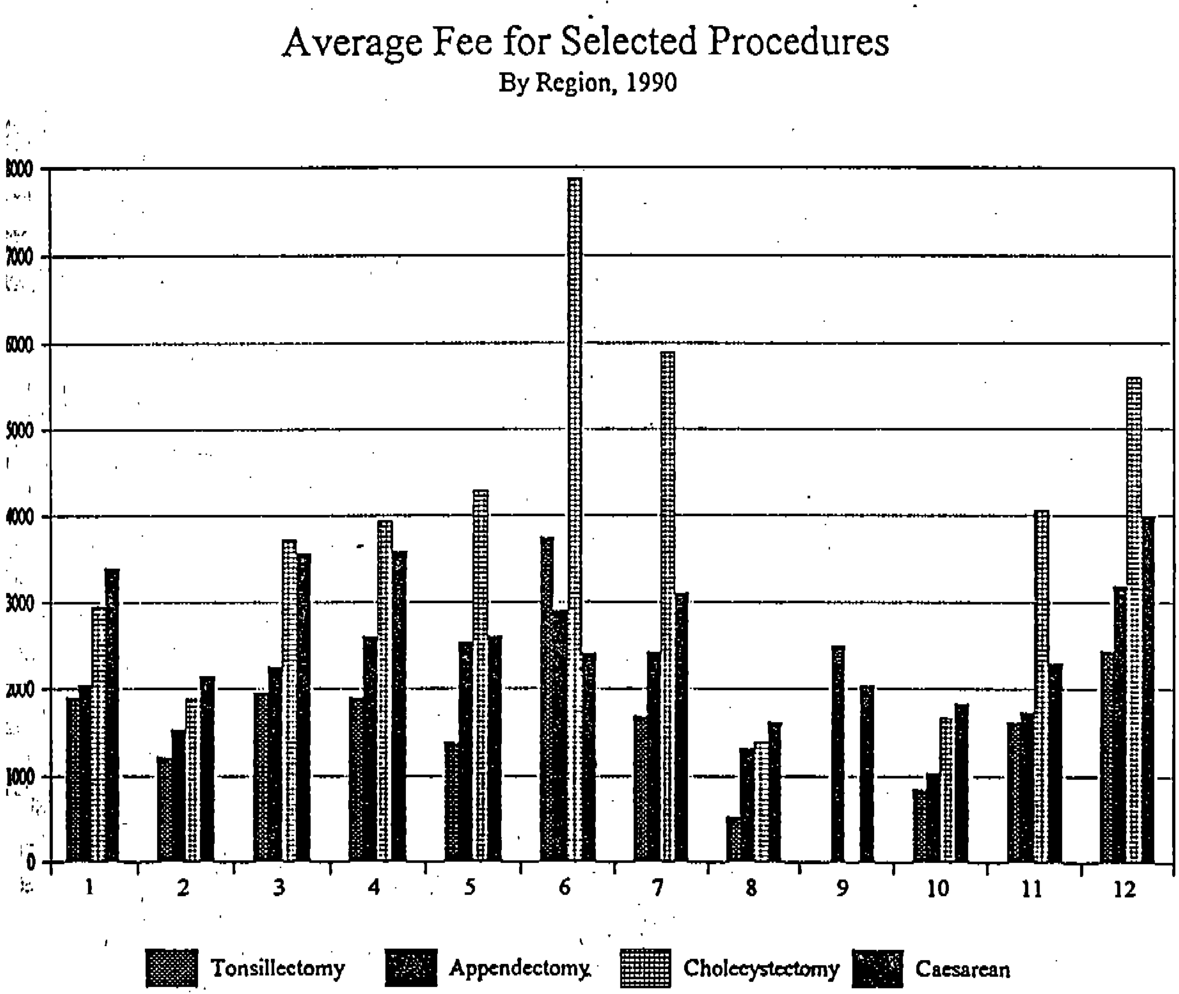

Structure of IP Fees by Specialty
1990
0
8
6
4
2
Anesthesiology
Cardiology
General Practice
Internal Med.
EENT
Ob-Gyne
Pediatrics
Surgery
Traumatology
Priv./Ward
Suite/Ward

Figure A.6


Average Fee for Selected Procedures
By Region, 1990
8000
7000
6000
5000
4000
3000
2000
1000
0
1
2
3
4
5
6
7
8
9
10
11
12
Tonsillectomy
Appendectomy
Cholecystectomy
Caesarean

APPENDIX B

MEDICARE REIMBURSABLE AMOUNTS AND PHYSICIAN FEES

To compare the amount that Medicare usually reimburses for physician fees and the fees that are actually prevailing, data obtained from the 1990 Physician Rider Survey of the Philippine Medical Care Commission can also be looked at. The exercise is intended to see how wide the differences are and if these differences vary across regions, procedures, hospital stations of providers and room accommodation. The ratios and differences that would be presented may differ from actual support rates for professional fees to the extent that the physician prices quoted are 'net of Medicare'. This refers to the practice of certain physicians of charging the full amount to patients and then charging Medicare for the reimbursable amount. The total price of the service thus increases.

Variations in these differences could point to different incentives for physicians in the provision/utilization of services covered by Medicare. These differences could also explain propensities for physician participation in the Medicare program.

Under the Medicare program I, only inpatient and some family planning procedures performed by physicians are reimbursable. These benefits have undergone several changes over the years, in both the methodology for reimbursement and the amounts to be reimbursed.

At the start of the program in 1972, physicians were reimbursed about P 10 per day for inpatient visits, with a maximum of P 100 and P 50 for minor surgeries, P 150 for medium surgeries and P 350 for major surgeries. No differentiation in reimbursement for inpatient consultation fees was placed for ordinary or intensive cases. Furthermore, no differentiation was placed for whether the case was handled by a general practitioner or by a specialist.

The same methodology for reimbursement of physicians was followed from 1972 to 1986 except that there were adjustments in the reimbursable amounts in 1978, 1984, and 1986. Reforms enacted in 1989 included not only adjustments in the reimbursable amounts but also in the methodology for reimbursement. Inpatient consultation fees were differentiated between general practitioners and specialists. In addition, maximum amounts reimbursable for a single period of confinement were differentiated according to whether the case was an ordinary case or intensive or catastrophic case. Reimbursement for surgeon's fees was now computed based on the relative value units of the particular procedure performed. A peso value per unit and a maximum reimbursable amount were also assigned for surgeon's fees. These amounts were adjusted in subsequent reforms in 1991 and 1992.

Tables B1 and B2 compare Medicare reimbursable fees for inpatient visits to inpatient consultation fees of practitioners. The comparison will proceed on the basis of rates per day for general practitioners and specialists. This is limited in the sense that reimbursable fees and fees of physicians per confinement episode are not considered. It is possible that total Medicare reimbursable amounts for confinement episodes as compared with actual professional fees per episode would be less than those on a daily rate. This is due to ceilings on the amounts reimbursable for an illness episode. For instance, the ceilings for a single period of confinement for ordinary cases are P 300 for general practitioners and P 450 for specialists. For intensive or catastrophic cases, the ceilings are P 450 for general practitioners and P 750 for specialists.

In 1990-92, Medicare reimbursable fees for inpatient visits ranged from .30-.50 of average fees in wards, .14-.25 of average fees in private rooms and about .05-.20 average fees in large suites. For the regions in 1990, Medicare reimbursable fees as a ratio of actual fees ranged from 0.63 to 1.74 for wards and from 0.20-0.46 for suites. A ratio which exceeds one means that the full amount of the actual fee is covered by Medicare. It is apparent that in some regions and for some room accommodations, the ratio exceeds one (Figure B1) .

There is a widening gap between Medicare reimbursable fees and actual inpatient consultation fees as room accommodation becomes more expensive.

The gap between Medicare reimbursable amounts is generally lower for Obstetrician-Gynecologists and general surgeons in Metro Manila. The gap seems to be wider for ophthalmologists and ENT's. These trends are also apparent in the PMCC data as cardiologist and EENT actual fees are higher than Medicare reimbursable fees (Table B3). For all the other specialties, Medicare reimbursable amounts exceeded actual fees in 1990 for ward patients. However, reimbursable amounts of Medicare begin to fall below actual fees as room accommodation becomes more expensive.

Table B4 presents Medicare reimbursable amounts and actual fees by the hospital station of the physician. As expected, as the category of the hospital increases, the gap between Medicare reimbursable amounts and actual fees widens. However, for primary and secondary hospitals, professional fees for ward and payward patients are almost always fully covered by Medicare. Professional fees for inpatient visits in public hospitals in ward, payward and private rooms are relatively fully covered by Medicare reimbursable fees. Coverage for public hospitals is greater than for private hospitals.

For selected procedures, Medicare reimbursable amounts were computed by multiplying the corresponding RVUs by the pesos/RVU allowed. RVUs for tonsillectomy, appendectomy, cholecystectomy and caesarean section are 4.8, 9.5. 14.5 and 13, respectively. In 1990, the corresponding peso value was P 187, P 237 in 1991 and P 280 in 1992. The corresponding reimbursable amounts were all less than the maximum allowable of P 4,700 in 1990, P 5,900 in 1991 and P 7080 in 1992 per procedure.

In Metro Manila, average charges for the four selected procedures are never fully covered by Medicare reimbursable amounts even for patients in wards (Table B5). This is not the case in the regions where some of the procedures are fully covered (Figure B2). Average professional fees for the four procedures in Regions 4 and 12 are above Medicare reimbursable amounts (Table B6).

Tonsillectomy seems to be less covered than the other procedures based on tables for Metro Manila. This seems to be the case in the regions although for some regions, tonsillectomy charges are more than fully covered. Appendectomy, cholecystectomy and caesarean sections have more or less similar ratios of Medicare reimbursable fee to actual fees.

Table B7 shows the ratio of Medicare reimbursable fee to actual fees by the specialty of the physician. Charges for tonsillectomies performed by EENTs are above reimbursable fees while those of surgeons are below reimbursable fees. Charges for appendectomies are fully covered by Medicare regardless of the provider of the service. The same is true for caesarean sections.

Average charges for appendectomies, cholecystectomies and caesarean sections are below Medicare reimbursable amounts regardless of the hospital station of the physician (Table B8). Only in the case of tonsillectomies performed by providers stationed in tertiary hospitals are charges higher than Medicare reimbursable amounts.

Charges for caesarean sections in both public and private hospitals are below Medicare reimbursable amounts. On the other hand, charges for tonsillectomies, appendectomies and cholecystectomies performed in private hospitals are above Medicare reimbursable rates.

SPECIALTY	WARD			SEMI-PRIVATE ROOM			PRIVATE ROOM			SMALL (REGULAR) SUITE			LARGE (EXECUTIVE) SUITE		
	Min.	Max.	Ave.	Min.	Max.	Ave.	Min.	Max.	Ave.	Min.	Max.	Ave.	Min.	Max.	Ave.
1. All practitioners															
1990	1.00	0.17	0.35	1.00	0.10	0.24	0.50	0.07	0.16	0.50	0.03	0.11	0.50	0.03	0.09
1991	0.81	0.13	0.36	0.65	0.13	0.26	0.65	0.07	0.18	0.65	0.04	0.13	0.65	0.02	0.10
1992	2.67	0.13	0.43	2.67	0.10	0.31	1.60	0.08	0.21	1.60	0.04	0.15	1.60	0.02	0.11
2. General Surgery															
1990	1.00	0.20	0.36	0.71	0.13	0.25	0.50	0.08	0.17	0.36	0.03	0.11	0.25	0.03	0.10
1991	0.65	0.19	0.42	0.65	0.14	0.30	0.65	0.11	0.20	0.33	0.07	0.14	0.33	0.04	0.12
1992	1.60	0.16	0.40	0.80	0.10	0.29	0.80	0.08	0.19	0.80	0.05	0.13	0.80	0.03	0.10
3. Obstetrics-Gynecology															
1990	1.00	0.24	0.41	0.67	0.17	0.30	0.50	0.13	0.22	0.50	0.07	0.17	0.50	0.06	0.15
1991	0.81	0.22	0.45	0.65	0.17	0.32	0.65	0.11	0.24	0.43	0.09	0.18	0.33	0.05	0.14
1992	1.00	0.32	0.51	0.80	0.21	0.36	0.53	0.11	0.25	0.40	0.07	0.19	0.40	0.06	0.15
4. Opthalmology															
1990	1.00	0.17	0.28	0.50	0.13	0.20	0.33	0.10	0.15	0.25	0.05	0.10	0.25	0.03	0.08
1991	0.43	0.13	0.24	0.33	0.13	0.19	0.33	0.07	0.14	0.33	0.07	0.11	0.33	0.02	0.06
1992	0.80	0.20	0.28	0.27	0.16	0.21	0.23	0.11	0.15	0.20	0.08	0.12	0.20	0.04	0.07
5. Orthopedics															
1990	1.00	0.20	0.33	1.00	0.20	0.29	0.50	0.14	0.21	0.33	0.13	0.17	0.33	0.13	0.17
1991	0.65	0.26	0.38	0.65	0.20	0.29	0.65	0.13	0.23	0.65	0.04	0.12	0.65	0.03	0.10
1992															
6. Otorhinolaryngology (ENT)															
1990	0.50	0.25	0.33	0.25	0.19	0.23	0.20	0.12	0.14	0.20	0.06	0.09	0.20	0.06	0.08
1991	0.65	0.22	0.29	0.43	0.16	0.23	0.43	0.11	0.17	0.43	0.08	0.13	0.33	0.07	0.12
1992	0.80	0.27	0.40	0.53	0.27	0.26	0.53	0.20	0.26	0.53	0.16	0.21	0.40	0.16	0.19
7. Pediatrics															
1990	0.33	0.26	0.31	0.25	0.14	0.18	0.20	0.08	0.11	0.17	0.06	0.08	0.17	0.03	0.04
1991	0.65	0.19	0.33	0.43	0.13	0.23	0.33	0.12	0.17	0.22	0.08	0.12	0.16	0.07	0.11
1992	0.80	0.27	0.48	0.80	0.20	0.36	0.53	0.11	0.23	0.40	0.08	0.16	0.40	0.02	0.12
8. General Medicine															
1990	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1991	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1992	1.83	0.14	0.40	1.83	0.14	0.37	1.10	0.13	0.27	1.10	0.06	0.18	1.10	0.02	0.11
9. Internal Medicine															
1990	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1991	0.43	0.22	0.31	0.33	0.16	0.22	0.22	0.13	0.16	0.22	0.04	0.09	0.16	0.03	0.06
1992	1.00	0.27	0.46	0.80	0.20	0.36	0.80	0.13	0.23	0.80	0.06	0.14	0.80	0.04	0.11

Table B2

Medicare Reimbursable and Inpatient Visit Fees of Medical Practitioners, 1990
(Medicare Reimbursable Fee/Actual Fee) By Region

Region / 1	Ward	Payward	Private	Suite
1 Ilocos Region	0.63	0.97	0.69	0.26
2 Cagayan Valley	1.57	1.31	0.39	0.27
3 Central Luzon	1.25	0.91	0.58	0.31
4 Southern Tagalog	0.91	0.60	0.35	0.27
5 Bicol Region	0.98	0.79	0.42	0.22
6 Western Visayas	1.50	0.78	0.45	0.21
7 Central Visayas	1.21	0.98	0.50	0.20
8 Eastern Visayas	1.74	1.86	0.90	0.40
9 Western Mindanao	1.02	0.97	0.57	0.29
10 Northern Mindanao	1.45	1.23	0.74	0.46
11 Southern Mindanao	1.08	0.92	0.65	0.24
12 Central Mindanao	0.84	0.63	0.40	0.30

/1 Results for NCR were not included due to only eight sample points.

Source: PMCC, Physician Rider of the 1990 Support Value Survey

Table B3

Medicare Reimbursable and Inpatient Visit Fees of Medical Practitioners, 1990
(Medicare Reimbursable Fee/Actual Fee) By Specialty

Specialty	Ward	Payward	Private	Suite
Anesthesiology	1.50	1.42	1.10	0.35
Cardiology	0.92	0.63	0.28	0.21
General Practice	1.05	0.95	0.52	0.23
Internal Medicine	1.06	0.77	0.45	0.30
EENT	0.92	0.85	0.55	0.31
Obstetrics-Gynecology	1.14	0.89	0.52	0.32
Pediatrics	1.04	0.79	0.50	0.30
Surgery	1.21	1.12	0.72	0.30
Traumatology	1.21	0.93	0.53	0.32

Source: PMCC, Physician Rider of the 1990 Support Value Survey

Table B4

Medicare Reimbursable and Inpatient Visit Fees of Medical Practitioners, 1990
(Medicare Reimbursable Fee/Actual Fee) By Hospital Category and Type

	Ward	Payward	Private	Suite
Hospital Category				
Primary	1.10	0.98	0.63	0.38
Secondary	1.29	1.06	0.65	0.28
Tertiary	0.91	0.77	0.40	0.26
Type of Hospital				
Public	1.60	1.27	0.97	0.41
Private	0.95	0.85	0.48	0.27

Source: PMCC, Physician Rider of the 1990 Support Value Survey

Medicare Surgeon's Fee and Fees for Selected Procedures of Medical Practitioners in Metro Manila, 1990-1992 /1
(Medicare Surgeon's Fee / Fees for Selected Procedures) /2

PROCEDURE	WARD			SEMI-PRIVATE ROOM			PRIVATE ROOM			SMALL (REGULAR) SUITE			LARGE (EXECUTIVE) SUITE		
	Min.	Max.	Ave.	Min.	Max.	Ave.	Min.	Max.	Ave.	Min.	Max.	Ave.	Min.	Max.	Ave.
TONSILLECTOMY															
1990	1.12	0.22	0.36	0.90	0.22	0.32	0.60	0.18	0.25	0.41	0.15	0.21	0.30	0.09	0.17
1991	0.76	0.23	0.35	0.57	0.16	0.29	0.38	0.14	0.22	0.38	0.11	0.19	0.28	0.08	0.16
1992	0.67	0.22	0.35	1.34	0.22	0.35	0.90	0.19	0.28	0.67	0.17	0.24	0.45	0.13	0.21
APPENDECTOMY															
1990	1.78	0.30	0.48	1.37	0.22	0.42	0.89	0.18	0.33	0.89	0.15	0.26	0.89	0.12	0.22
1991	2.24	0.32	0.54	1.49	0.22	0.43	0.90	0.22	0.35	0.90	0.15	0.29	0.90	0.11	0.24
1992	1.77	0.27	0.58	1.77	0.27	0.49	1.77	0.27	0.40	1.77	0.18	0.32	1.77	0.13	0.27
CHOLECYSTECTOMY															
1990	0.90	0.18	0.43	0.85	0.18	0.38	0.60	0.14	0.31	0.54	0.11	0.24	0.54	0.09	0.19
1991	2.28	0.23	0.47	1.71	0.20	0.40	1.14	0.14	0.31	1.14	0.11	0.25	1.14	0.11	0.20
1992	0.81	0.20	0.49	1.62	0.20	0.41	0.81	0.18	0.33	0.81	0.12	0.26	0.81	0.10	0.21
CAESAREAN SECTION															
1990	1.22	0.27	0.46	0.81	0.24	0.38	0.69	0.16	0.31	0.61	0.12	0.25	0.61	0.12	0.21
1991	1.02	0.31	0.48	0.77	0.20	0.41	0.61	0.20	0.35	0.56	0.15	0.28	0.51	0.15	0.23
1992	1.21	0.24	0.56	1.04	0.24	0.49	0.81	0.18	0.39	0.66	0.18	0.32	0.56	0.15	0.27

/1 Quoted fees are for all practitioners who responded to the particular question

/2 Medicare surgeon's fees were computed by applying the relative value units of the particular procedure to the allowed reimbursement per unit. Tonsillectomy was accorded 4.8, appendectomy 9.5, cholecystectomy 14.5 and caesarean section 13 RVUs respectively. The corresponding reimbursable amounts per RVU were P 187 in 1990, P 236 in 1991 and P280 in 1992. The corresponding reimbursable amounts were all less than the maximum allowable of P 4,700 in 1990, P 5,900 in 1991 and P 7,080 in 1992.

Source: Wyatt Survey of Physician Fees, 1990, 1991 and 1992

Table B6

Medicare Reimbursable Fees and Fees for Selected Procedures, 1990
(Medicare Reimbursable/Actual Fee) By Region / 1

REGION / 2	TONSILLECTOMY	APPENDECTOMY	CHOLECYSTECTOMY	CAESAREAN SECTION
1 Ilocos Region	1.69	1.52	1.95	1.79
2 Cagayan Valley	1.30	2.11	3.80	2.47
3 Central Luzon	1.40	1.98	2.45	1.88
4 Southern Tagalog	0.41	0.79	0.83	0.91
5 Bicol Region	1.75	1.56	1.74	2.04
6 Western Visayas	0.24	1.38	0.49	3.46
7 Central Visayas	0.62	0.82	0.69	3.25
8 Eastern Visayas	2.24	1.96	2.17	2.24
9 Western Mindanao	-	0.74	-	1.86
10 Northern Mindanao	0.66	1.47	1.18	1.73
11 Southern Mindanao	0.84	1.11	1.14	2.22
12 Central Mindanao	0.34	0.51	0.46	0.60

/ 1 Medicare reimbursable fees were computed by applying the relative value units of the particular procedure to the allowed reimbursement per unit. Corresponding RVU's for tonsillectomy, appendectomy, cholecystectomy and caesarean section are 4.8, 9.5, 14.5 and 13, respectively. The reimbursable amount in 1990 was P 187 per RVU.
/ 2 Results for NCR were not included due to only eight sample points.

Source: PMCC, Physician Rider of the 1990 Support Value Survey

Table 87

Medicare Reimbursable Fees and Fees for Selected Procedures, 1990
(Medicare Reimbursable/Actual Fee) By Specialty / 1

SPECIALTY	TONSILLECTOMY	APPENDECTOMY	CHOLECYSTECTOMY	CAESAREAN SECTION
Anesthesiology	0.87	1.18	1.64	1.51
General Practice	-	1.47	-	4.04
EENT	0.51	-	-	-
Obstetrics-Gynecology	-	1.58	-	1.26
Pediatrics	-	4.83	-	-
Surgery	0.94	1.15	1.12	1.69

/ 1 Medicare reimbursable fees were computed by applying the relative value units of the particular procedure to the allowed reimbursement per unit. Corresponding RVUS for tonsillectomy, appendectomy, cholecystectomy and caesarean section are 4.8, 9.5, 14.5 and 13, respectively. The reimbursable amount in 1990 was P 187 per RVU.

Source: PMCC, Physician Rider of the 1990 Support Value Survey

Table 88

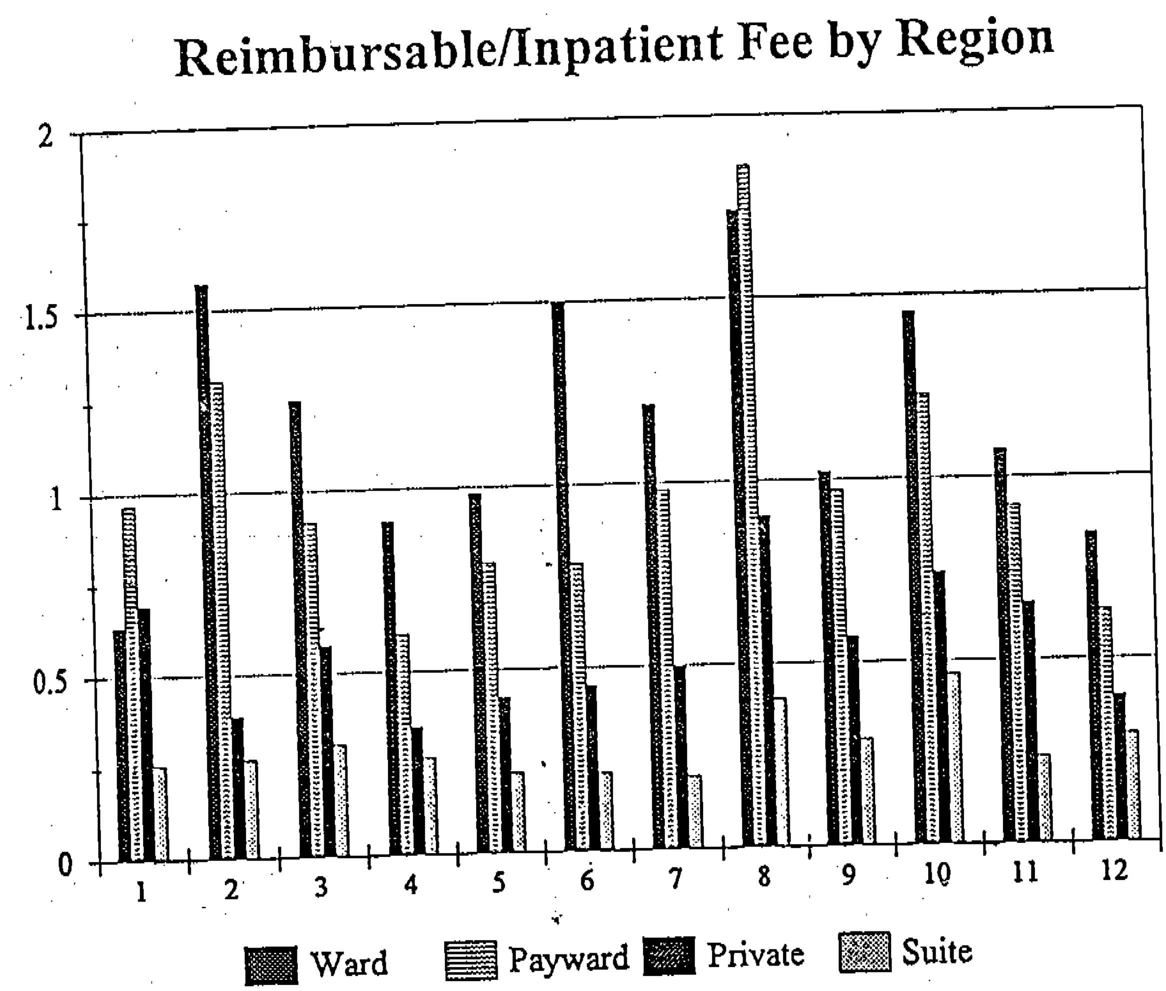
Medicare Reimbursable Fees and Fees for Selected Procedures, 1990
(Medicare Reimbursable/Actual Fee) By Hospital Category and Type / 1

	TONSILLECTOMY	APPENDECTOMY	CHOLECYSTECTOMY	CAESAREAN SECTION
Hospital Category				
Primary	1.53	1.54	2.56	3.45
Secondary	1.08	1.30	1.57	1.66
Tertiary	0.78	1.28	1.13	1.30
Type of Hospital				
Public	1.80	2.32	2.89	3.19
Private	0.38	0.90	0.51	1.32

/ 1 Medicare reimbursable fees were computed by applying the relative value units of the particular procedure to the allowed reimbursement per unit. Corresponding RVU's for tonsillectomy, appendectomy, cholecystectomy and caesarean section are 4.8, 9.5, 14.5 and 13, respectively. The reimbursable amount in 1990 was P 187 per RVU.

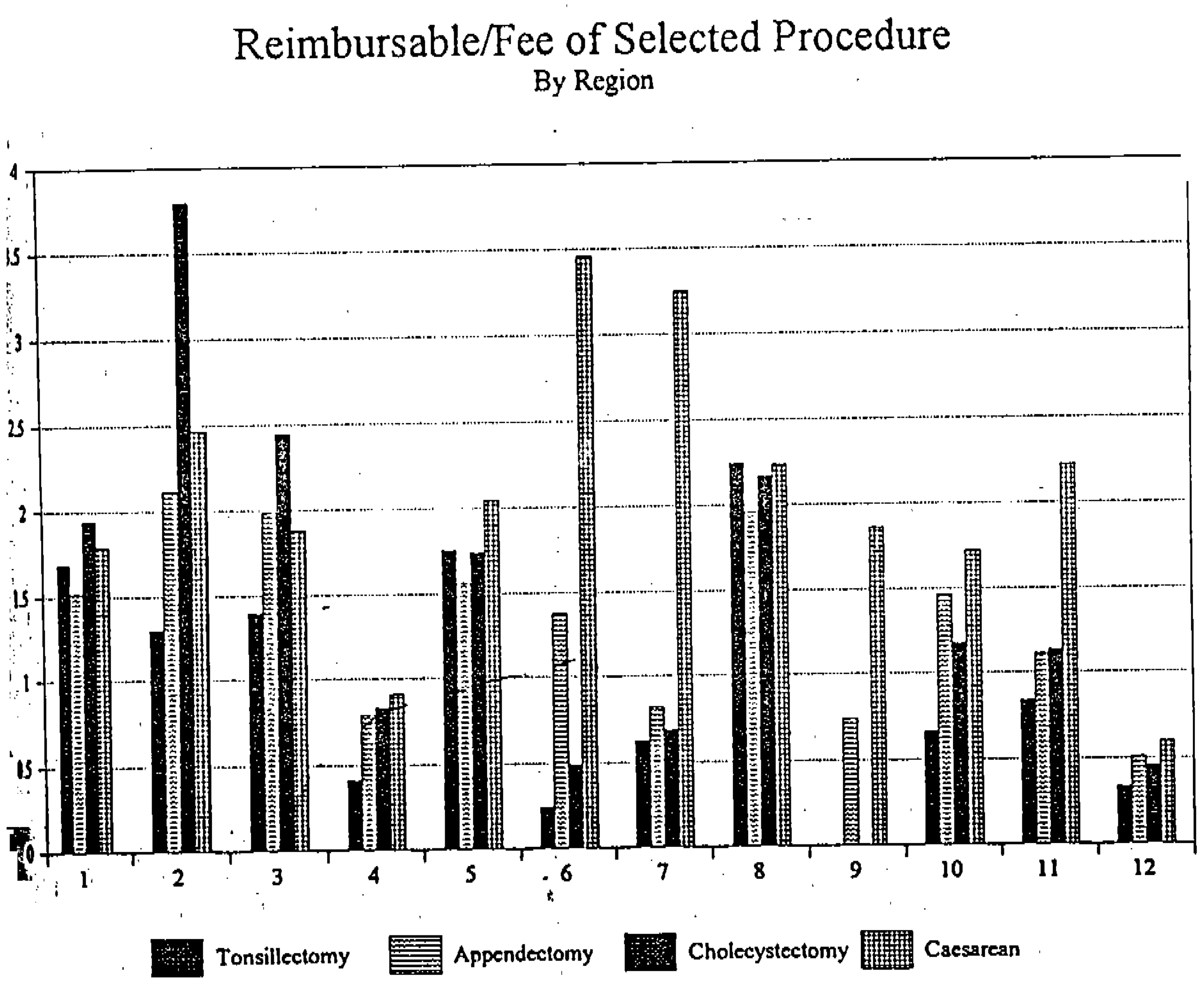
Source: PMCC, Physician Rider of the 1990 Support Value Survey

Figure B.1


Reimbursable/Inpatient Fee by Region
2
1.5
1
0.5
0
1
2
3
4
5
6
7
8
9
10
11
12
Ward
Payward
Private
Suite

Part II: Dentists

Figure B.2


Reimbursable/Fee of Selected Procedure
By Region
4
3.5
3
2.5
2
1.5
1
0.5
0
1
2
3
4
5
6
7
8
9
10
11
12
Tonsillectomy
Appendectomy
Cholecystectomy
Caesarean

1. INTRODUCTION

In a recent review of the health care sector, it was noted that there seems to be low levels of dental care service utilization.[1] Data cited from the 1987 National Health Survey indicate that while about half of the population have dental problems like tooth decay, crooked teeth, missing teeth, and bleeding gums or loosened teeth, only about one fifth sought care in the last twelve months prior to the survey date. Levels of utilization by region varied, with the lowest utilization found in Region 7, 15.7 percent, and the highest rates found in Region 4, 24.4 percent (Table 1.1).

The low level of utilization of dental care services is also reflected in the proportion of health care expenditures that are spent for dental charges (Table 1.2). The 1988 Family Income and Expenditure Survey report that households belonging to the lowest income quintile spend less than half of a percent of their total health care expenditures on dental charges. The proportions increase as one goes to higher income quintiles, i.e., 1.39 percent for the second income quintile, 1.95 percent for the third income quintile, 2.32 percent for the next income quintile and 4.03 percent for the highest income quintile. These imply that those with lower incomes have lesser utilization of dental services than those with higher incomes.

Differences in the utilization of specific dental services are also apparent as viewed in terms of the proportion of the population who visited a dentist for specific services and the average number of visits for specific services (Table 1.3). The proportions of those who visited for fillings and cleaning of teeth remain relatively low, about 2.0 percent and 5.9 percent for the whole population. The proportions of those with check-ups are 10.6 percent and those with extractions are 11.8 percent. Interregional differences are also noticeable, for instance, the proportion of those who visited the dentist for check-ups is highest in the National Capital Region which also registers one of the lowest proportion of patients who visited for extractions. The highest proportion of patients who visited the dentist for extractions comes from Regions 3 and 4 while those who visited for cleaning of teeth come from NCR and Region 3.

Of those who sought care, about 36 percent consulted RHU dentists or government hospital dentists while about 37 percent consulted private practitioners. School dentists remain as significant providers of care specially in Regions 1, 5, 6, and 7. Assuming that a significant part of school dentists is public school dentists, then the main providers accessed by those seeking care are public dental practitioners.

The low rates of utilization of dental services can be explained to a significant extent by considering the patterns of demand for these services. Bautista

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[1] Herrin, et al. Health Sector Review: Philippines. HFDP Monograph No. 3. March 1993.

Percent of Population Aged 6 Years and over with Dental Problems and Utilization of Dental Services

	Region	% of population with dental problems	Utilization of dental services	Dental Practitioner Consulted (% of population)						
				RHU Dentist	Gov't hospital dentist	School dentist	Private dentist	Compan Dentist	Herbo-lario	Others
	Philippines	48.6	20.8	22.0	14.5	16.7	37.3	3.1	4.9	1.5
	National Capital Region	42.6	23.3	16.2	21.2	12.8	41.9	6.2	0.8	0.9
1	Ilocos Region	52.0	23.7	24.0	11.6	23.5	34.3	1.8	2.6	2.2
2	Cagayan Valley	53.2	18.8	31.6	13.3	12.9	34.0	2.0	2.2	4.0
3	Central Luzon	51.0	24.0	22.8	9.6	7.1	56.5	1.7	1.8	0.5
4	Southern Tagalog	43.8	24.4	25.8	12.0	10.7	43.6	2.7	4.4	0.8
5	Bicol Region	50.4	19.6	15.8	8.9	27.6	32.7	0.3	12.9	1.8
6	Western Visayas	53.2	17.8	18.3	15.0	32.0	28.1	1.0	3.9	1.7
7	Central Visayas	40.3	15.7	26.9	6.6	34.8	22.6	1.6	6.2	1.3
8	Eastern Visayas	51.0	19.2	20.9	25.1	19.7	22.8	1.3	8.6	1.6
9	Western Mindanao	48.3	19.1	12.2	26.0	14.4	34.9	0.1	10.4	2.0
10	Northern Mindanao	52.4	19.9	28.3	19.4	11.5	19.7	9.9	9.4	1.8
11	Southern Mindanao	50.7	16.9	29.4	12.8	6.5	36.0	6.0	7.0	2.3
12	Central Mindanao	57.0	21.3	18.6	9.8	18.2	41.9	3.8	5.9	1.8

Source of data: National Health Survey, 1987

Table 1.2

Expenditures for Dental Services by Expenditure Class

Expenditure Class	Mean Total Dental Expenditures	Percent of Total Medical Expenditures
1	0.43	0.26
2	3.45	1.39
3	11.40	1.95
4	32.60	2.32
5	834.28	4.03

Source: Bautista, 1993

Region	Type of service							
	Dental check-up	Cleaning of teeth	Flouride therapy	Extraction	Gum treatment	Filling	Relief of pain	Others
Philippines	10.6	5.9	1.2	11.8	1.7	2.0	3.2	1.1
National Capital Region	17.0	10.8	2.1	8.3	1.4	3.9	3.3	1.2
1 Ilocos Region	12.0	6.2	1.1	13.9	1.9	1.5	2.7	1.4
2 Cagayan Valley	7.5	3.2	0.9	12.3	1.4	1.2	1.6	1.0
3 Central Luzon	12.1	6.5	1.6	15.6	2.2	2.8	4.9	1.4
4 Southern Tagalog	10.7	6.3	0.8	14.6	1.9	2.2	3.0	0.9
5 Bicol Region	9.8	6.6	1.0	10.6	1.6	1.7	3.0	1.1
6 Western Visayas	9.3	5.3	1.3	10.0	1.5	1.3	2.4	1.0
7 Central Visayas	6.9	6.0	1.1	7.3	1.5	1.6	2.8	1.2
8 Eastern Visayas	8.1	3.8	1.2	13.1	2.0	2.3	3.2	1.3
9 Western Mindanao	8.8	3.8	0.9	12.3	1.5	1.1	3.8	1.2
10 Northern Mindanao	10.0	4.0	1.4	11.6	1.4	1.8	3.4	0.9
11 Southern Mindanao	6.6	1.9	0.7	12.1	1.0	1.1	2.5	0.6
12 Central Mindanao	12.1	4.9	1.2	11.9	2.2	1.7	4.0	0.9

Source of data: National Health Survey, 1987

(1993) has calculated the income elasticity of expenditures for dental health services to be about 3.716. This means that a ten percent increase in income leads to a thirty-seven percent increase in expenditures for dental care services. Furthermore, there are higher income elasticities for those in the lower income quintiles, i.e., 3.686 for the lowest income quintile as opposed to 2.535 for the highest income quintile. This has been interpreted as indicative of the higher sensitivity of the poor's availment of dental care services as income increases. Given the low levels of income prevailing, low levels of utilization result. An interesting follow-up question is whether there are income elasticity differences for specific dental care services.

In the same study, the choice of whether a person will seek health care services outside the home and the choice to see a public or private provider for the services were also studied. Although dental services were not dealt with specifically, the results were illustrative as to the determinants that could possibly affect the utilization of dental care services and the choice of provider. In estimating the determinants of market entry decisions for adults, a significant factor which deterred individuals from seeking care was the perception of distance. Individuals who located in urban areas where health care facilities proliferate and where transportation is relatively easier, were more likely to seek care outside the home. On the other hand, estimates for seeking care in a private facility show that location in an urban area was more likely to lead to a choice of private provider for health care services.

The present low levels of utilization of dental health services and the high income elasticity for these services suggest that substantial increases in demand could result as the general economy and the incomes of the populace improve. This supposition can lead to a host of questions as follows.

If the perception of distance to a provider is to be taken as an important determinant of seeking care outside the home, then demand for dental care services is translated into utilization if there are dental care providers available within reasonable distances. The question arises therefore if there are or will be sufficient providers to help translate these demands to increased utilization. The availability of dental care providers is therefore a concern if the increased demands and utilization are to be met.

Since distance to a provider is a main concern, then the distribution of dental care providers may be the more significant issue than the number of providers. Although perceptions of distance to a provider are also determined by infrastructure conditions such as roads and availability of transportation, a provider still has to be present at the particular convergence point. What then determines the distribution of dentists in the Philippines? Will increased demands automatically translate into provider availability?

Another question that can be brought to bear on the discussion of increasing utilization for dental care services is the effects of increased demands on total expenditures for the same. This does not refer only to the services in general but increased demands for specific dental services such as fillings, extractions, check-ups and the like. Table 1.3 suggests that there are interregional differences in utilization of specific dental services. If regional differences are taken to proxy income levels, then it is reasonable to suppose that increases in demand for dental care services as incomes increase also translate to different increases in demand for specific dental care services. Greater increases in demand for specific dental services relative to others could also bring about shifts in the providers chosen for care. This is reasonable to suppose if public and private providers differ in the emphasis of the services that they provide. While increased utilization of services leads to increased expenditures, the magnitude of the increases will also depend on the prices charged for these services. This is specially relevant if there is a shift in the utilization from publicly provided services to privately provided services. Will increases in demand lead to price increases? What other factors determine prices?

These questions motivate the analyses to be presented in this paper. The paper then attempts to contribute in answering these questions by studying dentist practice patterns, specifically their location decisions, and the determinants of dentist prices.

The second part of the paper focuses on studying the current dentist distribution and analyzing some factors which could influence their location decisions. This part of the paper also presents a description of the profile of other aspects of dentist long-term decisions such as mode of employment, education and type of business.

The third part of the paper presents trends and determinants of dentist prices, specifically the prices charged by self-employed dentists. Realizing that pricing decisions is part of decisions which encompasses dentist work effort, inputs and outputs, some trends in these short-run decisions are presented.

2. DENTIST CAREER PATTERNS AND DECISIONS: FOCUS ON LOCATION

This part of the paper attempts to describe aspects of dentist career patterns and decisions, particularly dentist location decisions. Toward this end, the first part of this section provides a general description of the primary data used in the analysis. This includes a general description of the survey including sampling procedure, questionnaire used in the survey and implementation of the survey proper. This is followed by a discussion of the results of the survey on the distribution of dentists and a profile of other dentist practice patterns. Finally the last part discusses the conceptual framework used, the determinants of private dentist location decisions and some issues and implications of the results.

2.1 The 1990 Dental Manpower Survey[2]

The 1990 Dental Manpower Survey (DMS) was conducted in order to assess the country's dental manpower and the profile of dental economics. Specifically, its aims were the following:

a) To determine the ratio of dentist to population per region,

b) To identify the various categories and distribution of dental manpower in the country,

c) To determine the distribution and classification of equipment and facilities used in government and private dental service, and

d) To assess the average monthly income of the dentists derived from the practice of the profession.

It was conducted as a joint undertaking of the Dental Health Service of the Department of Health (DOH) and the National Statistical Coordination Board (NSCB). The latter agency provided partial funding and technical assistance while the former was tasked with the implementation of the survey. The survey, which was conducted in all regions and provinces nationwide, encompassed questionnaires on the dental manpower, dental auxiliaries and the economics of dental practice. The entire project was conducted from January 1990 to the second quarter of 1991 due to interruptions brought about by natural calamities.

Sampling design: Construction of the sampling frame involved the submission of the number and names of dental manpower falling under the areas of jurisdiction of the Regional Health Offices of the DOH, the School Health and Nutrition Center of the Department of Education, Culture and Sports (DECS), the Metropolitan Manila Authority (MMA) and the Armed Forces of the Philippines (AFP). This exercise provided a count and distribution of existing dental health manpower in the country.

These dental health workers were categorized into government dentists, occupational or establishment dentists, school dentists, private dental practitioners and dental aides/assistant/helper/prosthetic dental technicians, by province and by region. A systematic random sampling scheme was adopted where a 10 percent sample was drawn for every category of dental manpower by area. In cases where the population was less than ten, two random subjects were selected. This sampling design yielded a total number of 1,721 which is more than ten percent of the 12,821 dentists included in the sampling frame.

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2 This description of the survey is based mainly on "National Survey of Dental Manpower and the Economics of Dental Practice 1990: An Initial Report" by the Dental Health Service, Department of Health.

Questionnaire. Dentists included in the survey were asked to fill up two questionnaires, a dental manpower survey form and the economics of dental practice form (See Appendix A). The dental manpower survey form consisted of questions on the dentist's age, sex, civil status, education, employment status and type of practice or business. The economics of dental practice form consisted of questions on the dentist's gross monthly income, working hours and days per week, average number of patients a day for specific services, types and quantity of dental/laboratory equipment used, clinic expenses, and maximum and minimum clinic charges for selected services.

Implementation and processing. The questionnaires were distributed to the regional coordinators of the project. These coordinators then turned over the questionnaires to the Dentist II assigned in the respective municipalities for distribution to the dentists selected as respondents. The questionnaires were largely self-accomplished.

Upon collection of the survey returns, the same were submitted to the regional coordinators, and subsequently to the Dental Health Service. Further editing of the questionnaires was performed after which an outside firm was contracted for data encoding and processing.

2.2 Dentist Distribution

The construction of the sampling frame of the Dental Manpower Survey (DMS) has resulted in a very important output--a count and distribution of dentists practicing in the Philippines as of 1990.

Counting the number of practicing dentists in the country is no easy task given the dearth of data on health human resources. Several methodologies were attempted but each had its limitations. One such approach was to document the sources of increments and decrements in the stock of manpower in the country. This approach is embodied in the following identity:

$$\text{Net Stock}_t = \text{Net Stock}_{t-1} + \text{New Licensees}_t - (\text{Deaths}_t + \text{Retirements}_t + \text{Permanent Migrations}_t + \text{Temporary Migrations}_t)$$

Therefore, the number of practicing dentists at time t is just the sum of the previous year's stock and the additions to the stock in terms of new manpower produced and licensed less decrements in terms of retirees, deaths and migrations.

Counting the number of practitioners by way of this approach provides the most information useful for policy in that it identifies the possible areas where policy interventions may be necessary. On the other hand, it is the most intensive in its data requirements. While data on new licensees are available with the Professional Regulation Commission, the other components of the equation have limited if not deficient data. For instance, the number of permanent immigrants is not available; furthermore, assumptions would have to be made regarding death rates and retirement rates of dentists. If we also consider dentists shifting to other occupations as retirements, then data for this is simply unavailable. Therefore, the relative advantages of using this approach increase with the quality of the data used for the components of the identity.

Another approach that has been used is to count the number of practitioners through their institutional affiliations. This would mean counting the number of providers employed in the government either through rural health units, government health offices, public hospitals and schools or those employed or affiliated with private hospitals and clinics. This approach was used by Reyes and Picazo in their 1990 study. However, the accuracy of this approach depends on the propensity of the health practitioner to be affiliated with an institution. Counting physicians through this approach, for instance, may be worthwhile since physicians are, more often than not, affiliated with a hospital even as they maintain their private clinics. In the case of dentists, however, this approach may be limited since it is possible for dentists to maintain their own private clinics without even being affiliated with any government or private health institution.

Another institution which can be considered would be their professional associations. However, this approach may also be limited since not all practitioners are members of their professional associations. The DOH, on the other hand, has yearly data only for DOH dentists.

In the light of these limitations, the count which was conducted by the Dental Health Service overcame some of the limitations of the different approaches. Since it counted the number of dental manpower existing in the country, it circumvented the need to count those who were abroad. In addition, since the count was not limited by the institutional affiliation, even private general practitioner dentists were included in the count. As a baseline estimate, the count provides an approximate number from which estimates from other approaches can be compared.

About 12,821 dentists were practicing in the Philippines in 1990 (Table 2.1). This count seems reasonable based on the unofficial estimates of the professional association of the number of practitioners of 10,000 in 1987 (Reyes and Picazo), and the number of newly registered dentists for 1988, 1989 and 1990 of 4,480 (3,213 if only 1988 and 1989 are taken into account). The difference could be accounted for by migrations, deaths and retirements.

About 41.7 percent of dentists were located in the National Capital Region (NCR), 13.6 percent in Region 4 (Southern Tagalog) and 10.2 percent in Region 3 (Central Luzon). Regions 9 and 12 had the least number of dentists, 1.8 percent each.

Another way to look at the distribution of dentists is to consider the number of population per dentist (Table 2.1 and Fig. 2.1). Population per dentist ranged from about 1,483 in the NCR to about 13,000 plus for Regions 9 and 12. However, there were regional differences as shown in the Figure. Regions 3, 4, 7

Table 2.1

Distribution of Dentists, 1990

Region and Province	Number of Dentists			Total Population	Dentist to Population Ratio
	Government	Private	Total		
Philippines	2979	9842	12821	60,684,887	1: 4,733
National Capital Region	803	4543	5346	7,928,867	1: 1,483
Cordillera Administrative Region					
Abra	14	8	22	184,743	1: 8,397
Benguet	39	157	196	485,546	1: 2,477
Ifugao	6	2	8	147,281	1: 18,410
Kalinga Apayao	16	2	18	211,775	1: 11,765
Mountain Province	9	6	15	116,535	1: 7,769
Total	84	175	259	1,145,880	1: 4,424
Region I - Ilocos Region					
Ilocos Norte	28	48	76	461,661	1: 6,074
Ilocos Sur	25	39	64	519,930	1: 8,124
La Union	22	50	72	548,742	1: 7,621
Pangasinan	78	151	229	2,020,273	1: 8,822
Total	153	288	441	3,550,606	1: 8,051
Region II - Cagayan Valley					
Batanes	3	0	3	15,026	1: 5,009
Cagayan	43	34	77	829,974	1: 10,779
Isabela	41	85	126	1,080,341	1: 8,574
Nueva Vizcaya	14	24	38	301,179	1: 7,926
Quirino	7	1	8	114,132	1: 14,267
Total	108	144	252	2,340,652	1: 9,288
Region III - Central Luzon					
Bataan	16	93	109	425,803	1: 3,906
Bulacan	42	327	369	1,505,219	1: 4,079
Nueva Ecija	51	160	211	1,312,610	1: 6,221
Pampanga	69	289	358	1,532,682	1: 4,281
Tarlac	40	73	113	859,651	1: 7,608
Zambales	23	127	150	562,992	1: 3,753
Total	241	1069	1310	6,198,957	1: 4,732
Region IV - Southern Tagalog					
Aurora	13	7	20	139,586	1: 6,979
Batangas	70	287	357	1,476,783	1: 4,137
Cavite	46	303	349	1,152,534	1: 3,302
Laguna	40	294	334	1,370,232	1: 4,102
Marinduque	11	7	18	185,524	1: 10,307
Occidental Mindoro	16	16	32	282,593	1: 8,831
Oriental Mindoro	15	55	70	550,049	1: 7,858
Palawan	31	21	52	528,287	1: 10,159
Quezon	52	150	202	1,372,381	1: 6,794
Rizal	57	233	290	980,194	1: 3,380
Romblon	19	2	21	227,621	1: 10,839
Total	370	1375	1745	8,265,784	1: 4,737
Region V - Bicol Region					
Albay	41	84	125	903,023	1: 7,224
Camarines Norte	15	50	65	390,982	1: 6,015
Camarines Sur	49	107	156	1,305,919	1: 8,371
Catanduanes	16	5	21	187,000	1: 8,905
Masbate	27	7	34	599,915	1: 17,645
Sorsogon	26	25	51	522,960	1: 10,254
Total	174	278	452	3,909,799	1: 8,650

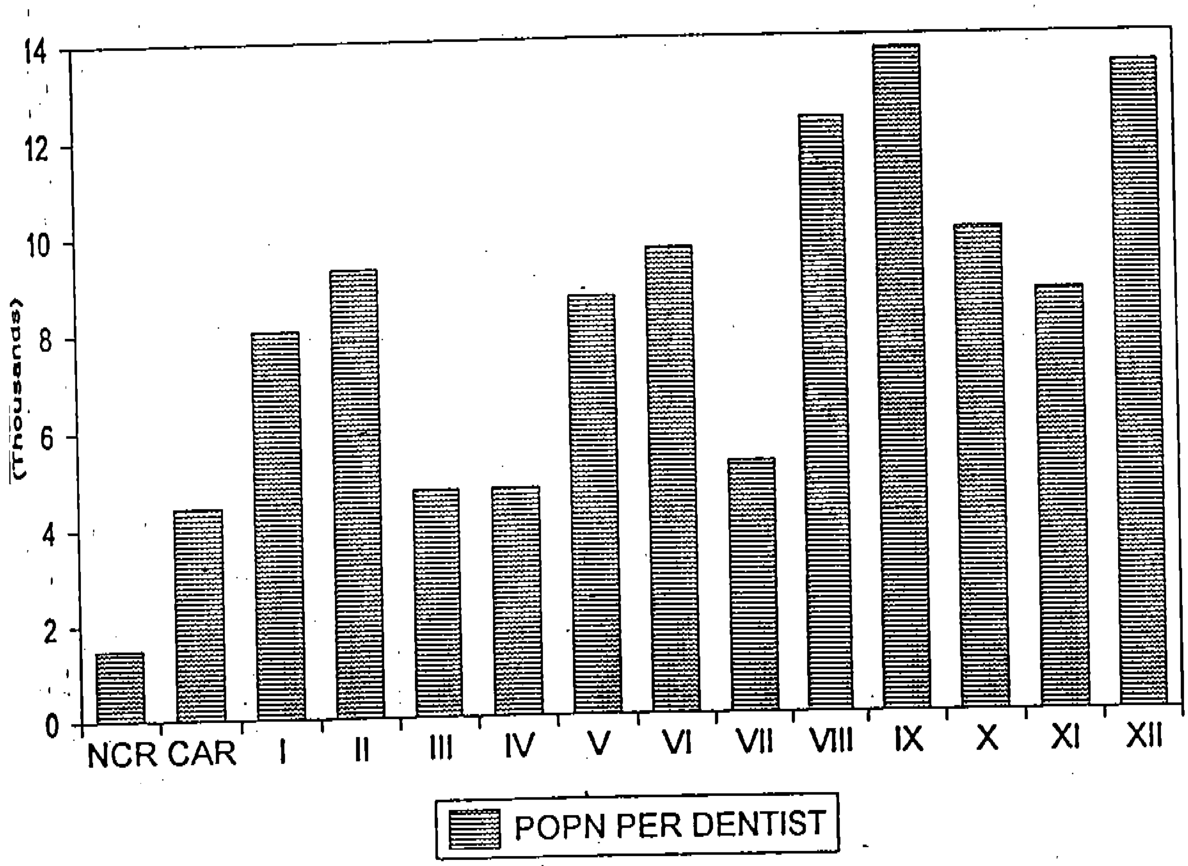
Table 2.1: continued

Region and Province	Number of Dentists			Total Population	Dentist to Population Ratio
	Government	Private	Total		
Region VI - Western Visayas					
Aklan	16	16	32	380,497	1: 11,891
Antique	16	19	35	406,361	1: 11,610
Capiz	31	26	57	584,091	1: 10,247
Iloilo	80	164	244	1,647,486	1: 6,752
Guimaras (sub-prov. of Iloilo)	3	0	3	117,990	1: 39,330
Negros Occidental	55	133	188	2,256,908	1: 12,005
Total	201	358	559	5,393,333	1: 9,648
Region VII - Central Visayas					
Bohol	40	38	78	948,315	1: 12,158
Cebu	132	597	729	2,645,735	1: 3,629
Negros Oriental	30	36	66	925,311	1: 14,020
Siquijor	4	2	6	73,790	1: 12,298
Total	206	673	879	4,593,151	1: 5,225
Region VIII - Eastern Visayas					
Eastern Samar	19	12	31	329,335	1: 10,624
Leyte	60	49	109	1,368,510	1: 12,555
Biliran (sub-prov. of Leyte)	6	4	10	118,012	1: 11,801
Northern Samar	23	13	36	383,654	1: 10,657
Samar (Western Samar)	32	9	41	533,733	1: 13,018
Southern Leyte	14	7	21	321,940	1: 15,330
Total	154	94	248	3,055,184	1: 12,319
Region IX - Western Mindanao					
Basilan	6	4	10	243,091	1: 24,309
Sulu	10	6	16	469,971	1: 29,373
Tawi-Tawi	7	0	7	228,204	1: 32,601
Zamboanga del Norte	24	24	48	673,774	1: 14,037
Zamboanga del Sur	58	91	149	1,544,157	1: 10,363
Total	105	125	230	3,159,197	1: 13,736
Region X - Northern Mindanao					
Agusan del Norte	18	37	55	465,458	1: 8,463
Agusan del Sur	15	9	24	420,763	1: 17,532
Bukidnon	32	32	64	843,959	1: 13,187
Camiguin	6	0	6	64,247	1: 10,708
Misamis Occidental	16	33	49	424,365	1: 8,661
Misamis Oriental	46	66	112	865,051	1: 7,724
Surigao del Norte	23	18	41	425,978	1: 10,390
Total	156	195	351	3,509,821	1: 9,999
Region XI - Southern Mindanao					
Davao	29	40	69	1,055,016	1: 15,290
Davao del Sur	40	247	287	1,482,648	1: 5,166
Davao Oriental	14	4	18	394,697	1: 21,928
South Cotabato	28	73	101	1,072,617	1: 10,620
Surigao del Sur	28	9	37	452,098	1: 12,219
Total	139	373	512	4,457,076	1: 8,705
Region XII - Central Mindanao					
Lanao del Norte	17	37	54	614,092	1: 11,372
Lanao del Sur	15	8	23	599,637	1: 26,071
Maguindanao	22	21	43	757,739	1: 17,622
North Cotabato	17	61	78	763,995	1: 9,795
Sultan Kudarat	14	25	39	435,905	1: 11,177
Total	85	152	237	3,171,368	1: 13,381

Source of basic data: DOH National Survey on Dental Manpower, 1990

Figure 2.1

POPULATION PER DENTIST, 1990



and CAR had relatively high dentists per population while regions 1, 2, 5, 6, 10 and 11 had higher population per dentist.

Not only were there regional differences in population per dentist. A closer look at the table reveals that there were differences in dentist density within regions. These variations were apparent in CAR, Regions 4, 5, 7, 10, 11 and 12, where provincial population per dentist ratio covered a wide spread.

Unevenness in the distribution of dentists within a province can also be found by looking at the distribution of respondents to the DMS (Table 2.2). As an approximation of the distribution of dentists within a province, the results suggest that majority of the dentists converge in the urban-city centers. Only about one-third of dentists locate in the rural-municipalities.

Less than one-fourth of all dentists in the Philippines were government dentists. The rest were connected with the private sector. Regions 8, 9, 10 and 2 had relatively higher proportions of government dentists than private dentists (Fig. 2.2).

Due to their relatively larger numbers, the location decisions of private dentists have had larger influences on the distribution of dentists, as Figures 2.2 and 2.3 show. The proportions of government dentists to the total number of dentists were relatively higher in areas with high population per dentist ratios. Likewise, population per government dentist showed a more stable trend than population per private dentist.

Among private dentists, i.e., those who are self-employed or are private employees, the most dominant form of organization was still the single-ownership or proprietorship (Table 2.3). More than three-fourths of private dentists were single owners. About 16 percent worked in partnerships or group practices while about four percent belonged to corporations.

As expected, these forms of organization were found in the more developed regions in the country. As seen in Table 2.4, Central Visayas, Southern Mindanao and the NCR boast of a more varied distribution of dentists by type of business. Within specific regions, urban areas supported a more varied form of organization than rural areas. Exceptions to these trends were in Southern Mindanao and Central Mindanao where the rural areas supported more varied forms of organization than the cities.

A dentist's educational attainment is one of the many indicators that can be used to infer the quality of dental services that they render. Note that this indicator belongs to what one may call as 'structural' indicators of quality.[3] On the other

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[3] Structural aspects of quality are the relatively easier ones to observe such as the cleanliness of the facility, amenities and the educational attainment of the provider. These are to be differentiated from process measures which refer to the modalities or process followed in treatment and outcome measures which refer to the outcome of care.

Table 2.2

Dentist Respondents by Location

	Region	Urban No.	Urban Percent	Rural No.	Rural Percent	Total
I	Ilocos Region	32	55.17	26	44.83	58
II	Cagayan Valley	-	-	30	100.00	30
III	Central Luzon	32	22.07	113	77.93	145
IV	Southern Tagalog	76	37.81	125	62.19	201
V	Bicol Region	22	35.48	40	64.52	62
VI	Western Visayas	55	53.40	48	46.60	103
VII	Central Visayas	88	76.52	27	23.48	115
VIII	Eastern Visayas	25	41.67	35	58.33	60
IX	Western Mindanao	29	55.77	23	44.23	52
X	Northern Mindanao	38	49.35	39	50.65	77
XI	Southern Mindanao	29	46.03	34	53.97	63
XII	Central Mindanao	17	38.64	27	61.36	44
CAR	Cordillera Admin. Region	15	57.69	11	42.31	26
NCR	National Capital Region	684	100.00	-	-	684
	PHILIPPINES	1142	66.40	578	33.60	1720

Source of basic data: DOH National Survey on Dental Manpower, 1990

Figure 2.2

Private and Government Dentists, 1990

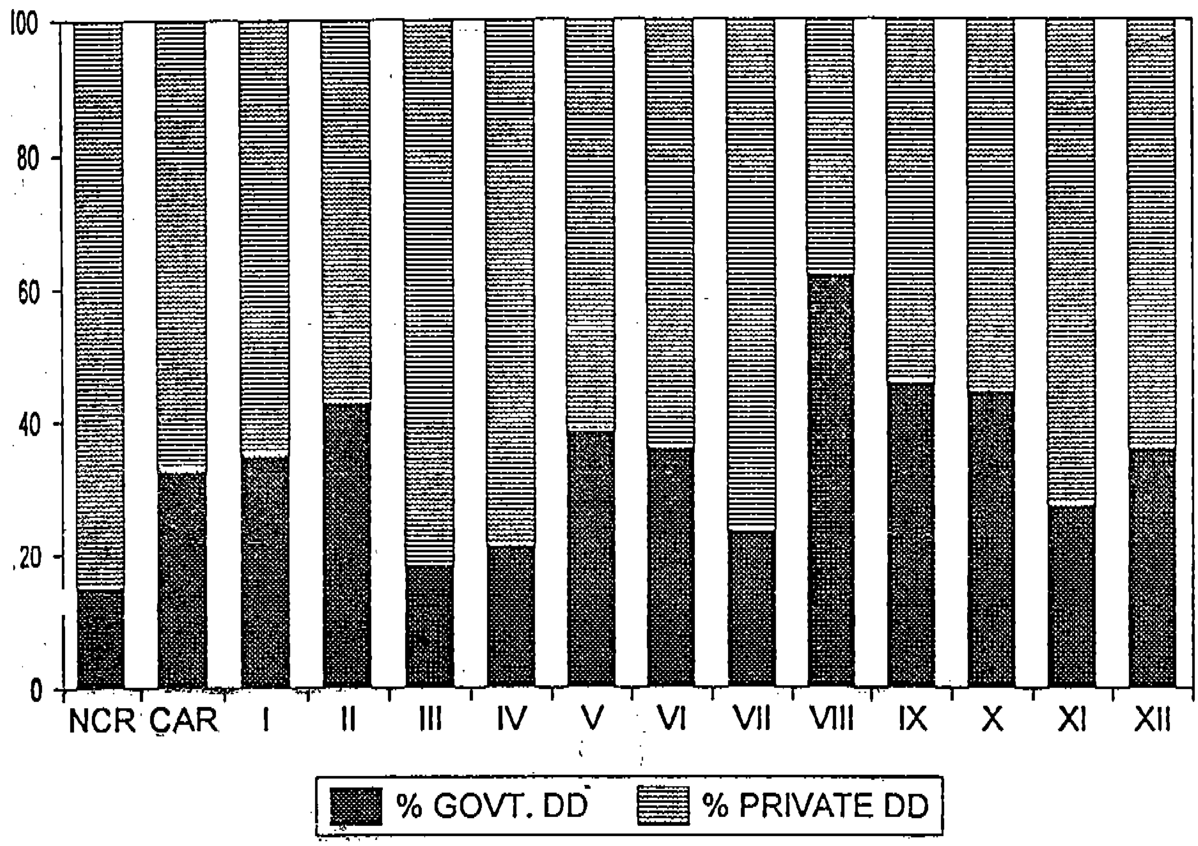

Figure 2.3

Pop'n per Private and Government DD

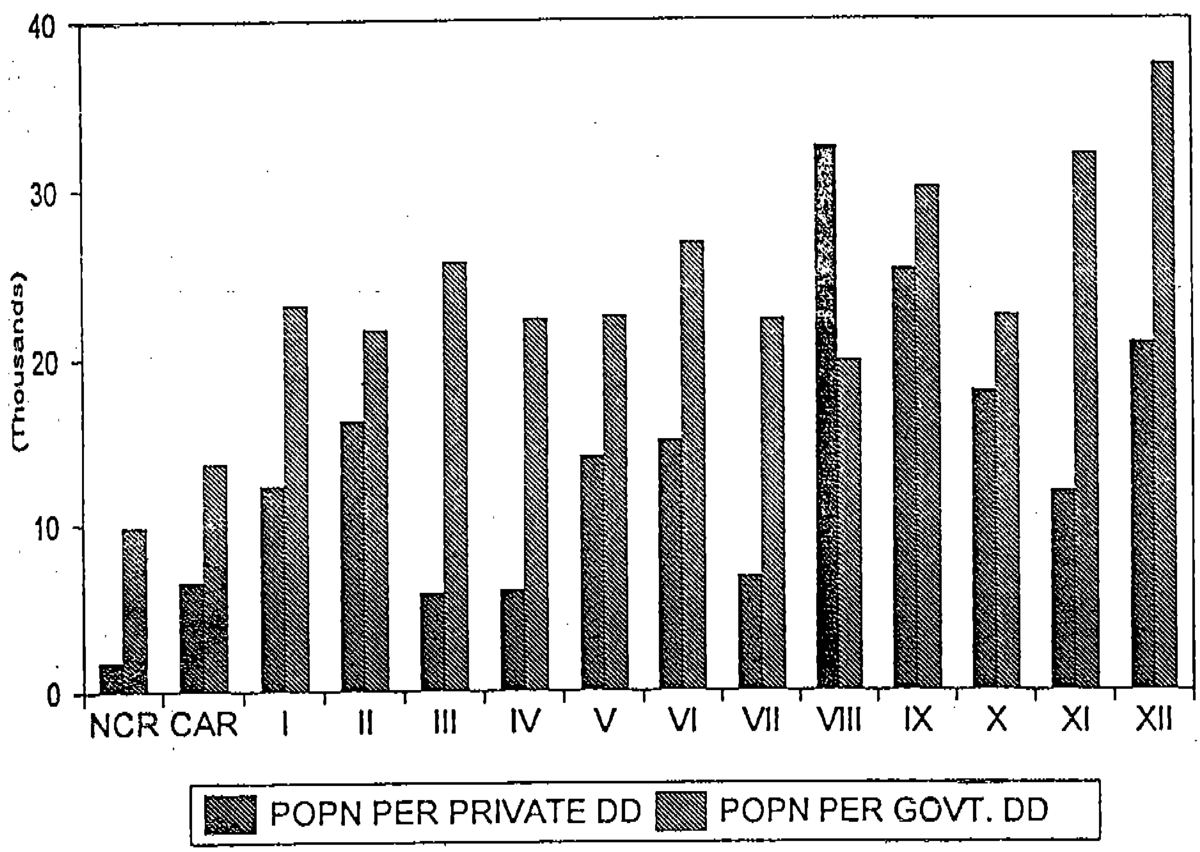

Table 2.3

Private Dentists by Type of Practice/Business

Type of Practice	Number	Percent
Single ownership	876	78.92
Partnership	163	14.68
Corporation	46	4.14
Group practice	25	2.25
N =	1110	100.00

Source of basic data: DOH National Survey on Dental Manpower, 1990

Table 2.4
Private Dentists by Type of Business and Region

Region		Type of business				
		Single Ownership	Partner-ship	Corpora-tion	Group Practice	N
I	Ilocos Region	28 84.85	2 6.06	2 6.06	1 3.03	33 100.00
II	Cagayan Valley	16 100.00	-	-	-	16 100.00
III	Central Luzon	82 85.42	12 12.50	2 2.08	-	96 100.00
IV	Southern Tagalog	125 86.81	18 12.50	-	1 0.69	144 100.00
V	Bicol Region	30 85.71	5 14.29	-	-	35 100.00
VI	Western Visayas	40 85.11	4 8.51	3 6.38	-	47 100.00
VII	Central Visayas	57 73.08	10 12.82	6 7.69	5 6.41	78 100.00
VIII.	Eastern Visayas	16 84.21	1 5.26	2 10.53	-	19 100.00
IX	Western Mindanao	21 87.50	3 12.50	-	-	24 100.00
X	Northern Mindanao	29 72.50	1 2.50	10 25.00	-	40 100.00
XI	Southern Mindanao	29 69.05	8 19.05	4 9.52	1 2.38	42 100.00
XII	Central Mindanao	21 91.30	2 8.70	-	-	23 100.00
CAR	Cordillera Admin. Region	19 79.17	4 16.67	1 4.17	-	24 100.00
NCR	National Capital Region	363 74.23	93 19.02	16 3.27	17 3.48	489 100.00

Source of basic data: DOH National Survey on Dental Manpower, 1990

hand, the educational attainment of a dentist could also reflect exposure to different treatment approaches and techniques.

As encoded, the DMS classifies educational attainment into two, whether a dentist holds a BS degree only or whether they also obtained post-graduate studies. However, post-graduate studies include full-fledged residency programs leading to specialization and short-courses on dental topics like orthodontia. These have to be borne in mind as data on educational attainment is presented.

Table 2.5 notes that a larger proportion of government dentists (9.3%) obtained post-graduate studies relative to self-employed (4.3%) or private employee dentists (3.5%). It can be supposed that there are greater incentives for government dentists to obtain post-graduate studies since these are the main avenues by which they can be promoted.

Some regions in the Philippines may not have had the benefit of enjoying the services of dentists with post-graduate education. Survey results for Regions 1, 8, 9, and 11 show that dentists practicing in those regions obtained BS degrees only (Table 2.6). Except for partnerships, there were no major differences in the proportions of dentists with post-graduate studies and those practicing in single ownership, corporation and group practices (Table 2.7).

2.3. Determinants of Dentist Location

As it was noted earlier, the distribution of private dentists affected the distribution of total dentists due to their relatively larger numbers. The distribution of government dentists followed a more stable trend. In addition, for government dentists, the place of practice may not be completely a choice since the places of assignment are determined by the head office.

It was also noted that more than 40 percent of total dentists and more than 45 percent of private dentists were congregated in the NCR. The factors that affect dentist decisions to locate in Metro Manila could therefore assist in identifying factors which can be used to even out the distribution of dentists. Given these considerations, this part of the paper then attempts to discuss the decision of private dentists to locate in Metro Manila or outside Metro Manila by estimating the probabilities that a dentist would locate in these areas.

However, some caveats to the following analysis need to be stated. The empirical verification may be limited to the extent that some of the determinant variables may not be represented or represented inadequately. These are specially relevant to the class of variables which seeks to describe the various characteristics of the area. To the extent that these characteristics are correlated with the variables used in the estimation partly solves this problem. Another problem which arises in the presence of some variables which describe the particular choice is the correlation between these variables. In this respect, the estimated coefficients may not measure the direct and sole effects of the variable but rather the joint effects of the variables.

Table 2.5

Educational Attainment by Nature of Employment

Education	Employment		
	Self employed	Private employee	Govt. employee
BS Degree holder	910 95.7%	276 96.5%	410 90.7%
Post-graduate studies	41 4.3%	10 3.5%	42 9.3%
Total	951	286	452

Source of basic data: DOH National Survey on Dental Manpower, 1990

Table 2.6

Dentist by Educational Attainment and Region

REGION		B.S. Degree Holder				Post-graduate Studies			
		Self employed	Private employee	Govt. employee	% to total	Self employed	Private employee	Govt. employee	% to total
I	Ilocos Region	20	15	23	100.0%	-	-	-	0.0%
II	Cagayan Valley	13	5	11	96.7%	-	-	1	3.3%
III	Central Luzon	83	28	20	90.3%		2	12	9.7%
IV	Southern Tagalog	126	26	36	93.5%	7	-	6	6.5%
V	Bicol Region	28	8	22	93.5%	2	-	2	6.5%
VI	Western Visayas	35	19	32	90.5%	5	-	4	9.5%
VII	Central Visayas	64	20	29	98.3%	1	1	-	1.7%
VIII	Eastern Visayas	19	8	28	100.0%	-	-	-	0.0%
IX	Western Mindanao	19	9	24	100.0%	-	-	-	0.0%
X	Northern Mindanao	21	19	32	98.6%	1	-	-	1.4%
XI	Southern Mindanao	40	11	12	100.0%	-	-	-	0.0%
XII	Central Mindanao	20	3	16	88.6%	3	-	2	11.4%
CAR	Cordillera Region	22	1	2	96.2%	1	-	-	3.8%
NCR	National Capital Regio	400	104	123	93.6%	21	7	15	6.4%

Source of basic data: DOH National Survey on Dental Manpower, 1990

Table 2.7

Educational Attainment by Type of Practice

Education	Type of Business			
	Single Ownership	Partnership	Corporation	Group Practice
BS Degree holder	828 95.3%	160 99.4%	44 95.7%	24 96.0%
Post-graduate studies	41 4.7%	1 0.6%	2 4.3%	1 4.0%
Total	869	161	46	25

Source of basic data: DOH National Survey on Dental Manpower, 1990

The estimates would therefore be more indicative of the effects of groups of variables rather than just one and should therefore be interpreted accordingly.

Conceptual framework. The decision to locate in a certain area is therefore hypothesized to be the result of the dentist maximizing his/her utility over the choice of location. Utility is assumed to be a random function because of imperfect perceptions and errors in measuring all the variables.

A dentist therefore faced with a choice of locating in the NCR or outside is therefore assumed to maximize Y^{j*} which is the level of indirect utility associated with the jth choice. However, the level of utility is unobserved. What is observed is Y_j which is defined as:

$$Y_j = 1 \text{ if } Y^{j*} = \text{Max}\ (Y^{M*}, Y^{NM*})$$

$$Y_j = 0 \text{ otherwise.}$$

The subscripts M and NM are used to denote NCR and outside NCR, respectively. Assume that:

$$Y^{j*} = B'X_{ij} + A'Z_i + e_{ij}$$

where Z_i are individual-specific variables and X_{ij} are vectors of values of attributes of the jth choice by the ith individual. Assuming that the residuals e_{ij} follow a cumulative logistic distribution function, then the probability of choosing the jth alternative can be written as:

$$P_{ij} = \text{Prob}\ (Y_{ij} = 1) = \frac{e^{B'Xij + A'Zi}}{e^{B'XiM + A'Zi} + e^{B'XiNM + A'Zi}}$$

This is the mixed logit model since the determinants include individual specific variables and values of the attributes.

What are some of the characteristics of the dentists and the location which determine the location choices and distribution of dentists? A review of literature for physician location choices provides some clues.[4]

Studies have hypothesized that providers locate in areas where they can earn relatively high incomes. This is based on the premise that dentist net income has positive effects on utility. Considering that the dentist is also an entrepreneur paying for the use of equipment and supplies and materials used in dental clinics means that the costs of practice associated with a certain location may also matter in the decision to locate in a certain area.

[4] For a review of studies on physician location, see Kraft and Limpiado, Preliminary Report on Analysis of Health Manpower Behavior, September 1992.

The demand for services largely determines the provider's potential income. In turn demand is usually measured by the size and composition of the population, the education level of residents and their income. Demand in this case is to be differentiated from dental service needs or requirements. While the latter refers to the incidence of disease, requirements need to be translated into effective demand by ability and willingness to pay.

The attributes of the area in terms of recreational, cultural and educational facilities as well as physical infrastructures have also been investigated as possible determinants of location. Educational facilities for children of married dentists have been found to be significantly related to the decisions of dentists to locate in a particular area.

In the literature for physician location decisions, the presence of medical facilities and support in the area have also been found to be significant determinants of location choice. In the case of private dentists, however, these may not be as important because of their relatively more clinic-based practices. For dentists who do not manufacture their prosthetics for their patients, the type of facility that may be more relevant would be dental laboratories for the processing of prosthetics. Unfortunately, the data on number and distribution of these laboratories are unavailable.

Furthermore, the personal characteristics of the provider such as age, sex, professional attitudes and prior contact with the community have been listed as possible determinants of location choice.

Data and variables. Table 2.8 lists the variables and the descriptive statistics of the variables used to estimate the probability of dentists locating in Metro Manila and outside Metro Manila. Of the 931 private dentists who had complete information, about 44.5 percent were located in the Metro Manila area. The remaining 517 dentists were distributed in the other 13 regions of the country.

To proxy for the characteristics of the area such as the number of recreational and leisure facilities and the number of educational institutions, the variable percent of population located in urban areas in each of the regions is used. It can be argued that the greater the population located in urban areas, the greater is the level of urbanity of the region; as a consequence, the greater is the probability of having more recreational facilities. The average percent of population located in urban areas is about 65 percent. In the least urbanized regions of the country, only about 20 percent of the population reside in the urban areas.

The incidence of dental caries is used to proxy for the dental health requirements of the population. This variable is therefore indicative of the level of need for dental care services. The data indicate that on average, about 90 percent of the population in the region have cavities. The incidence of caries varies from 83 percent to slightly more than 95 percent. To the extent that dental services are necessary for the restoration of carious teeth and the replacement of lost teeth due to

Table 2.8

Descriptive statistics of dentists' choice of location

Variable	Source	Mean	Std. dev.	Minimum	Maximum
City/Municipality is located in NCR	Dental Health Manpower Survey, DOH	0.44	0.50	0.00	1.00
Percent of population in urban areas	National Statistics Office	64.94	32.17	20.00	100.00
Incidence of dental caries (percent)	Dental Health Service, DOH	90.57	2.81	83.30	95.60
Literacy rate of the population	National Statistics Office	95.92	4.30	81.32	99.09
Average annual household income	Family Income and Expenditures Survey, NSO	67355.17	27152.71	31870.66	97086.26
Total cost of practice	Dental Health Manpower Survey, DOH	4909.58	960.59	2455.91	6519.77
Mean income of self employed dentists	Dental Health Manpower Survey, DOH	6672.31	660.86	4617.65	7968.35
Age of dentist	Dental Health Manpower Survey, DOH	35.81	11.70	23.00	72.00
Sex of dentist	Dental Health Manpower Survey, DOH	0.65	0.48	0.00	1.00

caries, then these figures indicate a significant need for dentists in all of the regions of the country.

While the incidence of caries can be thought of as a reflection of the need for dental services, this needs to be translated to dental service utilization. It is in this respect that the variable literacy rates and average household income in the region are included among the determinants.

Literacy rates in the region are used to reflect the population's level of education. To the extent that dental hygiene, proper care of the teeth, and the importance of dental care are part of the primary education curriculum, then the level of education of the populace could affect significantly the utilization of dental care services. If literacy rates are significantly correlated with the number of schools in the region, then literacy rates could also be correlated with the presence of school dental programs and dentists who provide dental care for schoolchildren. This could also mean added demand for dental care services specially if private schools hire private dentists on a part-time basis. The average literacy rate is about 96 percent, with a low of 81 percent and nearly 100 percent literacy as the maximum.

Expenditure data from the FIES indicate that the higher the income of the population, the higher is the level of expenditures for dental care services. To represent this effect on potential demand for dental care services of income, the average annual household income in the region is included. The average annual household income registered in the sample is about P 67355 or about P 5612 a month. Lowest income registered amounts to about P 2655 a month while the highest registered is about P 8090 a month.

Average household income is also correlated with the characteristics of the area. Its effects on the decision to locate could therefore capture some of the effects of these area characteristics.

The next two variables pertain to characteristics of the dental practice in the various areas. These are average incomes of self-employed dentists in the region and the average cost of practice.

The average income of the self-employed dentist is included in order to represent not only the average actual income that dentists could earn but also aspects of the market structure for dentist services. The average income of the self-employed dentist more directly reflects the potential earnings that a dentist could have in a particular region.

This average income, aside from being partly determined by the potential demand for dental services, could arguably be influenced by the number of providers and the amount of competition prevailing in the dental services market. Increases in demand brought about by increases in aggregate household incomes and literacy rates may not translate to significant increases in incomes of each dentist if there are many dentists to choose from. The regional averages of self-employment income could therefore capture aspects of market structure across regions.

The average monthly income of the self-employed dentist is about P 6,672. The lowest income registered is about P 4617 while the highest average income is about P 7968. However, the average income used in the analysis may be subject to some measurement error. The survey did not ask dentists for their exact income but rather their income category. In computing the average income, the midpoint of the income category was used for the individual dentists. To the extent that the upper limit of the highest income category was open-ended, then the estimated average incomes may be understated.

The average cost of practice was computed by summing dentist expenditures for rent, utilities, dental supplies and materials and salaries of assistants. Together with average incomes, costs of practice determine the net income that can be generated from the practice of dentistry in a particular region. Higher costs of practice in a certain location could deter a self-employed dentist from locating there.

The average cost of practice could, to a certain extent, capture aspects of the types of services demanded. Certain dental services are more time and materials intensive than others, extractions versus fillings, and fillings versus prophylactic and fluoride application. Higher costs of practice may be capturing a mix of services more biased towards those which are time and materials intensive. To the extent that dentists derive utility from leisure time and to the extent that the more materials intensive services are also time intensive, then costs of practice could also partly represent the costs in terms of the dentist's leisure time.

The mean average cost of practice is about P 4909 a month. Maximum reported average is about P 6519. Note that these costs may be understated to the extent that dentists utilize their homes as clinic space without paying rent.

One limitation of the analysis was that there were no variables available which could represent the dentist's prior contact with the community. Examples of such variables could include whether the dentist was born in the community, whether he spent his formative years in the community or whether he underwent dental education in the community. Unfortunately, these variables were not asked in the questionnaire. Although there was a question as to where the dentist studied, the responses were not encoded in the data set. This could result in biased estimates for some of the variables if the omitted variables were correlated with them. Since the characteristics of the practice location are regional variables, there may be little correlation with these prior contact variables which are personal characteristics.

Among the personal characteristics of the dentist included in the determination of practice location are age and gender of the dentist. In the literature for physician location decisions, older physicians were found to locate in rural communities rather than in urban communities. This may be due to preferences for a more leisurely pace of practice among older physicians. Female physicians were also likewise found to prefer practicing in rural communities for the same reasons.

These findings in the physician location literature are to be tested in the analysis for dentists. Average age of dentists in the sample is about 36 years; about 65 percent are female.

Results and implications. The results of the mixed logit model of the probability of locating in Metro Manila and outside is presented in Table 2.9. Out of the 931 cases, about 69 percent of the choices are correctly predicted by the estimated equation.

The variable proportion of population residing in an urban area was used as a proxy variable for the characteristics of the area. It positively and significantly affects the decision of the dentist to locate in an area. Every percentage point increase in the population residing in an urban area increases the probability of the dentist locating there by about 1.4 percent. This result is consistent with the findings in the dentist distribution data that show differences within regions between the number of dentists locating in urban and those locating in rural municipalities.

Of variables representing the potential demand for the services of the dentist, only literacy rates are positive and significant. The incidence of dental caries in the region and the average household income are not significant.

Several explanations could account for these trends. The insignificance of household income may not necessarily mean that increases in income do not translate into increases in demand for dental care services and therefore have no effect on dentist location. The insignificance of the income variable may be due to the high degree of correlation it has with the proportion of the population in urban areas and the average income of the self-employed dentists. The positive and significant effects of these two variables on the choice to locate in Metro Manila may capture some of the effects of increases in demand brought about by household income.

A percentage point increase in literacy rates increases the probability of dentists locating in an area outside Metro Manila by about 2.5 percent. To the extent that literacy rates are good indicators of having had at least primary education, the results indicate that basic education may significantly affect the demand for dental services. This could be so if primary education includes basic courses on dental hygiene and proper care of the teeth, and the importance of having dental checkups with the dentist. Policies which increase the awareness of the population about the necessities of dental care, either through basic education or information and education campaigns, could therefore significantly affect demand for dental care services and the propensity for dentists to locate in rural areas.

This result is especially relevant when juxtaposed with the insignificant result for the incidence of dental caries. This is taken to imply that location decisions of private dentists do not necessarily follow the requirements for dentists. These needs have to be translated into demand by way of awareness of the value of dental care and the means to purchase them before they are effective signals for dentists to locate in these regions.

Table 2.9

Results of mixed logit estimation of dentists' choice of location

Dependent variable: NCR
Log of the likelihood function = -600.775
Number of observations = 931
Percent correct predictions = 68 %

Variable	Coefficient	t-stat		Marginal effects
Percent of population in urban areas	0.056287	2.6901	**	0.0137610
Incidence of dental caries (percent)	-0.041070	-1.1704		
Literacy rate of the population	0.102698	2.5015	**	0.0251074
Average annual household income	-0.000034	-1.5033		
Total cost of practice	-0.000952	-4.3676	**	-0.0002327
Mean income of self employed dentists	0.000611	2.9141	**	0.0001494
Age of dentist	0.046384	6.9015	**	0.0113398
Sex of dentist	-0.007979	-0.0530		

** significant at the 95% level

Source of basic data: DOH National Survey on Dental Manpower, 1990

As noted earlier, part of the effect of increases in household incomes may be captured by the positive and significant effect of increases in the average incomes of self-employed dentists. The marginal effects indicate that a P 100 increase in the average monthly income of self-employed dentists could increase the probability of locating in an area outside Metro Manila by about 1.5 percent.

This implies that measures which tend to increase the demand for dentist services, to the extent that they lead to increases in the incomes of self-employed dentists, could also increase the probability of locating in that area.

Increases in the average costs of practice decreases the probability of a dentist locating in that area. The results estimate that a P 100 increase in the average monthly cost of materials, supplies, utilities, rent and salaries of assistants could tend to decrease the probability of a dentist locating in the area by about 2.3 percent. Factors which increase the costs of doing business, whether it be increases in the unit prices of the inputs used in the practice or shifts in the types of services provided may therefore affect the probabilities of dentists locating in those regions.

That costs could be affected by the structure of services performed is seen in Table which lists the average monthly costs of practice by various levels of the extractions to fillings performed by physicians ratio. The latter is analogous to a case-mix variable. As the extractions to fillings ratio increase (or a less time intensive case-mix) the lesser are the average monthly costs.

This implies that demand increases which increase the probability of locating in an area are mitigated by increases in the costs of doing business. Shifts in the structure of demand towards services which are more intensive in the use of other resources provide additional mitigating factors. Unless these cost increases are less than income increases, locational shift towards areas of increasing demands may not be automatic.

Female dentists do not significantly differ from male dentists in their choices of location.

The results indicate that as a dentist increases in age, the probability of locating in Metro Manila increases. Every year increase in age increases the probability of locating in Metro Manila by about 1.1 percent. Several reasons could account for these trends. In the literature for physician location decisions, older physicians were hypothesized to locate in areas which would afford them more leisure time. It could be that older dentists choose to locate in areas where they do not have to work long hours in order to earn a stable enough income. The NCR may therefore offer this advantage over the rest of the regions.

On the other hand, the results imply that younger dentists tend to locate in areas outside the NCR. Since the analysis does not have variables which control for the dentists' prior contact with a community, it could be that these younger dentists in our sample are coming from the other regions in the country.

However, the decisions of these younger dentists to practice in other regions may be related to the level of competitiveness in the market for dentist services and therefore the ease of establishing a practice in a certain location. Like physician services, establishing a practice takes some time. The number of patients that a certain physician has partly depends on the recommendations of satisfied customers since the quality of a physician services is very hard to ascertain.. Older physicians are more likely to be patronized since age is used as an indicator of experience and skill, as well as having more past customers to recommend them. This could also be said of dentists. In an environment where there are many older dentists, younger dentists would therefore have to compete vigorously in order to establish a practice. This could involve higher costs and longer time. Establishing a practice in areas outside where there are relatively less dentists could therefore prove to be less costly in terms of time and money.

These results imply that changes in the age profile of dentists could therefore have implications on the distribution of dentists as well.

3. DENTAL SERVICE PRICES

This section of the paper aims to shed light on the effects of demand increases and other factors on dental service prices. In order to achieve this, the determination of dentist service prices are situated within the context of dentist decisions with respect to mode of employment, hours of work and levels of output in the following discussion of the conceptual framework. The second part describes some of the trends in the underlying variables in the analysis. The third describes in more detail the variables to be used and the estimation techniques while the last section reports the results and their implications.

3.1 Conceptual Framework

The analysis of the dental service prices starts with the characterization of dentist behavior. A dentist can be considered as a utility maximizing individual with income and leisure entering the utility function. Dentist preferences over style of practice and other lifestyle considerations are assumed to be captured by physician preferences over leisure. It is posited that higher consumption and leisure have positive effects on utility but at a decreasing rate. Therefore:

$$U = U(Y, L) \qquad (3\text{-}1)$$

where U = Dentist utility
Y = Dentist income
L = Dentist leisure time.

Leisure time is the difference between the total time available to the dentist, T and the hours that he spends working , H,

$$L = T - H \qquad (3\text{-}2)$$

The leisure and income combination that a particular dentist achieves depends on the mode of practice that he/she chooses. A dentist could choose to be employed either by the government, an industrial firm or a private dentist practice, or to be a self-employed dentist. However, these modes of practice may not be mutually exclusive. Dentists could work part of the time as employees and still maintain their own independent clinics. The choice may therefore be one of degree or combination of these modes of practice rather than just one. For the purposes of the paper, however, we assume that just one mode is chosen.

The income that employed dentists receive come in the form of fixed salaries per month. These amounts received per month are not usually related with the amounts of services rendered but are tied to fixed working hours which are also set usually by the employers. The level of other inputs used in the production of dental care services are also set by the employers or the superiors of these employed dentists. Letting the subscript g denote employed dentists, then the salary or income of an employed dentist can be denoted as Y_g, and the leisure time, L_g as the excess of total time over fixed hours of work, H_g. The particular utility levels achieved by employed dentists can thus be stated as:

$$U_g = U_g (Y_g, L_g) \qquad (3\text{-}3)$$

A self-employed dentist, on the other hand, can be considered as an entrepreneur in that he/she maintains independent clinics which render various types of dental care services. Dentist income is the excess of revenues derived from the production and sale of these services, less the costs of producing these services. Aside from contributing her labor hours, the dentist as entrepreneur also decides on the amounts of other inputs to be used in the production of care.

The production of dental services such as extractions, temporary and permanent fillings, fluoride applications and prosthetics involve the application of inputs given a state of technology. These include such variable inputs as time inputs of auxiliaries and dental aides, clinic supplies and materials and utilities such as water and electricity which are important in running most dental equipment. Dental equipment like dental chairs, high speed drills, motors and x-rays are examples of important inputs which can be considered as fixed in the short run.

However, the major input in such a production process is the dentist's time. Recognizing that dentist time is the major input in dental service production, outputs are therefore dependent on the amount of time that a dentist spends working and how his/her time is combined with other inputs in the production of dental services.

The fact that dentists produce various dental services can be represented by the simplifying assumption of two dentist outputs. For our purposes, these outputs may represent extractions and fillings which are the most common dental services produced. In a way, these outputs also represent different requirements on the dentist time per service. To capture these assumptions, a product transformation function representing the production technology can be assumed thus:

$$F(q_1, q_2, H, K, X) = 0 \qquad (3\text{-}4)$$

where q_1 = dental service 1,
q_2 = dental service 2,
H = dentist hours spent at work,
K = vector of fixed dental equipment,
X = vector of variable inputs.

This implies that inputs H, K and X are combined to produce outputs q_1 and q_2.

The income of the self-employed dentist is the excess of revenues over costs. The total costs of practice can be represented by w.x, where w represents the vector of unit prices of the variable inputs used. Total dentist revenue can be represented as $p_1q_1 + p_2q_2$, where the p's are the corresponding prices charged for dental care services.

In the formulation of dental revenues, however, it is assumed that the prices charged for dental care services by the dentist could be affected by the amount of services produced and sold. A dentist wishing to work more hours and produce and sell more dental services would have to lower prices. That there is a certain amount of influence on the level of demand for dental services can be rationalized by difficulties faced by consumers about price and product. In a way, dental care is similar to medical care in that the patient or consumer has incomplete or little information regarding the nature of the disease and the alternative courses of treatment. Likewise, each dentist could be thought of as delivering a service which is differentiated in the style, place and technical competence of the provider. Therefore consumers may not be readily able to compare prices charged by other dentists due to variations in the quality of products and products produced.

However, the relationship between dental service outputs and prices may be affected by the number of sellers. The effects of the number of sellers on prices work their way through their effects on the degree of competition in the dental services market. If the number of sellers increases (decreases) the degree of competition in the dental services market, this is expected to reduce (increase) the sensitivity of prices to dental service outputs. Decreases in the degree of competition as the number of sellers increases have been hypothesized because of the difficulty of search. Both directions of effects have been hypothesized and empirically tested in the physician services market.[5]

The level of prices charged for dental services are also hypothesized to be influenced by other exogenous factors which affect the level of demand for dental services. These factors include the level of incomes of consumers, their dental care requirements and needs and factors which affect their tastes and preferences.

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[5] A review of empirical the studies which tests the effects of the number of sellers on physician services market is contained in Kraft and Limpiado, "Preliminary Report: Analysis of Health Manpower Behavior". September 1992.

Given these factors, the prices charged for dental care services can be formed thus:

$$p_1(q_1, N, D)$$
$$p_2(q_2, N, D) \qquad (3\text{-}5)$$

where N = number of sellers
D = vector of factors affecting demand for dental care services.

The income of the self-employed dentist can therefore by represented as:

$$p_1(q_1, N, D)q_1 + p_2(q_2, N, D)q_2 - w.x. \qquad (3\text{-}6)$$

From the foregoing, the level of prices that self-employed dentists charge can therefore be related to their decisions on the hours of work and outputs to produce. The level of prices charged becomes a factor in the determination of the particular income and leisure combination attainable by a self-employed dentist. However, whether to be self-employed or to seek employment elsewhere can also be considered as a dentist decision variable. It can be posited that dentists would choose to be self-employed if the utility derived from income and leisure from self-employment is greater than that from employment. The level of prices charged would therefore be affected by factors which affect the decision to become self-employed or employed.

These considerations are embodied in the following dentist maximization problem:

Max. $U = U(Y, L)$

where $Y = p_1(q_1, N, D)q_1 + p_2(q_2, N, D)q_2 - w.x$

$L = T - H$

s.t. $F(q_1, q_2, H, K, X) = 0$

$U \geq U_g(Y_g, L_g)$

The dentist therefore chooses his/her hours of work, the level of variable inputs and outputs, and therefore the level of prices that would give maximum utility. These choices are made, given the exogenous factors like the number of sellers, other factors affecting demand, factors which affect dentist preferences and predetermined amount of fixed equipment. The level of hours worked and outputs produced are within the limits of the technology. Likewise, the particular utility attainable should be greater than the utility that could be achieved from employment.

The Lagrangean function of the maximization problem is therefore:

$$\mathcal{L} = U(p_1(q_1, N, D)q_1 + p_2(q_2, N, D)q_2 - w.x , T - H) + \lambda F (q_1, q_2, H, K, X) + \mu (U - U_g (Y_g, L_g)). \tag{3-7}$$

The first order conditions when the constraint on utilities does not bind are:

$$\partial\mathcal{L}/\partial q_1 = \partial U/\partial Y (p_1(q_1, N, D) + q_1 \partial p_1/\partial q_1) + \lambda \partial F/\partial q_1 = 0 \tag{3-8}$$

$$\partial\mathcal{L}/\partial q_2 = \partial U/\partial Y (p_2(q_2, N, D) + q_2 \partial p_2/\partial q_2) + \lambda \partial F/\partial q_2 = 0 \tag{3-9}$$

$$\partial\mathcal{L}/\partial H = -\partial U/\partial L + \lambda \partial F/\partial H = 0 \tag{3-10}$$

$$\partial\mathcal{L}/\partial X = \partial U/\partial Y (-w) + \lambda \partial F/\partial X = 0 \tag{3-11}$$

$$\partial\mathcal{L}/\partial\lambda = F (q_1, q_2, H, K, X) = 0. \tag{3-12}$$

Getting the ratio of (3-8) and (3-9), one gets the result that outputs are set so that the ratio of marginal utilities arising from increases in income due to small increases in outputs is equal to the marginal rate of transformation of q_1 and q_2. Note that the terms enclosed in parenthesis for (3-8) and (3-9) indicate that the marginal income from the increases in these outputs are not constantly equal to prices. The second terms in the parentheses point to changes in prices as the outputs are increased.

Condition (3-10) states that the dentist will choose his/her hours of work such that the marginal disutility of his/her working time is equal to the marginal value product of her labor. Levels of employment of other inputs are also chosen so that the marginal disutility of decreases in income due to their wages are just commensurate to the values of their marginal products.

Additional first order conditions are necessary when the constraints on utilities bind:

$$\mu \geq 0 \tag{3-13}$$

$$U - U_g = 0 \tag{3-14}$$

These indicate that the level of hours of work and outputs are set so that utilities from self-employment are never lower than utilities from employment.

Assuming that an optimal value of utility exists, then the solution values for hours worked, levels of variable inputs, and outputs can be generated as functions of the exogenous and predetermined variables in the system. These in turn result in the optimal level of prices that can be charged. One notes that the variables which represent the level of utility that can be obtained from employment are likewise included in the reduced-form equations. These can be represented as:

$$H^* = H^* (N, D, K, U_g, w) \quad (3\text{-}15a)$$

$$q_1^* = q_1^* (H^* (N, D, K, U_g, w), N, D, K, U_g, w) \quad (3\text{-}15b)$$

$$q_2^* = q_2^* (H^* (N, D, K, U_g, w), N, D, K, U_g, w) \quad (3\text{-}15c)$$

$$p_1^* = p_1^* (q_1^* (.)) \quad (3\text{-}15d)$$

$$p_2^* = p_2^* (q_2^* (.)). \quad (3\text{-}15e)$$

The last two equations, (3-15d) and (3-15e) then become the bases for the empirical investigation of the determinants of dental service prices.

3.2 Trends in Dentist Service and Prices and Related Variables: A Digression

Before proceeding with the empirical operationalization of the concepts outlined above, some trends in the variables of interest are discussed. This serves to introduce the data to be used in the analysis as well as to provide a profile of dental practice in the Philippines. More detailed tables and descriptions of aspects of dental practice are contained in the Appendix.

As it was mentioned in the conceptual framework, dentists could choose either to be self-employed, or to be employed in the government or in private firms. It was also mentioned earlier that dentists could actually engage in a combination of these modes. While it would be ideal to see the extent of this practice, the DMS did not account for these combinations. It is to be assumed then that the mode of practice indicated is the primary one engaged in by the dentist.

Self- employment remained as the most prevalent mode of practice for dentists. More than half of dentists maintained their own independent practices. Slightly more than one fourth were government employees while about 17 percent were private employees (Table 3.1). In turn these private employees could be employed as company dentists, school dentists and dentists in dental firms. However, the data does not permit a categorization of these private employed dentists by their employer.

Table 3.2 shows the breakdown of dentists by nature of employment and by age, sex and civil status. A larger proportion of older dentists was employed in government and in the private sector than younger dentists. There are no significant differences in the proportions of male and female dentists employed or self-employed. However, greater proportions of married dentists than single dentists were employed by the government or the private sector.

Table 3.1

Dentist Respondents by Nature of Employment

Nature of Employment	Number	Percent
Self-employed	960	56.54
Private employee	286	16.84
Government employee	452	26.62
Total	1698	100.00

Source of basic data: DOH National Survey on Dental Manpower, 1990

Table 3.2

Nature of Employment by Age, Gender and Civil Status (in percent)

	Nature of Employment			
	Self-employed	Government employee	Private employee	N
Age				
20-29 years	66.85	16.58	16.58	100.00
30-39 years	58.39	27.45	14.16	100.00
40-49 years	47.97	32.43	19.59	100.00
50-59 years	35.91	47.10	16.99	100.00
60 years and above	53.49	24.81	21.71	100.00
Gender				
Male	56.72	27.24	16.03	100.00
Female	56.35	26.28	17.37	100.00
Civil Status				
Single	64.20	17.21	18.59	100.00
Married	52.74	31.23	16.04	100.00
Widowed	41.94	45.16	12.90	100.00
Separated	85.71	0.00	14.29	100.00

Source of basic data: DOH National Survey on Dental Manpower, 1990

Two alternative hypotheses may be forwarded to explain the relationship between age and the nature of employment. The first hypothesis is that younger dentists would tend towards employment since they are still establishing their own practices. Since starting a practice is costly in terms of initial investment in equipment, younger dentists would tend to join established practices first in order to save or establish their clientele. In addition, employment could provide further training or experience. On the other hand, as dentists grow older, their preference for leisure may also increase. Being employees either in the government or in the private sector may provide them with regular hours and therefore more leisure time. The trends outlined in the table tend to support the second hypothesis.

Two alternative economic reasons can be suggested for the greater proportions of married employed dentists. Married individuals may have stronger preference for stable incomes due to their family obligations. A salary-based income from employment may provide such security. As it will be shown later, employed dentists tend to receive lower income than self-employed dentists. For married dentists, this lower income may be acceptable since their spouses may have gainful employment, therefore providing some additional income. Social interaction for self-employed dentists may also be limited, thus reducing their chances of obtaining spouses.

How different are practice patterns of dentists across these modes of practice? Table 3.3 presents data on incomes, working hours, outputs and prices charged by dentists across modes of practice.

The DMS had compiled data on the average number of patients dentists see for four main services: extractions, permanent and temporary fillings and fluoride topical applications in a day. Multiplied by the number of days worked in a week and the number of weeks in a month, a monthly rate of output is also computed. These can be used as indicators of the quantities of dental services that dentists perform.

The data indicate that government employee dentists have higher patient loads than either self-employed or private-employed dentists be it on daily or monthly rates of output. This is true looking at both extractions and fillings. This is also reflected in the higher average number of patients seen by Dentists I, II and III relative to general practitioners (Appendix Table 1) on a daily basis. One notes that these categories of government employed dentists are the main dental service delivery personnel as higher category dentists have more administrative functions. These are roughly consistent with the findings in the 1987 National Health Survey that government dentists were the principal care providers for those seeking treatment, i.e., about 56 percent of dental care seekers. Only about 37 percent of those who sought care saw private dentists.

Private employee dentists see more patients for the three services on a daily and monthly basis than self-employed dentists on the average.

Table 3.3

Aspects of Dentist Practice Patterns by Mode of Practice

	Self-employed	Government Employee	Private Employee
1. Number of Patients with Extractions			
Daily	4.28	11.93	6.06
Monthly	100.4	255.4	135.5
2. No. of Patients with Permanent Fillings			
Daily	3.55	5.89	4.72
Monthly	82	121.1	100.9
3. Extractions to Fillings Ratio	1.53	3.49	1.57
4. Hours Worked			
Daily	6.9	7.7	6.7
Monthly	162.2	162.8	143.8
5. Monthly Cost	4944.2	2728.2	5337
6. Monthly Income	6679.3	3726.2	6206
7. Income per hour worked	49.5	26	51.5
8. Price of single extraction, uncomplicated			
Minimum	68.7	48	78.4
Maximum	102.6	80.3	108.6
Average	82.9	59.6	93.1
Max.-Min.	36.7	29.8	37.9
9. Price of One-surface Amalgam Filling			
Minimum	82.7	63.2	85
Maximum	109	86.9	118.8
Average	93.1	69.5	97.1
Max.-Min.	27.9	24.9	32.7

Source of basic data: DOH National Survey on Dental Manpower, 1990

Aside from the quantities of dental services performed, the mix of services performed may be used to qualify output trends from the quantitative data. Looking at the total number of patients seen by the dentist without regard for the mix of services may provide over or underestimates of dentist productivity. The greater proportion of more time intensive services performed such as fillings may understate the dentists' productivity if just the number of patients are counted. Aside from this, the mix of services could give clues to the propensity of dentists and or consumers for dental services toward a particular treatment mode. This could also give an indication of differences in practice approaches across regions and dentist characteristics, or severity of dental problems.

An indicator of the mix of services that could be employed is the ratio of number of patients with extractions to the number of patients with permanent fillings. Aside from limitations in the data which preclude the computation of a case-mix variable, this indicator is particularly appealing because it could represent the propensity toward early diagnosis and treatment of dental caries.

Extractions to fillings ratio derived from the data ranges from about 1.53 to about 3.5. This implies that absolutely more extractions are performed than permanent fillings. This finding is roughly consistent with the results of the 1987 National Health Survey where the proportion of visits for extractions (about 12 percent) was greater than the proportion of visits for fillings (less than 2 percent).

The data indicate that government dentists not only perform just more extractions, they also perform more extractions per permanent filling. The ratios of extractions to fillings of private employee dentists and self-employed dentists are near each other, hinting at the same pattern of services rendered.

That government dentists perform the greatest extraction to fillings ratio may be surprising in the light of emphasis on prevention of caries, early diagnosis and treatment, and restoration of carious teeth. Extraction of carious teeth is preliminary to the application of dentures and bridges which can be considered as tertiary interventions to restore form and function of teeth.

However, these trends for government dentists may be related to the clientele that government dentists serve. Cross-tabulating extractions to fillings ratio and the region and urban-rural location of dentists (Appendix Table 4) came up with the results that the higher the income of the region, the lower was the extractions to fillings ratio. Extraction to fillings ratio in urban communities was likewise lower than those in rural communities. This can be indicative that those afflicted with dental caries in the lesser income regions waited until the caries were severe before approaching a dentist for treatment. In these cases, it may have been difficult if not impossible to save the tooth. If lower income members of the community were the ones patronizing government dentists, then higher extraction to fillings ratio may be indicative of more severe dental caries that government dentists treat.

Part of the variations in the number of patients seen and dental services performed is due to amounts of inputs that are expended. The major input in the production of dental services is the number of hours worked by the dentist in his clinic performing dental services.

On the average, Philippine dentists worked for slightly more than seven hours a day. Government employees worked about an hour longer on average than self-employed dentists or private employee dentists on a daily basis. However, accounting for days worked in a month, about the same monthly working hours are spent by government employed dentists and self-employed dentists. This implies that self-employed dentists make up for shorter hours worked in a day by working extra days. Private employee dentists spend the least amount of hours of work in a month. For private employee dentists at least, the argument of employment affording more leisure time holds true, although these hours of work may be understated to the extent that they hold their own clinics elsewhere.

Comparing the number of patients seen with the number of hours worked in a month, it would seem that employed dentists performed more of the above services per hour worked than self-employed dentists. Private employed dentists did perform more services for lesser hours of work than self-employed dentists while government employed dentists performed more services for the same amount of hours worked.

Other inputs in the production of dental services include the time of dental aides, the clinic space that dentists occupy, the clinic supplies and drugs that were used as well as utilities. The quantities of these inputs, however, were not directly asked in the DMS. An indicator of the quantities that were used of these services were expenditures for the salaries of the dental aides, the rent that dentists pay for the space, and expenditures for utilities and clinic supplies.

However, it should be noted that these measures have their limitations. Dentists may be using some inputs without incurring pecuniary costs for them. For instance, dentists may be utilizing family members as assistants or secretaries, or clinics attached to dentist residences may not be incurring rental expenses (although an estimate of this is asked for).

Average monthly costs of practice for self-employed and private employee dentists are given in row 4 of Table 3.3. Although there are some government dentists who reported some costs, there are ambiguities whether the reported amounts are actual expenditures or budget allocations. Likewise, it may be difficult to separate the costs attributable to dental care services performed in rural health units.

Although average monthly costs of practice are higher for private employee dentists than for self-employed dentists, these could not conclusively indicate more non-dentist time resources expended by firms who employ dentists for every hour of dentist time. More than one dentist employee may be utilizing these supplies. If so, costs per hour of dentist time for employed dentists may actually be lower than that for self-employed dentists.

On the average, about P 2,000 was spent on rent, P 1,500 on salaries, P 1,000 on utilities, P 2,100 for commercial laboratory charges, P 1,700 on clinic supplies and P 500 on laundry and office supplies, in a month (Table 3.4). It seems that commercial laboratory charges can be considered as the major cost item, followed by rent and then clinic supplies and drugs.

As it was mentioned in the framework, the income that dentists receive from alternative practice modes is among the determinants of the choice of practice mode. The indicator of income in the DMS is gross monthly income. As with other income data, these reported incomes may be understated for several reasons. Aside from the general hesitancy to reveal incomes, the reported incomes of government dentists may just include income from salaries which does not include incomes from outside private practice. Income reported in the DMS comprises of income brackets. To compute for the mean income for each employment mode, the midpoint of the income range was assumed.

Row 6 of Table 3.3 specifies the monthly income that dentists receive. Self-employed dentists receive the highest average monthly incomes, followed by private employee dentists. Government employee dentists receive the least monthly incomes. Comparing incomes with the hours of work expended, private employee dentists receive the most income per hour, although these are not significantly different from incomes per hour received by self-employed dentists. Government employee dentists receive the least amount per hour of work expended.

Figure 3.1 presents the cumulative distribution of dentists by income. A relatively flatter cumulative distribution curve implies that more of the sample points are concentrated in the lower income ranges. The flattest cumulative distribution curve is for government dentists while self-employed dentist have a relatively steeper curve. Those of private employees fall in between the two. This implies that relatively more of the self-employed dentists have higher incomes than government and private employee dentists.

The trends in income and working hours from the data do not clearly delineate the income-leisure tradeoff from mode of practice choices. While it was expected that more dentists would be willing to live with lesser income with more leisure time, government employee dentists live with lower incomes and more working hours while private employee dentists live with higher incomes and lower working hours. This points out the possible differences even among the various employment options for dentists. On the other hand, there is a clear tradeoff comparing self-employed dentists and private employee dentists in the sense that self-employed dentists earn more income but at lower leisure time.

Comparing incomes received with outputs generated, it would seem that government employees receive the least income for the greater number of patients seen for extractions, permanent and temporary fillings. Private employee dentists

Table 3.4

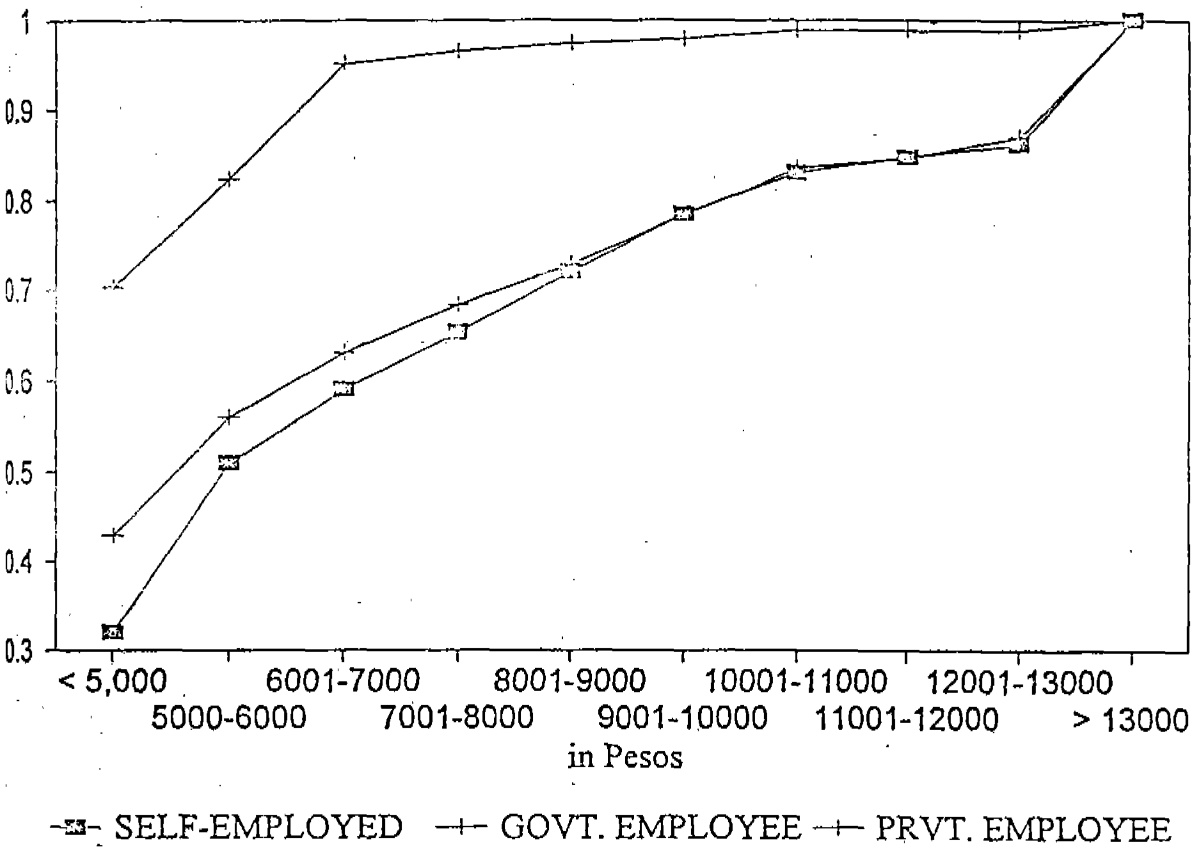
Average Monthly Clinic Costs, by Type of Business

Type of Business	Clinic Costs: Total Cost /1 Average	(n)	Rent Average	(n)	Salaries /2 Average	(n)	Utilities Average	(n)	Commercial Laboratory Charges Average	(n)	Clinic Supplies Drugs Average	(n)	Laundry Office Supplies Average	(n)
Single Ownership	4850.57	721	1967.85	620	1395.44	249	900.06	711	2053.21	443	1615.33	439	500.09	374
Partnership	5543.60	136	2050.89	124	1504.17	36	1020.00	134	2037.38	82	1730.23	86	605.14	73
Corporation	7740.58	12	2471.11	9	6051.75	4	987.09	11	3975.00	8	5408.75	12	1061.43	7
Group Practice	4436.36	11	2076.92	13	1333.33	3	1190.91	11	3500.00	8	1541.67	6	425.00	4
For Entire Population	4991.91	880	1989.05	766	1471.99	292	923.39	867	2100.63	541	1716.55	543	524.76	458

/1 includes rent; salaries; utilities; commercial laboratory charges; clinic supplies and drugs; laundry and office supplies
/2 includes salaries paid to dentists, hygienists, dental assistants, and technicians employed by the respondent

Source: DOH National Survey on Dental Manpower, 1990

Fig. 3.1: Cumulative
Distribution of Dentists by Income



generate more outputs than self-employed dentists while receiving relatively similar incomes.

The income received by self-employed dentists is largely determined by the prices that they charge. In the case of government dentists, the money price paid is usually zero. However, there could be other non-money costs to the patients in terms of travel time and waiting time. In the case of private dentists, there are money prices aside from time prices.

An ideal indicator to measure movements and differences in prices would be to construct a price index for dental services. This index would be an average price with the weights corresponding to the mix of services performed by dentists. However, this is rather difficult to do considering that it requires the construction of appropriate weights. Therefore, the indicator of prices that will be used in the description is the minimum and maximum price of a single uncomplicated extraction under local anaesthesia, and a one surface amalgam filling.

On the average, private self-employed dentists in the Philippines charge an average minimum price of about P 68.70, an average maximum charge of P 102.6 and an average price of P 82.9 for a single extraction, and about P 82.7 minimum, P 109. maximum and P 93.1 for a one-surface amalgam filling. It can be noted that prices charged for a one surface amalgam filling are higher than fees for single uncomplicated extractions. Going by mode of practice, private employee dentist on the average charge higher than self-employed dentists for both extractions and fillings. However, the prices charged by employed dentists may not reflect their own pricing decisions but that of their employers.

One measure of the variability in prices charged is the difference between the maximum price and the minimum price. The figures for extractions and fillings are given in rows 8 and 9 of Table 3.3. In absolute terms, the band through which prices range is wider for single extractions than for fillings. The magnitude of the bands follows the trend in for mode of practice, i.e., wider differences for private employees than self-employed dentists and government employees, following the trend in prices charged.

It could be noted that there are prices charged by government dentists and these are generally lower than the prices charged by private dentists. However, it is not clear whether these prices are those charged by government dentists in the public facilities or in their outside private practices. If it is the former, then it can be said that money prices in public facilities are lower than those in private facilities. If the latter, then lower prices charged by government dentists for their own private practices could be indicative that their private practices are just supplementary sources of income.

Table 3.5 expounds on the differences in prices charged by private employed dentists and self-employed dentists by type of business. Average charges for single proprietorship practices were the lowest, while those of group practices were the

Table 3.5

Price of Selected Dentist Services of Private Employee and Self-employed Dentists

	Single Extraction		One-Surface Amalgam Filling	
	Average Price	Max.-Min. Price	Average Price	Max.-Min. Price
By Region				
Ilocos Region	60.40	28.70	68.50	21.20
Cagayan Valley	53.20	15.00	69.40	22.00
Central Luzon	57.80	19.30	88.30	28.20
Southern Tagalog	81.70	44.90	80.10	25.40
Bicol Region	57.50	16.50	78.40	21.30
Western Visayas	83.50	28.20	94.80	22.70
Central Visayas	104.40	42.60	95.60	27.80
Eastern Visayas	60.30	19.20	72.90	20.00
Western Mindanao	73.80	34.30	100.80	32.00
Northern Mindanao	81.80	43.70	100.20	42.40
Southern Mindanao	81.00	47.00	115.20	39.50
Central Mindanao	97.90	32.60	90.00	29.40
Cordillera Admin. Region	59.90	24.60	84.70	23.80
National Capital Region	94.80	41.50	100.60	30.00
By Type of Business				
Single Ownership	82.70	34.40	92.80	28.30
Partnership	92.20	56.50	94.80	28.20
Corporation	83.90	30.00	100.90	33.20
Group Practice	132.80	41.70	107.80	36.60
By Age of Dentist				
20-29 years	82.20	36.40	89.40	25.30
30-39 years	81.80	34.50	93.80	28.30
40-49 years	88.80	31.90	95.80	27.80
50-59 years	91.20	44.60	103.40	41.70
60 and above	90.40	38.00	99.40	31.80

Source of basic data: DOH National Survey on Dental Manpower, 1990

highest. For one surface amalgam fillings, the higher the average level of prices, the wider the differences between maximum and minimum prices.

Regional differences in prices charged by private dentists are shown in Fig. 3.2. Average fees charged for single extraction seem to follow three broad tiers. At the lowest tier are found Regions 1-3, 5, 8 and CAR. Middle tier regions as far as prices of extractions are concerned are comprised of Regions 4, 6, and 9-12. Regions 7, 12 and the NCR comprise the regions where the highest average price of extractions is found. Lower differences between maximum and minimum prices for extraction are found in regions with absolutely lower average prices for extractions. This indicates that in areas with higher average prices, there are wider bands within which prices vary.

Differences in poverty levels within regions, as proxied by the urban and rural locations also conform with this observation. Prices charged for urban locations were usually higher than those charged for rural locations. (Figure 3.3). Likewise, differences in maximum and minimum prices charged are usually wider in urban rather than in rural locations, although there are exceptions (Fig. 3.4).

Average prices of amalgam fillings are highest in Region 12, followed by the NCR. Instead of a three-tiered structure like the ones found for extractions, amalgam prices across regions seem to follow two levels rather than three (Fig 3.5). Of note is the lower differences between minimum and maximum prices for amalgam fillings than those found in extractions. However, wider differences are observed for those regions with absolutely higher average prices.

In general, higher prices for fillings are also found in urban areas relative to rural areas (Fig 3.6). Differences however, in maximum and minimum prices charged are not much across urban and rural areas, with instances where rural differences in prices are even higher than those in urban areas (Fig 3.7).

How do fees vary with the characteristics of dentists? Indicators from two-way tables, though not controlling for some other factors, point to some interesting trends (Table 3.6). Male dentists usually charged higher than female dentists. This is true for average prices of extractions and fillings. However, this trend was broken for female dentists aged 40-49. On average, they charged higher than male dentists of those same ages.

Higher extractions and fillings prices are charged as dentists grow older, with a significant peak reached at ages 50-59. Prices fall after this age, though not to the previous levels. Differences in maximum and minimum charges for extractions seem to follow the opposite trend, decreasing as prices are increasing, although differences are widest at the highest average level of prices. On the other hand, differences in prices of amalgam fillings follow the overall trend, widening as the level of average prices increases.

These trends indicate that there are differences in incomes, hours of work, patterns of outputs, and prices charged by dentists practicing in different modes.

Figure 3.2

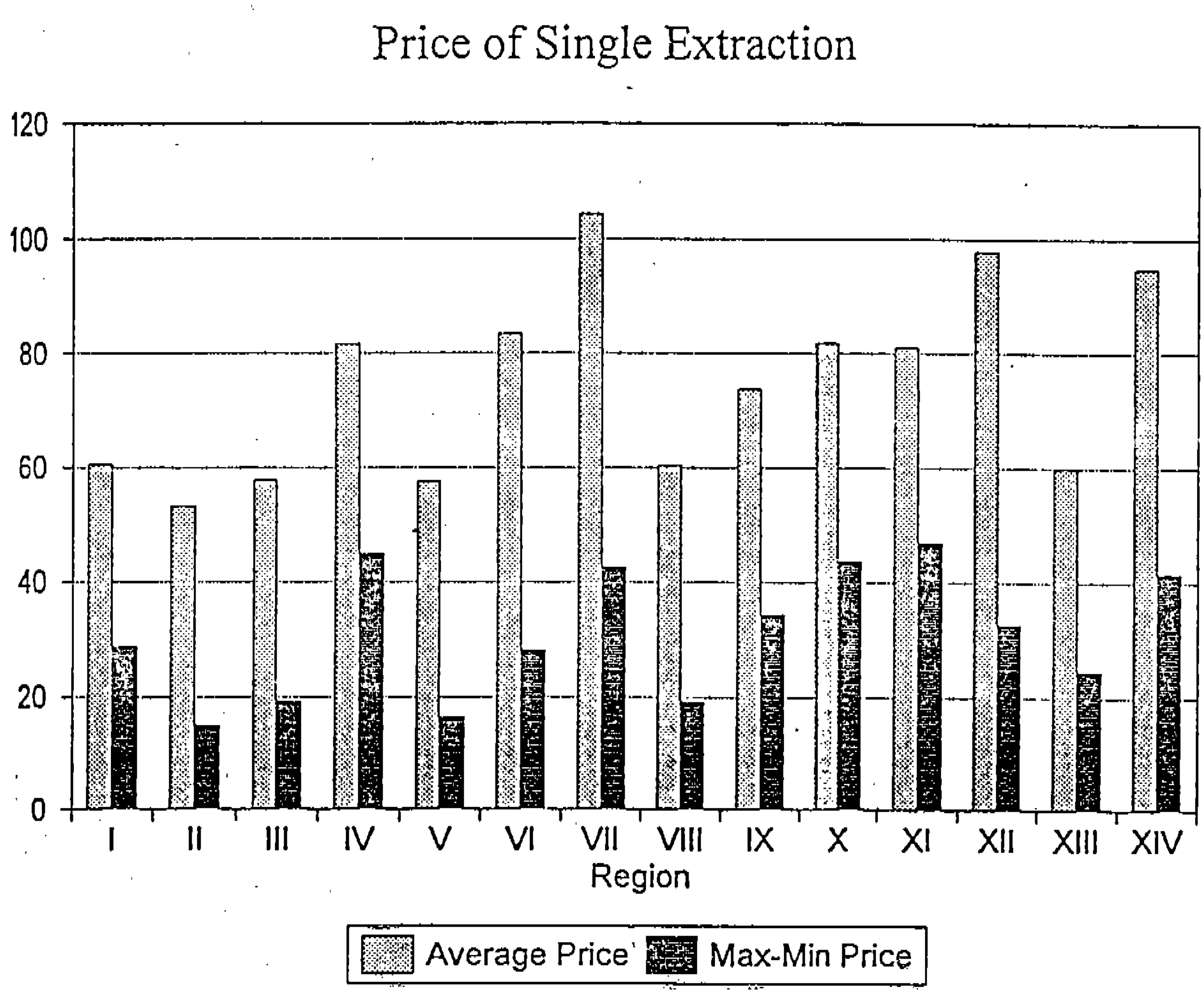

Price of Single Extraction
120
100
80
60
40
20
0
I
II
III
IV
V
VI
VII
VIII
IX
X
XI
XII
XIII
XIV
Region
Average Price
Max-Min Price

Figure 3.3: Price of Single Extraction
By Urban-Rural Location

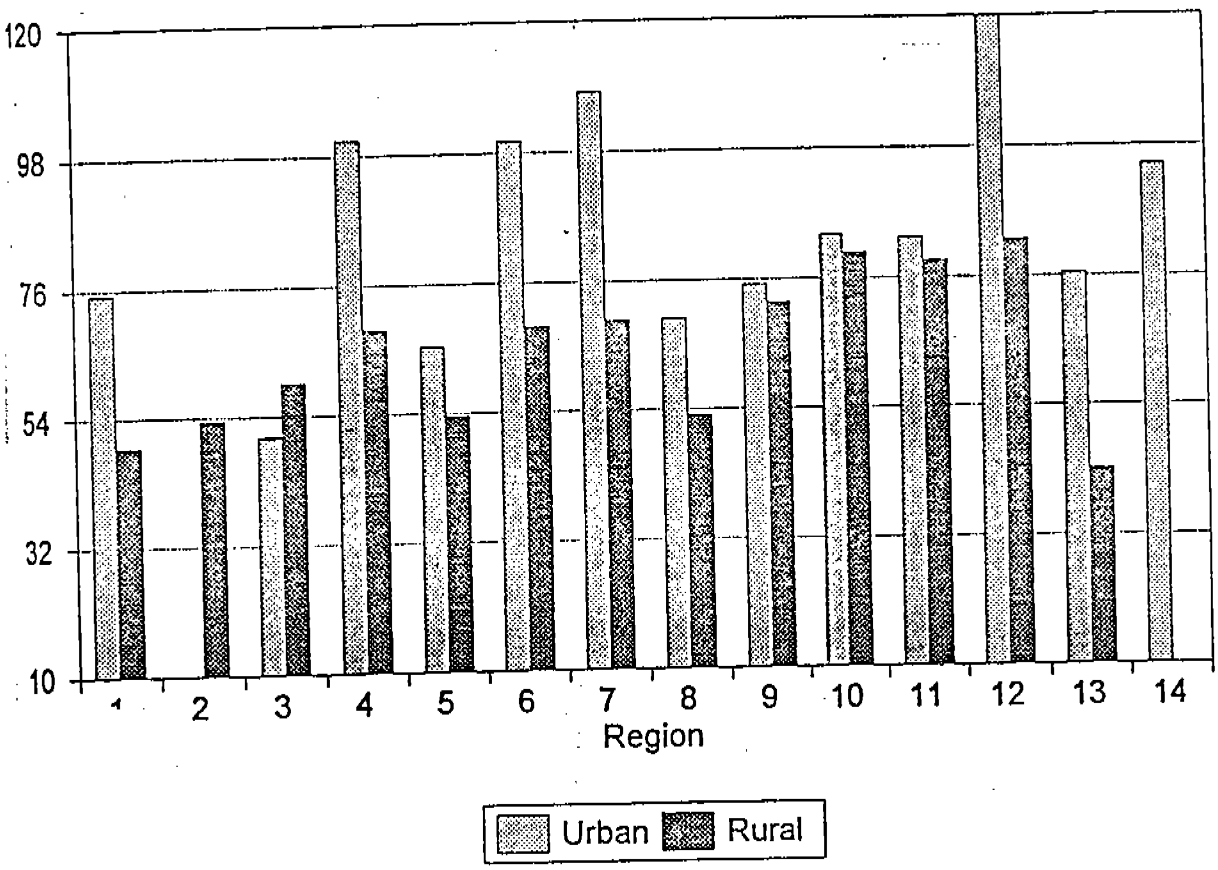


Fig. 3.4: Max-Min Price of Extraction
by Urban-Rural Location

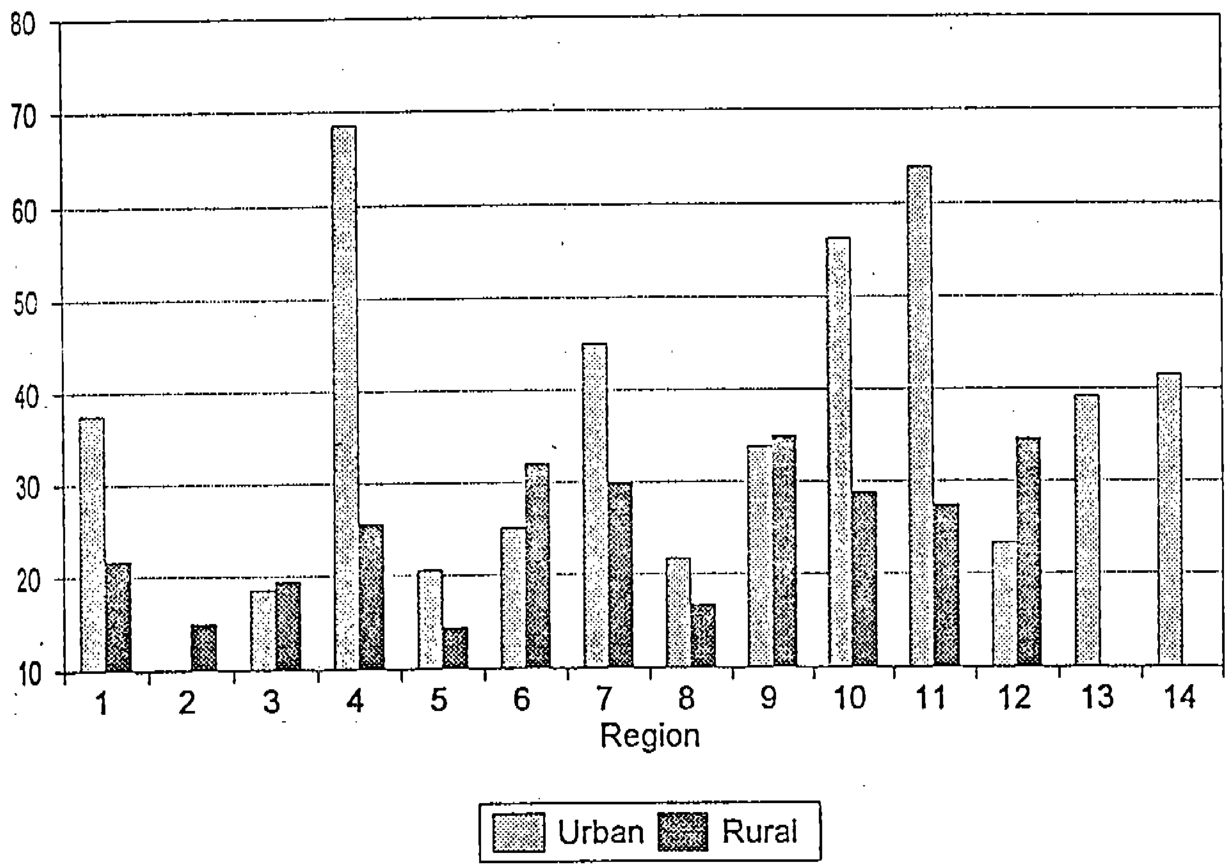


Figure 3.5

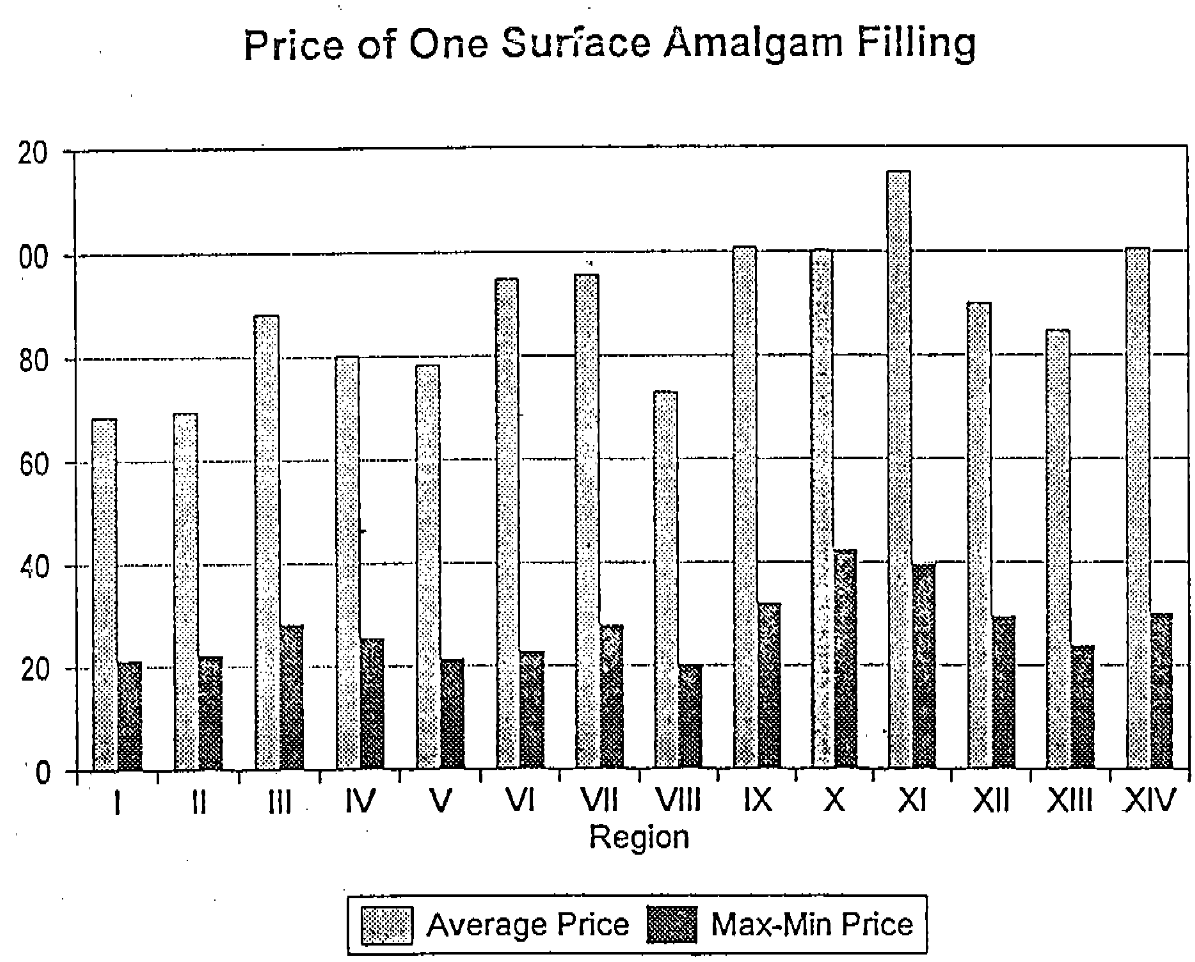

Price of One Surface Amalgam Filling
20
00
80
60
40
20
0
I
II
III
IV
V
VI
VII
VIII
IX
X
XI
XII
XIII
XIV
Region
Average Price
Max-Min Price

Fig. 3.6: Price of One Surface Amalgam Filling by Location

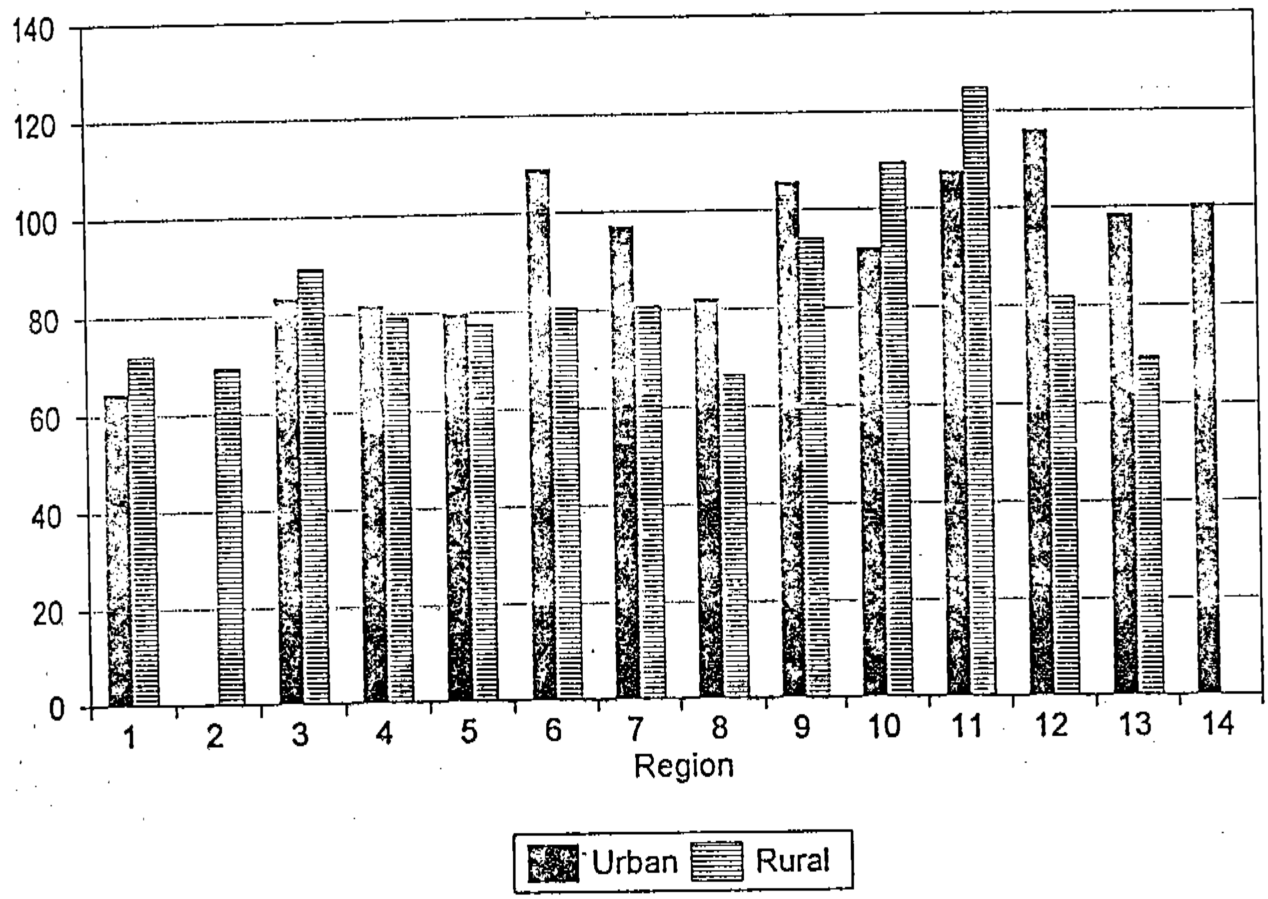


Fig. 3.7: Max-Min Price of Fillings
by Urban-Rural Location

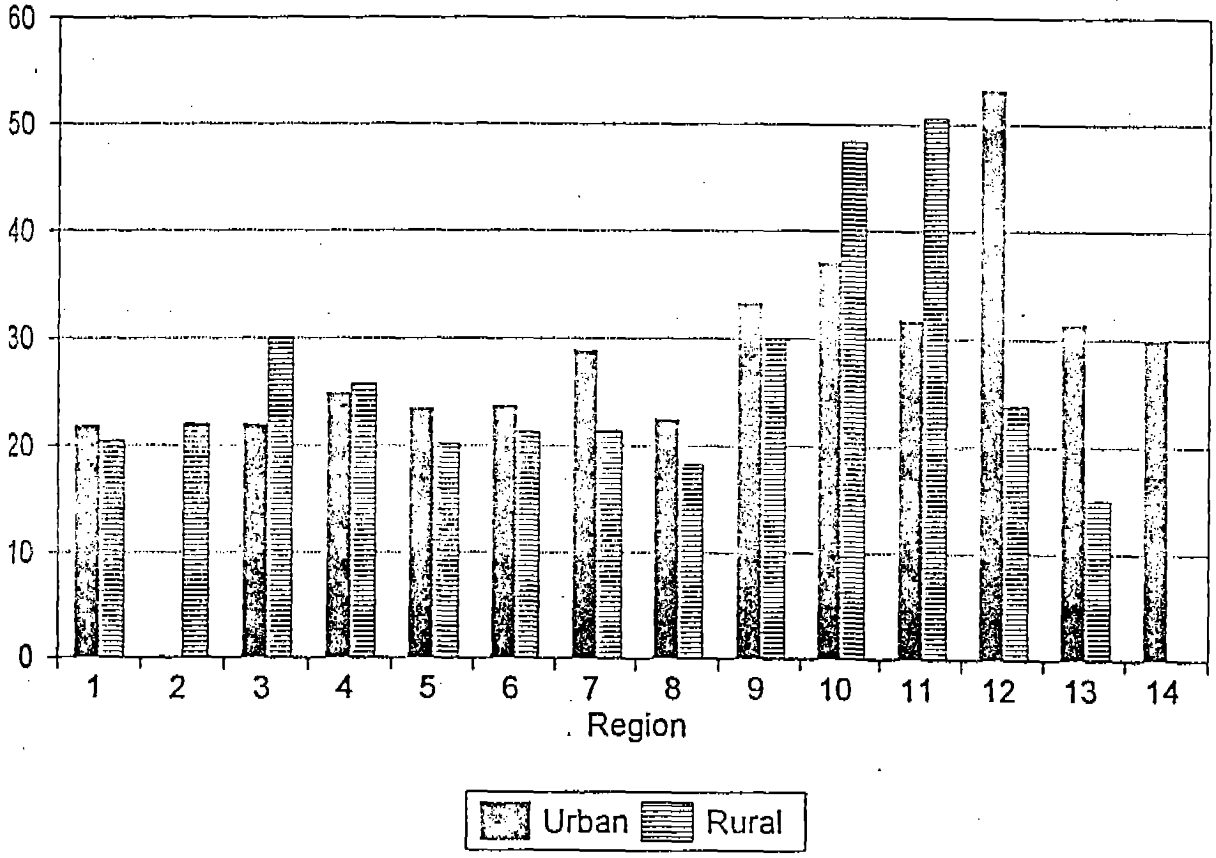


Table 3.6

Price of Selected Dentist Services, Private Employee and Self-employed Dentists By Age and Gender of Dentist (in Pesos)

A. Single Extraction

	Average Price			Max.-Min. Price		
	All	Male	Female	All	Male	Female
20-29 years	82.20	98.90	77.10	36.40	48.20	32.80
30-39 years	81.80	88.50	77.90	34.50	36.60	33.30
40-49 years	88.80	73.40	98.40	31.90	27.00	35.20
50-59 years	91.20	97.20	85.90	44.60	49.80	41.00
60 and above	90.40	90.80	89.90	38.00	40.70	33.10

B. One-Surface Amalgam Filling

	Average Price			Max.-Min. Price		
	All	Male	Female	All	Male	Female
20-29 years	89.40	93.00	88.40	25.30	30.10	24.00
30-39 years	93.80	95.40	92.80	28.30	29.20	27.80
40-49 years	95.80	90.20	99.40	27.80	37.30	32.10
50-59 years	103.40	107.10	100.00	41.70	39.40	43.30
60 and above	99.40	99.10	99.90	31.80	36.90	21.50

Source of basic data: DOH National Survey on Dental Manpower, 1990

The choice of mode of practice could therefore affect the particular income-leisure combination and style of practice that dentists could achieve.

The two-way tables have also indicated that there are differences in the levels of prices charged across dental services. Amalgam fillings are priced higher than extractions. Furthermore, there seems to be differences in the patterns exhibited by extractions and fillings as far as variability in average and maximum and minimum prices are concerned. Prices were also exhibited to differ across characteristics of dentists.

There are also differences in the prices charged for extractions and fillings across regions. To a certain extent, these differences may be capturing the net effects of regional differences in the levels of demand, the market structure of the dentist services market and cost of practice considerations. Further verification of these trends is the purpose of the multivariate analysis to follow.

3.3 Empirical Implementation

The prices of single uncomplicated extractions and one-surface amalgam fillings charged by self-employed dentists are the dental service prices that would be estimated. Although prices are observed for government dentists and private employed dentists, there are several reasons why they have been excluded from the multivariate analysis. Prices charged by self-employed dentists can reasonably be assumed as being decided by the particular dentist entrepreneurs. On the other hand, prices for services performed by employed dentists may arise not from their own decisions but those of their employers. As such they do not fit within the framework that was set earlier.

On the more practical side, there were very few government and private employee dentists relative to the total number of respondents who indicated answers on the questions on pricing.

However, just using the part of the sample who are self-employed and using ordinary least squares estimation would result in inconsistent estimates. This is because in the reduced form price equations, the level of utilities which can be derived from employment, is also taken into consideration. Prices are only observed when there had been a decision to be self-employed. However, the decision to become employed or self-employed is simultaneously determined after weighing the levels of prices that could be charged and the resulting utility derived from these decisions. There could therefore be characteristics and variables which affect the decision on the mode of practice and the decisions on the levels of prices to charge. Not accounting for this selection procedure would result in inconsistent estimates since it would be like an omitted variable.

To account for the correlation of the variables which affects the mode of practice with the variables which affect prices, Heckman's two-step procedure was adopted[6]. This involves estimating a selection equation, a probit equation to determine the effects of the independent variables on the choice of self-employment. Using the coefficients estimated from the probit, the inverse Mills ratio is computed for the selected sample and included among the least squares regressors of the price variables. The inverse Mills ratio serves to control for the effects of the variables which affect the choice of employment in the equation for prices. The coefficient of the inverse Mills ratio is indicative of the correlation between the errors of the selection equation and the price equation.

Data and variables. Equations (3-15d) and (3-15e) are the bases for the estimation of average prices of single extractions and one-surface amalgam fillings set by self-employed dentists. In reduced form, these prices are hypothesized to be determined by the number of sellers or market structure, other factors affecting demand like income, education and incidence of dental problems, unit costs of variable factors of production, the level of fixed inputs, and dentist characteristics which affect dentist preferences. On the other hand, the choice of self-employment is likewise affected by these characteristics and demand factors which affect the incomes of self-employed dentists, together with costs of practice and the incomes received by employed dentists.

In attempting to include variables which represent these factors, regional averages were used. However, preliminary estimates using these averages did not yield significant coefficient estimates, a symptom of high degree of multicollinearity of the variables. Indeed, computing for the condition number of the set of variables confirmed this high degree of multicollinearity. To get away from this problem, these regional averages were instead replaced by regional dummies with the NCR as the base region. It can be argued that these regional dummies represented a unique combination of the indicator variables at hand. The use of regional dummies, however, disables the separation of the individual effects of the factors on the dependent variables. While attempts to explain the effects of regional dummies can be traced to the levels of the variables, these explanations remain as hypotheses and conjectures which need further confirmation. What are left are individual dentist characteristics and presence of fixed equipment.

Table 3.7 enumerates the regional averages of the variables which were used to represent the determinants of prices. To represent the number of sellers or the market structure, two indicators can be used. These are population per private dentist and population per government dentist. These providers can be considered as substitute providers of care. The greater the number of dentists, the greater could be the amount of competition prevailing.

The NCR registered the lowest population per dentist ratio, implying that both private and government dentists are relatively plentiful in the Metro Manila

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6 Although Heckman's procedure yields consistent estimates, these are still inefficient. The ideal estimation procedure to use in the case of sample selection is maximum likelihood estimation. This estimation procedure assures consistent and efficient estimates. However, attempts to estimate the model using maximum likelihood methods failed to yield estimates due to non-convergence. Hence, despite some inefficiencies, Heckman's procedure was used instead.

Table 3.7

Regional Data

	Region	Hours per month	Hours per day	No. of extraction	No. of temporary filling	No. of permanent filling	Ratio of extraction to filling	Income per hour (in P)	Cost per hour (in P)
1	Ilocos Region	165.56	7.27	9.55	5.00	5.69	2.57	42.77	33.29
2	Cagayan Valley	182.00	7.60	7.00	4.17	4.17	2.43	34.05	17.54
3	Central Luzon	157.16	6.98	7.54	4.16	4.23	2.29	54.55	44.52
4	Southern Tagalog	169.16	7.34	6.53	3.64	4.09	1.85	38.25	26.17
5	Bicol Region	172.52	7.41	7.70	4.00	3.21	2.93	31.38	21.31
6	Western Visayas	145.10	6.71	8.38	5.00	4.43	2.80	42.91	30.19
7	Central Visayas	152.26	6.69	6.89	4.71	4.04	1.88	41.03	27.91
8	Eastern Visayas	161.33	7.16	9.11	6.77	4.74	2.46	27.06	16.93
9	Western Mindanao	150.88	6.98	9.07	4.61	4.11	2.52	38.35	34.74
10	Northern Mindanao	157.82	7.03	8.30	4.92	4.97	2.32	29.05	30.23
11	Southern Mindanao	162.62	7.02	5.79	3.92	3.47	2.07	37.21	25.51
12	Central Mindanao	155.54	6.82	6.61	1.92	2.28	4.32	38.66	23.46
	Cordillera Admin. Region	189.04	7.58	6.30	4.47	4.21	1.46	42.62	21.96
	National Capital Region	156.86	7.10	4.92	4.28	4.52	1.39	49.85	42.46

Source of basic data: DOH National Survey on Dental Manpower, 1990

area. It can be noted that for some regions where the population per private dentists were relatively low, population per government dentists were relatively larger; Regions 3, 4, 7, and 11 are some examples. On the other hand, there are some regions where both private and government dentists were not plentiful.

Regional averages for annual household incomes, literacy rates and incidence of dental caries, which are partial indicators of the level of demand for dental care services, are given in the same table. Although higher literacy rates are identifiable with regions with higher household incomes, lower literacy rates are sometimes found in regions with relatively higher incomes and vice versa. In the same vein, higher incidences of caries are sometimes found in areas with relatively higher household incomes.

Highest incomes and literacy rates are registered in the NCR, as with the lowest population per dentist.

Aside from these demand variables which determine to a certain extent the incomes that self-employed dentists could attain, the costs of practice differ across regions. Column 3 of Table 3.7 indicates that the average cost of practice, defined as the sum of variable costs, are highest in Region 3, followed by the NCR, and Region 10. Of note is the high costs of practice in Region 2, a low demand area, relative to that in Regions 4 which registers higher household income and potentially higher demand.

Average incomes earned by government dentists also differ across regions. Government dentists earn more in regions with relatively less private dentists per population, Regions 2 and 5 and in those regions where there are higher household incomes, e.g., NCR and Region 12.

Table 3.8 lists down the descriptive statistics of the variables used in the probit estimation of self-employment. The total sample consisted of 1631 observations, of which 56 percent were self-employed. The average age was 38 years old, and about 65 percent were females. About 46 percent were located in rural areas. The rest of the variables represented the proportions coming from the different regions.

Table 3.9 lists down the descriptive statistics for the part of the sample for which prices were estimated. About 539 of the self-employed dentists reported complete information and were therefore used in the estimates. Less than 1 percent of the sample were dental specialists. Average price of extraction reported was P 74 while that for a filling was P 90.50. Not all dentists on average possessed at least one of the equipment listed. High speed drill was the equipment which dentists, on average, could have one of, while x-rays were the least commonly had. The average number of hydraulic chairs was consistent with only slightly more than half of the dentists owning one.

Table 3.8

Descriptive Statistics: Self-employed

Variable	Mean	Std. Dev.	Minimum	Maximum
Self-employed	0.5579	0.4968	0	1
Age of dentist	37.7033	12.2434	21	74
Age squared	1571.3440	1062.3930	441	5476
Female dentist	0.6548	0.4756	0	1
Female * Age	23.6879	19.5632	0	72
Dentist is a specialist	0.0116	0.1073	0	1
Rural Municipality	0.4660	0.4990	0	1
Ilocos Region	0.0343	0.1821	0	1
Cagayan Valley	0.0184	0.1344	0	1
Central Luzon	0.0834	0.2766	0	1
Southern Tagalog	0.1202	0.3253	0	1
Bicol Region	0.0362	0.1868	0	1
Western Visayas	0.0570	0.2320	0	1
Central Visayas	0.0699	0.2551	0	1
Eastern Visayas	0.0337	0.1806	0	1
Western Mindanao	0.0319	0.1757	0	1
Northern Mindanao	0.0441	0.2055	0	1
Southern Mindanao	0.0386	0.1928	0	1
Central Mindanao	0.0270	0.1621	0	1
Cordillera Autonomous Region	0.0147	0.1205	0	1
Number of observations: 1631				

Source of basic data: DOH National Survey on Dental Manpower, 1990

Table 3.9

Descriptive Statistics: Prices

Variable	Mean	Std. Dev.	Minimum	Maximum
Price of single extraction	73.9842	34.3379	25	300
Price of one-surface amalgam filling	90.5427	33.0293	15	225
Age of dentist	34.6011	10.9041	23	67
Age squared	1315.9147	931.8267	529	4489
Female dentist	0.6790	0.4673	0	1
Female * age	22.4156	17.3863	0	67
Dentist is a specialist	0.0074	0.0859	0	1
Rural Municipality	0.4453	0.4975	0	1
No. of X-ray machines	0.1243	0.3920	0	3
No. of Hydraulic chairs	0.6030	0.6021	0	3
No. of amalgamators	0.2356	0.4936	0	3
No. of high speed drills	0.9276	0.6901	0	3
Lambda	0.6616	0.2391	0.13933	1.51048
Ilocos Region	0.0260	0.1592	0	1
Cagayan Valley	0.0204	0.1415	0	1
Central Luzon	0.0872	0.2824	0	1
Southern Tagalog	0.1243	0.3302	0	1
Bicol Region	0.0334	0.1798	0	1
Western Visayas	0.0519	0.2221	0	1
Central Visayas	0.0668	0.2499	0	1
Eastern Visayas	0.0167	0.1283	0	1
Western Mindanao	0.0278	0.1646	0	1
Northern Mindanao	0.0334	0.1798	0	1
Southern Mindanao	0.0501	0.2183	0	1
Central Mindanao	0.0260	0.1592	0	1
Cordillera Autonomous Region	0.0186	0.1351	0	1

Number of observations: 539

Source of basic data: DOH National Survey on Dental Manpower, 1990

Results. The probit estimates of the decision for self-employment are listed in Table 3.10. The number of observations correctly predicted by the estimated equation is about 65 percent.

Age and gender of dentists significantly affect the decision to be self-employed. Every year increase in age lessens the probability of the dentist to be self-employed by about 3 percent. However, the coefficient of the square of age is positive, thereby implying that the effect of age on the probability of self-employment is u-shaped. There is a certain age at which the probability of self-employment once again increases.

Since younger dentists are expected to have a longer time profile for practice, they may not mind self-employment since they could afford spare time to establish their own practices. They might be willing to invest in their own equipment and clinics since they have longer time to recoup their investments. This could also reflect preferences among younger dentists for independent practices, even at the expense of longer hours.

On the other hand, preferences for stable incomes and hours may provide the incentive for older dentists to be employed. Older dentists may have greater financial responsibilities, hence their preference for more stable incomes. However, the reversal to self-employment for older dentists may be occurring as these financial responsibilities decrease and as preferences for leisure increase.

Female dentists were more likely to choose self-employment. However, the difference in probabilities is not that great. What is more interesting is the increase in probability of being employed for older females. This could partly be reflective of preferences of female dentists in their reproductive ages to spend more time at home caring for children and family, even at the expense of lower incomes. Stability of hours in employed settings may thus be preferred by these dentists.

The urban or rural location of the dentist did not turn out to be a significant determinant of employment mode.

Regions where the likelihood of dentists to be self-employed is lower than those in the NCR include Region 1, 5, 6, 8, 9, and 10 while the likelihood of being self-employed is higher than that for NCR in the Cordillera Autonomous Region (CAR). Regions 1, 5, 8 and 9 are the regions where household incomes are relatively lower. It could be likely that the levels of demand for dental services in these regions may not be sufficient to support self-employed dentists. These are reflected in lower incomes for self-employed dentists in Regions 1, 5, and 8. The level of demand for dental services in Region 9 may be affected by the low literacy rates of the population.

The greater probability of being self-employed in the CAR may be due to the relatively higher incomes of self-employed dentists there. These incomes are even higher than those in the NCR. On the other hand, relatively low incomes of

Table 3.10

Results of Probit Estimation of Self-employment

Dependent variable: Self-employed				
Log of the likelihood function =	-1040.25			
Number of observations =	1631			
Number of positive observations =	910			
Percent positive observations =	0.55794			
Sum of squared residuals =	363.988			
R-squared =	0.0951872			
Percent correct predictions =	0.652974			
	Coefficient	T-statistic		Marginal Effects
Constant	2.12789	3.99975	**	0.77619
Age of dentist	-0.082376	-3.30582	**	-0.030048
Age squared	0.000854111	3.13134	**	0.00031155
Female dentist	0.452496	1.93988	**	0.0014192
Female * Age	-0.014609	-2.5562	**	-2.6988E-05
Dentist is a specialist	0.231617	0.772289		
Rural municipality	-0.102391	-1.48456		
Ilocos Region	-0.646342	-3.52409	**	-0.0087554
Cagayan Valley	-0.372371	-1.54832		
Central Luzon	-0.050361	-0.39851		
Southern Tagalog	0.131614	1.20454		
Bicol Region	-0.304321	-1.72657	*	-0.0024804
Western Visayas	-0.401034	-2.77132	**	-0.0036819
Central Visayas	-0.041726	-0.314849		
Eastern Visayas	-0.581437	-3.10709	**	-0.0071588
Western Mindanao	-0.554592	-3.01544	**	-0.0065784
Northern Mindanao	-0.713079	-4.34516	**	-0.010478
Southern Mindanao	0.074581	0.432566		
Central Mindanao	-0.265636	-1.33576		
Cordillera Autonomous Region	0.861459	2.53764	**	0.0016337

** = Significant at the 5 percent level
* = Significant at the 10 percent level

Source of basic data: DOH National Survey on Dental Manpower, 1990

self-employed dentists and narrower distance between incomes and cost of practice may be discouraging dentists in Region 10 from being self-employed.

Of note is the similarity in the likelihood of self-employment with the NCR for Regions 3, 4, 7, 11 and 12 and 2. For Regions 3, 4, 7 and 11, the level of household incomes and potential demand may therefore be sufficient to support self-employed dentists despite relatively many providers of dental care and relatively higher costs of practice. For Regions 12 and 2, which are relatively low income regions, there could be incentives to be self-employed since the number of private dentists is still few, thereby affording a captive market for those who do decide to establish their practices there. This captive market is reflected in the relatively higher incomes of self-employed dentists in these regions.

Table 3.11 shows the results of the determination of prices for single uncomplicated extractions and prices for one-surface amalgam fillings. The adjusted R-squared for prices of extractions reach .29 which is relatively high for cross section data. The adjusted R-squared for prices of amalgam fillings, though lower, is still acceptable.

Results for the determination of prices for single-extraction and for one-surface amalgam fillings both show that the coefficients for the inverse of the Mills ratio are insignificant. Strictly speaking, this can be interpreted as pointing to the absence of self-selection in the data. However, there could be limitations to this interpretation. It could be that there are determinants for the decision to be self-employed and prices that have not been fully captured by the data. Examples of these are dentist characteristics which could further influence preferences such as the amount of wealth or assets and non-practice incomes. Other reasons could point to remaining correlations between the inverse of the Mills ratio and the various regional dummies. In this respect, the conclusion of no self-selection cannot be fully supported.

Another result that needs to be pointed out is the differences in the pattern of the effects of the independent variables on prices of extractions and fillings. Although both share a common set of hypothesized determinants, the list of significant determinants is different for each price. This points to differences in the magnitudes of the effects of the underlying variables on these two prices.

Of the dentist characteristics, age of the dentist figures prominently in the determination of both price variables. Every year increase in age of dentist increases the price of a single extraction by P .68 and the price of a one-surface amalgam filling by P .43. Although the average prices of extractions are lower than those of amalgam fillings, the effects of age on extractions are higher in absolute amount per year increase in the age of the dentist.

The increase in prices for older dentists could be reflecting the preferences for leisure among dentists, or the quality signals of experience. Since older dentists may want to reduce the time that they spend working, they would tend to increase their prices in order to deter new patients from coming into the practice. Age of the

Table 3.11

Results of Estimates for Prices of Dental Services

Variable	Price of Single Extraction		Price of One-surface Amalgam Filling	
	Coefficient	T-statistic	Coefficient	T-statistic
nstant	58.0933	9.20946 **	71.9387	10.205 **
e of Dentist	0.678846	2.97901 **	0.435402	1.88368 *
male dentist	-5.19206	-1.70367 *	-2.38141	-0.80748
ntist is a specialist	63.5087	1.96869 **	21.0143	1.50821
ral municipality	-9.74846	-3.86259 **	-3.57993	-1.31367
mber of x-ray machines	14.4304	2.55416 **	1.4911	0.312967
mber of hydraulic chairs	1.30127	0.523882	1.40244	0.513111
mber of high speed drills	4.70029	2.29667 **	6.48587	2.7554 **
mber of amalgamators	9.34884	2.40157 **	16.6727	3.70018 **
cos Region	-7.63274	-0.619212	-24.4216	-2.23798 **
gayan Valley	-16.0053	-2.38445 **	-25.0301	-2.83779 **
ntral Luzon	-19.5717	-4.92948 **	-7.82698	-1.40441
uthern Tagalog	-12.7528	-3.93205 **	-9.2349	-2.57161 **
ol Region	-9.42855	-1.67196 *	-12.8533	-2.35358 **
estern Visayas	6.16448	0.987668	3.11472	0.467265
ntral Visayas	13.6835	1.80021 *	-3.81558	-0.721186
stern Visayas	-10.7623	-1.50983	-15.4838	-1.49044
estern Mindanao	-3.39973	-0.407914	8.23229	0.992063
rthern Mindanao	7.68314	0.714762	5.03475	0.427742
uthern Mindanao	7.29397	0.709422	21.0562	3.41302 **
ntral Mindanao	7.41397	0.855862	-1.5996	-0.158051
rdillera Autonomous Region	-12.833	-1.45259	-3.91307	-0.293264
mbda	-10.2004	-0.651549	-2.96801	-0.185296

= Significant at the 5 percent level
: Significant at the 10 percent level

umber of observations : 539		
ean of dependent variable	73.9842	90.5427
d. dev. of dependent variable	34.3379	33.0293
um of squared residuals	433683	446694
ariance of residuals	840.471	865.687
d. error of regression	28.9909	29.4226
squared	0.316335	0.238921
djusted R-squared	0.287186	0.206472
statistic	10.8525	7.36294

ource of basic data: DOH National Survey on Dental Manpower, 1990 dentist is correlated with the number of years of practice. More experienced dentists may have more stable patient loads than their younger counterparts. Their reputation and the quality of their services may have been already established. This moderates the need for them to attract more patients by decreasing the prices that they charge for dental care services.

Greater absolute effects of age on the prices of extractions than for fillings may be capturing the practice patterns of older dentists. Relatively more extractions per filling are performed by older dentists, thereby playing a more important role in their total incomes. Efforts to decrease patient load and, consequently, total working time may therefore be better served by increasing prices of extractions than fillings.

In addition to age, dental specialty and gender have influences on the price of single extractions but not on the price of amalgam fillings. Female dentists charged about P 5 less than male dentists.

Dental specialists like orthodontists, pedodontists, oral surgeons and prosthodontists charge about P 64 higher or nearly double the average price of single extractions. There are relatively few dental specialists in the country. Dental specialization could therefore be a signal of the skill of the dentist and the quality of the dental service performed.

Dentist specialists may also prefer to perform certain dental services relative to others. For instance, oral surgeons may prefer to handle more difficult cases, orthodontists may prefer to align teeth while periodontists would be handling gum problems. In these instances, they may be using higher prices of extractions in order to select out the cases requiring extractions only.

Dentists located in rural areas charge about P 10 less for extractions than those in urban areas. These lower prices may be reflective of lower incomes and lower demand for dental care services. Although this effect is expected to extend to fillings, the rural location of the dentist does not significantly affect the price of one-surface amalgam fillings.

Ownership of equipment by the dentist increases the prices that are charged. Prices of single extractions are higher by about P 14.4 for every x-ray machine, by P 4.70 for every high-speed drill and by P 9.34 for every amalgamator. On the other hand, prices of one-surface amalgam fillings are higher by P 6.5 for every high speed drill and P 16.70 for every amalgamator.

These increase in prices due to the presence of fixed equipment may be related to the higher costs of variable inputs that may be complementary to these machinery. In particular, high speed drills are dependent on electricity.

High speed drills and amalgamators speed up the performance of fillings. Drills are used to smooth out the cavities before fillings are applied while amalgamators mix the substance for the fillings at a faster rate than ordinary mortar and pestles. If faster time spent for fillings is an aspect of the quality of the service that patients consider, then faster service time may be reflected in higher prices.

High speed drills and amalgamators are not usually used in the performance of extractions. However, these equipment have positive effects on single extraction prices. The presence of these equipment is used to signal the faster adoption of new technology by the dentist, and therefore on the overall quality of the dental service performed. Their signalling effects may redound to the demand and therefore the prices charged for single extractions by the particular dentist. The higher prices for extractions charged may also reflect the allocation of the additional depreciation costs due to the presence of equipment.

Prices of extractions are lower in Regions 2, 3, 4, and 5 than those in the NCR and higher in Region 7 than NCR. The highest differences are found in Region 3 where prices are lower by about P 20.00. Looking at household incomes and distributions of dentists, one can characterize Regions 2 and 5 as low income with relatively higher population per private dentist than Regions 3 and 4 which are high income and lower population per private dentist regions. One can surmise that the level of demand for Regions 2 and 5 are providing constraints against dentists charging higher prices there. On the other hand, while levels of demand in Regions 3 and 4 are higher, competition among private dentists may be providing the constraints against higher prices charged. Likewise, these higher demands may be characterized by a shift away from extractions to fillings, thereby contributing to the downward shift in prices.

The case of Region 7 is quite surprising since it has relatively lower income than the NCR and higher population per private dentist. Cost of practice in the region is also not as high. There could be other factors which explain the relatively higher costs of extractions performed there.

Prices of extractions are not significantly different from those in the NCR for Regions 1, 6, 8-13. Note that these regions have lower incomes than those for NCR and lower number of private dentists. In fact, Regions 8, 9 and 12 have the highest populations per private dentist. Only in Region 8 do government dentists outnumber private dentists. This implies that although there are substitute providers, there are not too many. These two factors can be combined to sustain prices. On the one hand, the lower income levels may be consistent with lower demand for dental services but greater demand for extractions relative to fillings. Lower numbers of providers may be preventing prices from declining. The combination may therefore be approximating the effects on prices of the situation in NCR.

Prices of fillings are lower by about P 25 in Regions 1 and 2. While Region 2 registered significant difference in the prices of extractions and fillings, Region 1 is only lower as far as fillings are concerned. This could be supportive of observations that there are differences not only on the levels of demand but on the patterns of demand as well. The level of demand in Region 2 may be such that demand for both extractions and fillings is significantly lower while demand for only fillings is lower in Region 1.

Dental patients in Region 3 are charged the same rates as in the NCR. One could surmise that the level of demand in Region 3 for fillings may approximate the levels in the NCR. This would also tend to support the shifting of demand away from extractions to fillings in the case of Region 3 since extraction prices are lower but filling prices are not.

On the other hand, prices of amalgam fillings in Region 4 are lower than those in NCR. This may indicate that the shift to amalgam fillings may not be as extensive as in Region 3 and that the number of providers is still providing the constraint to increases in prices.

Region 11 posts about P 21 higher prices for one surface amalgam fillings than NCR. This is a region which can be classified as a medium income region with high incidence of caries and high literacy rates. It may be hypothesized that demand in this region for dental services may be relatively high. Most of the dental care providers are private dentists; next to NCR, and Regions 3, 4, 7 and 13, this region has the lowest population to private dentist ratios. There are relatively few government dentists as this region has the second highest population to government dentist ratio. Alternative, lower priced providers of fillings are therefore scarcer than in the other regions. Higher prices may therefore be offshoots of the relatively higher demand for fillings provided mostly by private dentists.

Consistent with the prices of extractions, prices of fillings in Regions 6, 8, 9, 10, and 12 are not significantly different from those in NCR. The same mechanisms as in extractions may explain the higher prices in these regions. Although demands may be lower, demand per dentist may be high due to the relative scarcity of providers.

Implications and limitations. The results for the probit equation on the decision to be self-employed or not indicate that age and gender of dentists affect the decision to become self-employed or not. Changes in the age and sex distribution of dentists in the Philippines would therefore have effects on the mode of practice choices of dentists.

It seems from the pattern of the regions where the likelihood of self-employment is higher that demand and income considerations do affect the decision to become self-employed. These are specially apparent in Regions 3, 4, 7 and 11 where the likelihood of being self-employed is the same as those in the NCR, while dentists in the lower income regions are less likely to be self-employed. This implies that as household incomes increase, as demand for health care services increase and as the incomes of self-employed dentists increase, the distribution of dentists across practice modes would likely be affected.

These could have implications on the requirements for dentists to provide for care. It was noted in the two-way tables that government dentists were more productive than private dentists. A shifting of the distribution of dentists toward self-employment may mean less patients served, unless there are corresponding changes in private dentist productivities. To serve the increased demand for dental care services may require more dentists than would otherwise be needed. Further investigation into the productivity differences between private and public dentists may be in order.

Based on the patterns of effects of the regional dummies on prices of extractions and amalgam fillings, it can be noted that changes in household incomes and demand and the number of providers of dental care services would have different effects in each of the regions. If the magnitudes of household incomes, literacy rates, incidence of caries, cost of practice and number of private and public dentists would increase to levels like those in NCR, increases in prices of extractions are expected in Regions 2, 3, 4, and 5 while increases in prices of fillings are expected in Regions 1, 2, 4, and 5. The average levels of prices in Regions 8, 9, 10, 12, and 13 are expected to remain at current levels, approximating those of NCR. This indicates that increases in expenditures due to increases in prices can be expected as the levels of demand increase.

For those regions where prices are not significantly different from levels in the NCR, it can not be concluded that movements in the underlying variables would not involve changes in the prices of dental care services. The pattern of significant differences in prices of other regions and the differences in the structures of the underlying variables there point to the possible movements in prices in these regions before settling at the current NCR levels. One such possibility is the decrease in prices as demand increases are tempered by increases in the number of providers, as in the case of Regions 3 and 4. Likewise, it can be expected that changes in prices of extractions relative to fillings may also differ.

Taking the presence of equipment as representing possible increases in the costs of practice, then increases in the costs translate to increases in the prices charged for dental care services. It can therefore be expected that increases in the rate of adoption by dentists of technological advancement in the form of new dental equipment would increase the prices charged for dental care services. These would have to be factored in any estimates of dental care expenditures through time.

Differences in quality, either perceived or actual, also affect prices of dental care services. Increases in demand for dental care services accompanied by increases in demand for quality would therefore tend to increase total expenditures for dental care by way of their effects on the prices.

While the general trend of increases in expenditures due to increases in prices can be supported by the data, measures to moderate these price increases are not readily observable since the effects of the underlying variables cannot be separated out. Perhaps analysis of the variables at hand could be conducted at a more disaggregated level, perhaps at the level of the province, in order to do away with the high degree of multicollinearity.

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Appendix

NSCB Approval No. A5742-
R-251-HN
Expires:Dec. 31,1990

Republic of the Philippines
Department of Health
Dental Health Service
Manila

* Code Number ________

DENTAL MANPOWER SURVEY FORM

Instructions:

Please complete and return at the earliest date. Read it through to the end before starting to answer the questions.

Answers in the boxes maybe indicated with a check mark [/]. If the answer to the question is zero, please write in "zero" rather than leaving the space blank.

A good estimate is better than no answer. If it is not possible to answer a question, write "NA" (which will indicate information is "Not applicable or that question does not apply to you"). These information will be treated as confidential.

1. Name ______________________________________
   (Surname) (First Name) (Middle Name)
2. Home Address: ______________________________________
   (No. of St./Barrio) (Municipality) (Province)
3. Clinic Address: ______________________________________
   (No. of St./Barrio) (Municipality) (Province)
4. Age ____ years
5. Sex: Male [ ] Female [ ]
6. Civil Status: Single [ ] Married [ ]
   Widow [ ] Widower [ ]
7. Educational Attainment:

   ____
   Title of Degree / Name of School Date Graduated

   ____
   Other Educational Attainment/Post Graduate or Others,specify
8. Employment:
   (please check answer) [ ] Self-employed [ ] Employed
9. Nature of employment:
   (please check answer)

   [ ] Government
   If gov't., check what level
   [ ] Department/Bureau
   Specify:________________
   [ ] Regional
   Specify:________________
   [ ] Provincial
   Specify:________________
   [ ] Municipal/City
   Specify:________________

   [ ] Private
   If private,check time invested
   [ ] Full-time
   [ ] Part-time
   [ ] Half-time
   [ ] Others

10. Category (Check all that apply and specify)
   [ ] Occupational (Industrial, Agricultural, Manufacturing, Business, etc.)
   Specify: ______________________
   [ ] School (Private)
   Specify: ______________________
   [ ] Hospital (Private)
   Specify: ______________________

11. Type of Practice/Business (Please check answer)

	Name
[ ] Single (proprietorship)	______________
[ ] Partnership, specify name of partner	______________
[ ] Corporation, specify name and address of corporation	______________
[ ] Group practice, specify name that comprises the group	______________

* Code Number

1	Dentist V	8	General Practitioner
2	Dentist IV	9	Orthodontist
3	Dentist III	10	Pedodontist
4	Dentist II	11	Oral Surgeon
5	Dentist I	12	Prosthodontist
6	Staff Dentist	13	Others, Specify
7	Instructor/Professor		

NSCB Approval No. A5742-
R-253-HN
Expires: Dec. 31, 1990

Republic of the Philippines
Department of Health
Dental Health Service
Manila

ECONOMICS OF DENTAL PRACTICE SURVEY
(Dentist)

1. Gross Monthly Income (please check)

____ Below P5,000.00	____ P9,001.00 to P10,000.00
____ P5,001.00 to P6,000.00	____ P10,001.00 to P11,000.00
____ P6,001.00 to P7,000.00	____ P11,001.00 to P12,000.00
____ P7,001.00 to P8,000.00	____ P12,001.00 to P13,000.00
____ P8,001.00 to P9,000.00	____ P13,001 and above

2. Average clinic working hours per day ____ Days per week ____

3. Average number of patients per day:
Extractions ______________ Temporary Filling ________
Permanent Filling ________ Other Services ________
Flouride topical application ____________

4. Type and quantity of dental/laboratory equipment used:

TYPE	QUANTITY		
[ ] Portable	[ ] 1	[ ] 2	[ ] 3 or more
[ ] Hydraulic Chair & Unit	[ ] 1	[ ] 2	[ ] 3 or more
[ ] Motor Chair	[ ] 1	[ ] 2	[ ] 3 or more
[ ] High Speed Drill	[ ] 1	[ ] 2	[ ] 3 or more
[ ] Ultrasonic device	[ ] 1	[ ] 2	[ ] 3 or more
[ ] X-ray	[ ] 1	[ ] 2	[ ] 3 or more
[ ] Electronic Pulp Vitality Tester	[ ] 1	[ ] 2	[ ] 3 or more
[ ] Amalgamator	[ ] 1	[ ] 2	[ ] 3 or more
[ ] Motor	[ ] 1	[ ] 2	[ ] 3 or more
[ ] Flask	[ ] 1	[ ] 2	[ ] 3 or more
[ ] Lathe	[ ] 1	[ ] 2	[ ] 3 or more
[ ] Articulator	[ ] 1	[ ] 2	[ ] 3 or more
[ ] Porcelain Oven (furnace)	[ ] 1	[ ] 2	[ ] 3 or more
[ ] Casting Machine	[ ] 1	[ ] 2	[ ] 3 or more
[ ] Oven	[ ] 1	[ ] 2	[ ] 3 or more
[ ] Blow Torch	[ ] 1	[ ] 2	[ ] 3 or more

5. Monthly clinic rental (if you own the building, please estimate)

6. Average monthly operating expenses in your practice/business

a.	Utilities (electricity, water, telephone, gas, etc.)	P_______
b.	Insurance related to office practice (liability, equipment, fire, etc.)	P_______
c.	Commercial dental laboratory charges	P_______
d.	Laboratory supplies, drugs, etc. (not equipment or business office supplies and material)	P_______
e.	Salaries (including commissions) per month	
	Dentists employed by you	P_______
	Hygienist	P_______
	Dental assistant	P_______
	Technicians	P_______
	Others (Specify)	P_______
f.	Travel and Professional Meetings	P_______
g.	Depreciation of dental equipment and other expenses	P_______
h.	Laundry, business and office supplies, porterage and office maintenance	P_______

Current rate charge:	Minimum	Maximum
Orthodontic Treatment	P_______	P_______
Dental Prophylaxis	P_______	P_______
Two Surfaces Amalgam Fillings	P_______	P_______
One Surface Amalgam Fillings	P_______	P_______
Silicate Filling	P_______	P_______
Composite Filling	P_______	P_______
Two Surfaces Gold Fillings	P_______	P_______
Single Extraction (Uncomplicated, under local anesthesia)	P_______	P_______
Jacket Crown	P_______	P_______
Complete Denture	P_______	P_______
Partial Denture (per unit)	P_______	P_______
Orthodontic Appliance	P_______	P_______
Periodontal Treament	P_______	P_______
Repair:		
a. Broken denture	P_______	P_______
b. Pontic (porcelain or plastic)	P_______	P_______
c. Additional	P_______	P_______
d. Others (specify)	P_______	P_______

Table A-1

Average Number of Patients, by Position/Specialization

Position/ Specialization	TYPE OF SERVICE					
	Extraction		Temporary Filling		Permanent Filling	
	Average	Cases (n)	Average	Cases (n)	Average	Cases (n)
Dentist V	3.00	1	-	-	5.00	1
Dentist IV	8.40	5	7.67	6	8.50	6
Dentist III	11.65	46	6.95	42	4.85	40
Dentist II	11.68	243	6.32	221	5.36	193
Dentist I	12.48	42	9.72	47	8.21	38
Staff Dentist	9.91	11	7.09	11	6.20	10
Instructor/Professor	2.67	6	2.33	3	3.57	7
General Practitioner	4.34	855	3.02	786	3.56	822
Orthodontist	9.67	6	5.60	5	5.14	7
Pedodontist	5.00	2	4.00	2	6.00	2
Oral Surgeon	13.33	6	13.60	5	15.25	4
Prosthodontist	10.00	1	5.00	1	15.00	1
Others	6.55	104	5.45	99	5.54	100
For Entire Population	6.49	1328	4.32	1228	4.30	1231

Source of basic data: DOH National Survey on Dental Manpower, 1990

Table A-2

Average Number of Patients, by Type of Service, by Region and Location

	Region	Extraction		Temporary Filling		Permanent Filling	
		Average	Cases (n)	Average	Cases (n)	Average	Cases (n)
I	Ilocos Region	9.55	47	5.00	50	5.69	48
	Urban	10.38	29	5.10	30	6.00	29
	Rural	8.22	18	4.85	20	5.21	19
II	Cagayan Valley	7.00	22	4.17	23	4.17	23
	Rural	7.00	22	4.17	23	4.17	23
III	Central Luzon	7.54	125	4.16	113	4.23	109
	Urban	5.48	25	3.33	18	3.39	18
	Rural	8.06	100	4.32	95	4.40	91
IV	Southern Tagalog	6.53	164	3.64	143	4.09	147
	Urban	6.34	61	3.55	49	4.28	53
	Rural	6.64	103	3.69	94	3.98	94
V	Bicol Region	7.70	53	4.00	51	3.21	47
	Urban	8.89	18	4.06	18	3.65	17
	Rural	7.09	35	3.97	33	2.97	30
VI	Western Visayas	8.38	71	5.00	63	4.43	58
	Urban	8.16	32	5.10	29	4.34	29
	Rural	8.56	39	4.91	34	4.52	29
VII	Central Visayas	6.89	107	4.71	100	4.04	102
	Urban	6.39	83	4.55	76	4.33	80
	Rural	8.63	24	5.21	24	3.00	22
VIII	Eastern Visayas	9.11	44	6.77	44	4.74	42
	Urban	9.25	16	7.20	15	5.07	15
	Rural	9.04	28	6.55	29	4.56	27
IX	Western Mindanao	9.07	45	4.61	36	4.11	37
	Urban	7.38	24	3.90	20	3.40	20
	Rural	11.00	21	5.50	16	4.94	17
X	Northern Mindanao	8.30	69	4.92	65	4.97	62
	Urban	8.89	37	4.97	34	4.65	31
	Rural	7.63	32	4.87	31	5.29	31
XI	Southern Mindanao	5.79	56	3.92	49	3.47	49
	Urban	4.69	26	4.04	25	3.19	26
	Rural	6.73	30	3.79	24	3.78	23
XII	Central Mindanao	6.61	44	1.92	36	2.28	36
	Urban	9.82	17	1.50	12	2.00	11
	Rural	4.59	27	2.13	24	2.40	25
CAR	Cordillera Region	6.30	20	4.47	19	4.21	19
	Urban	4.89	9	3.13	8	4.13	8
	Rural	7.45	11	5.45	11	4.27	11
NCR	Nat'l Capital Region	4.92	525	4.28	499	4.52	514
	Urban	4.92	525	4.28	499	4.52	514
For Entire Population		6.51	1392	4.33	1291	4.31	1293

Source of basic data: DOH National Survey on Dental Manpower, 1990

Figure A.1

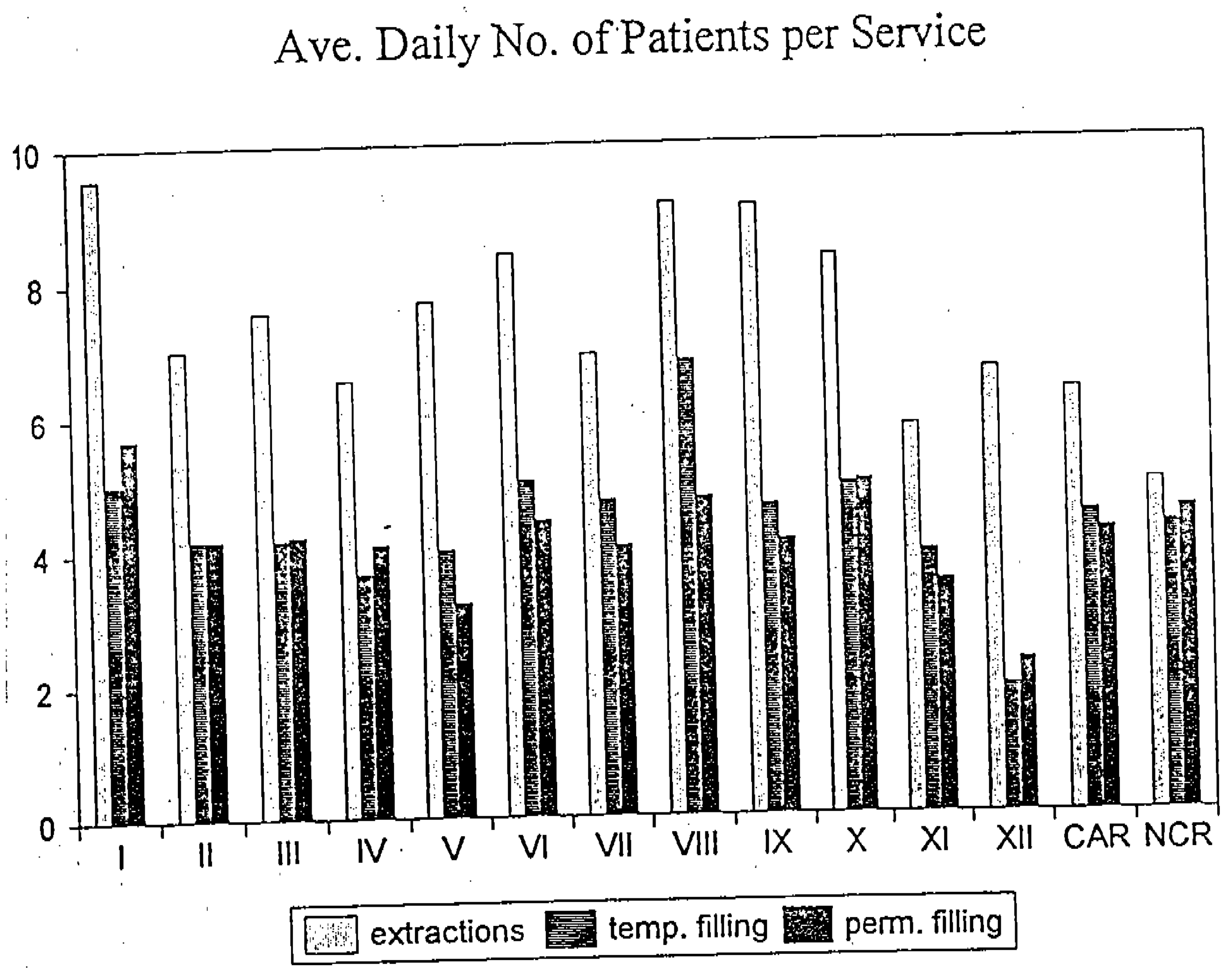
Ave. Daily No. of Patients per Service
10
8
6
4
2
0
I
II
III
IV
V
VI
VII
VIII
IX
X
XI
XII
CAR
NCR
extractions
temp. filling
perm. filling

Table A-3

Ratio of Extraction to Permanent Filling, by Position/Specialization

Position/Specialization	Average Ratio	Cases (n)
Dentist V	0.60	1
Dentist IV	3.31	5
Dentist III	5.27	38
Dentist II	3.25	187
Dentist I	3.47	27
Staff Dentist	2.88	10
Instructor/Professor	1.36	6
General Practitioner	1.52	799
Orthodontist	2.38	6
Pedodontist	1.50	2
Oral Surgeon	0.88	4
Prosthodontist	0.67	1
Others	1.42	94
For Entire Population	1.97	1180

Source of basic data: DOH National Survey on Dental Manpower, 1990

Table A-4

Ratio of Extraction to Permanent Filling, by Region, by Location

	Region	Ratio Average	Ratio Cases (n)
I	Ilocos Region	2.57	44
	Urban	2.57	27
	Rural	2.55	17
II	Cagayan Valley	2.43	22
	Rural	2.43	22
III	Central Luzon	2.29	107
	Urban	1.52	18
	Rural	2.45	89
IV	Southern Tagalog	1.85	143
	Urban	1.71	52
	Rural	1.93	91
V	Bicol Region	2.93	47
	Urban	2.89	17
	Rural	2.95	30
VI	Western Visayas	2.80	56
	Urban	3.06	27
	Rural	2.55	29
VII	Central Visayas	1.88	101
	Urban	1.54	79
	Rural	3.08	22
VIII	Eastern Visayas	2.46	37
	Urban	2.01	12
	Rural	2.67	25
IX	Western Mindanao	2.52	35
	Urban	2.26	19
	Rural	2.83	16
X	Northern Mindanao	2.32	62
	Urban	2.74	31
	Rural	1.90	31
XI	Southern Mindanao	2.07	48
	Urban	1.78	25
	Rural	2.39	23
XII	Central Mindanao	4.32	36
	Urban	9.11	11
	Rural	2.22	25
	Cordillera Administrative Region	1.46	19
	Urban	1.11	8
	Rural	1.72	11
	National Capital Region	1.39	483
	Urban	1.39	483
	For Entire Population	1,97	1240

Source of basic data: DOH National Survey on Dental Manpower, 1990

Table A-5

Ratio of Extraction to Permanent Filling, by Age, Gender and Civil Status of Dentist

Age, Gender, Civil Status	Average Ratio	Cases (n)
20 TO 29 YEARS	1.62	416
Male	1.59	91
single	1.58	60
married	1.61	31
Female	1.63	325
single	1.48	228
married	1.97	97
30 TO 39 YEARS	1.93	421
Male	1.95	162
single	2.07	33
married	1.90	128
widowed	4.00	1
Female	1.91	259
single	1.73	78
married	2.00	181
40 TO 49 YEARS	2.11	112
Male	2.52	41
single	1.33	2
married	2.58	39
Female	1.88	71
single	2.35	11
married	1.82	57
widowed	1.28	3
50 TO 59 YEARS	2.84	171
Male	2.82	61
single	0.87	3
married	2.95	55
widowed	2.44	3
Female	2.85	110
single	2.27	9
married	2.88	95
widowed	3.27	6
60 YEARS AND ABOVE	2.15	83
Male	2.15	54
single	-	-
married	2.16	50
widowed	3.33	1
separated	1.67	3
Female	2.14	29
single	2.31	6
married	2.14	17
widowed	1.89	5
separated	2.50	1
For Entire Population	1.98	1203

Source of basic data: DOH National Survey on Dental Manpower, 1990

Figure A.2

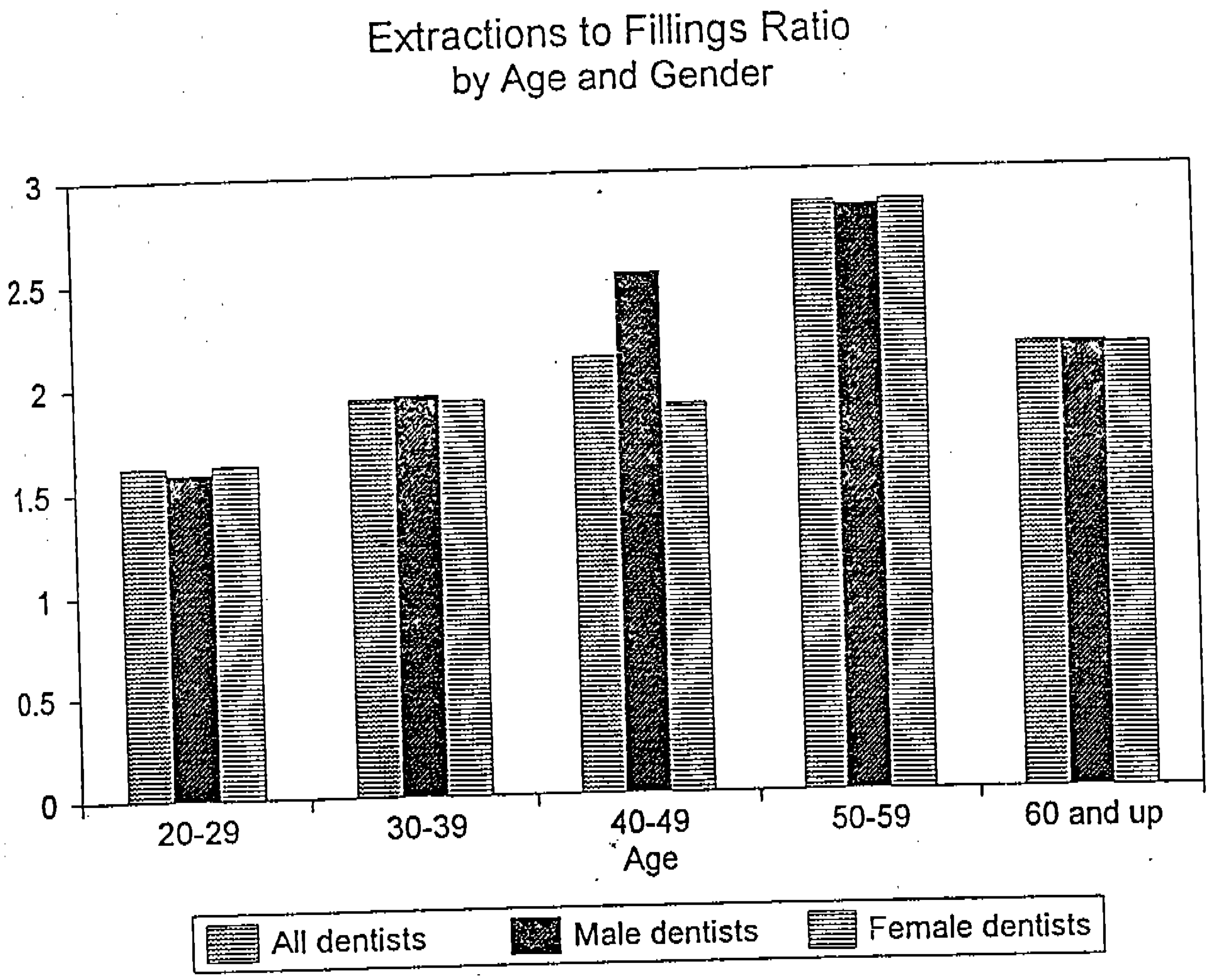
Extractions to Fillings Ratio
by Age and Gender
3
2.5
2
1.5
1
0.5
0
20-29
30-39
40-49
50-59
60 and up
Age
All dentists
Male dentists
Female dentists

Table A-6

Average Working Hours by Region and Location

	Location/Region	Average Working Hours				Variability		
		Region	Urban city	Rural municipality	N	Region	Urban city	Rural municipality
I	Ilocos Region	7.27	7.34	7.17	55	1.8605	1.5986	2.2085
II	Cagayan Valley	7.60	-	7.60	25	1.4142	-	1.4142
III	Central Luzon	6.98	7.36	6.88	132	1.6062	1.2536	1.6797
IV	Southern Tagalog	7.34	7.20	7.42	196	1.4707	1.5078	1.4479
V	Bicol Region	7.41,	7.53	7.35	59	1.5100	1.3486	1.5941
VI	Western Visayas	6.71	6.53	6.90	86	1.9696	2.0627	1.8682
VII	Central Visayas	6.69	6.59	7.09	109	1.7089	1.7755	1.3770
VIII	Eastern Visayas	7.16	6.95	7.31	49	1.6751	1.8489	1.5608
IX	Western Mindanao	6.98	6.89	7.09	50	1.6841	1.4763	1.9286
X	Northern Mindanao	7.03	6.89	7.18	69	1.5240	1.6695	1.3568
XI	Southern Mindanao	7.02	6.46	7.50	60	1.7123	1.6884	1.6064
XII	Central Mindanao	6.82	7.00	6.70	44	1.5443	1.5000	1.5888
CAR	Cordillera Region	7.58	7.54	7.64	24	0.9286	0.7763	1.1201
NCR	National Capital Regio	7.10	7.10	-	633	1.9268	1.9268	
	PHILIPPINES	7.088				1.7579		

Source of basic data: DOH National Survey on Dental Manpower, 1990

Figure A.3

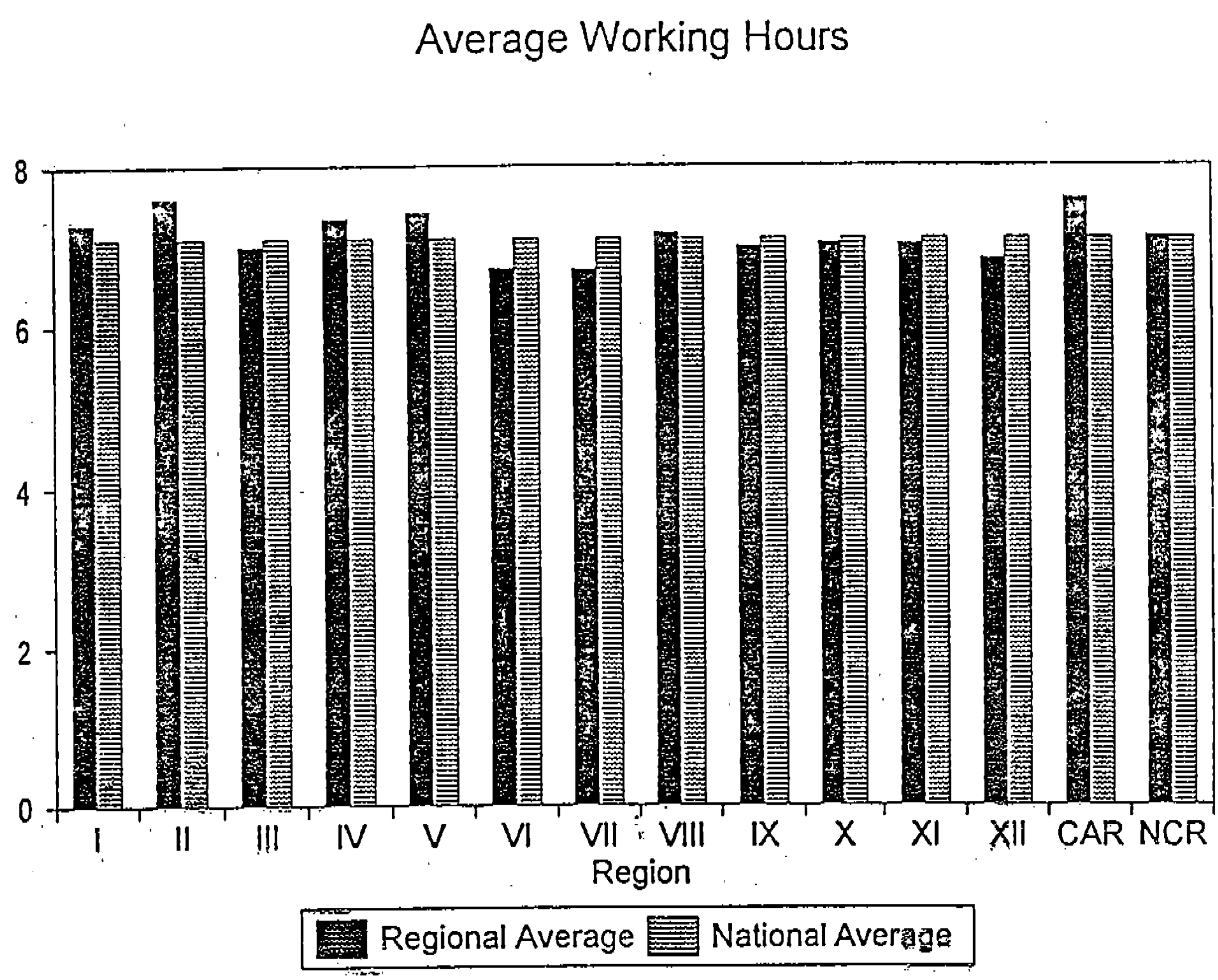
Average Working Hours
8
6
4
2
0
I
II
III
IV
V
VI
VII
VIII
IX
X
XI
XII
CAR
NCR
Region
Regional Average
National Average

Figure A.4

Average Working Hours by Region

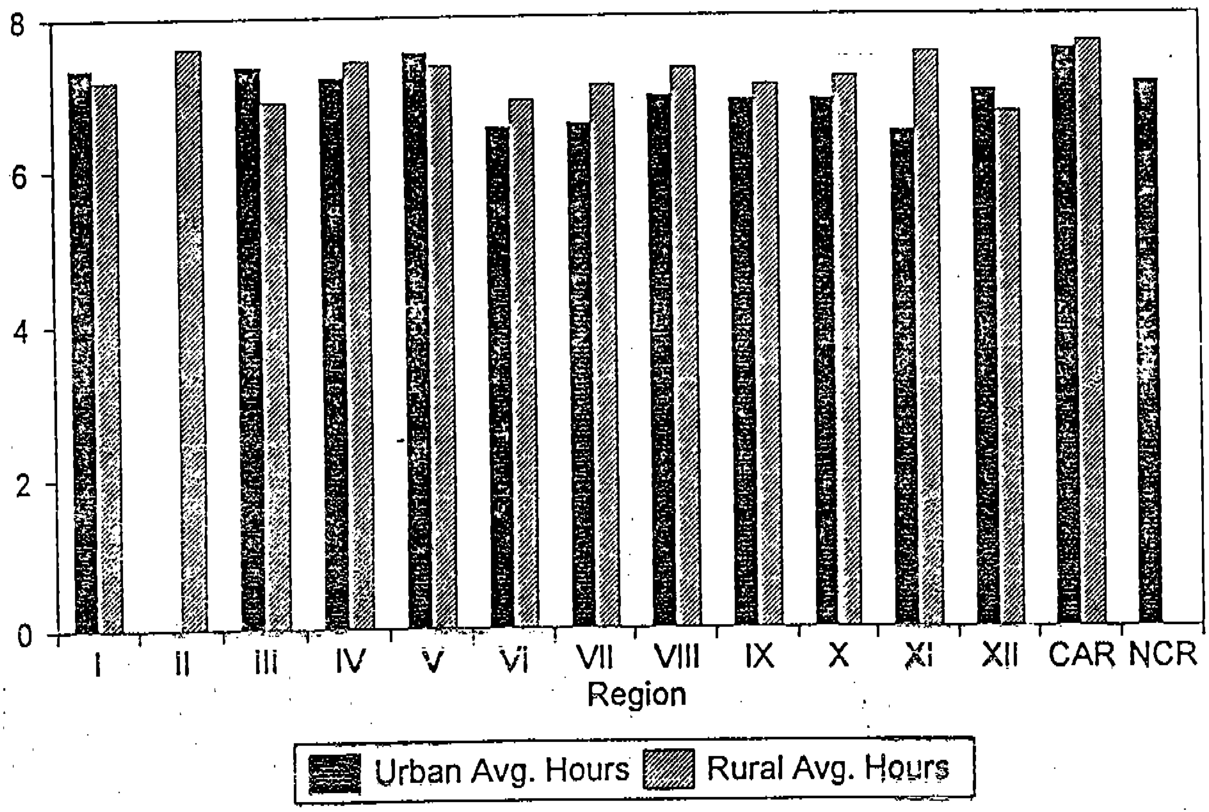

Figure A.5

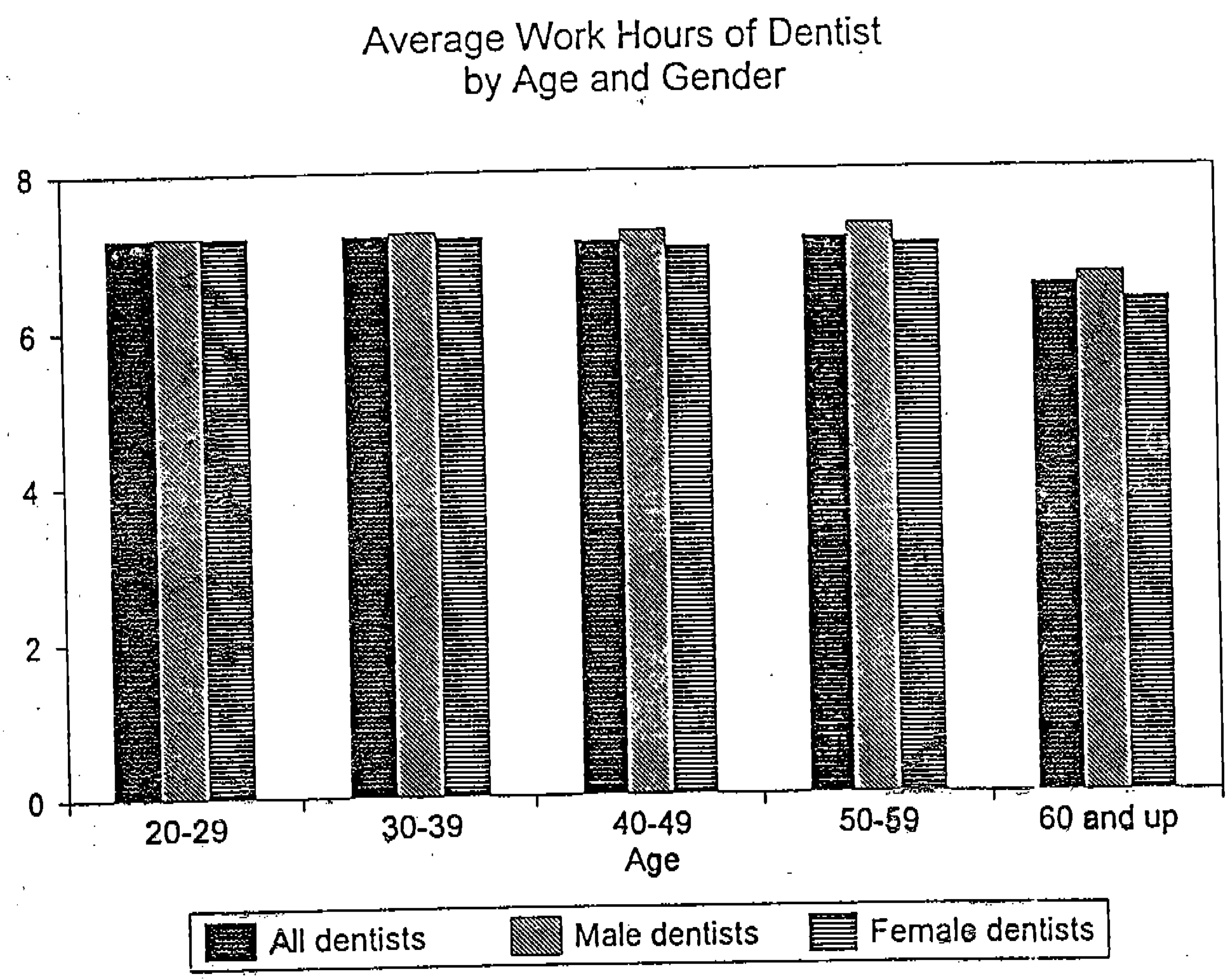
Average Work Hours of Dentist
by Age and Gender
8
6
4
2
0
20-29
30-39
40-49
50-59
60 and up
Age
All dentists
Male dentists
Female dentists

Table A-8

Dental/Laboratory Equipment Used by Dentists, by Position/Specialization

Position/ Specialization	DENTAL CHAIR								
	Portable Chair			Hydraulic Chair & Unit			Motor Chair		
	1	2	3 or more	1	2	3 or more	1	2	3 or more
Dentist V									
Dentist IV	2			2		2			1
Dentist III	10	3		30	2	2	7	1	2
Dentist II	125	7	1	103	3	3	30	1	1
Dentist I	27	5	1	19	2	3	2	3	4
Staff Dentist	3	2		7	3	2	3	2	2
Instructor/Professor	6			6	-		6		2
General Practitioner	282	23	6	481	63	5	219	35	15
Orthodontist	3	1		2		1	1	4	2
Pedodontist	1	1		1			1		
Oral Surgeeon	1	1		1	1	2		1	4
Prosthodontist					1		1		1
Others	23	4	3	72	6	6	32	2	2

Position/ Specialization	High Speed Drill			Ultrasonic Device			X-ray			Electronic Pulp Vitality Tester		
	1	2	3 or more	1	2	3 or more	1	2	3 or more	1	2	3 or more
Dentist V												
Dentist IV	3	1	1		1	1	2					
Dentist III	15	1	2	3	1	1	5	1	1	2	1	
Dentist II	92	1	5	9	2	1	10		1		2	
Dentist I	10	2	5		5		5	3				
Staff Dentist	4	6	2	2	3		7	2	1		1	
Instructor/Professor	7	1	3	7			4		2	1		
General Practitioner	565	111	39	180	34	10	107	10	5	40	3	1
Orthodontist	5	2	1	2	1	2	4	1		4		
Pedodontist	3									1		
Oral Surgeeon		1	5	1		3		2	2			1
Prosthodontist		1	1	1		1			1			
Others	66	12	9	24	2	1	25	3	1	9		

Table A-8: continued

Position/ Specialization	Amalgamator			Motor			Flask			Lathe		
	1	2	3 or more	1	2	3 or more	1	2	3 or more	1	2	3 or mc
Dentist V												
Dentist IV	1			1			1			1		
Dentist III	4	1	1	12		2	5	1	4	4		2
Dentist II	9	1		32	1	1	9	1	1	10	1	1
Dentist I	7	2		6	3	2		1	5	2	1	3
Staff Dentist	6	3	1		4				4	6		
Instructor/Professor	5	1		3	1	1	4		2	3		2
General Practitioner	194	21	6	296	29	21	125	62	47	140	24	24
Orthodontist	3	2	1	4	1		1		1	3	1	
Pedodontist	1			1			1					
Oral Surgeeon		2	3		2	2			4		3	2
Prosthodontist		1	1			1			1			1
Others	39	3	1	27	6	1	14	7	7	18	4	1

Position/ Specialization	Articulator			Porcelain Oven (Furnace)			Casting Machine			Oven		
	1	2	3 or more	1	2	3 or more	1	2	3 or more	1	2	3 or mc
Dentist V												
Dentist IV		1	1									
Dentist III	7	1	3	3			3	1		3		1
Dentist II	17	6	4	1			2			3		
Dentist I	6	2	5	5			4			2	1	
Staff Dentist		1	6	2	1	1	4	1		3	1	
Instructor/Professor	3	2	3	1		1	1		1	1		1
General Practitioner	290	123	107	20	6	2	24	1	1	36	5	2
Orthodontist	1	1	2				2			2		
Pedodontist	1	1								1		
Oral Surgeeon		1	4	4			4			1	2	
Prosthodontist			1	1			1				1	
Others	27	10	12	3	3		6			7	2	

Table A-8: continued

Position/ Specialization	Blow Torch			Others		
	1	2	3 or more	1	2	3 or more
Dentist V						
Dentist IV		1				
Dentist III	8					
Dentist II	9	4		1		
Dentist I	6		1			
Staff Dentist	5					
Instructor/Professor	2		1	1	1	
General Practitioner	215	47	20	9	1	1
Orthodontist	3					
Pedodontist						
Oral Surgeeon	3	1				
Prosthodontist	1					
Others	16	1	4	1		

Source of basic data: DOH National Survey on Dental Manpower, 1990

Table A-9

Dental/Laboratory Equipment Used by Dentists, by Region and Location

Region		DENTAL CHAIR								
		Portable Chair			Hydraulic Chair & Unit			Motor Chair		
		1	2	3 or mor	1	2	3 or more	1	2	3 or more
I	Ilocos Region									
	Urban	17			11	3		5	1	
	Rural	12	1		10	1		4	1	
II	Cagayan Valley									
	Rural	9	2		13	1		5	1	
III	Central Luzon									
	Urban	1	1		15	2		5		1
	Rural	28	4		51	13		23	3	1
IV	Southern Tagalog									
	Urban	21	1		35	4		19	3	1
	Rural	46	5		75	3		26	1	
V	Bicol Region									
	Urban	12			12	4		5		
	Rural	17	2		16			4		
VI	Western Visayas									
	Urban	12	1	1	28			4		
	Rural	19	3	1	20	1		4		
VII	Central Visayas									
	Urban	20	1		51	10	1	12	3	2
	Rural	14	1		8		1			1
VIII	Eastern Visayas									
	Urban	7		1	11	1	1			1
	Rural	11	1	1	10			5		
IX	Western Mindanao									
	Urban	13			14	1		2		
	Rural	13			8	1		3		
X	Northern Mindanao									
	Urban	16	1		24			8	1	
	Rural	22	1		9	1		3		2
XI	Southern Mindanao									
	Urban	10			15			4		
	Rural	12	2	1	11	3		6	2	
XII	Central Mindanao									
	Urban	3	2		9	1		4		
	Rural	12	1		12		1	1		
	Cordillera Admin. Region									
	Urban	7			5			4		
	Rural	8	1		3			1		
	National Capital Region	143	18	6	283	35	22	162	36	29
	Urban	143	18	6	283	35	22	162	36	29

Table A-9: continued

Region	High Speed Drill			Ultrasonic Device			X-ray			Electronic Pulp Vitality Tester		
	1	2	3 or mor	1	2	3 or more	1	2	3 or more	1	2	3 or mor
I Ilocos Region												
Urban	14		3	4	2		1			1		
Rural	9	1	2	3			2			1		
II Cagayan Valley												
Rural	20	2	1	2			3					
III Central Luzon												
Urban	16	2	1	4		1	1	1		1		
Rural	54	12	2	15	1		8			4		
IV Southern Tagalog												
Urban	39	8	3	12		2	7	1		1		
Rural	74	6	1	17	3		6	1		2		
V Bicol Region												
Urban	14	1	1	2			5			2		
Rural	17	2					1					
VI Western Visayas												
Urban	16	2	1	2	1		1					
Rural	21	3		1			1					
VII Central Visayas												
Urban	44	8	8	18	8	1	10	2		3		
Rural	1		1	1			1					
VIII Eastern Visayas												
Urban	12			1			1				1	
Rural	3	2					1					
IX Western Mindanao												
Urban	11	1	1	2			1			2		
Rural	8		1	1			1			1		
X Northern Mindanao												
Urban	13	2		2			4					
Rural	8		3	3			1	2		1		
XI Southern Mindanao												
Urban	18	2	1	9			3			1		
Rural	13	6		5	1		7				1	
XII Central Mindanao												
Urban	6			4								
Rural	11		1	1			2					
Cordillera Admin. Region												
Urban	10			2	1		1			1		
Rural	3	1		1			1					
National Capital Region	357	84	49	126	37	18	109	15	15	37	5	2
Urban	357	84	49	126	37	18	109	15	15	37	5	2

Table A-9: continued

Region	Articulator			Porcelain Oven (Furnace)			Casting Machine			Oven		
	1	2	3 or mor	1	2	3 or more	1	2	3 or more	1	2	3 or more
I Ilocos Region												
Urban	7	3	2				1			2		
Rural	6		3				1					
II Cagayan Valley												
Rural	5	2	4							2		
III Central Luzon												
Urban	6	1	2			1	1			1		
Rural	17	15	12	1			1			1	1	
IV Southern Tagalog												
Urban	20	5	6	2	1		2	1		1	1	
Rural	29	11	11							5		
V Bicol Region												
Urban	6	2	3	2			2			2		
Rural	8	5	5				1			1		
VI Western Visayas												
Urban	7	3	1							1		
Rural	8	3	1							1		
VII Central Visayas												
Urban	14	7	5	2			3			4		
Rural			1									
VIII Eastern Visayas												
Urban	1	2	2				1					
Rural	3	1										
IX Western Mindanao												
Urban	8	2	1		1		1					
Rural	5	2	1	1			1					
X Northern Mindanao												
Urban	11	1					1			1		
Rural	7	4	2	1			2			4		
XI Southern Mindanao												
Urban	8	4	1	2	1					1		
Rural	6	4	2	1			1					1
XII Central Mindanao												
Urban	3	5	1				1					
Rural	11	2	1	1	2		2			2	1	
Cordillera Admin. Region												
Urban	4									1		
Rural	3	2	1	1						2		
National Capital Region	168	69	85	27	6	3	29	2	2	28	9	3
Urban	168	69	85	27	6	3	29	2	2	28	9	3

Table A-9: continued

Region	Blow Torch			Others		
	1	2	3 or mor	1	2	3 or more
I Ilocos Region						
Urban	3	2				
Rural	3					
II Cagayan Valley						
Rural	1		1			
III Central Luzon						
Urban	1	1	1			
Rural	20	4	2	3		
IV Southern Tagalog						
Urban	19	1	1	1		
Rural	22	2	1	2		
V Bicol Region						
Urban	4					
Rural	4	3				
VI Western Visayas						
Urban						
Rural	5	1				
VII Central Visayas						
Urban	8	2	2			
Rural						
VIII Eastern Visayas						
Urban	2	1	1			
Rural	2	2				
IX Western Mindanao						
Urban	4	1				
Rural	3					
X Northern Mindanao						
Urban	1					
Rural	6					
XI Southern Mindanao						
Urban	3		1	2		
Rural	3		1			
XII Central Mindanao						
Urban	4	2				
Rural	6	3	1			
Cordillera Admin. Region						
Urban	2					
Rural	5		1			
National Capital Region	141	31	14	5	2	1
Urban	141	31	14	5	2	1

Source of basic data: DOH National Survey on Dental Manpower, 1990

Table A-10

Dental/Laboratory Equipment Used by Dentists, by Age, Gender and Civil Status of Dentists

Age, Gender Civil Status	DENTAL CHAIR								
	Portable Chair			Hydraulic Chair & Unit			Motor Chair		
	1	2	3 or more	1	2	3 or more	1	2	3 or more
20 TO 29 YEARS									
Male									
single	28	3		35	5		21	2	
married	14	2		18	3		7	3	1
Female									
single	92	7	1	130	8	4	61	5	4
married	46	4	1	55	6	1	22	4	
30 TO 39 YEARS									
Male									
single	11	1	1	19			6	4	1
married	52	5	3	72	10	3	35	4	2
widowed	1								
Female									
single	37	3		38	6	1	28	2	1
married	73	8	1	114	4	1	62	6	5
widowed							1		
40 TO 49 YEARS									
Male									
single	3			2					
married	13	1		24	4		6	3	4
Female									
single				7			2		
married	17	1	1	37	3	2	12	2	2
widowed		1		4					
separated					1				
50 TO 59 YEARS									
Male									
single	1	1		3					
married	24	2	2	37	8	4	11	4	6
widowed	1			3			1		
Female									
single	3			7	1	1	1		1
married	48	4	1	62	7	6	18	2	5
widowed	2	1		6	1		1		
60 YEARS AND ABOVE									
Male									
single									
married	15	4		39	5		6	4	2
widowed	1			1					
separated				2				1	
Female									
single	4			2	3		1		1
married	9			16	3	1	5	1	1
widowed	2			3	1				1
separated	1								

Table A-10: continued

Age, Gender Civil Status	High Speed Drill			Ultrasonic Device			X-ray			Electronic Pulp Vitality Tester		
	1	2	3 or more	1	2	3 or more	1	2	3 or more	1	2	3 or mo
20 TO 29 YEARS												
Male												
single	48	8	3	11	3		8			5		
married	22	4	1	7		1	4		1	1		
Female												
single	161	29	10	37	8	2	25	3	2	4	1	
married	72	7	3	24	1		9			1		
30 TO 39 YEARS												
Male												
single	19	3	2	4	4		3	1		1	1	
married	84	21	9	25	8	1	25	3	1	6	2	
widowed												
Female												
single	59	10	2	22	3		15	1		5		
married	126	23	11	36	7	4	24	3	1	8		
widowed	1						1					
40 TO 49 YEARS												
Male												
single		2		1								
married	26	6	6	12	2	2	7	4	1	1		
Female												
single	7			1			1					
married	24	7	4	13	2	3	7	1	1	4		
widowed	1						2			1		
separated												
50 TO 59 YEARS												
Male												
single	2						1					
married	31	6	9	7	4	4	10	4	2	2		2
widowed	3			1			1			1		
Female												
single	6		1		1		1	1				
married	49	4	10	14	5	1	13	1	2	5	2	
widowed	5			1			1					
60 YEARS AND ABOVE												
Male												
single												
married	26	6	2	10	2	2	7		1	3		
widowed												
separated		1					1					
Female												
single	1		1	2			1		1			
married	11	4	1	2	1		4			3		
widowed	2		1				1					
separated	1											

Table A-10: continued

Age, Gender Civil Status	Amalgamator			Motor			Flask			Lathe		
	1	2	3 or more	1	2	3 or more	1	2	3 or more	1	2	3 or mo
20 TO 29 YEARS												
Male												
single	17			26	2	2	14	4	2	18	3	2
married	7	1		14	2	1	7	5	2	10		1
Female												
single	32	3	1	72	4	4	32	12	10	32	5	5
married	17		1	36	1	1	11	4	2	7	2	1
30 TO 39 YEARS												
Male												
single	6	2		13	1		6	4	1	8		1
married	27	5	1	39	11	4	18	12	11	23	6	6
widowed				1								
Female												
single	21	2		28		2	11	6	1	9	2	2
married	46	4	2	52	5	3	23	5	9	16	3	2
widowed	1											
40 TO 49 YEARS												
Male												
single	1			2								
married	17	3	2	15	4	2	5	5	5	12	1	2
Female												
single	3			3						1		
married	12	4	1	13	2		7	1		9	1	
widowed	3						1					
separated												
50 TO 59 YEARS												
Male												
single									1	1		
married	14	2	4	16	8	4	8	4	11	8	4	6
widowed	1			2			1			1		
Female												
single	2			1		1	2		1	2		1
married	26	4		22	3	4	5	6	5	10	2	2
widowed	1			3				1	1	2		
60 YEARS AND ABOVE												
Male												
single												
married	13	2	1	20	2	3	11	4	9	19	2	4
widowed												
separated				1	1			2		2		
Female												
single	1		1			1			1	2		1
married	3	1		7	1		3	2	1	2		
widowed	1		1	1					1	1		
separated												

Table A-10: continued

Age, Gender Civil Status	Articulator			Porcelain Oven (Furnace)			Casting Machine			Oven		
	1	2	3 or more	1	2	3 or more	1	2	3 or more	1	2	3 or more
20 TO 29 YEARS												
Male												
single	26	11	13	2	1		2			4	2	
married	16	6	4	1		1			1			1
Female												
single	95	41	20	7	4		3	1		14	2	
married	33	15	7	2			2			5		
30 TO 39 YEARS												
Male												
single	12	5	5	1								
married	40	18	20	6	1	1	7			5	3	1
widowed	1											
Female												
single	20	13	9	1	1		1			3		
married	52	13	15	3	1		2	1		5	1	
widowed												
40 TO 49 YEARS												
Male												
single	1											
married	7	5	9	4		1	6			6	1	
Female												
single	3											
married	13	2	3		1							
widowed	2	1								1		
separated												
50 TO 59 YEARS												
Male												
single			1									
married	9	6	14	5	1	1	4	1	1	3	2	2
widowed	1			1			1			1		
Female												
single	3		1	1			1					
married	8	6	10	4			8			5		
widowed		1	1				1					
60 YEARS AND ABOVE												
Male												
single												
married	13	3	13	2			7			4	1	
widowed												
separated			1									
Female												
single		1	1									
married	2	2	2				2			1		
widowed	1	2										
separated												

Table A-10: continued

Age, Gender Civil Status	Blow Torch			Others		
	1	2	3 or more	1	2	3 or more
20 TO 29 YEARS						
Male						
single	23	5	3	2		
married	14	2	2	1		
Female						
single	84	27	11	2	2	
married	25	8	3			
30 TO 39 YEARS						
Male						
single	1	1		1		
married	26	1	2			
widowed						
Female						
single	14	4	2	1		
married	25	6		1		
widowed						
40 TO 49 YEARS						
Male						
single						
married	11		1			
Female						
single						
married	2			1		
widowed						
separated						
50 TO 59 YEARS						
Male						
single	1					
married	8	1	1	1		1
widowed	1					
Female						
single	3					
married	10	1		2		
widowed	1			1		
60 YEARS AND ABOVE						
Male						
single						
married	12		2			
widowed						
separated						
Female						
single	1					
married	3					
widowed						
separated						

Source of basic data: DOH National Survey on Dental Manpower, 1990

Table A-11

Average Monthly Clinic Costs, by Region, by Location

Region	Clinic Costs													
	Total Cost /1		Rent		Salaries /2		Utilities		Commercial Laboratory Charges		Clinic Supplies Drugs		Laundry Office Supplies	
	Average	(n)	Average	(n)	Average	(n)	Average	(n)	Average	(n)	Average	(n)	Average	(n)
I Ilocos Region	5078.09	32	1152.45	22	1726.67	15	599.60	25	1876.32	19	3058.33	18	347.19	16
Urban	4187.50	16	1366.67	12	1985.71	7	540.91	11	1785.71	7	2242.86	7	364.29	7
Rural	5968.69	16	895.40	10	1500.00	8	645.71	14	1929.17	12	3577.27	11	333.89	9
II Cagayan Valley	3843.33	12	883.33	6	566.67	3	1057.31	13	2075.00	4	2060.00	5	893.75	8
Rural	3843.33	12	883.33	6	566.67	3	1057.31	13	2075.00	4	2060.00	5	893.75	8
III Central Luzon	6240.62	92	1629.10	50	1256.98	43	803.70	87	3385.52	67	2507.63	59	473.14	51
Urban	4758.68	19	1955.00	16	933.33	12	815.00	19	1914.29	7	1091.67	12	991.67	6
Rural	6626.33	73	1475.74	34	1382.26	31	800.54	68	3557.17	60	2869.15	47	404.00	45
IV Southern Tagalog	3884.60	131	1584.34	83	1378.06	36	871.79	118	2082.10	59	2010.60	63	416.50	60
Urban	4780.75	53	1861.90	42	1410.63	16	938.98	49	2427.50	20	2713.04	23	602.63	19
Rural	3275.68	78	1300.00	41	1352.00	20	824.07	69	1904.97	39	1606.70	40	330.24	41
V Bicol Region	3944.31	29	1001.85	27	592.86	7	813.59	32	2292.31	13	2014.71	17	477.08	24
Urban	5438.57	7	1191.67	6	637.50	4	1091.11	9	1000.00	5	3500.00	5	400.00	7
Rural	3468.86	22	947.62	21	533.33	3	705.00	23	3100.00	8	1395.83	12	508.82	17
VI Western Visayas	3919.09	33	1097.14	35	1307.89	19	594.19	31	1339.52	21	1028.13	16	723.81	21
Urban	3620.00	16	1227.78	18	1131.82	11	816.00	15	1155.56	9	835.71	7	744.44	9
Rural	4200.59	17	958.82	17	1550.00	8	386.25	16	1477.50	12	1177.78	9	708.33	12
VII Central Visayas	4632.15	26	1355.90	51	1831.25	16	911.09	64	1528.21	39	1296.51	43	451.63	43
Urban	4918.17	24	1367.04	47	1831.25	16	990.36	56	1502.78	36	1351.28	39	412.03	37
Rural	1200.00	2	1225.00	4	-	-	356.25	8	1833.33	3	762.50	4	695.83	6
VIII Eastern Visayas	2942.86	7	906.25	16	400.00	3	579.41	17	919.55	11	1160.50	11	213.33	9
Urban	3800.00	2	650.00	6	450.00	2	328.57	7	980.00	5	1500.00	5	233.33	3
Rural	2600.00	5	1060.00	10	300.00	1	755.00	10	869.17	6	877.58	6	203.33	6
IX Western Mindanao	3931.88	26	1509.52	21	793.75	16	515.58	25	1349.50	20	769.23	13	496.88	16
Urban	3564.33	15	1481.82	11	881.82	11	483.21	14	1209.00	11	625.00	8	300.00	8
Rural	4433.09	11	1540.00	10	600.00	5	550.73	11	1521.11	9	1000.00	5	893.75	8
X Northern Mindanao	5575.48	25	1490.74	27	2041.59	17	508.63	32	1828.57	21	1695.65	23	728.70	23
Urban	4650.83	12	1546.43	14	945.45	11	656.47	17	2230.00	10	1916.67	12	688.33	12
Rural	6429.00	13	1430.77	13	4051.17	6	341.07	15	1463.64	11	1454.55	11	772.73	11
XI Southern Mindanao	4327.14	14	1435.19	27	594.44	9	775.55	30	977.78	18	1461.36	22	597.37	19
Urban	5100.00	4	1452.78	18	400.00	2	834.44	18	890.91	11	892.14	14	605.56	9
Rural	4018.00	10	1400.00	9	650.00	7	687.21	12	1114.29	7	2457.50	8	590.00	10
XII Central Mindanao	3304.79	24	1267.50	20	577.27	11	539.78	23	1112.50	16	926.67	15	218.75	16
Urban	4100.00	7	1378.57	7	500.00	4	471.43	7	1933.33	6	433.33	3	212.50	4
Rural	2977.35	17	1207.69	13	621.43	7	565.65	16	620.00	10	1050.00	12	220.83	12
Cordillera Admin. Region	4018.50	20	1405.00	20	1700.00	4	439.41	17	1292.86	14	1475.00	12	314.29	7
Urban	4710.50	10	1445.00	10	1700.00	4	485.00	8	1400.00	5	2057.14	7	287.50	2
Rural	3326.50	10	1365.00	10	-	-	398.89	9	1233.33	9	660.00	5	325.00	5
National Capital Region	5324.47	461	2587.82	399	1770.88	108	1130.97	400	2205.86	244	1606.41	253	575.15	171
Urban	5324.47	461	2587.82	399	1770.88	108	1130.97	400	2205.86	244	1606.41	253	575.15	171
For Entire Population	4927.95	932	1976.87	804	1459.03	307	917.77	914	2081.96	566	1716.41	570	516.37	484

/1 includes rent; salaries; utilities; commercial laboratory charges; clinic supplies and drugs; laundry and office supplies

/2 includes salaries paid to dentists, hygienists, dental assistants, and technicians employed by the respondent

Source of basic data: DOH National Survey on Dental Manpower, 1990

Figure A.6

Total Clinic Costs per Region

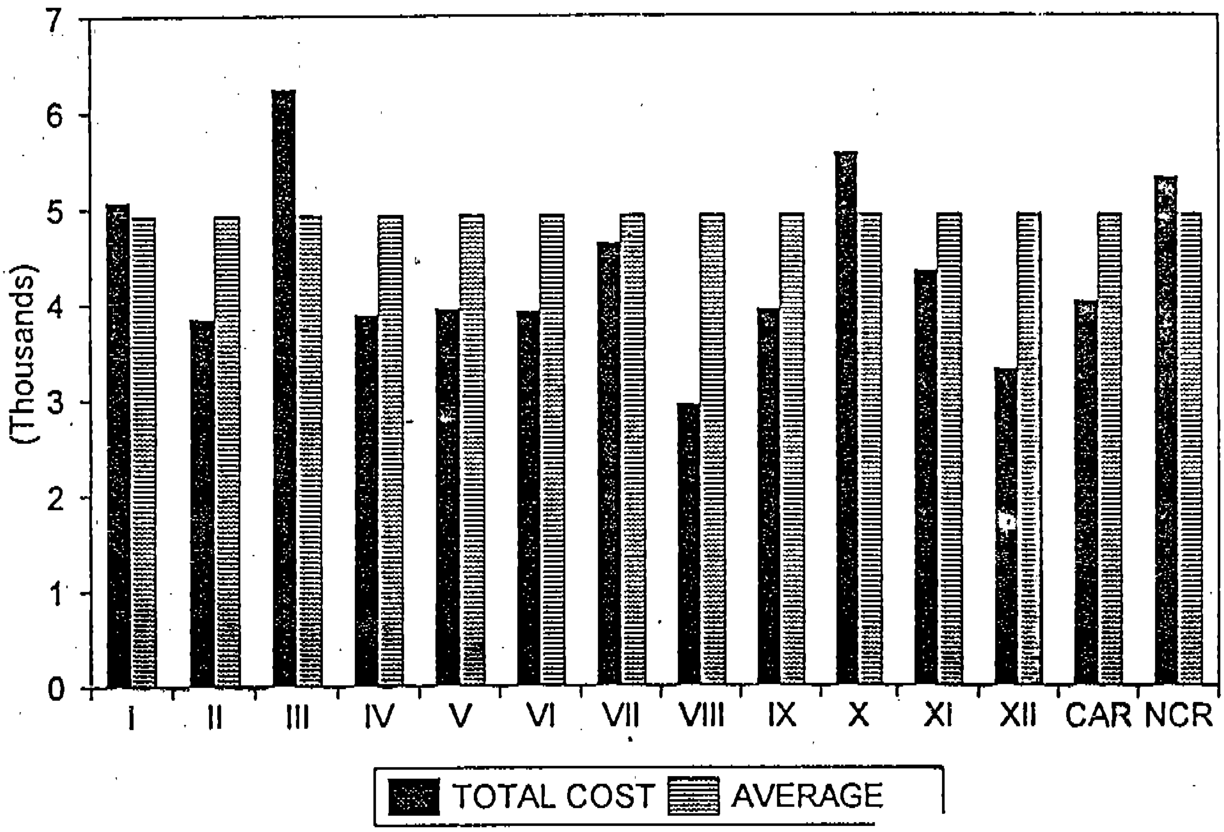

Table A-12

Gross Monthly Income of Dentists, by Nature of Employment

Gross Monthly Income	Nature of Employment		
	Self-Employed	Government Employee	Private Employee
below P5,000	288	302	115
P5,000 to P6,000	171	52	35
P6,001 to P7,000	73	55	19
P7,001 to P8,000	56	6	14
P8,001 to P9,000	60	4	12
P9,001 to P10,000	59	2	15
P10,001 to P11,000	41	4	14
P11,001 to P12,000	15	-	3
P12,001 to P13,000	13	-	6
P13,001 and above	125	5	35

Source of basic data : DOH National Survey on Dental Manpower, 1990

Table A-13

Gross Monthly Income of Dentists, by Position or Specialization

Position/ Specialization	Gross Monthly Income									
	below P5,000	P5,000 to P6,000	P6,001 to P7,000	P7,001 to P8,000	P8,001 to P9,000	P9,001 to P10,000	P10,001 to P11,000	P11,001 to P12,000	P12,001 to P13,000	P13,001 and above
Dentist V	-	-	1	-	-	-	-	-	-	-
Dentist IV	4	-	2	1	2	-	1	-	-	-
Dentist III	6	11	40	-	-	-	1	-	-	1
Dentist II	226	33	7	1	-	1	1	-	-	3
Dentist I	55	3	1	-	-	1	-	-	-	2
Staff Dentist	5	4	1	-	-	1	1	-	-	1
Instructor/Professor	5	3	1	-	-	1	1	-	-	2
General Practitioner	323	177	75	57	59	57	47	16	14	126
Orthodontist	2	1	1	1	-	1	-	-	-	5
Pedodontist	-	1	-	-	-	1	-	-	-	1
Oral Surgeon	-	1	2	-	-	1	-	-	-	1
Prosthodontist	-	-	-	-	-	-	2	-	-	-
Others	55	14	10	13	8	6	3	1	2	13

Source of basic data: DOH National Survey on Dental Manpower, 1990

Table A-14

Gross Monthly Income of Dentists, by Age, Gender, and Civil Status

Age, Gender Civil Status	Gross Monthly Income									
	below P5,000	P5,000 to P6,000	P6,001 to P7,000	P7,001 to P8,000	P8,001 to P9,000	P9,001 to P10,000	P10,001 to P11,000	P11,001 to P12,000	P12,001 to P13,000	P13,001 & above
20 TO 29 YEARS	271	90	33	27	25	20	18	4	4	17
Male	57	17	15	6	9	4	8	0	1	3
single	36	12	11	6	5	3	7	-	1	3
married	21	5	4	-	4	1	1	-	-	-
Female	214	73	18	21	16	16	10	4	3	14
single	151	47	12	15	15	10	8	1	1	8
married	63	26	6	6	1	6	2	3	2	6
30 TO 39 YEARS	219	85	47	26	22	33	17	3	10	68
Male	77	36	19	9	7	12	7	0	5	27
single	13	7	4	1	1	1	4	-	1	6
married	63	29	15	8	6	11	3	-	4	21
widowed	1	-	-	-	-	-	-	-	-	-
Female	142	49	28	17	15	21	10	3	5	41
single	43	14	6	4	7	9	2	2	2	10
married	99	35	22	13	8	12	8	1	2	31
widowed	-	-	-	-	-	-	-	-	1	-
40 TO 49 YEARS	57	11	11	8	5	5	7	7	1	22
Male	19	5	4	4	1	3	5	4	0	9
single	4	-	-	-	-	-	-	-	-	1
married	15	5	4	4	1	3	5	4	-	8
Female	38	6	7	4	4	2	2	3	1	13
single	5	3	-	1	1	-	1	-	-	1
married	33	3	7	3	3	2	1	2	1	10
widowed	-	-	-	-	-	-	-	1	-	1
separated	-	-	-	-	-	-	-	-	-	1
50 TO 59 YEARS	98	38	39	8	14	8	11	4	3	27
Male	25	15	14	6	4	4	4	1	1	14
single	1		1	1	-	-	-	-	-	1
married	24	15	11	5	3	4	4	1	1	12
widowed	-	-	2	-	1	-	-	-		1
Female	73	23	25	2	10	4	7	3	2	13
single	6	3	3	-	1	-	1	-	1	-
married	60	19	21	2	8	4	6	3	1	13
widowed	7	1	1	-	1	-	-	-	-	-
60 YEARS AND ABOVE	48	21	12	5	3	6	4	0	0	24
Male	29	13	5	4	3	3	3	0	0	16
single	1	-	-	-	-	-	-	-	-	-
married	27	13	5	4	3	3	2	-	-	13
widowed	1	-	-	-	-	-	-	-	-	1
separated	-	-	-	-	-	-	1	-	-	2
Female	19	8	7	1	0	3	1	0	0	8
single	4	2	-	1	-	-	-	-	-	2
married	12	6	4	-	-	3	1	-	-	5
widowed	2	-	3	-	-	-	-	-	-	1
separated	1	-	-	-	-	-	-	-	-	-

Source of basic data: DOH National Survey on Dental Manpower, 1990

Figure A.7

Cumulative Distribution by Age

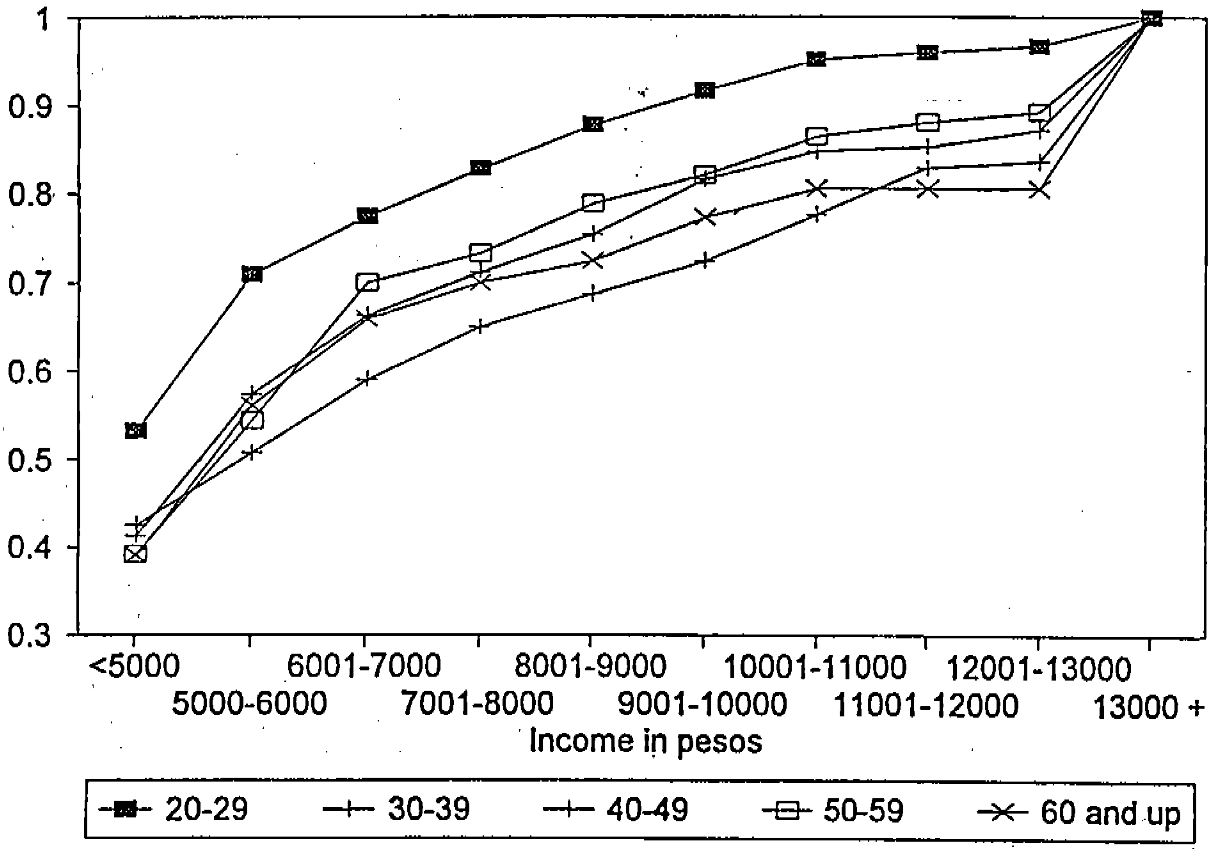

Table A-15

Average Minimum and Maximum Charge for Single Extraction, by Nature of Employment

Nature of Employment	Average Minimum Charge	Cases (n)	Average Maximum Charge	Cases (n)
Self employed	65.77	635	103.34	654
Private employee	73.86	140	106.19	143
For Entire Population	67.23	775	103.85	797

Source of basic data: DOH National Survey on Dental Manpower, 1990

Table A-16

Average Minimum and Maximum Charge for Single Extraction, by type of business

Type of Business	Average Minimum Charge	Cases (n)	Average Maximum Charge	Cases (n)
Single Ownership	66.29	579	100.36	594
Partnership	69.69	109	126.46	113
Corporation	71.20	25	101.20	25
Group Practice	90.00.	15	131.67	15
For Entire Population	67.45	728	104.97	747

Source of basic data: DOH National Survey on Dental Manpower, 1990

by Region, by Location

	Region	Minimum Charge		Maximum Charge	
		Average	Cases (n)	Average	Cases (n)
I	Ilocos Region	49.44	27	78.15	27
	Urban	58.33	12	95.83	12
	Rural	42.33	15	64.00	15
II	Cagayan Valley	48.57	14	63.57	14
	Rural	48.57	14	63.57	14
III	Central Luzon	50.14	70	67.95	73
	Urban	46.07	14	64.64	14
	Rural	51.16	56	68.73	59
IV	Southern Tagalog	67.33	90	108.57	91
	Urban	79.50	40	146.22	41
	Rural	57.60	50	77.70	50
V	Bicol Region	50.19	27	66.07	28
	Urban	56.67	9	74.50	10
	Rural	46.94	18	61.39	18
VI	Western Visayas	70.31	35	95.29	35
	Urban	84.21	19	102.63	19
	Rural	53.81	16	86.56	16
VII	Central Visayas	78.30	47	120.70	43
	Urban	82.50	40	127.78	36
	Rural	54.29	7	84.29	7
VIII	Eastern Visayas	56.67	12	73.85	13
	Urban	63.33	6	85.00	6
	Rural	50.00	6	64.29	7
IX	Western Mindanao	57.75	20	81.25	20
	Urban	56.25	12	72.08	12
	Rural	60.00	8	95.00	8
X	Northern Mindanao	58.71	35	101.81	36
	Urban	55.26	19	110.00	20
	Rural	62.81	16	91.56	16
XI	Southern Mindanao	58.29	38	103.97	39
	Urban	54.76	21	116.43	21
	Rural	62.65	17	89.44	18
XII	Central Mindanao	64.41	17	119.47	19
	Urban	80.00	3	182.50	4
	Rural	61.07	14	102.67	15
	Cordillera Admin. Region	52.73	11	70.38	13
	Urban	68.00	5	109.00	5
	Rural	40.00	6	46.25	8
	National Capital Region	76.04	332	118.69	346
	Urban	76.04	332	118.69	346
	For Entire Population	67.23	775	103.85	797

Source of basic data: DOH National Survey on Dental Manpower, 1990

Table A-18

Price of Selected Dentist Services, Private Employee and Self-employed Dentists

Region	Single Extraction						One-Surface Amalgam Filling				
	Average price			Max. - Min. price			Average price			Max. - Min. pr	
	All	Urban	Rural	All	Urban	Rural	All	Urban	Rural	All	Urban
1 Ilocos Region	60.40	75.00	49.00	28.70	37.50	21.70	68.50	64.50	71.90	21.20	21.90
2 Cagayan Valley	53.20	-	53.30	15.00	-	15.00	69.40	-	69.40	22.00	-
3 Central Luzon	57.80	50.50	59.60	19.30	18.60	19.50	88.30	83.60	89.60	28.20	22.00
4 Southern Tagalog	81.70	100.50	68.30	44.90	68.50	25.60	80.10	81.70	79.10	25.40	24.90
5 Bicol Region	57.50	65.30	53.40	16.50	20.60	14.40	78.40	79.80	77.70	21.30	23,50
6 Western Visayas	83.50	100.00	68.50	28.20	25.00	32.10	94.80	109.00	80.50	22.70	23.80
7 Central Visayas	104.40	108.10	69.30	42.60	45.00	30.00	95.60	97.10	80.70	27.80	28.90
8 Eastern Visayas	60.30	69.40	53.00	19.20	21.70	16.70	72.90	82.10	66.50	20.00	22.50
9 Western Mindanao	73.80	75.00	72.00	34.30	33.80	35.00	100.80	105.70	94.00	32.00	33.30
10 Northern Mindanao	81.80	83.30	80.30	43.70	56.30	28.80	100.20	92.10	109.30	42.40	37.10
11 Southern Mindanao	81.00	82.80	78.90	47.00	63.80	27.40	115.20	107.60	124.80	39.50	31.70
12 Central Mindanao	97.90	142.50	82.20	32.60	23.30	34.60	90.00	116.00	81.90	29.40	53.30
13 Cordillera Admin. Region	59.90	76.40	43.30	24.60	39.20	10.00	84.70	98.50	69.40	23.80	31.40
14 National Capital Region	94.80	94.80	-	41.50	41.50	-	100.60	100.60	-	30.00	30.00

Source of basic data: DOH National Survey on Dental Manpower, 1990

Table A-19

Average Minimum and Maximum Charge for Single Extraction by Age, Gender and Civil Status of Dentist

Age, Gender, Civil Stat	Average Minimum Charge	Cases (n)	Average Maximum Charge	Cases (n)
20 TO 29 YEARS	64.24	329	100.87	329
Male	68.12	77	117.73	77
single	72.55	51	110.29	51
married	59.42	26	132.31	26
Female	63.06	252	95.71	252
single	60.57	183	89.86	183
married	69.64	69	111.23	69
30 TO 39 YEARS	65.67	284	100.37	284
Male	69.27	103	104.76	103
single	73.33	21	106.19	21
married	68.23	82	104.39	82
Female	63.62	181	97.87	181
single	65.17	58	100.69	58
married	62.75	122	96.11	122
widowed	80.00	1	150.00	1
40 TO 49 YEARS	65.09	53	96.70	53
Male	58.41	22	85.23	22
single	75.00	3	93.33	3
married	55.79	19	83.95	19
Female	69.84	31	104.84	31
single	70.00	4	92.50	4
married	71.80	25	108.80	25
widowed	45.00	2	80.00	2
50 TO 59 YEARS	67.72	79	108.54	79
Male	79.67	30	126.33	30
single	90.00	1	150.00	1
married	79.31	29	125.52	29
Female	60.41	49	97.65	49
single	80.00	2	110.00	2
married	60.78	45	99.44	45
widowed	32.50	2	45.00	2
60 YEARS AND ABOVE	77.96	49	114.39	49
Male	76.45	31	115.81	31
single	-	-	-	-
married	74.64	28	111.07	28
separated	93.33	3	160.00	3
Female	80.56	18	111.94	18
single	63.33	3	116.67	3
married	86.67	12	113.33	12
widowed	73.33	3	101.67	3
For Entire Population	66.00	794	102.01	794

Source of basic data: DOH National Survey on Dental Manpower, 1990