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H HEALTH
F INANCE
E DEVELOPMENT
D
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HFDP Monograph No. 2
March 1992

Department of Health
Republic of the Philippines

United States Agency for
International Development
(USAID)

**Health
Sector
Financing
in the
Philippines**

**Orville Solon
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We apologize to anyone we have inadvertently omitted. As always, the authors are responsible for all errors.

■

List of Abbreviations

ADAB	Australian Development Assistance Bureau
ADB	Asian Development Bank
APMC	Association of Philippine Medical Colleges
BHS	Barangay Health Station
BLR	Bureau of Licensing and Regulations
CAR	Cordillera Autonomous Region
CBA	Collective Bargaining Agreement
COA	Commission on Audit
CPI	Consumer Price Index
CPIALL	Consumer Price Index, All Items
CPIMED	Consumer Price Index, Private Medical Services
CPIMS	Consumer Price Index, Pharmaceutical and Medical Supplies
DBM	Department of Budget and Management
DOH	Department of Health
ECC	Employee Compensation Commission
FAIS	Foreign-Assisted Projects
FIES	Family Income and Expenditures Survey
GAA	General Appropriations Act
GASS	General Administration and Support Services
GDP	Gross Domestic Product
GNP	Gross National Product
GOP	Government of the Philippines
GSIS	Government Service Insurance System
GTZ	German Agency for Technical Assistance
HAAI	Health and Accident Insurance
HAMIS	Health and Management Information System
HCE	Health Care Expenditure
HFD	Health Finance Development Project
HFSM	Health Finance Simulation Model
HIF	Health Insurance Fund
HMO	Health Maintenance Organization
HOMS	Hospital Operations and Management Service
HISF	Health Sector Financing
IBRD	International Bank for Reconstruction and Development
IEC	Information, Education and Communication
IDA	International Development Assistance
IPA	Individual Practice Association
IPHO	Integrated Provincial Health Office
LSCA	Limited Scope Grant Agreement
MHO	Municipal Health Office
MOOE	Maintenance and Other Operating Expenses
NBI	National Bureau of Investigation
NCR	National Capital Region
NEDA	National Economic Development Authority
NHA	National Health Accounts
NSCB	National Statistical Coordination Board
NSO	National Statistics Office
OPHN	Office of Population, Health and Nutrition
OMS	Office of Management Services
PDMP	Philippine Airlines Dependent Medical Plan
PGP	Prepaid Group Practice
PHA	Philippine Hospital Association
PHSFM	Philippine Health Sector Financing Model
PHO	Provincial Health Office
PMA	Philippine Medical Association
PMCC	Philippine Medical Care Commission
PPA	Philippine Pharmacists Association
PVO	Private Voluntary Organization
RHO	Regional Health Office
RHU	Rural Health Unit

RTI Research Triangle Institute
RVS Relative Value Scale
SAIIMO San Antonio HMO
SSS Social Security System
UNFPA United Nations Funds for Population Activities
UPHMO University of the Philippines HMO
UPSE University of the Philippines School of Economics
USAID United States Agency for International Development
WHO World Health Organization

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Executive Summary

The Research Triangle Institute / University of the Philippines, School of Economics (RTI / UIPSE) Health Sector Financing (HSF) study is intended primarily to establish time series health care financing baseline data, develop efficiency measures and conduct policy simulations. The study was conducted in tandem with other analytical pieces on the roles, constraints, and prospects of the public and private sectors in the delivery and financing of health services, including the Medicare Program.

The study was divided into three separate but related tasks: 1) the development of a health care financing data base, called the National Health Accounts (NHIA), as the basis for further development under the Health Finance Development (HFD) Project; 2) the development of health sector efficiency measures; and 3) a policy simulation exercise.

Major Findings

Size of Health Sector. The estimated range for nominal total health expenditures in 1988 for the Philippines is from P14.322 billion to P15.676 billion when corrections are made for lack of data on several categories of private health care expenditures. Even assuming that the excluded categories amount to 30 percent of private health care expenditures, a generous assumption, the percent of GNP devoted to health care is only 1.91 percent. Thus, it seems likely that health care, as a percent of GNP, is much lower than previously thought. Total resources, both public and private, devoted to health care in 1988 is likely to be in the range of 1.66 to 1.91

percent of GNP. Previous estimates of GNP devoted to health care are much higher, in the neighborhood of 2.5 to 3 percent of GNP.

The estimated range for health care as a percent of GNP is much lower than that of Thailand and Malaysia (with at least 3 percent), China and India (with at least 4 percent), and South Korea (with 5 percent). The relatively low levels of total expenditures for health in the Philippines compared to neighboring countries does not, however, necessarily suggest that total expenditures as a percentage of GNP should automatically be increased to levels approximating those of other countries. The question of how efficiently the existing resources are allocated is a major consideration. However, the data do suggest the need to consider the question of whether current levels of spending for health may in fact be suboptimal.

Macroeconomic Influences on Health Financing Prospects. The macroeconomic characteristics of the Philippine economy have important implications for health financing:

1) slow growth of household incomes and continued high poverty rates in the Philippines mean a reduced capacity of households to finance health expenditures, including private health insurance;

2) since the Medicare Program only covers the formal salaried sector in private and government sectors, the slow shift in the proportion of employment from agriculture to modern industry means a slow expansion of the population that can be readily covered by the Medicare Program;

3) slow economic growth means slow growth in government resources that places a limit on government

resources that can be allocated for health; and

4) high rates of inflation mean erosion of purchasing power, including that for health care services and other health promoting goods and services.

Use of Public Hospitals. The pattern of public hospital use appears to vary significantly by income class. As income increases, the use of public hospitals increases initially, levels off in the mid-income range, and then decreases over the higher income classes. The use of government hospitals by the highest income groups, however, is about the same as the use of public hospitals by the lowest income groups. The data tends to dispel the notion that the only low and middle income groups use public hospitals. It has been suggested that people in higher income groups are effectively using the public hospitals as private facilities; they are admitted by private physicians and use private rooms available in the public hospitals. If true, this pattern suggests that higher private room rates and other services in public hospitals, in line with what is charged in private hospitals, could be established to increase the cost recovery rates of public hospitals. The use of other public health facilities, most notably BHSs and RHUs, declines significantly as income increases.

Family Health Expenditures. The most recent data available on family health expenditures indicates that 1.7 percent of total family expenditures were health care goods and services in 1988. Families, however, spend proportionately more for items such as tobacco and alcohol than for health care. This suggests that there is room for modifying expenditure patterns with the aim

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of promoting better health, and hence on future health care expenditures.

Family Planning Expenditures. Over the period 1978-1988, real total family planning expenditures from public sector sources, including GOP, USAID, and other donor agencies reached its maximum point in 1981, and has been declining over the remainder of the period, with the exception of a modest real increase in 1988. The likely relationship between family planning expenditures by the public sector and the increasing growth rate of the population in the Philippines suggests that increases in family planning expenditures could relieve pressure on public health service budgets.

Health Sector Performance : Efficiency and Equity. The review of available data indicates that while there are indicators that suggest that the health sector may be operating at a lower level of efficiency than potentially possible, only a few conclusions about specific aspects of health sector performance because of major gaps in information can be made:

1) **Intersectoral Resource Allocation.** The national level of health expenditures as a percent of GNP is still lower than in other developing countries in Asia. While this might be taken as evidence of under-investment in health care, it is possible that the Philippines is under-investing even more in other health-promoting activities. How much additional spending should be made for health care and for other health-promoting activities would depend on how efficiently current resources are being allocated. Such information is not available for the non-health sectors, and we are only beginning to look at this for the health sector.

2) **Health Service Structure.** The common perception that the health sector is inefficiently allocating resources because of its emphasis on hospital (curative) care relative to primary (preventive and promotive) care cannot be readily supported by available data. Recent efforts to improve efficiency, however, point to the fact that, ex post, the health service structure was less efficient in the past and that the potential

exists for improving efficiency in the future both as a result of improvements in medical technologies and strong political and administrative will to implement known cost-effective technologies.

3) **Access to Health Services.** Several indicators, in spite of measurement problems, do strongly suggest the persistence of unequal access to health services arising from both demand (household income) and supply (health facilities) factors. Efforts to widen access through social insurance are only partially successful due to constraints imposed by the overall performance of the macroeconomy. Efforts are being made by the DOH to improve access through its budgetary allocation procedures and program priorities. The impact of these efforts, however, have not yet been assessed.

4) **Service Focus.** While the appropriate focus has been clearly identified, that is, towards major health problems and towards population groups most in need of services such as the rural population and the poor as well as various age groups, the actual coverage of various services and programs has yet to be accurately determined.

5) **Health Service Utilization.** There are indications that service utilization is less efficient than what it could be. Such indications include the large proportion of reported deaths without medical attendance, the large variations in hospital occupancy rates by types of hospitals and across regions, and the leading causes of hospitalization based on Medicare cases. The underlying factors influencing less efficient utilization, however, have yet to be determined to guide the identification of concrete actions.

6) **Health Service Production.** There are indications that input mix at the aggregate level might be less than optimal. Such indications include the apparent decline in maintenance and operating expenses in DOH budgetary allocations in recent years. Moreover, the manner in which budget cuts are effected further distorts input mixes that are likely to exacerbate current inefficiencies. The recent initiatives which changed input mixes in the

provision of basic services and the adoption of networking activities among hospitals point to the fact that past input mixes and capacity utilization were less than optimal in the past and that the potential for further improving efficiency exists.

7) **Management and Operations.** There are many cases, often undocumented, that point to managerial and operational shortcomings of both public and private sector providers in the areas of logistics and information systems particularly on cost, target populations and coverage of programs. However, there are very few systematic studies on the management goals, investment and pricing decisions, and various operational modes of various providers to provide inputs into a more systematic assessment of their managerial performance.

8) **Health Care Financing Efficiency.** Further efficiency gains can be achieved through modification of management and operations of Medicare and user fees in public hospitals. A number of community financing schemes currently exist but little systematic assessment of their long-run viability and sustainability has been made.

9) **Health Care Financing Equity.** Public provision of health services financed by taxes tend to be highly inequitable because the effective tax rates are highly regressive. The Medicare programs covers only a small segment of the total population which are on the average likely to include the economically better off relative to the population still not covered by such a scheme. User charges in the private sector, without compensating pricing schemes for different income classes, tend to be regressive.

Limitations

Data. A large and important part of the study was to collect and critically examine health care financing data that is currently available from secondary sources in the Philippines. Unfortunately, what already was suspected

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to be the availability and quality of the data was, in fact, true.

A critical requirement for the HFD Project is detailed and accurate data to inform the policy agenda formation process, support policy research and track the results of demonstration projects and implemented policies. Data on health care financing in the Philippines are not well developed and integrated. There is a woeful lack of reliable practitioner, facility and household data from which to generate accurate aggregate estimates of health sector expenditures and financing in the Philippines, especially for the private sector. Available secondary data on the health sector are scattered in a wide variety of government departments and private trade associations, including various offices of DOH, NEDA, NSO, COA, DBM, PMCC, PHA, and others. Private sector data are scarce, and limited to a few dated small sample surveys of private facilities. There is no central storehouse for health sector financing statistics.

As the first step in the process to fully develop the NIIA, the RTI / UIPSE study collected and developed time series data from the available secondary sources for the period 1986-1990. The complete set of NIIA statistical data tables are contained in Volume II of this report. Even so, the NIIA is still in its infancy; the data base is far from satisfactory to answer some of the most basic questions for sound policy decisions. What is the infant mortality rate this year as compared to five or ten years ago? How many total physicians and nurses are currently practicing in the country? How many people were hospitalized last year? How much of total national resources was spent on health care, and who paid for it? These and other fundamental questions cannot be answered today without making cavalier assumptions and crude estimations based on incomplete and sometimes questionable data.

Efficiency Measurement and Simulation Modeling. Perhaps even worse than the problem of answering the most basic health sector questions due to data limitations is that accurate, complete, and detailed up-to-date data in the

form necessary for efficiency measurement and accurate simulation modeling are simply not available; the NIIA data base is not sufficient in its present form for even the more basic forms of analysis to accurately guide health sector financing policy.

While there exists a large body of data (although often of poor quality) dealing with many aspects of health sector, there is not one complete set of information that could be used to fully and adequately assess a specific aspect of health sector performance. This is a major limitation because assessing even a single aspect of health sector performance, for example, service structure efficiency, requires a number of interrelated indicators measured at various levels, for example, sector level, service level, and facility level. Any gaps in information reduces the confidence we have on any conclusion that might be made on the availability data.

There have been a number of health sector financing simulation models developed and applied to other countries, but such a model has not been developed for the Philippines. Because of the wide range and mix of public and private sector health providers and risk-sharing schemes in the Philippines, and the lack of detailed or aggregate private sector data, simply applying health financing simulation models developed for other settings to the Philippines is problematic. More sophisticated simulation models require extensive data on both the demand and supply sides of the public and private sectors, and so can not be used for health care financing analysis in the Philippines. Less sophisticated models only include the public sector of the health care market, and so do not account for a large portion of the market.

The simulation model used in this study is a modification of a model developed by the World Bank, and essentially involves simple sets of accounting relationships describing the cost of delivering services only by the public supply side of the health sector. It was chosen for this study primarily because the data required for its opera-

tion came close to matching the limited NIIA data available. Even so, the model required substantial modification for the application to the Philippine setting.

In order for any model to be useful for policy simulation greatly depends on the completeness and quality of the data. The current version of the model and the simulation exercises in this study are severely hampered by data restrictions.

Recommendations

NHA Development. Clearly, a key requirement for the HFD Project is the full development of the NIIA. The fully developed NIIA would provide reliable information on public and private supply-side and demand-side health care financing, and support all HFD project components. A centralized NIIA data base would support policy agenda formation, policy research and simulation, and testing the feasibility and effectiveness of insurance and hospital demonstration schemes.

A menu driven NIIA will enable standardized regular reporting of the current status of the health financing system and efficiency indicators to key policy makers. Continuous monitoring and tracking of health financing data by the NIIA will reveal trends, inform policy research and simulations, and provide the basis for accurate short-run and long-run forecasting.

The full development of the NIIA should involve standardizing and computerizing currently available and new public health sector data in a format suitable for quick access and analysis. Supplemental data bases should be required for micro-level survey data collected for 1) supply-side health care data for both the public and private sectors; and 2) demand-side health care use data from households. Micro-level public and private facility and household sample survey data should be required early in the HFD project to establish reliable baseline data, and on continuous regular schedule to monitor changes over time.

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On the supply-side, the NHA should track public and private sources of health sector finance including: (1) public expenditures through central, provincial, and municipal authorities; (2) private health care prices charged for the use of private clinics, hospitals and practitioners; (3) prices and payments made to traditional practitioners; (4) user charges levied for use of public health care facilities, including voluntary donations; (5) payments made under health care schemes financed by employers; (6) payments made under health care insurance schemes; (7) religious, civic, and philanthropic groups health care provision; and (8) private and public disaster relief aid used for health care.

On the demand-side, the NHA, through nationally representative sample surveys, would provide household health care access and utilization data including choice of public or private health facilities and practitioners, public and private health care expenditure data, insurance coverage and benefit payments, and socio-economic and demographic data.

Efficiency Measurement. Side by side with the development of aggregate indicators described in NHA development, there is a need to obtain more detailed information through special studies to fill some of the glaring gaps in information, including but not limited to the following, the details and justification for which are given in Section 5:

- 1) cost-effectiveness of various public health programs as implemented on a national scale;
- 2) more complete information on coverage rates of various public health programs;
- 3) determinants of health service utilization; and
- 4) cost structures of hospitals.

Simulation Model Development. The current version of the simulation model used in this study can be viewed as the corner-stone of a larger, more complete, Philippine Health Sector Financing Model (PHSFM) to be developed under the HFD Project and related research efforts. Most importantly, to provide a truly accurate representation

of the total Philippine health sector, several major components of the demand and supply sides of the health sector should be added in future development work, including, but not limited to:

- 1) private sector supply side;
- 2) private sector demand, including demographic factors such as the age-sex distribution of the population, and epidemiological factors;
- 3) own-price and cross-price elasticities that account for shifts between alternative public and private health care providers;
- 4) exogenous macroeconomic factors that influence both the demand and supply sides of the health care market;
- 5) linkages between the major input and output components of the health care market.

The future modeling effort to add these components must be closely coordinated with future NHA data collection to ensure that data requirements for a more complete PHSFM are met.

■

Main Report

Introduction

Background

At the time that Research Triangle Institute and The University of the Philippines, School of Economics (RTI / UPSE) collaborated to conduct this study, the United States Agency for International Development (USAID) was in the process of designing a bilateral project with the Government of the Philippines (GOP), through the Department of Health (DOH), Health Finance Development (HFD). The purpose of the HFD Project is to increase resource mobilization, efficiency, and quality of health care by improving the processes and institutions for generating and implementing policy initiatives and reforms in the health sector.

Three objectives

The Health Sector Financing study is intended primarily to :

- ◆ *establish time series health care financing baseline data*
- ◆ *develop efficiency measures*
- ◆ *conduct policy simulations.*

As part of the project design effort, USAID and DOH signed a Limited Scope Grant Agreement (LSGA) which provided resources for various analytical studies, of which the RTI / UPSE Health Sector Financing (HSF) study is one. These background analytical pieces provide an overview of the mechanics of health care financing in the Philippines, the constraints to growth and improved efficiency faced by both the public and private sectors, and sectoral development issues with particular emphasis on the private sector. They also indicate the required policy initiatives in the area of health care financing, and the direction DOH and USAID should take in promoting development of the sector.

Scope and Objectives

The RTI /UPSE HSF study is intended primarily to establish time series health care financing baseline data, develop efficiency measures and conduct policy simulations. The study was conducted in tandem with other analytical pieces on the roles, constraints, and prospects of the public and private sectors in the delivery and financing of health services, including the Medicare Program. Together, the studies are meant to provide a comprehensive overview of health care financing in the Philippines. The overall purpose of the companion studies was to provide inputs into the design of the HFD Project.

The study was divided into three separate but related tasks : 1) the development of a health care financing data base, called the National Health Accounts (NHA), as the basis for further development under the HFD Project; 2) the development of health

sector efficiency measures; and 3) a policy simulation exercise.

Health Care Financing Data Base : The National Health Accounts. A critical requirement for the HFD Project is detailed and accurate data to inform the policy agenda formation process, support policy research and track the results of demonstration projects and implemented policies. The development and continuous updating of the NHA will fulfill this requirement.

Data on health care financing in the Philippines were not well developed and integrated at the time of the study, and accurate data were not available for policy simulation modeling exercises. Major initiatives in health care delivery and financing in the Philippines have occurred over the past few years. Government health services have been integrated at the provincial level and down, budget appropriations to the health sector have been increased, and there have been major realignments of DOH budget items.

In general, there is a lack of reliable practitioner, facility and household data from which to generate accurate aggregate estimates of health sector expenditures and financing in the Philippines, especially for the private sector. Available secondary data on the health sector are scattered in a wide variety of government departments and private trade associations, including various offices of DOH, NEDA, NSO, COA, DBM, PMCC, PHA, and others. Private sector data are scarce, and limited to a few dated small sample surveys of private facilities. There is no central storehouse for health sector financing statistics.

As the first step in the process to fully develop the NHA, the RTI / UPSE study collected and developed time series from available secondary sources, public and private, on health

sector financing in the Philippines. The study updated data generated by an earlier study conducted by InterCare Research Foundation, and collected an additional large volume of health sector financing data previously not assembled together in one document. Data definitions and methodologies for collecting, aggregating, and disaggregating the statistical data, and replicating the study over time to continuously update the NHA data series were developed and documented.

In several instances, the same data elements collected from different sources are not consistent. For completeness, and because there is no basis on which to judge the relative reliability of various data sources, all data collected was included in the set of NHA statistical tables. Similarly, the data is presented in the form in which it was made available; statistical aggregation and averaging of data are presented in separate tables, and so noted. In addition, throughout the analysis sections of the report, nominal peso values are consistently converted to real terms using the Implicit Price Index of the Gross National Product with 1972 as the base year. In the NHA tables, peso values remain in nominal terms so that other researchers are free to use nominal values, or choose whichever base year and index is desired to convert to real terms.

The task to develop NHA baseline time series data on health sector expenditures had the following specific objectives:

(1) update and supplement the InterCare data base by developing new baseline data and indicators on the sources and uses of health sector expenditures;

(2) document data sources for each data element, and document the statistical procedure used to construct new measures;

(3) develop data definitions and methodologies for collecting and disaggregating the data, and replicating the study over time to create the NHA data series.

Efficiency Measurement. The second task of the RII / UPSE HSF study was a review and formulation of efficiency measures in the health sector. A major purpose of the HED Project is to improve efficiency in the provision of health services in both the public and private sectors. While efficiency is a well organized value in health care, very little attention has been devoted to its quantification.

While the efficiency and equity criteria for assessing the economic per-

formance of the health sector are conceptually clear, the data necessary to make much more than a tentative and suggestive assessment at this time are unavailable. Full development of the NHA will enable such assessments in the future.

Health sector performance is assessed by the study with the available NHA data. Unfortunately, the data hide more than is revealed, and suggest a more systematic effort to obtain the necessary data, as well as to further develop the methodologies for future sector assessments.

Health sector performance is assessed in the following terms:

- 1) efficiency in intersectoral resource allocation;
- 2) efficiency in health service structure;
- 3) efficiency in health service focus;
- 4) efficiency in health service utilization;
- 5) efficiency in health service production;
- 6) efficiency in management and operations;
- 7) efficiency in financing;
- 8) equity in access; and
- 9) equity in financing.

Policy Simulations. The third task of the RII / UPSE HSF study was to use the NHA data base to conduct policy simulations for health sector financing alternatives, using existing simulation software. Health sector financing is a broad and complex area. Policy initiatives and reforms in health financing can have profound effects on the health sector as well as other related sectors. Similarly, exogenous factors can have a strong impact on the financing of health services. For these reasons, policy simulations for health sector financing are highly desirable.

Unfortunately, the more sophisticated simulation models require extensive data on both the demand and supply sides of the public and private health sectors, and could not be used for this study. An important goal of the HED Project is to collect the data necessary to fully develop the demand and supply side data for the public and private sectors, and to develop a model that incorporates the demand and supply relationships inherent in public and private portions of the Philippine health sector.

Most health financing models involve sets of accounting relationships describing the cost of delivering services by the public supply side of the health sector. A model developed by the World Bank, the Health Finance Simulation Model (HFSM), is an example of such a model.¹ The model

was chosen for this study primarily because the data required for its operation comes close to matching the data currently available in the Philippines. Even so, the model required substantial program modification for the application to the Philippine setting.

Data from the NHA data base were used to give an accurate representation of the structure of public health sector financing in the Philippines. The model is based on current and historical Philippine public health sector supply, and predicts the supply requirements of the public health sector in the future. The policy simulations consist of straightforward evaluations of the Philippine health sector highlighting relationships between the health care needs of the population and the ability of the public health system to respond to those needs. The model will assist DOH and USAID in evaluating various options in public health sector financing. In particular, historical health budget allocations and projection of future allocations may be matched against the health care needs of the population.

Organization of the Report

The study findings are contained in two volumes. Volume I contains the analysis and interpretation of the health sector data. Selected data from the NHA data base are presented in tables and figures to illustrate the findings. Included in Volume I are an Executive Summary and the body of the report which is divided into six sections. The first section of the body of the report presents the background and scope of the study. The second section presents an overview of the Philippine economy and health delivery system. The third section presents a description of health care expenditure patterns, followed by the fourth section which examines health sector financing. The fifth section contains an analysis of health sector performance, and the sixth section presents the results of the health care financing policy simulations.

Volume II contains a description of the data collection methodology, a list of individuals and offices contacted by the RII / UPSE study team during the data collection process, a list of the NHA tables, and the complete set of NHA statistical tables.

Overview of the Philippine Economy and Health Delivery System

The Macroeconomic Environment²

The past twenty-five years in the Philippines have been characterized by: 1) a slow transformation of the economic base from agriculture to manufacturing; 2) slow and uneven economic growth; and 3) the differential effects of these and other developments on various population segments and areas of the country, including uneven spatial distribution of economic activities and employment opportunities, high rates of inflation relative to neighboring countries, a highly uneven income distribution, and high poverty rates.

The Philippine economy is characterized by unusually slow structural transformation. The percentage of employment in industry in general, and in manufacturing in particular, has remained stagnant at around 20 percent for the last 30 years. The economy is gradually diversifying from its agricultural domination (primarily in export-oriented crops). The share of industry in Gross Domestic Product (GDP) increased from 28 percent in 1965 to about 34 percent in 1988. Manufactured products as a percentage of total exports grew from 22 percent in 1976 to 61 percent in 1986.

Uneven economic growth and increasing industrialization has been partly responsible for uneven spatial distribution of economic activities and employment opportunities. The urban population has grown disproportionately to the rural population, and the locus of economic activity is shifting toward urban areas. The health industry, particularly the private portion of the health sector, has emerged with a bias toward urban areas. In-

dustrialization and manufacturing has also brought new occupational health hazards to the Philippines.

Compared to neighboring countries in Southeast and East Asia, Philippine economic growth has been slow, averaging only about 4 to 6 percent over the past 30 years, and worse, averaging only 2.06 percent in the 1980's. High economic growth rates in the 1970's stimulated by heavy investments in industrialization and extensive foreign borrowing gave way to slower growth in the early 1980's and actual decline by 1984, as rising interest rates and oil prices revealed structural weaknesses in the Philippine economy.

These factors plus the assassination of Benigno Aquino Jr., in 1983 led to a financial crisis. In real terms, GNP declined by 7.1 percent in 1984 and 4.1 percent in 1985 before increasing by 1.9 percent in 1986 (Figure 2.1).³

With the advent of the Aquino administration in 1986 a gradual

economic recovery was initiated. GNP increased 5.81 percent in 1987, 6.8 percent in 1988, 5.7 percent in 1989, and 3.1 percent in 1990. Inflation, although still relatively high at 14.21 percent in 1990, was considerably less than the average 34 percent per year that prevailed over the 1984-85 period. Since 1981, the price index for pharmaceutical and medical supplies has grown at an average annual rate of 15.29 percent, slightly higher than the 14.47 percent increase in all consumer goods prices for the same period. Private medical services, somewhat surprisingly, averaged a 12.04 percent increase over the same period.

In the early 1980's, prices of private medical services grew at a higher annual rate than overall consumer prices. By the mid-1980's the situation reversed, with the overall CPI outpacing private medical services. Prices of pharmaceutical and medical supplies grew at a higher rate than the CPI in the late 1980's. By 1990 the rate of increase of the CPI was higher than both private medical services and pharmaceutical and medical supplies (Figure 2.2).⁴

Recent economic growth has had varying impacts on the country. Income remains highly skewed, with the upper 10 percent of the population receiving 35.7 percent of the national wealth and the lower 50 percent only 20.3 percent (Figure 2.3).⁵

Most of the recent economic growth has been concentrated in a few geographic regions and in urban areas. The incidence of families living below the poverty line has declined slightly in recent years. Several regions still have poverty incidence greater than 60 percent, and, despite the 12 percent increase in real income, families in several rural regions exhibited real increases of only 2 to 5 percent between 1985 to 1988.⁶

The Philippine economy

- ◆ *slow structural transformation*
- ◆ *slow and uneven economic growth*
- ◆ *uneven distribution of economic activities*
- ◆ *uneven distribution of employment opportunities*
- ◆ *high rates of inflation*
- ◆ *uneven income distribution*
- ◆ *high poverty rates*

Effect on Health Financing. The macro-economic characteristics of the Philippines have important implications for health sector financing. First, the slow growth of household incomes and continued high poverty rates mean a reduced capacity of households to finance health expenditures.

Second, since the Medicare Program covers only the formal salaried sector in private and government sectors, the slow shift in the proportion of employment from agriculture to modern industry means a slow expansion of the population that can readily be covered by the Medicare Program. This means that the problem of extending wider coverage of social insurance or similar risk-sharing schemes that are relatively easy to administer becomes more difficult with the growth of the labor force or population.

Third, the slow economic growth also means slow growth in government resources. This puts a limit on government resources that can be allocated for health.

Fourth, the high rates of inflation mean erosion of purchasing power, including that for health care services and other health-promoting goods and services.

Health and Population ⁷

There is little reliable information on the aggregate health status of the Philippine population. For example, government data on life expectancy at birth, infant mortality rates, and leading causes of death, often are based on crude linear projections of data collected ten or more years ago. Available information suggest a slowing down in health status improvements in the past two decades up to the middle of the 1980's as indicated by trends in life expectancy at birth and infant mortality rates, the persistence of infectious and parasitic diseases, and continued high rates of malnutrition especially among preschool children. Data, however, are not up-to-date, hence we have little information from which to assess recent trends in health status.⁸

Recent PMCC survey data (1989) indicate that the ten leading causes of hospitalization are 1) acute gastroenteritis; 2) acute bronchitis; 3) bronchopneumonia; 4) bronchial asthma; 5) typhoid fever; 6) acute gastritis; 7) upper respiratory tract in-

FIGURE 2.1 ● GROSS NATIONAL PRODUCT (1972 = 100)

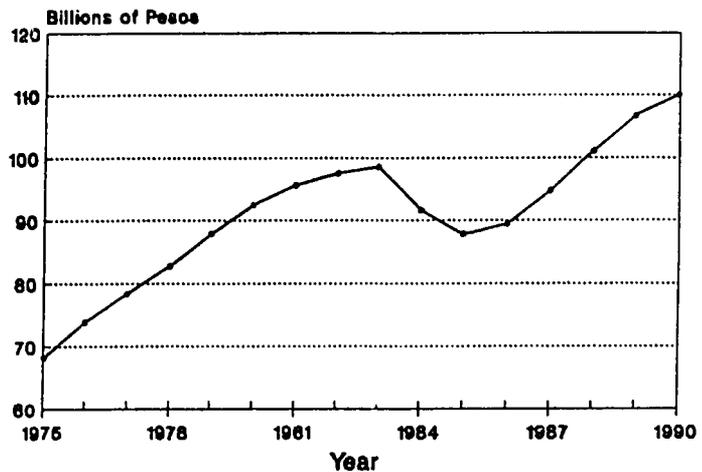


FIGURE 2.2 ● PRICE INDICES (1972 = 100)

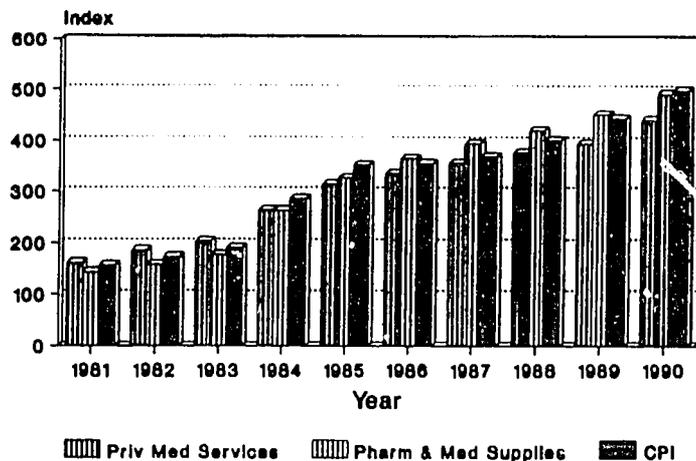
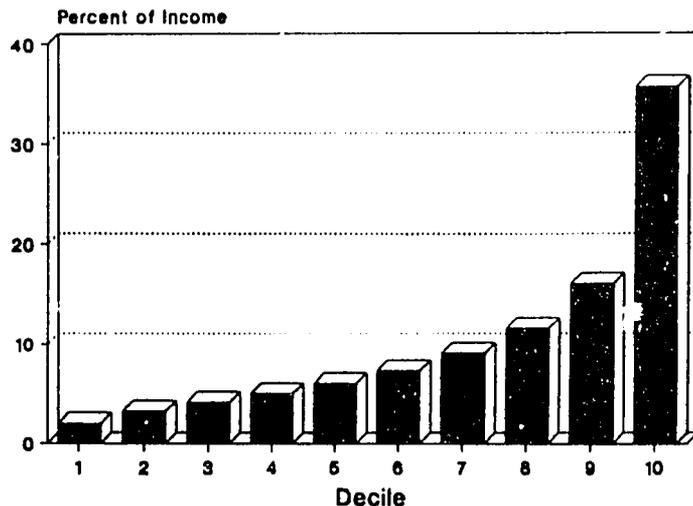


FIGURE 2.3 ● 1988 INCOME DISTRIBUTION



fection; 8) influenza (viral) / flu; 9) Koch's infection / PTB; and 10) intestinal amoebiasis.⁹

According to DOH, the ten leading causes of death in 1988 were : 1) pneumonia; 2) diseases of the heart; 3) diseases of the vascular system; 4) tuberculosis; 5) malignant neoplasms; 6) accidents; 7) diarrheal diseases; 8) measles; 9) nephritis, nephrotic syndrome, and sep. tosis; and 10) septicemia.¹⁰

According to the 1990 census, the Philippines has a population of 60.68 million, and an estimated gross density of 203 inhabitants per square kilometer. The population continues to grow at

very high rates, about 2.3 percent on the average during the past decade. This is mainly due to the failure to reduce fertility. This population growth rate is the highest in the Southeast and East Asian region. The continued high fertility partly contributes to the slowing down in reducing the high infant and child mortality rates.

With an estimated annual growth rate of 2.3 percent, the country is expected to have a population of about 78 million in the year 2000, an increase of 29 percent over its present population.

Health Delivery System

Health services are offered by a range of private and government providers in the Philippines. The health delivery system consists of a network of health, diagnostic and treatment facilities operated by the government and a loosely linked network of privately operated medical facilities spread unevenly across the archipelago.

Health facilities operated by the government provide preventive, curative and rehabilitative services while those operated by the private sector tend to focus on direct personal care that are curative and rehabilitative in nature.

Currently, the financing and the delivery of public health services are essentially the obligation of the national government. Local governments basically augment such efforts through limited additional personnel, supplies, and / or funds. The likely passage of a local autonomy law in the near future may substantially affect the organization and the delivery of public health services in the Philippines.

The current government health delivery system provides a range of preventive, curative and rehabilitative services, mostly aimed toward low-income groups. At the lowest level are the primary health care facilities, consisting of barangay (village) health stations (BHS), with a midwife, and rural health units (RHU), which are supposed to be staffed by a team consisting usually of a physician, a nurse, and a midwife. In 1989, there were 9,145 BHSs and, in 1988, there were 2,072 RHUs nationwide, making care available to about 70 percent of the population. In addition, in 1989 there were 237 puericulture centers.¹¹

TABLE 2.1 • DISTRIBUTION OF HOSPITALS AND HOSPITAL BEDS BY CATEGORY

	Public		Private		Total	
	Hospitals	Beds	Hospitals	Beds	Hospitals	Beds
Primary	132	2,228	657	10,459	789	12,687
Secondary	294	11,105	377	11,885	671	22,990
Tertiary	117	30,483	155	20,363	272	50,846
Total	543	43,816	1189	42,707	1732	86,523

TABLE 2.2 • AVERAGE NUMBER OF HOSPITAL BEDS

	Public	Private	All
Primary	16.88	15.92	16.07
Secondary	37.72	31.52	34.26
Tertiary	260.54	131.37	186.93

*The health delivery system :
a network of health,
diagnostic and treatment
facilities operated by the
government ...
a loosely linked network of
privately operated medical
facilities spread unevenly
across the archipelago.*

- Use of government hospitals :**
- ◆ initially increasing as income class increases
 - ◆ leveling off in the mid-income range
 - ◆ decreasing over the higher income groups

BHSs and RHUs usually refer more complicated cases to the District Hospital (25-50 beds), or to the Provincial Hospital (100-150 beds), or the Regional Hospital (200-250 beds). A small number of Medical Centers (250 beds or more), mostly located in Metro Manila, provide more specialized care.

The private sector includes pharmacists, physicians in solo or group practice, small hospitals and maternity centers, diagnostic centers, employer-based outpatient facilities, health maintenance organizations (HMOs), secondary and tertiary-care institutions, traditional birth attendants and indigenous healers. The modern private sector generally concentrates on the provision of curative and rehabilitative care to upper and middle-income households.

As of April, 1991, there were 1,732 hospitals of which 543 were public and 1,189 were private, and an undetermined number of privately operated clinics.¹² Over 49 percent of all hospital beds are in private hospitals.

Hospitals are classified into five levels of hierarchy based on their services, teaching / training and research capabilities. At the lowest level are the primary hospitals which are simply expanded clinics with 5-10 beds. At the apex are the medical centers which provide highly specialized tertiary health care with teaching / training and research capabilities. In between are the secondary hospitals with limited surgical capability, the tertiary-provincial hospitals with four basic specialty services capability, and the tertiary-regional hospital with seven basic specialty and sub-specialty services as well as teaching / training capabilities.

Table 2.1 gives the number of government and private hospitals and bed capacity of hospitals by category of hospital.¹³ The table shows that while there are fewer government hospitals, government hospitals are generally much larger than private hospitals in terms of bed capacity. Government hospitals make up only 31 percent of

FIGURE 2.4 A ● USE OF HOSPITALS IN 1987

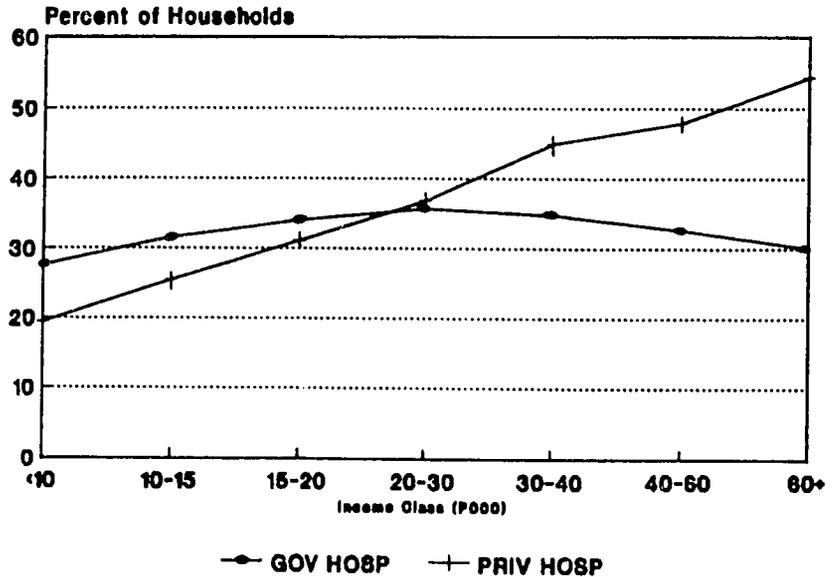
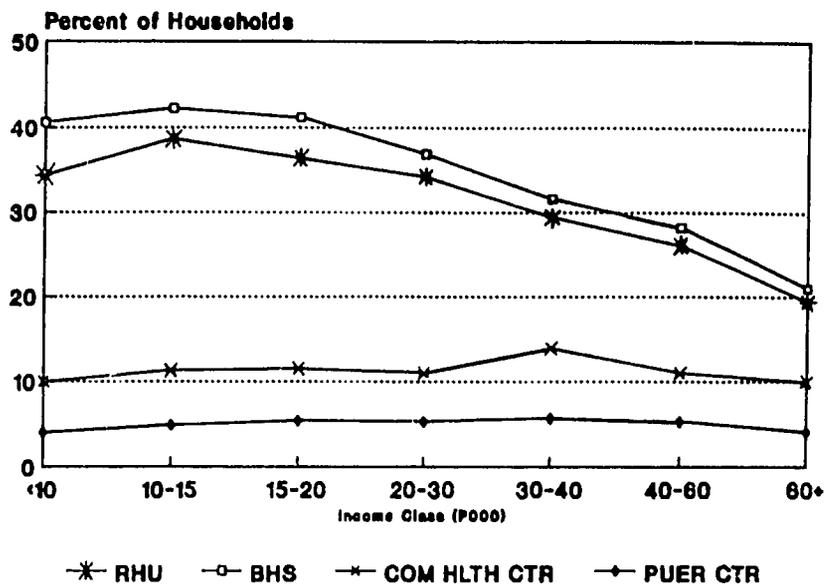


FIGURE 2.4 B ● USE OF FACILITIES IN 1987



all hospitals, but account for over 50 percent of all beds.

While there are more private than public hospitals, the private facilities tend to be either very small operations (with about five beds each) in rural areas, or very large hospitals in urban areas, particularly Metro Manila. Private health facilities are often operated as independent units, loosely linked through affiliations with professional associations such as the Philippine Hospital Association (PHA), the Philippine Medical Association (PMA) and other ad-hoc and informal arrangements. The professional associations usually adopt measures to regulate their members through quality control standards and accreditation schemes, among others.

The average number of beds for government and private hospitals by category of hospital are listed in Table 2.2.¹⁴ Average bed size reveals that tertiary government hospitals are, on average, much larger than private hospitals. Government and private primary and secondary hospitals do not significantly vary in size as measured by number of beds.

Health Facilities¹⁵

As of 1989, the hospital bed to population ratio in the Philippines was one hospital bed for 707 people, an increase over the 1 to 607 bed to population ratio reported in 1985. In terms of accessibility of government hospitals, 86.4 percent of the population lived within 17.5 kilometers of a DOH hospital in 1989.

According to HOMS, the rate of utilization of public hospitals as indicated by the overall average occupancy rate was 81.5 percent in 1989. Medical Centers had the highest occupancy rate at 88.7 percent, and Special Hospitals the lowest at 54 percent.¹⁶

According to the National Health Survey conducted in 1987, 32.2 percent of the sample reported using a government hospital in the past year, 34.1 percent used a private hospital or clinic, 11.1 percent used an RHU, 36.2 percent used a BHS, and 4.9 percent used a puericulture center.¹⁷

The pattern of hospital and health facility use appears to vary significantly by income class. The percent of households who reported in 1987 that they had used a government hospital and private hospital, by seven income classes, illustrates this relationship (Figure 2.4a).¹⁸

Health personnel:

◆ *half of all practicing doctors are in Metro Manila and Southern Tagalog*

◆ *two-thirds of dentists are in Metro Manila and Southern Tagalog*

The reported use of government hospitals has an inverted-U shape, initially increasing as income class increases, leveling off in the mid-income range, and then decreasing over the higher income groups. It is interesting to note, however, that the reported use of government hospitals by the highest income groups is about the same as the use of government hospitals by the lowest income groups. The data tend to dispel the notion that only low and middle income groups use public hospitals. The reported use of private hospitals increases dramatically as income group increases, as expected.

The reported use of other public health facilities, including RHUs, BHSs, community hospitals or health centers, and puericulture centers, by income class is illustrated in Figure 2.4b. The reported use of RHUs and BHSs increases initially, but then falls over the five highest income groups. The use of BHSs is higher than RHUs for all income groups. The use of community hospitals or health centers and puericulture centers is relatively low, probably because there are so few of these facilities, but is fairly constant across all income groups.

Health Personnel¹⁹

There are little detailed reliable data on health care practitioners in the Philippines, particularly for the private sector. On a broad scale, PMCC data indicate that a total of 11,336 doctors were accredited in 1990, or about 21.5 percent of the 53,556 registered doctors in the country as of 1986. In 1981, there were 1,007 medical doctors and 10,872 nurses newly registered.²⁰

About half of all practicing doctors are in Metro Manila and Southern Tagalog, although these regions ac-

count for only a quarter of the country's population. The distribution of dentists is even more extreme with two-thirds of them in Metro Manila and Southern Tagalog. Midwives and nurses are relatively more dispersed. Lack of incentives and appropriate training in "grassroots medicine" are believed to be factors preventing many doctors and other health professionals from practicing in rural areas.²¹

The rate of growth of the number of DOH doctors and nurses over the last half-decade does not appear to have kept up with the rate of growth in the population. In 1985 the ratio of government physicians to population was one doctor for every 6,423 people. By 1989, the ratio had fallen to one doctor for every 8,825 people. Similarly, the ratio of nurses to population was one to 5,245 people in 1985, and had fallen to one for 6,292 people in 1989.

In contrast, the number of DOH midwives and dentists appears to have increased more rapidly than the population. There were more DOH midwives and dentists per person in 1989 than in 1985. The ratio of midwives to population was one for 5,382 people in 1985, and had grown to one for 5,218 in 1989. The ratio of dentists to population was one for 47,704 people in 1985, and had increased to one for 37,789 people in 1989.

the rate of growth of the number of DOH doctors and nurses over the last half-decade does not appear to have kept up with the rate of growth in the population.

the rate of growth of the number of DOH midwives and dentists appears to have more than kept up with the rate of growth in the population

Health Care Expenditures

Total Health Care Expenditures

Total health care expenditures are the sum of public sector and private sector spending on health. Public health sector allocation and expenditure data are relatively up-to-date and complete,²² but there is a dearth of reliable, complete, and up-to-date data on the private health care expenditure component on which to base accurate estimates of total (public plus private) health care expenditures in the Philippines.

In principle, private health care expenditures can be estimated from either the private demand-side (expenditures made by individuals), or the private supply-side (revenues of private health care practitioners, facilities, and drug stores) of the private health care market. Because there are virtually no sources for total private supply-side health care revenues, a demand-side approach is chosen for estimation of private sector health expenditures.

Total health care expenditure equals public sector spending plus private sector spending on health.

On the demand-side, private sector health care expenditures are the sum of:

1) out-of-pocket health care expenditures made by individuals, including expenditures for private-sector health care practitioners, expenditures for private health facilities, fees charged at public facilities, and expenditures for pharmaceuticals;

2) health care benefits paid by compulsory and private health insurance for claims made by individuals;²³

3) benefits provided by other health insurance schemes including HMOs and community-based risk pools; and

4) health care spending by PVOs, civic groups and philanthropic societies.

The Family Income and Expenditure Survey (FIES) includes family expenditures on health care, which is likely to be the largest component of private health expenditures, by far. Health expenditures reported in the FIES presumably include all payments for health care, including purchases of pharmaceuticals. Some have suggested that expenditures on health care may be under-reported in the FIES, because family members may not be able to recall all purchases of health services and pharmaceuticals. Also, the FIES is only available periodically, with 1985 and 1988 being the most recent years.

The Medicare Program and the ECC provide annual data on health benefits paid on behalf of individuals. A problem with the reported health benefits paid by these compulsory health insurance programs is that they include payments made to public health facilities. Thus, if used in the calculation of private health expenditures, a portion of the benefits would be double-counted with expenditures made by the public health sector. That is, benefit payments received by public facilities are already included in public

Private sector spending composed of

- ◆ *out-of-pocket health care expenditures of individuals;*
- ◆ *health care benefits paid by health insurance funds;*
- ◆ *benefits provided by other risk sharing schemes;*
- ◆ *spending by PVO's, civic groups, and philanthropic societies.*

sector expenditure data. Reported health benefits must be adjusted to avoid this potential double-counting.²⁴

Data on pharmaceutical sales are available, but are not used in the demand-side private health expenditure estimation. Expenditures for drugs are already included with family health care expenditure data reported in FIES, and including supply-side drug sales along with FIES data in the estimation of total private expenditures would double-count these expenditures.

There are virtually no data available on expenditures made by HMOs and other health insurance schemes, private employer provided health benefits, and health care payments made by PVOs, civic groups and philanthropic societies. An important gap to be filled by the HFD Project is to collect, in a systematic fashion, reliable data on all sources private health care expenditures.

Given the demand-side data on the private health sector that are available, an estimate can be made of the *absolute minimum* private sector health expenditures in 1985 and 1988 by adding family health expenditures, adjusted compulsory health insurance benefits, and private health insurance benefits.

Two elements of private health care expenditures are available for 1985 and 1988. The FIES survey data indicate that P5.36 billion was spent on health care by families in 1985, and P5.82 billion in 1988. Private non-life health insurance benefits amounted to P62 million in 1985, and P124.1 million in 1988.²⁵

Compulsory health insurance

(Medicare Program and ECC) paid benefits totaling P682.1 million in 1985, and P892.4 million in 1988.²⁶ In a random sample of 5,300 Medicare claims, only about 20 percent used public facilities. Assuming that 20 percent of compulsory health insurance benefits are already captured by public health expenditure data, then compulsory health insurance benefit payments are estimated to be P545.7 million in 1985, and P713.9 in 1988.

Estimated values for *minimum total health care expenditures*, and public and private component shares are listed in Table 3.1 for 1985 and 1988. Public sector health expenditures amounted to P3.779 billion in 1985, and P6.874 bil-

lion in 1988.²⁷ By adding public sector health expenditures, minimum total health expenditures are estimated to be P9.831 billion in 1985, and P13.645 billion in 1988.

Under these assumptions, the government's share of minimum total health expenditures in 1985 is 38 percent, and is 50 percent in 1988. Although minimum total health expenditures in nominal terms are seen to increase between 1985 and 1988, in real terms the increase represented in Table 3.1 amounts to less than 3 percent.

As a percentage of GNP, the 1985 estimated minimum total health expenditures account for 1.64 percent, and 1.66 percent in 1988. Previous estimates of the percentage of GNP devoted to health care are much higher, in the neighborhood of 2.5 to 3 percent of GNP.

Not included in the estimated minimum private health expenditures are payments made by HMOs and other pooled-risk programs and schemes, private employer provided health benefits, and health care payments made by PVOs, civic groups and philanthropic societies. It is not likely that these private health expenditure categories would amount to a large percentage of total private health spending.

In order to examine the sensitivity of estimated total health care expenditures and percent of GNP devoted to health care to excluding relatively minor components of private health care expenditures, total health expenditures are re-estimated assuming that the excluded categories are some fraction of private health care expenditures.

Table 3.2 gives estimates of total health expenditures assuming excluded private health expenditure categories are 10, 20, or even as much as 30 percent of private health expenditures.

The estimated range for nominal total health expenditures in 1988 is from P14.322 billion to P15.676 billion when corrections are made for excluded categories of private health care expenditures. Even assuming that exclusions amount to 30 percent of private health care expenditures, a generous assumption, the percent of GNP devoted to health care is only 1.91 percent. Thus, it seems likely that health care, as a percent of GNP, is *lower* than previously thought. Total resources, both public and private, devoted to health care in 1988 is likely to be in the range of 1.661 to 1.91 percent of GNP.

The estimated range for health care

TABLE 3.1 • ESTIMATED MINIMUM TOTAL HEALTH CARE EXPENDITURES (NOMINAL)

Source	1985		1988	
	P Bil	% Total	P Bil	% Total
Public	3.779	38%	6.874	50%
Private	6.052	62%	6.771	50%
Family	5.360	55%	5.820	43%
Private Ins	.146	1%	.237	2%
Compulsory Ins	.546	6%	.714	5%
Total	9.831	100%	13.645	100%
Percent GNP	1.64%		1.66%	

TABLE 3.2 • ESTIMATED TOTAL HEALTH EXPENDITURES AND GNP SHARE, 1988

	Baseline	+ 10%	+ 20%	+30%
Private	6.771	7.448	8.125	8.802
Public	6.874	6.874	6.874	6.874
Total	13.645	14.322	14.999	15.676
% GNP	1.66%	1.74%	1.82%	1.91%

as a percent of GNP is much lower than the 5 percent rate suggested by WHO as the guideline for middle-income developing countries, and lower than that of Thailand and Malaysia (with at least 3 percent), China and India (with at least 4 percent), and South Korea (with 5 percent).

The relatively low levels of total expenditures for health in the Philippines compared to neighboring countries does not, however, necessarily suggest that total expenditures as a percentage of GNP should automatically be increased to levels approximating those of other countries. The question of how efficiently the existing resources are allocated is a major consideration. However, the data do suggest the need to consider the question of whether current levels of spending for health may be in fact be suboptimal.

GOP Health Expenditures ²⁸

As a share of GNP, GOP health care expenditures have increased since 1984, but have averaged only .61 percent over the last decade (Figure 3.1).

Although GOP health expenditures as a proportion of GNP have remained relatively stable, the share of GOP resources committed to the health sector began a downward trend in 1984 that continued through 1987 (Figure 3.2).

After achieving a ten year high of 4.5 percent of the GOP budget in 1983, the proportion of total GOP resources devoted to health fell to just 2.7 percent by 1987. The decline in the proportion of national government resources devoted to health may be due in part to increasing demands of GOP resources

for debt service since 1983. The proportion of the GOP resources allocated to debt service grew from 15.1 percent in 1983 to 45 percent in 1987. Debt service is likely to be a constraining factor for all government provided services, including health care, for the foreseeable future. By 1990 the proportion of GOP resources spent on health care had increased to 3.38 percent.

Because government health expenditures are drawn largely from tax revenues, government health resources are effectively subject to GOP's fiscal situation. Beginning with the economic recovery which started in 1986, the national health budget more than

doubled to P7.6 billion by 1990. However, the recent Persian Gulf crisis has triggered budget cuts in GOP health expenditures early in 1991.

Moreover, substantial annual increases in GOP nominal health expenditures from 1984 to 1987 were not sufficient to offset high inflation rates during the period. In real terms, GOP health care expenditure had not attained the 1983 level by 1987. By 1990, however, real GOP health expenditures had increased by 24 percent over the 1983 level (Figure 3.3).

On a per capita basis, average health care expenditures per person follows a trend similar to total GOP health care

FIGURE 3.1 ● GOP HEALTH EXPENDITURES : PERCENT OF GNP

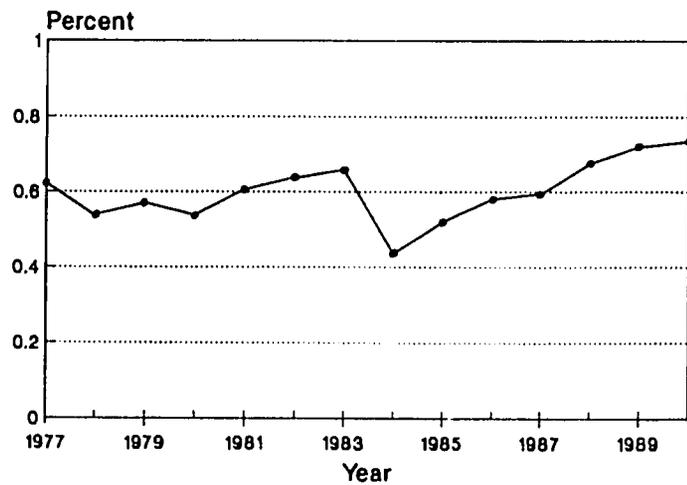
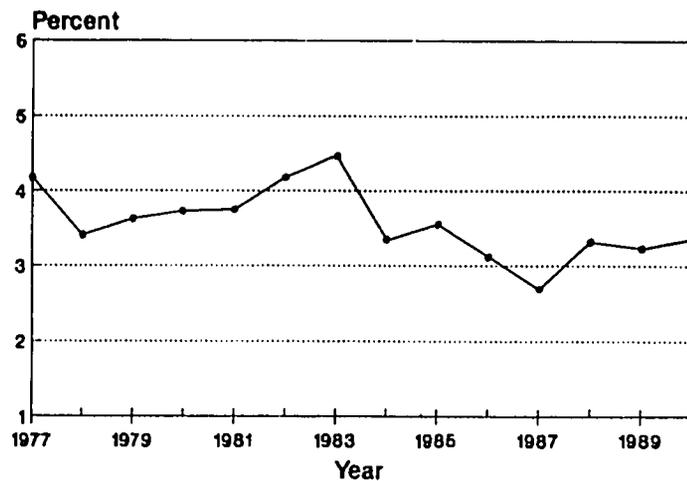


FIGURE 3.2 ● GOP HEALTH EXPENDITURES : PERCENT OF GOP BUDGET



Government's share in estimated minimum total health expenditures

- ◆ 38% in 1985
- ◆ 50% in 1988

expenditures. In 1990, per capita health care expenditures was P135 and had more than quadrupled during the previous ten years.

In real terms 1987 per capita spending had not recovered to the 1983 level, and had increased by only 5 percent over the 1983 level by 1990 (Figure 3.4). The growth of population has had a moderating effect on real increase in health care expenditures. The growth rate of per capita health care spending is lower than the growth rate of real total GOP health expenditures over the last decade.

DOH Expenditures by Category

Within the 1990 DOH budget, 65.4 percent was allocated to hospitals, 14.3 percent to field services, 19.3 percent to administrative expenses, and 1 percent to training. In recent years (1989-1990) there has been a significant increase in the percentage of the DOH budget allocated to administrative expenses. This is largely

due to the 1988 government salary standardization that resulted in significant administrative increases.

The increase in the percentage share for administration appears to have come at the expense of the hospital share of the budget (Figure 3.5). In real terms, however, both the DOH administrative and hospital budgets increased in 1989 and 1990. Field services actually declined by 12 percent in real terms in 1990. Note that the training budget share is not shown in Figure 3.5, but amounted to only about 1 percent of the DOH budget.

FIGURE 3.3 ● GOP HEALTH EXPENDITURES (1972 = 100)

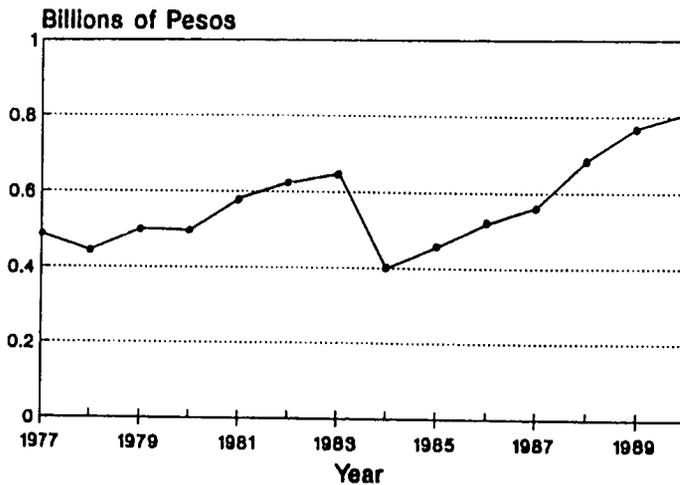
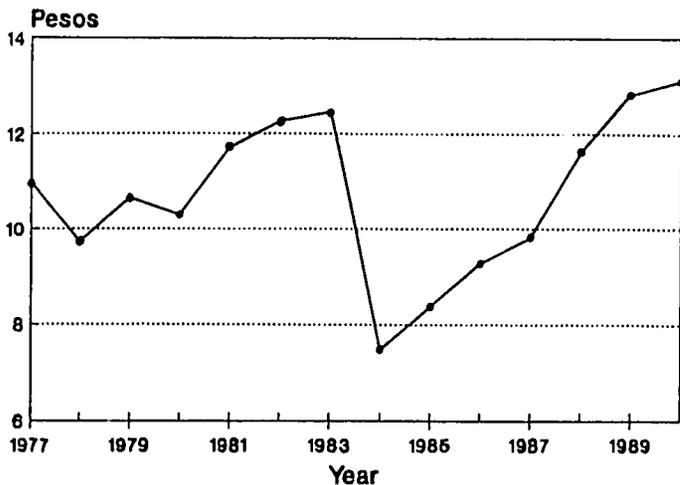


FIGURE 3.4 ● GOP HEALTH EXPENDITURES: REAL PER-CAPITA (1972 = 100)



Pharmaceuticals²⁹

The majority of pharmaceuticals are purchased in the Philippines through drug stores. Private and public hospitals also purchase drugs. Sales data from the Drug Association of the Philippines, also known as the Pharmaceutical and Healthcare Association of the Philippines, indicate that, in real terms, private hospitals drug sales are twice the amount of government hospital drug sales. (Figure 3.6).

According to the Pharmaceutical and Healthcare Association of the Philippines, total drug sales in 1990 amounted to P14.2 billion. Of this

Private hospitals bought twice as much drugs in value than government hospitals.

Manila and Luzon accounted for 73% of total drug sales in the country.

amount, government hospitals accounted for P858.9 million, or 6 percent. Private hospitals had drug sales of P1.63 billion, or over 11 percent of the total. The remainder, P11.7 billion pharmaceutical sales were through drug stores around the country.

Luzon and Manila together accounted for 72.8 percent of the drug store sales. In 1989, 49 percent of DOH purchases of drugs were for drugs and medicines for RHUs, and the remaining 51 percent for drugs and medicines at DOH hospitals.

Health Expenditures by Families ³⁰

Health care expenditures made by families make up the largest share of private health care expenditures. The National Census and Statistics Office estimates that in 1988 a total of P5.8 billion was spent by families on health. Urban families spent an estimated P3.2 billion, and rural families an estimated P2.6 billion on health care. Overall, 1.7 percent of total family expenditures were for health care. The data also indicate, not surprisingly, that family health expenditures are positively correlated with income (Figure 3.7).

Families, however, spend proportionately more for such items as tobacco and alcohol than for health care. This suggests that there is room for modifying expenditure patterns with the aim of promoting better health, and hence on future health care expenditures.

On average, urban families spend

Spending by families make up the largest share of private health care expenditures.

But only 1.7% of total family spending went for health expenditures.

FIGURE 3.5 ● DOH BUDGET USES : PERCENTAGE SHARES

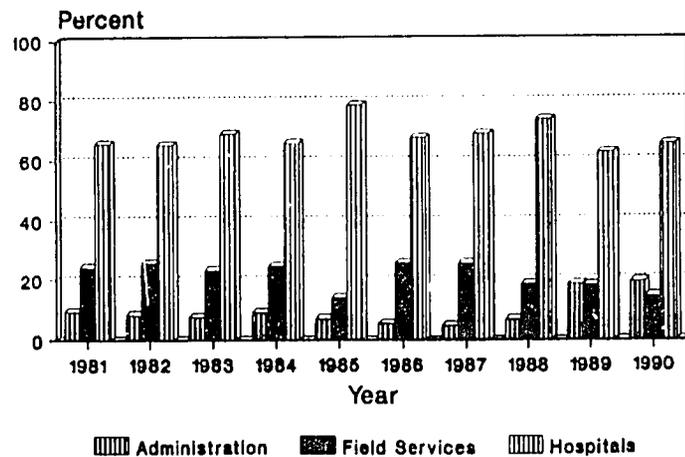


FIGURE 3.6 ● PHARMACEUTICAL SALES (1972 = 100)

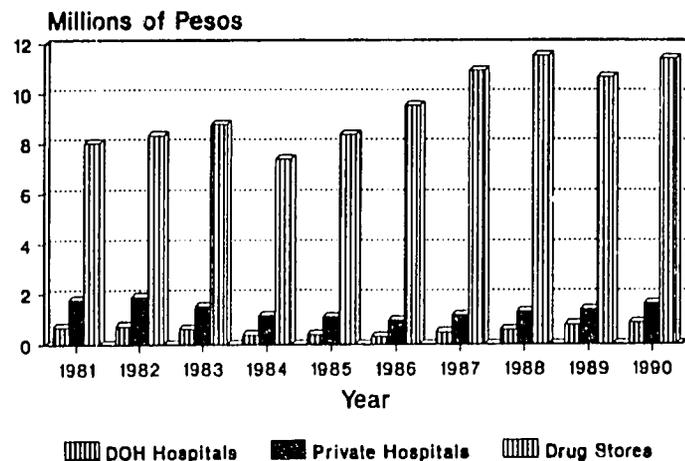
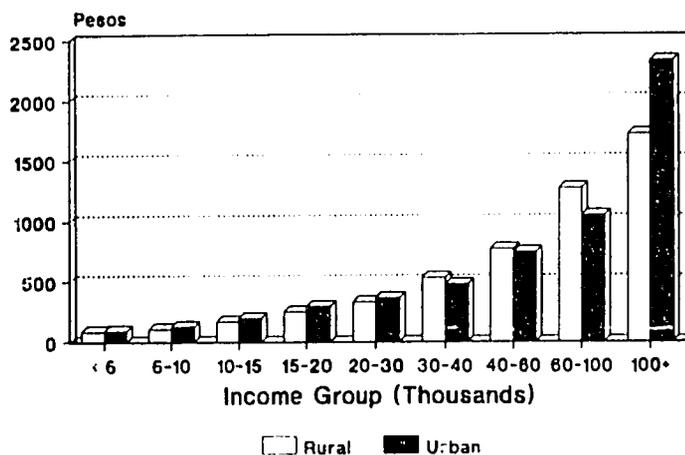


FIGURE 3.7 ● FAMILY HEALTH EXPENDITURES : 1988 RURAL/URBAN BY INCOME GROUP



about twice as much on health expenditures per year (P805) than rural families (P400). The relationship of average health expenditures of urban and rural family health expenditure is not constant over all income groups. In the lower income groups (less than P30,000) urban families spend more on health care than rural families, on average. In higher income groups (more than P30,000 but less than P100,000), rural families spend more than urban families on health care. In the highest income families (more than P100,000), urban families spend a higher amount for health care.

Family Planning Expenditures ³¹

Over the period 1978-1988, real family planning program expenditures from public sector sources (including GOP, USAID, and other donor agencies) reached its maximum point in 1981, and has been declining over the remainder of the period, with the exception of a modest real increase in 1988 (Figure 3.8).

There is a lack of data on private sec-

tor family planning expenditures. It is likely that respondents included family planning expenditures (consultations, examinations, checkups, drug store purchases of pills, condoms, etc.) in total health care expenditures in the FIES, but the proportion of reported health expenditures for family planning is not known.

Service delivery, including clinic services and a relatively small share devoted to natural family planning (since 1982), accounted for nearly 48 percent of all family planning expenditures in 1988. Outreach, training, and administration accounted for 40 percent of total family planning expenditures, while research and evaluation, IEC and others accounted for the remainder in 1988.

The largest foreign donor for family planning programs is USAID over the 1978-1988 time period (Figure 3.9). In the late 1970's, GOP expenditures accounted for up to 66.5 percent (1980) of total family planning expenditures.

By 1987, the GOP share had declined to 44.7 percent. The share of total family planning program expenditures contributed by USAID and other donors has followed an increasing trend since the early 1980's.

FIGURE 3.8 ● FAMILY PLANNING EXPENDITURES (1972 = 100)

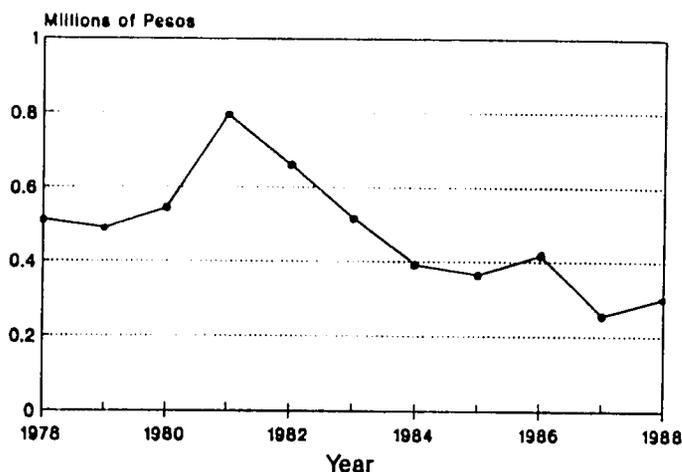
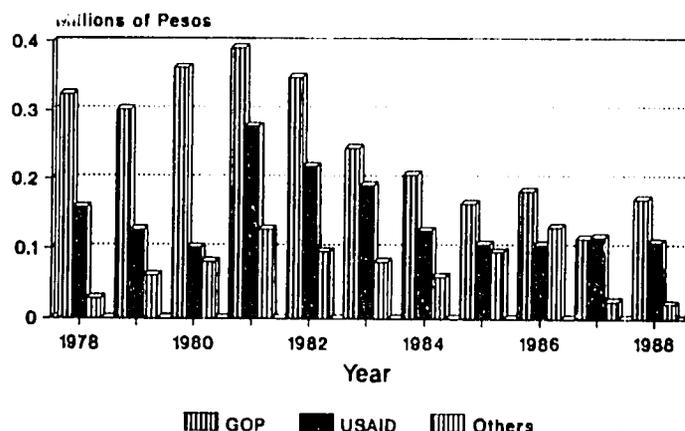


FIGURE 3.9 ● FAMILY PLANNING EXPENDITURES BY SOURCE (1972 = 100)



Population growth has lessened the effect of real increase in health care expenditures from 1983 to 1990.

Per capita health care spending has grown slower than real total GOP health expenditures.

Family planning expenditures has been declining in real terms.

Health Sector Financing

Introduction

A relatively wide range of financing mechanisms has evolved in the Philippines, including taxation, compulsory health insurance, prepayment through HMOs, private health insurance, and fee-for-service, making the Philippine health sector one of the more diversely financed of those in Third World countries.

Using the estimation procedure for total and private health expenditures in 1988 discussed in detail in Section 3, Table 4.1 gives a summary of financing sources and estimated health sector shares in the Philippines.¹²

Tax revenues are the major source of

government health care expenditures, accounting for about 85 percent in 1988. Other government sources include operating income, foreign loans and grants, and local government revenues.

One of the first compulsory health insurance systems initiated by a developing country, the Philippines Medical Care Commission (PMCC) current Medicare I Program covers all civil service and private sector wage, non-owner employees and their dependents. In 1988, Medicare, though covering about 38 percent of the population, accounted for less than 6 percent of estimated total health expenditures.

The private health insurance system remains underdeveloped. Although some firms offer hospitalization in-

urance, it is usually treated as an add-on to life or accident insurance, and in 1988 is estimated to account for less than one percent of total health expenditures.

In recent years, capitation schemes have evolved in metropolitan areas. Some 17 HMOs now offer services on an individual, family or group / corporate basis. Reported provider abuses are said to inhibit many households from enrolling in HMOs. Some have suggested that many Filipinos are unaware of the value of HMOs. Other country experience suggests that HMOs essentially cater to the middle class. These reasons likely contribute to the fact that, currently, private insurance policyholders and HMO enrollees represent less than one percent of

Insurance funds less than 6% of estimated total health expenditures.

Fee-for-service payments comprise the most common mode of private financing of health care.

TABLE 4.1. ESTIMATED HEALTH CARE FINANCING SOURCES, 1988 (BILLIONS OF PESOS)

Public Sector		6.87
Taxes		5.87
Indirect	4.11	
Direct	1.76	
Operating Income		.29
Foreign Assistance		.09
Local Government		.62
Private Sector		6.77
Family Spending		5.82
Private Ins		.24
Compulsory Ins		.71
Total		13.65

the population.

A few private companies (e.g. mining concerns, plantations) finance health services for their workers, either fully or with partial subsidies.

Fee-for-service is by far the most common mode of financing health care in private health sector. User fees are collected in public health facilities but are not a significant source of financing. Hospitals retain professional fees from Medicare patients, but because they must turn all other revenues over to the National Treasury, there is little incentive to collect them.

Public Sector Health Financing ³³

Public sector health financing was supported primarily by tax revenues of the government over the last decade (Figure 4.1).³⁴ The average share of health care finance from taxes during the period 1981-1989 was 81.6 percent. The tax share for public health finance has been steadily increasing since 1984 when it was 79.5 percent, through 1989 when it amounted to 88.9 percent. The shares of public health finance contributed by operating income and local governments have remained relatively stable since 1981.

User charges in public hospitals are established via guidelines issued by the DOH Central Office. For Medicare patients, the normal practice is for the

hospital to determine if the Medicare benefits are adequate to cover the total bill incurred. If not, the patient is billed for the difference, although the hospital's success in collecting the balance may be mixed. Thus, if the patient does not pay the total bill, then the hospital's total cost may not be fully recovered.

The charging of fees in public hospitals is partly based on Medicare standard benefit rates. For medicines and x-ray, laboratory, and other diagnostic services, Medicare benefits are in lump-sum amounts. Since Medicare benefit rates do not adequately reflect the true cost of providing health care services, fees charged are often less than cost. Most of the income of public hospitals from user charges are remitted to the national treasury and become part of the overall government revenue for national spending.³⁵

Private Sector Health Financing

Private sector health expenditures are financed primarily from operating income of private health facilities. While initial capital investments in private health facilities may have been financed by development loans and owner equity, annual sustained operations rely on operating income. Thus, private health financing consists of out-of-pocket health care payments by individuals and families,

insurance benefit payments, company-financed health benefits, community-generated resources and donations of cash, material or technical services from charitable sources.

The forms of health insurance in the Philippines include : 1) government sponsored health insurance - the Medicare Program and Employees Compensation Commission (ECC); 2) private insurance - HMOs and private or commercial indemnity health insurance; 3) employer provided health insurance; and 4) preferred provider plans - community or cooperative shared-risk schemes.³⁶

The Medicare Program.³⁷ The Medicare Program is a compulsory health insurance scheme that was implemented in 1972 with the creation of the Philippine Medical Care Commission (PMCC). The original program, Medicare I, covered public and private sector employees and their dependents. Since 1972, coverage has been expanded to cover retirees and the self-employed. A parallel program not yet implemented, Medicare II, is intended to cover those in the informal sector.

As of 1990, Medicare I covered 23.5 million Filipinos, or 38 percent of the population. In spite of being a compulsory program, there were a total of 4.6 million Medicare members as of 1989, or only about 20 percent of the estimated 21.8 million people employed. Part of the low coverage of the Medicare Program of the employed labor force is the slow structural transformation of the economy mentioned earlier. The employed who are not members of the Medicare Program are likely to be concentrated in agriculture and the service sectors which account for 45 percent and 39 percent of the labor force respectively. In addition, it is suspected that many small and medium scale enterprises do not enroll their employees or remit Medicare payments.

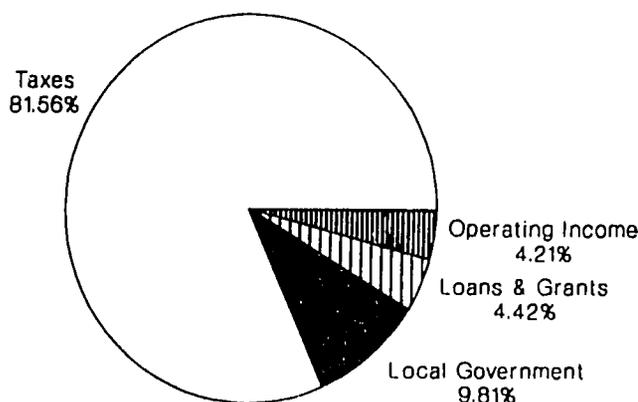
Premium contribution to Medicare is shared equally by the employee and the employer at 2.5 percent of the salary base credit. Total premium collection by SSS in 1990 amounted to P777 million, and GSIS collected P347 million. In 1990, benefits paid by SSS amounted to P710 million; GSIS paid benefits in the amount of P442 million.

In real terms, Medicare benefits were larger than collections in 1975 through 1978 (Figure 4.2). This trend was reversed, with collections far larger than benefit payments, for the period 1979 through 1989, and resulted in a significant build-up of reserves.

The Health Insurance Fund (HIF)

FIGURE 4.1 ● GOP HEALTH FINANCING SOURCES

AVERAGE PERCENTAGE SHARES, 1981 TO 1989



consists of premium collections or contributions from members, earnings from investments, and other income (e.g. penalties to employers for delayed payments). As of 1990, SSS had reserves amounting to P4.5 billion, and GSIS had P620 million.

The current medical benefits under Medicare are basically in-patient in nature. For hospital expenses, there are maximum peso allowances that depend on the type of hospital service (e.g. room and board, medical expenses, operating room fees) as well as on the category of hospital (primary, secondary, tertiary). Professional services are compensated on whether the illness is surgical or non-surgical.

Surgeons are paid via a Relative Value Scale (RVS), and anesthesiologists are paid one-third the surgeon rate. Non-surgeons are paid a fixed amount per day, with specialists accredited by the medical specialty societies receiving higher rates than general practitioners. Medicare currently does not cover expenses for out-patient services.

Medicare support values, the proportion of total hospitalization expenses paid for by Medicare, have failed to reach the original 70 percent target rate for actual costs incurred in private hospital ward room confinement.

Table 4.2 lists estimated support values by type of hospital (primary, secondary, tertiary), and ownership (private, government) for years that have estimates available.

Estimates of support values range from 31.5 percent to 48.9 percent, the later experienced in 1989 – the highest recorded support value to date. Support value is highest in primary hospitals for all years estimated. Out-of-pocket costs are highest at tertiary hospitals, though the benefit structure tends to encourage the use of these higher level hospitals by providing for higher reimbursable allowances. The highest support values are at government hospitals for all levels, and particularly at primary hospitals where a 91 percent support value was realized in 1989.

Employees Compensation Commission (ECC). The ECC is a compulsory social insurance scheme that was established in 1975, replacing the Workmen's Compensation Commission. The ECC gives tax exempt benefits to employees, or their dependents, for work-related disability or death. ECC benefits are in the form of: 1) cash income in the case of disability or death; 2) medical and related services for injury and sickness;

and 3) rehabilitation service in the case of permanent disability. Administratively, ECC operates like the Medicare Program. SSS and GSIS serve as the collecting and claims processing agents.

ECC coverage is compulsory for all employees who are not over 60 years old. As of 1987, ECC covered about 12.2 million workers, representing about 21 percent of the Philippine population. The Medicare Program has

a higher coverage rate (38 percent) because it benefits not only employees, but also dependents, retirees, and a portion of the self-employed.

ECC contributions are paid entirely by the employer. In 1987, total ECC membership contributions in SSS amounted to P257 million, and P217 million in GSIS. Benefits paid by SSS amounted to P61 million, and P117 million for GSIS in 1987. During the period

FIGURE 4.2. ● MEDICARE COLLECTIONS VS. BENEFITS (1972 = 100)

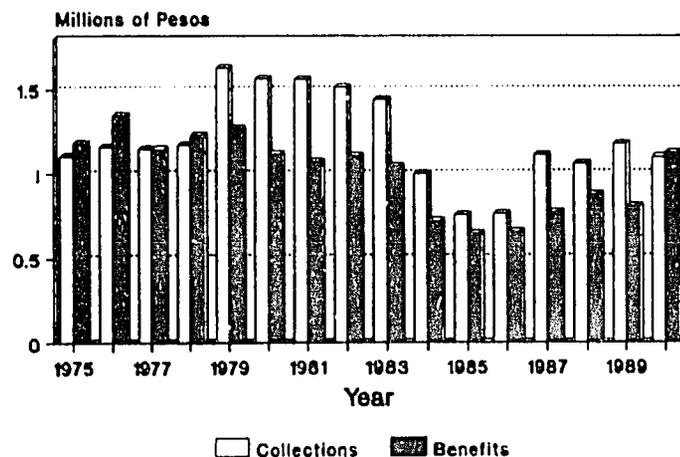


TABLE 4.2. ● MEDICARE SUPPORT VALUES

Year	Hospital Type			All
	Primary	Secondary	Tertiary	
1981	48.8	33.8	23.6	39.8
1985	NA	NA	NA	31.5
1987	55.8	38.4	25.8	33.4
1989	66.2	46.1	45.8	48.9
Ownership (1989):				
Private	64.3	40.4	33.9	41.4
Govt	91.3	86.9	82.9	84.7
All	66.2	46.1	45.8	48.9

Source: PMCC

1975 to 1988, GSIS paid an average of P5461 in benefits per claim, compared to P804 for SSS.

Health Maintenance Organizations (HMOs)

Three types of HMOs exist in the Philippines : 1) investor-based HMOs; 2) community-based HMOs; and 3) employer-initiated HMOs. Investor-based HMOs are those that focus on the employed sector and are basically profit-oriented. Community-based HMOs are those organized for lower income communities on an experimental basis and are non-profit. Employer-initiated HMOs are those formed by companies for their employees and / or their dependents.

HMOs are classified further by : 1) prepaid group practice (PGP); and 2) individual practice association (IPA). Under the PGP model, salaried physicians serve in the HMO facility where they share equipment and staff. Enrollees go to the facility when they need care. In the IPA, the physician maintains his private office and patients. Enrollees choose from a list of participating physicians and receive care from the doctor's own office. Most Philippine HMOs do not own their hospitals, but accredit or enter into service arrangements with existing hospitals.

Philippine investor-based HMOs have features of both the PGP and IPA. In 1991, there were 17 investor-based HMOs estimated to be operating in the Philippines. In the first quarter of 1991, there were an estimated 500,000 to 600,000 total number of people covered by all HMOs in the population, or about .81 to .97 percent of the total population.

There are only two known community-based HMOs in the Philippines that are part of a pilot-test : 1) San Antonio (SAHMO) which began in 1988 and had 400 members in 1990; and 2) University of the Philippines, Diliman (UPHMO) started in 1989, and had 429

As of 1990, the Medicare Health Insurance Fund had reserves of P4.5 billion in SSS and P620 million in GSIS.

HMO's currently serve less than one percent of the population, most of whom have significant ability to pay.

members in 1990. Community-based HMOs are operated like investor-based HMOs. Members pay a monthly fee in exchange for a specified set of inpatient and outpatient benefit packages, but the benefit limits are much lower than investor-based HMOs. It is premature to make definitive conclusions about the potential of community-based HMOs in the Philippines.

There is only one known employer-initiated HMO in the Philippines, the Philippine Airlines Dependents Medical Plan (PDMP). The PDMP differs from an investor-based HMO in that : 1) the PDMP is non-profit; 2) it serves only PAL employees and dependents; 3) members are subsidized by PAL; and 4) membership fees are lower than those charged by investor-based HMOs.

Overall, HMOs in the Philippines : 1) serve less than one percent of the population, and thus do not yet play a significant role; 2) are mostly investor-based HMOs that favor the market segment that can afford to pay the premium; 3) focus on group accounts more than individual accounts; and 4) avoid the high-risk elderly with age requirements for membership.

Commercial Indemnity Health Insurance. As of 1988, there were 102 companies involved in health and accident insurance (HAAD) in the Philippines. By type of company, there were more non-life insurance companies involved in HAAI than life insurance companies during the 1975 to 1988 time period. By location, domestic nonlife companies were most active in HAAI (76 percent), than foreign nonlife insurance companies (15 percent) and domestic life insurance companies (7 percent).

Gross premiums collected by all health insurance companies amounted to P469 million in 1988. From 1974 to 1988 nominal gross premiums grew at an average annual rate of about 20 per-

cent. In 1988, group health insurance sold by life insurance companies amounted to P146 million, about 2.5 times the P58.5 million for ordinary insurance (which includes sales to individuals and families). Moreover, group health insurance grew at a faster annual rate (27 percent) than ordinary HAAI (14 percent).

Gross risks represent the total potential amount in benefit payments (or total face value of policies issued) that the insurance companies contracted with their insured clients. In 1988, for nonlife companies, there is a P476 risk for every P1 premium collected.

Losses refer to the amount of benefits paid by insurance companies. For 1988, the industry's total losses amounted to about P237 million. This represented about 51 percent of the gross premiums collected for the year, or about P0.51 paid for every P1.00 premium earned.

Due to the general low income of the majority of the population in the Philippines and the unprofitability of HAAI, commercial indemnity health insurance is not likely to grow dramatically in the Philippines.

Employer-Provided Health Benefits. Apart from Medicare and ECC, the Labor Code of the Philippines specifies a minimum set of medical, dental, and occupational safety obligations to employers. The requirements range from the availability of first aid treatment to the provision of a company clinic with a full-time doctor, nurse, and dentist. Collective bargaining agreements (CBAs) also specify a variety of medical benefits. There is little information on the extent of population coverage, or benefit payments from employer-provided health benefits.

Community-Level Health Insurance. Community-level health insurance is a general term for risk-sharing health care financing characteristics, including such activities as people donating labor or materials to construct a health center, and contributions to a common pool in exchange for discounted medical services or drugs. The extent to which community level health insurance activities occur in the Philippines has not been determined, though grassroots initiatives are reportedly numerous as revealed in a recent HAMIS contest. It is too early to tell how viable or sustainable these initiatives are since no assessments have been made. This is definitely one area for further investigation.

Health Sector Performance

Concepts and Data Requirements

The health sector performance referred to here deals mainly with economic performance, that is, the main criteria used are based on well known concepts derived from economic theory. The framework, however, is sufficiently broad and flexible so that other aspects of health sector performance can easily be incorporated. The emphasis on the economic aspects of health sector performance is based on the fact that these aspects are the most neglected in current discussions of health sector performance.

While the efficiency and equity criteria for assessing the economic performance of the health sector are conceptually clear, the information needed to make such an assessment is incomplete. While some initial and indirect assessment can be made based on inferences from these fragmentary data,

The Philippines allocates less than 2% of GNP for health.

Is the the economy allocating enough resources for health?

such assessment must necessarily be tentative and suggestive. This situation is, of course, not unique to the Philippines, since the difficulty in making assessments is rooted not only in data inadequacy but also in the shortcomings of current methodologies for practical assessment of health sector performance according to well-known theoretical concepts.

Conceptually, health sector performance can be assessed, and indicators can be developed, from different standpoints, among these are:

1) in terms of health status improvements through the allocation of resources between the health sector and other health-promoting sectors of the economy (efficiency in intersectoral resource allocation);

2) in terms of health status improvements through the allocation of resources among various types of health services (efficiency in health service structure);

3) in terms of health status improvements through the provision of health services to the population irrespective of income levels and geographical location (equity in access);

4) in terms of health status improvements through the targeting of priority beneficiaries (efficiency in health service focus);

5) in terms of health status improvements through utilization of existing health services (efficiency in health service utilization);

6) in terms of the quantity and quality of health services provided through the choice of health inputs in the production of health services (efficiency in health service production);

7) in terms of the quantity and quality of services provided through management of existing resources (efficiency in management and operations);

8) in terms of the financial resources

generated through the choice of various financing mechanisms (efficiency in financing); and

9) in terms of the financial burden that different groups in society bear in the provision of health services through the choice of various financing mechanisms (equity in financing).

These concepts are used to examine available Philippine health sector performance data in the discussion that follows. As will become readily apparent, the available data hide more than they reveal, and suggest that a more systematic effort to obtain the necessary information as well as to further develop practical methodologies for health sector assessment should be a high priority activity in current efforts to reform the health system.

Intersectoral Resource Allocation

Is the economy allocating enough resources for health? This question, often raised in public forums, is perhaps the most difficult question to answer adequately. Part of the difficulty stems from the fact that the health status of the population is determined by a host of other sectoral activities, both public and private. To answer the question, there is a need for information not only on the amount of resources being expended in each health-promoting sectoral activity, but also information on the relative health impacts of a peso investment in each of such sectoral activity. The first set of information is grossly incomplete even for the public sector, while the second set of information as it relates to the Philippine situation is practically nonexistent.

Inferences about the relative impacts of sectoral activities, however, can be made based on international and national studies on the determinants of health, measured by infant and child mortality in particular. These studies generally point to the importance of such direct factors as fertility, environmental contamination, and dietary and nutrient intake, as well as indirect factors such as education of parents and household income or wealth.³⁸

A recent study that attempted to quantify the relative importance of these various factors using household survey data shows that sanitation and food consumption tend to have relatively high impacts on the health status of children, while housing condition, education of parents and medical care have moderate but nonetheless significant impacts (Table 5.1).³⁹ What this set of information implies is that greater efficiency in intersectoral

resource allocation might be achieved at the margin by investing more of incremental national resources on those sectoral activities that have relatively larger impacts on health status, and less on those sectoral activities that have relatively smaller impacts.

The estimation of total health expenditures in the Philippines given earlier (Table 3.1) reveals that health care expenditures are lower than in neighboring countries, that is, less than 2.0 percent of GNP as opposed to around 3.0 to 5.0 percent in other developing countries in Asia. While this information might readily be taken as evidence to support the commonly perceived under-investment in health care, it is possible that at the margin, the Philippines is under-investing even more in other health-promoting sectoral activities. For example, data cited earlier (Figure 3.8) reveal that family planning expenditures have been declining in real terms since 1981. It is well known that high fertility is strongly associated with high infant and child mortality. Moreover, possible under-investment in environmental sanitation might be readily inferred from data showing continued high rates of diarrheal diseases and intestinal parasitism among children. Available data also reveal continued high rates of child malnutrition which reflect not only the effects of low income on dietary / nutrient intake, but also the effect of lack of knowledge on proper nutrition among parents, especially among mothers.

Thus, while international comparisons of health care expenditures as a proportion of GNP might initially suggest that the Philippines' resource allocation for health is suboptimal, they do not give us a complete picture that would allow a firm conclusion. In fact, inferences above regarding the trends in the allocation of resources on other health-promoting sectoral activities are not inconsistent with the opposite suggestion that the current intersectoral allocation of resources might even have larger health impacts if, at the margin, more resources were allocated to these other health-promoting activities instead of directly on health care, given the very limited national resources available.

The importance of other health promoting sectoral activities is further suggested by the data which show the relationship between health spending per capita and the infant mortality rate among selected Asian countries (Figure 5.1).

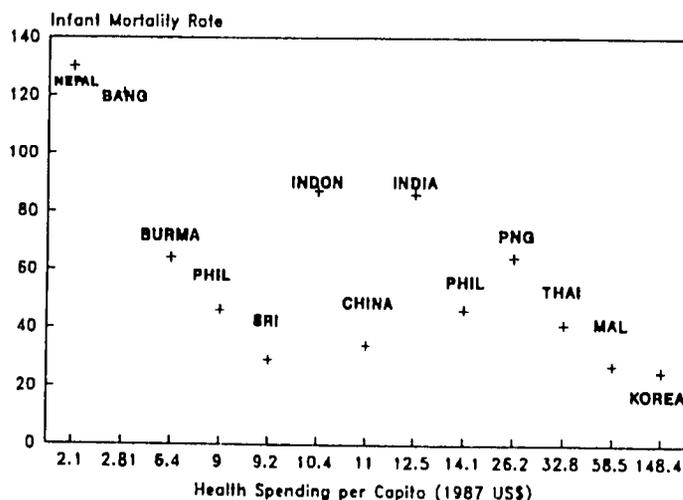
Discounting the potential effects of measurement errors in each variable that will bias the observed relationship,

TABLE 5.1 • IMPACT OF SELECTED FACTORS ON THE HEALTH STATUS OF CHILDREN

Factor	Impact
Housing Condition	Medium
Sanitation	High
Education of Parents	Medium
Food Consumption	High
Medical Care	Medium

Source: Solon (1988)

**FIGURE 5.1 • HEALTH SPENDING AND IMR
SELECTED ASIAN COUNTRIES, 1987**



the data suggest that while on the average, infant mortality rates decline with increasing per capita health spending, significant mortality declines can still be achieved even at relatively low levels of health spending per capita such as those achieved by Sri Lanka and China by investments in health-promoting activities other than health care. These investments would invariably include, among others, demographic investments that affect the age structure of the population, and investments in water supply and sanitation. In addition, the data suggest that greater efficiency of resource allocation within the health sector which results in more services being made available to a larger segment of the population from a given level of resources could generate additional health impacts.

To properly identify the specific factors that allowed these two countries to achieve greater health status improvements from limited health sector spending, however, requires more detailed country-specific information than are available at present. This limits the lessons that might be learned from just examining the intercountry relationships depicted in Figure 5.1. Thus, ultimately, the assessment of a country's resource allocation among sectors with respect to health status improvements must rely more on country-specific assessment than on intercountry comparisons. Unfortunately, as observed by a recent international study, country-specific health research, particularly on the operation of the health sector, is a neglected area of research.¹⁰

There are indications of a shift towards investments with larger health impacts in the public health sector, such as

- ◆ immunization;
- ◆ oral rehydration;
- ◆ control of acute respiratory infections;
- ◆ family planning.

Health Service Structure

By health service structure is the composition of health services according to defined categories. The question relevant to the assessment of health sector performance is whether the current structure of health services is the most effective in generating large health impacts, or whether a different structure will achieve still larger impacts.

For purposes of initial assessment, health services may be classified broadly into community health services and personal health services. Community health services are those services which are provided to communities or population groups and which benefit large communities or groups simultaneously. This category includes such services or activities as: 1) public information and education; 2) health surveillance and vital registration; 3) environmental health services; and 4) training and research. Personal health services, on the other hand, are those provided to individuals to treat illness, prevent disease or disability, improve nutrition and facilitates such normal processes as human reproduction. The category includes outpatient care and inpatient care.

Ideally an assessment of the efficiency of health services structure would require information on the relative cost-effectiveness of the various types of services being provided. Such information is not available except for a few specific services, however. Again, not only is there a problem of data inadequacy, but methodological shortcomings as well. It might be possible to achieve a qualitative sense of the efficiency of health service structure by looking at selected indicators such as the distribution and trend over time of expenditures allocated to each category of service in the light of prevailing and changing epidemiological patterns. But even then, unresolved problems in the estimation of health expenditures and disease patterns might seriously distort the relationship.

For example, data are available on DOH expenditures on such broad categories as hospital services and field health services, and household expenditures for such items as medical services, drugs, hospital services, dental services, and other services obtained from national health surveys.¹¹ These data alone cannot reveal much about the efficiency of health service spend-

ing. First, the distinction between hospital and field services do not accurately capture the underlying analytical distinction between community services and personal services, and within personal services, between outpatient and inpatient services. Secondly, in the case of household expenditures, information about the pattern of illness among households is not available from the same data source that could be matched against the composition of health expenditures. Hence, from both sets of available data, it is hard to tell whether the health service structure as inferred from the expenditure patterns is efficient, or not, in relation to either past structures or in relation to alternative structures.

The DOH on expenditures for field health services and hospital services, at least as currently aggregated, may hide more than they reveal. Field health services may include curative care on cases that are readily preventable by public health programs. Hospital services, on the other hand, may contain items such as drugs that are reallocated to field health facilities. If so, then the reported expenditures for hospital services overestimate the resources used for hospital services and correspondingly underestimate the resources used for field health services.

Moreover, simply looking at the percentage of total DOH expenditures for hospital services relative to field health services and concluding that there is an over-allocation to hospital services relative to field health services, does not take into account the fact that hospital services are by their nature relatively more costly to provide per person than field health services. Additionally, it is not hard to think of a situation where a large part of preventive and promotive health activities are being undertaken outside of the health sector, such as the use of safe water sources, adequate food consumption and proper nutri-

Is the current structure of health services provided the most effective in generating health impact?

tion, health promoting lifestyles, etc. Under this situation, the main role of the health sector would be to provide services for people who become ill from diseases that are not readily preventable by non-health sector activities, and as a consequence, the expenditures for hospital services would constitute a major part of total health sector expenditures. And yet, the

health sector may still be efficient in its allocation of resources. To assess the efficiency of health service structure under this situation, it is necessary to ultimately determine how much improvement in health status is achieved by a peso investment in hospital services versus a peso investment in field services, and information that is still not available at present.

Thus, the common assertion in many circles of the health community that the current health sector is not efficiently allocating resources because it is allocating relatively more resources to "curative" or hospital services than to "preventive" or field health services given the prevailing disease patterns or health needs cannot be totally supported by currently available data. There is, therefore, a need for better data and method of analysis to properly assess this aspect of sector performance.

Supplementary information do reveal, however, that efforts are being intensified to shift resource allocation towards those activities that are likely to have larger health impacts per peso investment than alternative activities. These activities include 1) universal immunization coverage; 2) the adoption of oral rehydration therapy as opposed to intravenous therapy and use of anti-diarrheals and anti-biotics in the control of diarrheal diseases; 3) the adoption of primary care-based control of acute respiratory infections, especially among children involving the use of simple diagnostic procedures and oral anti-biotic by Barangay Health Station midwives as opposed to hospital-based treatment using expensive diagnostic procedures and medicines; and 4) the promotion family planning as part of overall reproductive health.

FIGURE 5.2 POVERTY INCIDENCE AND DEATHS WITH MEDICAL ATTENDANCE

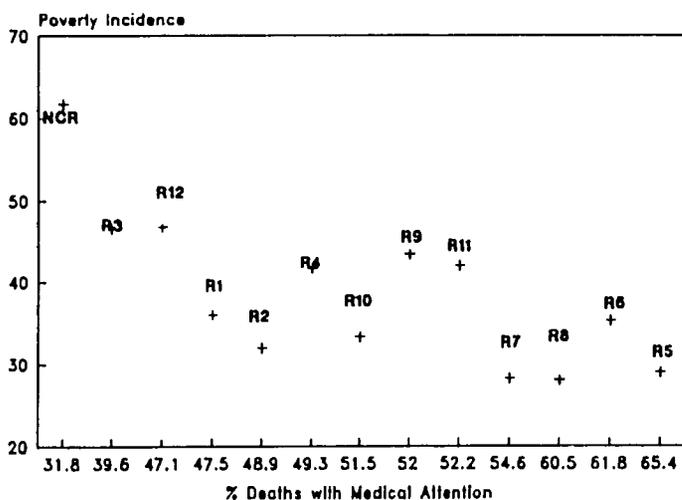
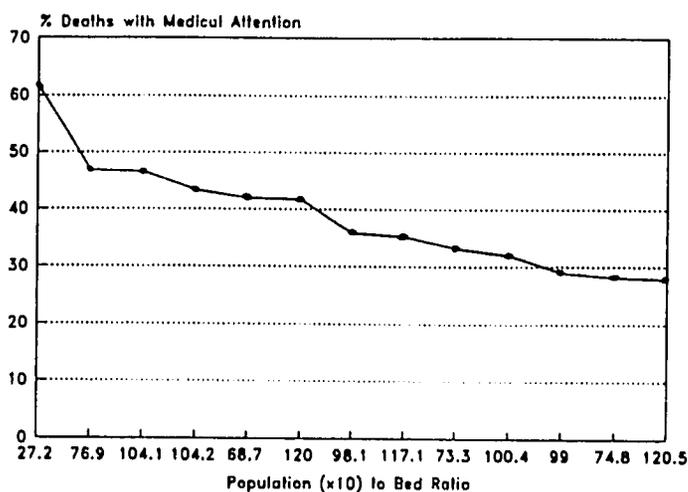


FIGURE 5.3 RELATIONSHIP BETWEEN DEATHS ATTENDED AND POPULATION TO BED RATIOS



Access to Health Care Services

Several indicators suggest the persistence of unequal access to health care services, particularly hospital services, among various population groups. These indicators include (1) the high percentage of reported deaths without medical attendance; (2) the declining percentage of reported deaths with medical attendance with increasing regional poverty rates; (3) the declining percentage of reported deaths with medical attendance with increasing population to bed ratios; and (4) low population coverage and declining support value of Medicare.

Data on reported deaths by medical attendance reveal that a very large percentage of deaths are without medical attendance.¹² This implies that a large percentage of the population with serious illness or injury that eventually results in death does not have easy access to the needed medical services. In

Indicators of poor access to health care services :

- ◆ high percentage of reported deaths without medical attendance;
- ◆ declining percentage of reported deaths with medical attendance due to poverty and lack of health facilities;
- ◆ low population coverage of health insurance;
- ◆ declining support value of Medicare.

1988, this improvement over previous years, i.e. from 70 percent in 1983, the figure is still very low, in 1989 the reported deaths with medical attendance was only 28 percent in Region VII and VIII, higher at about 47 percent in Regions III and XII, and still higher at 62 percent in the National Capital Region.

It should be noted, however, that not all deaths are reported. The extent of under-registration of deaths is not accurately known, although it is expected that the completeness of registration has been improving over time, especially for adult deaths. It is reasonable to assume that unreported deaths, most probably infant deaths, are also deaths without medical attendance. Thus, the data on the percentage of deaths without medical attendance underestimates the true value. Thus overall, there may be more people who were ill or injured but did not have access to medical care than what the data reveal. Differences in the completeness of reporting of deaths by regions, on the other hand, could introduce biases in the observed regional pattern of medical attendance that was noted earlier.

The lack of access to medical care suggested by the data on reported deaths by medical attendance may be due to financial constraints on the household or due to the lack of health facilities and services, or both. This observation is based on the analysis of the relationship between deaths with medical attendance and regional poverty

incidence (Figure 5.2), and the relationship between deaths with medical attendance and population to bed ratios (Figure 5.3). The analysis shows that at the regional level, the percent of deaths with medical attendance decreases with regional poverty rates. Moreover, the data shows that the percent of deaths with medical attendance decreases with regional population to bed ratios. Both sets of relationships suggest that both poverty and lack of health facilities in a region, particularly hospital facilities limit access to health care. More in-depth analysis, however, is needed to separate out the independent effects of these two factors on medical attendance as well as to identify the underlying factors involved.

Data on the population coverage of Medicare and the changing support value over the years allow inferences to be made regarding trends in (financial) access to health care. The data show that Medicare still covers only 20 percent of the employed labor force or about 38 percent of the population in spite of its 20 years of existence. The slow growth in the coverage of the employed population is mainly due to the fact that economic transformation has been terribly slow in the Philippines. The support value of the program had been declining since 1972 from 70 percent as originally designed to only about 33 percent in 1987 before it was raised in 1989. Currently, the average support value is about 50 percent.⁴⁵ What these data suggest is that over the years, even those with social insurance coverage were finding it relatively harder to afford medical care. The relative increase in out-of-pocket costs that these people had to pay because of declining Medicare support value implies declining (financial) ac-

Priority seems to be for services to:

- ◆ infants;
- ◆ young children;
- ◆ women of reproductive age;
- ◆ pregnant and lactating women.

cess to the needed health services, in particular, hospital services.

A review of DOH initiatives, however, reveal that efforts have been made to increase access to health services, especially among the poor. These efforts include the expansion of public health programs which are more likely to benefit the poor and rural population; the allocation of incremental budgetary resources according regional poverty incidence; and the increase in support value of Medicare instituted in 1989. It is expected that, if sustained, these initiatives would result in improved access in the long run.

Service Focus

Service focus can be assessed either from the standpoint of the health problems being addressed or from the standpoint of the population groups being reached. The first standpoint is partially addressed under service structure where the directions which the DOH has taken were indicated, namely, the vigorous implementation of preventive and promotive health care, with major focus on maternal and child health care.

Since the major policy orientation the DOH is to focus health services population groups on the basis of health needs as medically defined, and on the capacity of these groups to obtain the necessary services using only their own resources, the efficiency of service focus could be assessed by looking at the population in need, both medically and financially, who have in fact been reached with the appropriate health services. To perform such an assessment information is required on the coverage rates (i.e. the percent of population in need reached by the appropriate service) of various health services delivered by both public and private sectors. Unfortunately, such information is not available.

The population group focus of the health sector can be inferred, however, from the type of services being emphasized. Thus the high priority given to maternal and child care implies high priority given to infants and young children, women of reproductive age, and pregnant and lactating women. The priority given to the allocation of incremental budgetary resources to regions with high poverty incidence implies high priority to poor population in rural areas. While these priorities give a sense of the focus of health services, which broadly would

be expected to improve focus efficiency, there is very little detailed information about the population within these broad categories that are actually being reached (coverage), or are being reached more than others because of certain favorable characteristics (bias). Such detailed information, which can be obtained from household surveys, could also be used to refine procedures for targeting specific population groups most in need of specific services.

Health Service Utilization

Assessment of the efficiency of health service utilization, while conceptually simple, is difficult in practice because of the difficulty of disentangling from the available data the various sources of "inefficient" utilization.

Efficiency in health service utilization is achieved when individuals with real health needs, i.e. those recognized by medical science including both curative and preventive care, do seek care and are able to obtain the needed care from the appropriate health care facilities. Inefficient utilization of health care services can, therefore, take on several forms, namely:

1) unmet needs: individuals with real health needs either do not seek care or are unable to obtain the appropriate care;

Some evidence of possible inefficiencies in health service utilization:

- ◆ data on existence of unmet needs;
- ◆ inappropriate use of hospital facilities based on type of cases and level of care needed;
- ◆ large variations in hospital bed occupancy.

2) inappropriate use of existing health care facilities: individuals seeking care bypass lower level facilities in favor of higher level facilities even if they could be appropriately attended to at lower level facilities, resulting in under-utilized facilities at lower level and overcrowding at the higher level facilities;

3) inappropriate use of health services: individuals either fail to come for necessary follow-up consultations and treatment, or claim more services or drugs than they need, likewise, practitioners either require unnecessary follow-up consultations or require more services and drugs than their patients require, or require patients to stay longer in the hospital more than is necessary.

Data that suggest the existence of unmet needs include those already referred to earlier, i.e. data on reported deaths without medical attendance. These data suggest that a large proportion of the population who have "health needs" do not use or are unable to have the necessary health care.

Data that suggest the possible existence of the other two types of inefficiencies include the data on the leading causes of hospitalization which shows that in 1989, based on a survey of hospitals by the Philippine Medicare Commission, 84 percent of the leading causes are acute respiratory and gastrointestinal infections.⁴⁴ One could interpret such hospital use pattern as arising from either of two possibilities: 1) preventive health care and basic curative care in primary health care facilities are under-utilized leading to worsening of cases that eventually require hospitalization, or 2) hospital facilities were in fact treating cases which could have been adequately treated in primary care facilities but patients chose to bypass such facilities and proceeded directly to high level facilities for various reasons. The available data, however, do not allow a determination of which of these two possibilities represent the actual situation.

Another indicator that suggests the existence of inefficient health service utilization is the average occupancy rate of reporting DOH hospitals by category of hospitals and by region.⁴⁵ While the overall occupancy rate for all hospitals in 1989 is a respectable 82 percent, there exists wide regional variations in occupancy rates by type of hospitals, as well as variations among different hospital types within a region. For example, among regional hospitals, occupancy rates vary from a low of 65 percent in Region III to a high

Recent initiatives possibly increasing efficiency in service production through altered input mix:

- ◆ from intravenous therapy to oral rehydration therapy in treating diarrhea;
- ◆ from hospital-based care to health center-based care in treating acute respiratory infections;
- ◆ use of generic terminology in drugs;
- ◆ sharing of hospital facilities via networking.

of 111 percent in Region X. Among provincial hospitals, the occupancy rates varied from 49 percent in Region II to 118 percent in Region III. In another vein, for example, that in Region VIII, district and provincial hospitals have occupancy rates of around 65 percent, while the regional hospital in that region had an occupancy rate of 99 percent. In Region X, the occupancy rates increases as one moves from district to provincial and to regional hospitals (the occupancy rates were 71, 83, and 111 percent, respectively). The coexistence of under-utilized and over-utilized facilities is suggested by this wide variations in occupancy rates. What underlies this pattern of hospital utilization, however, is difficult to determine without additional detailed information on the operation of each hospital and the environment which it operates in the regions.

Health Service Production (Input Mix)

Increasing the efficiency of health service production requires the shift from more costly inputs to less costly inputs in the production of the same level and quality of services. Recent DOH initiatives are geared towards increasing efficiency in health service production. These initiatives include:

1) the shift in techniques of diarrheal control from relatively expensive (intravenous therapy) and sometimes ineffective (anti-diarrheal and anti-biotic) therapy to simple and low cost modern oral rehydration therapy;

2) the development of a national program for the control of acute respiratory infection involving the shift in treatment protocols for moderately-severe cases from expensive hospital-based treatment to less expensive BHS-based treatment involving midwives and the use of simple diagnostics procedure (detection of rapid breathing and chest in-drawing instead of sophisticated diagnostic tests, i.e. X-rays) and less expensive drugs (oral anti-biotic instead of intravenous anti-biotic);

3) the passage of the Generic Act of 1988 which provided for the use of generic terminology in the importation, manufacture, distribution, marketing, advertising and promotion, prescription and dispensing of essential drugs. The use of generic terminology of drugs is designed to help reduce health care expenditures due to drugs, which is a major component of total health expenditures, by giving consumers greater choice in the purchase of drugs and thereby promoting price competition among suppliers of drugs; and

4) networking activities among hospitals to minimize duplication of facilities and to fully utilize existing capacities (both personnel and facilities). Although this initiative has yet to be fully evaluated, one would expect that this initiative would indeed promote greater efficiency in the use of existing hospital resources, both public and private. That favorable results are in fact being achieved even if they cannot be readily quantified can be inferred from the recommendations of segments of the health community, particularly in the private sector, to expand networking activities among hospitals.

There are, however, certain indicators that suggest that the health sector may be operating at lower efficiency levels than could otherwise be the case in spite of limited resources, or at least suggest a need for closer examination to see if greater efficiency can be achieved by modifying input mixes. These indicators include the trend in DOH expenditures by input categories; staffing patterns in hospitals of various types; and the cost structure of private and public hospitals as inferred from a sample of Medicare claims. Each is discussed in turn.

Since the production of health services is a highly labor-intensive activity, it is expected that expenditures

for personal services will figure prominently in the overall cost of production. However, to be effective, health personnel must be complemented with other inputs, i.e. drugs, supplies and materials, and transportation. Data reveal that the DOH expenditures for maintenance and operating expenses was 56 percent in 1985 and 1986.⁴⁶ This percentage dropped to 51 percent in 1987, but rose again to 56 percent in 1988. However, in 1989, the percentage declined to 47 percent. In contrast, expenditures for personal services was maintained at about 38 to 40 percent of total expenditures during the period, while expenditures for capital outlays rose from 6 percent in 1985 to 13 percent in 1989. The rather sharp drop in expenditures for maintenance and operating expenses in 1987 and the sharper drop in 1989 are likely to have affected the effectiveness of DOH personnel in delivering health care given that the lack of medicines and means transport, among other operating expenditures, have been perennial problems.

A reduction in production efficiency can further be expected from budget cuts in the 1991 DOH budget wherein the agency, as well as other agencies of government, were given very little flexibility in choosing the items of expenditures to be cut. This has been particularly lamented by the current leadership at the DOH because they recognized that efficiency can still be maintained at a lower budget level by altering the resource mix of the reduced budget to finance higher

Management and operational practices can significantly affect quantity and quality of health services under any given level of resource allocation.

priority activities, rather than being forced administratively to cut expenditures across all items.

Assessing the efficiency of production at the facility level is not possible due to the absence of reliable information on the cost structure of production. Hospitals, both public and private do not have well-developed and maintained information system that can access cost of inputs by category in the production of different quantities of specific services. It is now generally accepted among DOH officials that cost studies are needed. Thus cost studies, particularly of hospital services, were included in the research agenda under the DOH-PIIDS project designed to provide baseline information on the operation of the health sector.

In view of this situation, data on actual hospitalization cost per item of hospitalization for both private and public hospitals based on a large sample of Medicare claims do not really reflect the cost structure of either private or public hospitals.⁴⁷ The reason is that the data are essentially claims to Medicare reimbursement. Hence, such claims would tend to follow the benefit structure of Medicare, i.e. the cost of each item of hospitalization that is reimbursable by Medicare. Since the Medicare claim structure is the same for both private and public hospitals, it is not surprising that both types of hospitals would exhibit identical "cost structures". Thus we are still far from being able to assess the efficiency of hospital service production. It is important to note that the claim structure of Medicare, if it itself is not based on actual cost structures that might be considered efficient, could in fact reinforce existing production inefficiencies by encouraging health care providers to use inputs that maximizes the amount of reimbursement rather than inputs that minimizes the cost of the health services provided.

Possible signs of inefficiencies in health service production:

- ◆ sharp drop in maintenance and other operations expenditures in DOH budget;
- ◆ across the board budget cuts;
- ◆ absence of information to assess facility-based efficiency;
- ◆ variations in manpower to bed ratio.

Another set of indicators that might reveal clues into the efficiency of production is the staffing patterns of hospitals by category of hospitals.⁴⁸ The variations in the mixes between health personnel and facilities (manpower to bed ratios) and between different manpower categories either by type of hospital or by region point to the question of what is a more efficient mix than what is currently prevailing. The question, however, cannot be answered just by looking at the data on staffing patterns without at the same time relating these data to more detailed information about patient loads, case-mix, and other indicators of output.

Management and Operations

It is generally recognized that in spite of limited budgets, governments can still generate additional resources for expanding and improving the quality of health services by simply managing the resources that they now have more efficiently. Greater efficiency can be achieved by adopting management and operational procedures that ensure that the potential quantity and quality of health services that were expected from the chosen combination of resource inputs (refer to the concept of service production efficiency) are actually realized.

Management areas considered important for improving efficiency in delivery of services :

- ◆ *logistics, particularly drug supply and distribution;*
- ◆ *information systems;*
- ◆ *targetting of clients and assessing unit performance;*
- ◆ *personnel motivation and suspension;*
- ◆ *laws of decision-making (centralization-decentralization)*

There are many areas where operational efficiency can be improved. These include the areas of personnel motivation and supervision, procedures for drugs and supplies procurement, and logistics. Other areas include operational procedures for identifying target populations for service provision, and budgeting procedures. Still others include the locus of decisions-making and communication channels, i.e. what decisions are best devolved to various units of decision-making, e.g. BHS, RHU, hospitals, and what decisions are best left to central management; and how are the health needs and demands perceived at lower administrative levels communicated to upper decision making units so that resource allocation decisions are made that reflect these needs and demands?

For years, it has been commonly observed that there are a number of areas where the DOH could improve the delivery of services by improving various aspects of its management. These aspects include, among others : 1) logistics, particularly of drug supply and distribution (delays in drug distribution in addition to inadequate supplies); 2) ineffective information systems (too many forms to fill and too many reports to be submitted from lower level facilities to central management without a clear indication of how these information are being used at the central level, and without any feedback of the data compiled or analyzed to the source facility for management and operational purposes); 3) lack of information on cost of programs for budgeting purposes; and 4) crude methods for assessing the target populations and for assessing personnel or facility performance. Such observations, however, were not systematically documented, and with some exceptions, so were the initiatives undertaken to address specific management or operational problems.

Two recent initiatives of the DOH, which have attracted more attention than others, include efforts to develop a health and management information system, and efforts to develop and adopt program budgeting procedures. The first set of efforts involved a review of field reports with the view of streamlining reporting requirements from the field and of using field information for management purposes in field health facilities. It also involved developing indicators for health sector assessment at the district level. The second set of efforts involved the development of procedures for costing various inputs of specific health services and the training of DOH person-

nel to adopt such procedures in preparing budgets and relating these budgets to service targets. Both sets of efforts are still in the early stages for impact assessment.

While it is common to expect that private sector health facilities would be managed more efficiently than public sector facilities because private sector managers are governed by market incentives while public sector managers are not. However, this might not always be the case, or at least that private sector facilities may not always be managed efficiently. This view is often supported by data, again fragmentary, regarding many private hospitals incurring huge losses which might be taken to indicate inefficient management. However, there is actually very little systematic information about the management of private hospitals in terms of management goals, and investment and pricing decisions to even begin an initial assessment. It is possible, given the organization of the hospital, that the "hospital-firm" is losing but the "physician-firm" which manages the hospital is maximizing profits.

Efficiency in Health Care Financing

In view of limited government budgets and low incomes of the large majority of the population, there is increasing interest in developing alternative health care financing mechanisms. Currently, health care is financed mainly from tax revenues, social insurance through the Medicare Program, user charges, and various types of community financing schemes. Lately, prepaid schemes such as HMOs have been established. While each of these current schemes as well as others that might be developed can generate revenues for health care, some are likely to be more efficient than others. Greater efficiency can be achieved by adopting operational changes that reduce the cost of revenue collection and disbursement of funds for the same amount of funds generated for direct health care provision. The recognition of this has led to proposals to conduct a comprehensive review and study of current financing schemes with particular attention to the Medicare Program with the view of improving its efficiency at the same time expanding its health benefits and its coverage of the population. The

various aspects to be looked into include the claims processing and utilization review procedures, the organizational structure of the Program, fund management, and information systems.

One form of health care financing that has attracted so much attention because of the stress it places on self-reliance and community participation in health care delivery is community financing. This scheme, which can take on many forms, refers to contributions by individuals, family beneficiaries or community groups to support part of the cost of health care. Contributions could be in cash, in kind, or individual or family labor. By mobilizing underutilized local resources (e.g. organizational skill, and manpower) and by developing affordable and culturally appropriate delivery systems, the proponents hoped that basic health care will become universally accessible. Another reason for advocating community financing is the observation that individual households already spend substantial amounts of money purchasing both modern and traditional health services from the private sector. It is argued that redirecting such expenditures towards services that can have greater impact on health improvements will not cause additional financial burden on the population.

On the other hand, people who are skeptical about the long-run viability of community financing schemes argue that it is easy to overestimate the amount of unutilized resources in the community that could be mobilized to support health activities. One such major resource is the capacity of communities or groups to organize for a common objective. Organizational ability may indeed be the most scarce resource in many communities. If so, then the cost of organizing a community with external support can be very high. This reduces the efficiency of the scheme. Moreover, given low incomes, the amount of contributions in cash are not likely to be large nor can these contributions be sustained over long periods of times. Contributions of labor time may also be low given that the opportunity cost of time even for rural poor households may be very high relative to their total income. Further, there is the "free rider problem" to contend with. Individuals are not likely to contribute to support an activity where the benefits can be derived by everybody in the community irrespective of whether they participate or not. These individuals will think that even if they do not contribute they would still not be excluded from benefitting from the community activity. This is

true for health activities that have the characteristics of "public goods", e.g. vector control, and environmental sanitation. This free rider problem may be addressed partly by setting up a governing authority in the community to exact compliance or participation. However, this may not always be easy to do. Thus all in all, the cost of organizing the community to obtain resources for health activities might indeed be large relative to the amount of resources that can be mobilized. Under these conditions, the financial efficiency of the scheme would tend to be low. Moreover, in community insurance schemes, the population coverage is often small to be actuarially sound, and adverse selection could pose a serious problem, thus limiting the long-run sustainability of the scheme.

In the Philippines there are a number of community financing schemes of various types. A recent contest sponsored by the HAMIS project of DOI and GTZ has uncovered the fact that communities or groups of families on their own initiatives or occasionally encouraged by community influentials, have set up various schemes to finance health activities. More than a hundred of these schemes have been identified from all over the country, and those identified by the contest represent only groups who had both the time and inclination to join the contest. Thus, there may be many more such community financing schemes that have not yet been identified. However, systematic efforts to study these various com-

munity financing schemes with respect to long-run viability, sustainability, financial efficiency (and financial equity) and health impacts have yet to evolve, although some early attempts have been undertaken. Thus there is little information by which to assess these schemes from the standpoint of financial efficiency or other criteria at the moment.

Equity in Health Care Financing

Related to the question of financial efficiency in financial equity. This refers to the relative financial burden borne by different groups of the population in support of health care provision. One of the main justification for government provision of health care services financed through tax revenues is to improve equity in the use of health care services. The greatest irony is that this financing scheme can be the most regressive among financing schemes. The inequity arises from the regressive nature of the tax system. This is the case in the Philippines. A recent study on effective tax rates by income class in 1985 shows that the bottom third of the income distribution paid proportionally more of their income in taxes than the upper third, with the middle class paying the largest percentage of their income in taxes. The effective tax rates for the three broad income groups were 27, 32 and 18 percent for the bottom, middle and highest income classes, respectively.⁴⁹ This situation arises in spite of the relatively progressive nature of the income tax system from the very regressive nature of indirect taxes and the failure of government authorities to fully enforce tax collection among the higher income classes.

Data on the use of health facilities by income class obtained from the 1987 National Health Survey reveal that while the use of public sector primary care facilities decline with income, public hospitals are used equally by both the lowest and the highest income groups.⁵⁰ This means that the highest income groups which is perhaps not what was intended given that higher income groups have relatively easier access to private hospitals than the lower income groups.

Finally, it might be noted that the Medicare program while designed to improve financial access to the health care services is, given its current

Two faces of inequity in health care financing :

- ◆ *government expenditures for health are financed through taxes generated by a regressive tax system where the poor pay a greater proportion of their income as taxes than the rich;*
- ◆ *government supported hospitals are used equally by the poorest and the richest.*

limited coverage of the population, benefitting that portion of the population that on the average are better off than the population not covered. Moreover, to the extent that the Medicare contributions of private employers are passed on to consumers in terms of higher prices, the uncovered population bears the additional burden of paying higher prices for commodities and paying higher indirect taxes. Thus, in effect, a larger portion of the self-employed and unemployed population currently not covered by Medicare ends up paying a part of the medical benefits of those employed in the formal sector as well as the medical benefits of higher income groups who avail of public sector-provided health services.

Summary and Conclusions

While there exists a large body of data (although often of poor quality) dealing with many aspects of health sector, there is not one complete set of information that could be used to fully and adequately assess a specific aspect of health sector performance. This a major limitation because assessing even a single aspect of health sector performance, e.g. service structure efficiency, requires a number of inter-related indicators measured at various levels, e.g. sector level, service level, and facility level. Any gaps in information reduces the confidence we have on any conclusion that might be made on the available data.

Our review of available data shows that while there are indicators that suggest that the health sector may be operating at a lower level of efficiency

While the Philippines may be under-investing in health care services, it may be under-investing even more in other health-promoting areas like family planning, sanitation, and nutrition.

than potentially possible, we can only make a few conclusions about specific aspects of health sector performance because of major gaps in information. In fact, the information is so incomplete that we can not even make strong conclusions to support or refute the most commonly held (and intuitively plausible) views about health sector performance by the health community. The following paragraphs summarize the findings.

Intersectoral Resource Allocation. The national level of health expenditures as a percent of GNP is still lower than in other developing countries in Asia. While this might readily be taken as evidence of underinvestment in health care, it is possible that the Philippines is under-investing even more in other health-promoting activities of the other sectors as suggested by information on the declining expenditures for family planning, the continued high rates of diarrheal diseases and intestinal parasitism among children, and the continued high rates of malnutrition among children and among pregnant and lactating women.

How much additional spending should be made for health care and for other health-promoting activities would depend on how efficiently current resources are being allocated. Such information is not available for non-health sectors, and we are only beginning to look at this for the health sector.

Health Service Structure. The common perception that the health sector is inefficiently allocating resources because of its emphasis on hospital (curative) care relative to primary (preventive and promotive) care cannot be readily supported by available data. Recent efforts to improve efficiency, however, point to the fact that, ex post, the health service structure was less efficient in the past and that the potential exists for improving efficiency in the future both as a result of improvements in medical technologies and strong political and administrative will to implement known cost-effective technologies.

Access to Health Services. Several indicators, in spite of measurement problems, do strongly suggest the persistence of unequal access to health services arising from both demand (household income) and supply (health facilities) factors. Efforts to widen access through social insurance are only partially successful due to constraints imposed by the overall performance of the macroeconomy, i.e. slow economic

While the health care sector may still be inefficient in allocating resources among various types of services, there are indications that health service structure may have improved compared to the past.

transformation and rapid price increases, the latter partly resulting from the social insurance itself. Efforts are being made by the DOH to improve access through its budgetary allocation procedures and program priorities. The impact of these efforts, however, have not yet been assessed.

Service Focus. While the appropriate focus has been clearly identified, i.e. towards major health problems and towards population groups most in need of services such as the rural population and the poor as well as various age groups, the actual coverage of various services and programs has yet to be accurately determined.

Health Service Utilization. There are indications that service utilization are less efficient than what it could be. Such indications include the large proportion of reported deaths without medical attendance, the large variations in hospital occupancy rates by types of hospitals and across regions, and the leading causes of hospitalization based on Medicare cases. The underlying factors influencing less efficient utilization, however, have yet to be determined to guide the identification of concrete actions.

Health Service Production. There are indications that input mix at the aggregate level might be less than optimal. Such indications include the apparent decline in maintenance and operating expenses in DOH budgetary allocations in recent years. Moreover, the manner in which budget cuts are effected further distorts input mixes that are likely to exacerbate current inefficiencies. The recent initiatives which changed input mixes in the provision of basic services and the adoption of networking activities

among hospitals point to the fact that past input mixes and capacity utilization were less than optimal in the past and that the potential for further improving efficiency exists.

Management and Operations. There are many cases, often undocumented, that point to managerial and operational shortcomings of both public and private sector providers in the areas of logistics and information systems particularly on cost, target populations and coverage of programs. However, there is very little systematic studies on the management goals, investment and pricing decisions, and various operational modes of various providers to provide inputs into a more systematic assessment of their managerial performance.

Health Care Financing Efficiency. Further efficiency gains can be achieved through modification of management and operations of Medicare and user fees in public hospitals. A number of community financing schemes currently exist but little systematic assessment of their long-run viability and sustainability has been made.

Health Care Financing Equity. Public provision of health services financed by taxes tend to be highly inequitable because the effective tax rates are highly regressive. The Medicare programs covers only a small segment of the total population which are on the average likely to include the economically better off relative to the population still not covered by such a scheme. User charges in the private sector, without compensating pricing schemes for different income classes, tend to be regressive.

Recommendations

Side by side with the development of aggregate indicators described in NHA development, there is a need to obtain more detailed information through special studies on the following to fill some of the glaring gaps in information. These studies would include but not limited to the following list.

1) Cost-effectiveness of various public health programs as implemented on a national scale. There are enough international studies that provide basic information as to relative cost-effectiveness of various public health interventions, all of which how-

ever, are based on pilot studies. It is often the case that in pilot settings, many favorable factors come into play that tend to make the intervention produce significant outcomes. When such interventions are implemented on a wider scale, however, many of these factors, e.g. well trained and motivated health workers, effective logistics, and sufficient funding are diluted. Thus both the theoretical and the pilot-based cost-effectiveness of public health interventions may substantially differ from the actual cost-effectiveness in a larger setting. Monitoring and evaluation of on-going public health interventions implemented on a national scale such as the expanded program of immunization and the national program for the control of acute respiratory infections, among others, needed to be undertaken. The findings from such studies could provide information useful both for assessing service structure efficiency and production efficiency and for refining program operations to achieve greater cost-effectiveness of the interventions.

2) Coverage rates of various public health programs. The information based on field health service reports that are currently collected on a regular basis refer only to the cases seen by public sector facilities in their respective catchment areas. They do not include cases seen by other providers operating within the catchments areas nor of treatments received by residents in the catchment areas from providers, mostly private, outside the catchment areas. As such, the field service information cannot be used to estimate coverage rates of services provided by all types of health providers. There is a need both to tailor the national health surveys and to undertake small area surveys from time to time to obtain these types of information at the household level. When supplemented by information on the number and types of health facilities and personnel operating in the area, and the socioeconomic characteristics of households, it will be possible to analyze both coverage and bias in the provision of health services. Likewise it will be possible to identify more accurately the appropriate target populations for more intensive health service provision. Thus such information could help make assessments of health sector performance in terms of service focus and access equity.

3) determinants of health service utilization. Assessment of the efficiency of health service utilization is difficult due to the problem of disentangling the many factors affecting utilization, i.e.

New infrastructure needs:

- ◆ *cost-effectiveness studies of various public health programs implemented nationally;*
- ◆ *coverage rates of various public health programs;*
- ◆ *determinants of health service utilization;*
- ◆ *cost structures of hospitals.*

various demand and supply factors. There is a need to undertake more systematic utilization studies, starting from analysis of existing national health surveys matched with socioeconomic information available in labor force surveys (this is possible for the 1987 National Health Survey and the 1987 round of labor force survey). Further information gaps which would invariably include information on prices could then be obtained from special surveys designed for the purpose. The information to be generated from these activities would be useful directly for assessing utilization efficiency, i.e. for uncovering factors affecting "unmet needs", under-utilization of service capacity in certain facilities, and overcrowding in others, as well as for assessing the likely impact of alternative health care financing schemes on utilization behavior.

4) Cost structures of hospitals. The largest user of health care resources are hospitals of various types, yet we have very little information on how efficiently hospitals are utilizing resources. Systematic studies on the costs of hospital service production need to be undertaken based on economic concepts. Initially a small sample of public hospitals might be studied at the same time that information systems are developed to identify, record and retrieve cost information for analytical and managerial uses. Then the sample can be extended to private hospitals. Finally, experiments involving changing input mixes might be undertaken to see how such changes affect both the quantity and quality of hospital services produced for given levels of available resources.

Policy Simulations

Introduction

There have been a number of health sector financing simulation models developed and applied to other countries, but such a model has not yet been developed for the Philippines. Because of the wide range and mix of public and private sector health providers and risk-sharing schemes in the Philippines, and the lack of detailed or aggregate private sector data, simply applying health financing simulation models developed for other settings to the Philippines is problematic. In addition, more sophisticated simulation models require extensive data on both the demand and supply sides of the public and private sectors, and can not be used for health care financing analysis in the Philippines at the same

time. Future development of the NHA data base will allow the development of a more complete simulation model.

The simulation model used for this study is a modification of a model developed by the World Bank, the Health Finance Simulation Model (HFSM).⁵¹ The model essentially involves sets of accounting relationships describing the cost of delivering services by the public supply side of the health sector. It was chosen for this study primarily because the data required for its operation came close to matching the NHA data available. Even so, the model required substantial modification for the application to the Philippine setting.

The current version of the model can be viewed as the cornerstone of a larger, more complete, Philippine Health Sector Financing Model (PHFSM) to be developed under the

HFD Project and related research efforts. Most importantly, to provide a truly accurate representation of the total Philippine health sector, several major components of the demand and supply sides of the health sector must be added in future development work, including, but not limited to:

- 1) private sector supply side;
- 2) private sector demand, including demographic factors such as the age-sex distribution of the population, and epidemiological factors;
- 3) own-price and cross-price elasticities that account for shifts between alternative public and private health care providers;⁵²
- 4) exogenous macroeconomic factors that influence both the demand and supply sides of the health care market;
- 5) linkages between the major input and output components of the health care market.

FIGURE 6.1 ● PATIENT BUDGET, BY TYPE OF CARE (BASELINE)

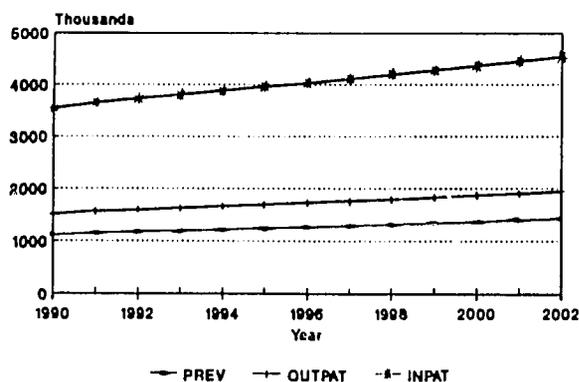
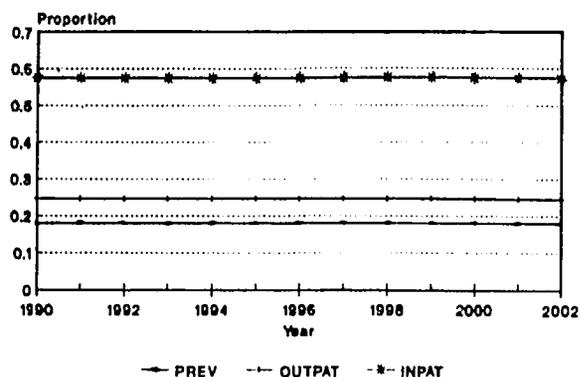


FIGURE 6.2 ● DISTRIBUTION OF PATIENT BUDGET (BASELINE)



In order for any model to be useful for policy simulation greatly depends on the completeness and quality of the data. The current version of the model and the simulation exercises in this study are severely hampered by the data restrictions discussed earlier. The future modeling effort to add the major components listed above must be closely coordinated with future NHA data collection to ensure that data requirements for a more complete PHISFM are met.

In the current version of the model, health care services (preventive, outpatient, and inpatient services) are a function of an exogenous DOH budget (the only independent variable in the model) and unit costs. Thus, even with this limited version of the model, it possible to simulate the effect of changes in the size of the DOH budget and the proportional share of its various components. The DOH budget may be increased either through a larger allocation from the national government, or through increases in user fees.

The model predicts and graphically illustrates for each of the next twelve years:

- 1) the DOH patient budget by preventive, outpatient and inpatient care;
- 2) the proportional distribution of the DOH patient budget by preventive outpatient, and inpatient care;
- 3) expenditures per unit of patient care by preventive, outpatient and inpatient care; and
- 4) the ratio of patient services to population; by preventive, outpatient and inpatient care.

Baseline Projections

Data from the NHA were used to give a fairly accurate representation of the current structure of public health sector financing in the Philippines, and to establish baseline projections from which to compare simulated changes in health care financing. Several assumptions were necessary to establish the baseline projections:

- 1) the beginning year for the model is 1990, and projections are for twelve years ending in 2002;
- 2) rates of growth, including those for the DOH budget and all prices of inputs (wages of health personnel, drugs, administrative expenses, etc.) are set initially at 2.0 percent per year; the rate of growth of the population is

assumed to be 2.3 percent (the average rate in recent years);

3) a standardized unit of measurement is required for each of three types of services, and are defined as follows:

a) preventive care : the annual number of immunizations administered by the public sector,

b) outpatient care : the annual number of outpatients treated by the public sector,

c) inpatient care : the annual number of patient days in public sector health facilities;

4) the proportion of the curative hospital budget devoted to inpatient care is set initially at 70 percent and the proportion of outpatient care is set initially at 30 percent;

5) the salaries of doctors, nurses, medical technicians, and other medical workers are the weighted average of the number of personnel in various salary grades; and

6) public sector user fees are imbedded in the current DOH budget and expenditure pattern so that simulated changes in fees are changes at the margin.

The baseline case from which simulations of changes are performed is illustrated by Figure 6.1, 6.2, 6.3, and 6.4.

Figure 6.1 illustrates the total DOH budget growing at the assumed 2 percent rate for each of the three types of patient care included in the model (preventive, outpatient, and inpatient care) over the projected 12 year time horizon.

Figure 6.2 simply shows the proportional share of the DOH budget for each type of patient care. In the

FIGURE 6.3 ● EXPENDITURES/UNIT OF SERVICE (BASELINE)

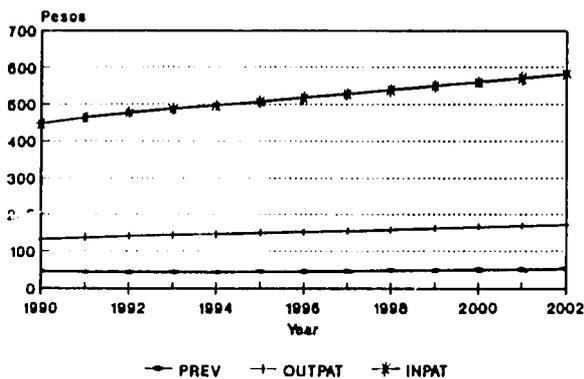
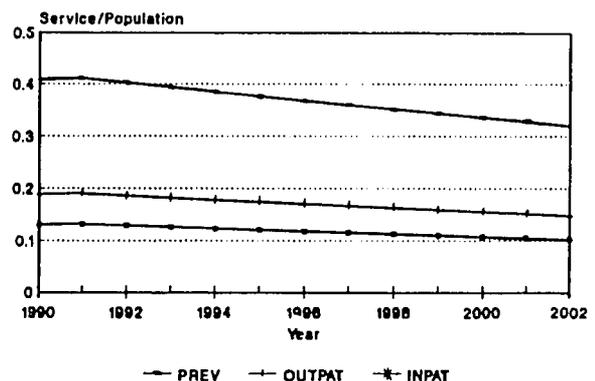


FIGURE 6.4 ● RATIO OF SERVICES TO POPULATION (BASELINE)



baseline case, the proportional shares are assumed to remain constant over the projected time period.

Figure 6.3 shows the time trend for DOH expenditures per unit of preventive, outpatient, and inpatient services. Because the DOH budget and input costs all are assumed to grow at 2 percent per year, per unit expenditures illustrate the same growth rate.

Figure 6.4 shows the effect of population growth on the provision of DOH patient services. Note that even though the rate of growth of the population is nearly identical to the rate of growth of the DOH budget,

prices of inputs also are growing at this same rate. Thus, few additional units of services may be provided, and the ratio of each service (immunizations, outpatient, and inpatient) declines over time as the population increases.

Conversely, the clear implication of the simulation results shown in Figure 6.4 is that resources directed toward decreasing the rate of growth of the population can have a positive effect on health service ratios. Decreases in the fertility rate effectively allow for greater coverage rates of preventive, outpatient, and inpatient health care services.

Increasing the DOH Budget

As an example of the effect of additional GOP resources devoted to the public health sector, the model is used to simulate the effect of increasing DOH's percentage share of the total GOP budget. Similar results are obtained with the model if increases in user fees are increased to increase the size of the DOH budget.

In 1990, the DOH share of GOP

FIGURE 6.5 ● PATIENT BUDGET BY TYPE OF CARE

INCREASE DOH BUDGET

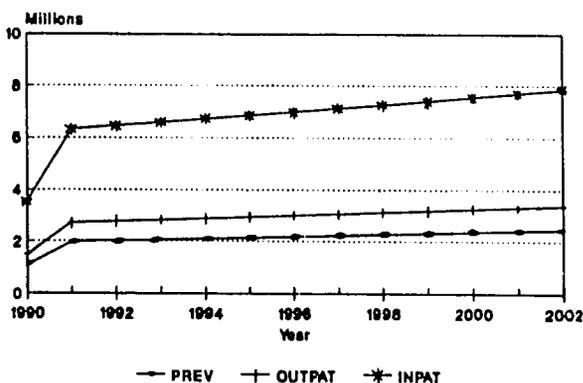


FIGURE 6.6 ● DISTRIBUTION OF PATIENT BUDGET

INCREASE DOH BUDGET

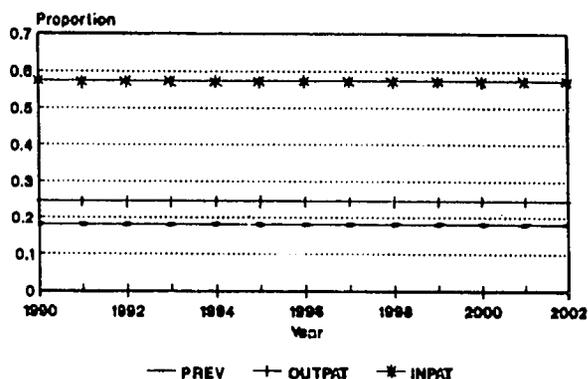


FIGURE 6.7 ● EXPENDITURES UNIT OF SERVICE

INCREASE DOH BUDGET

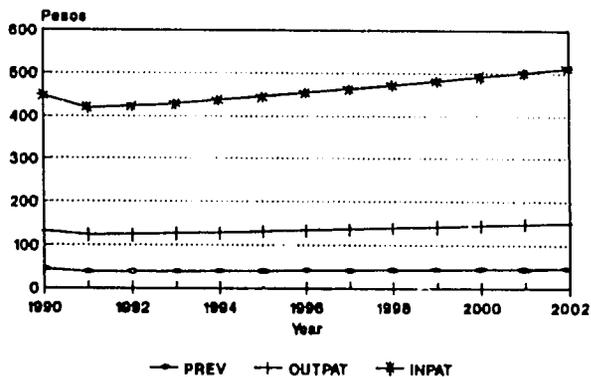
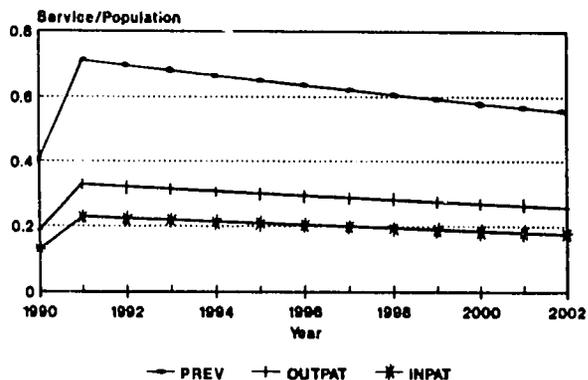


FIGURE 6.8 ● RATIO OF SERVICES TO POPULATION

INCREASE DOH BUDGET



resources was P7.731 billion, or 3.38 percent. The HFSM model was used to simulate the effect of increasing this share to 5 percent, or P12.285 billion. The results of the simulation are illustrated in Figures 6.5, 6.6, 6.7 and 6.8.

A comparison between Figure 6.5 and the baseline case shown in Figure 6.1 reveals that the patient budget by type care increases dramatically from the relatively large increase in the DOH budget, and then assumes the baseline growth rate in succeeding years.

Because resources are not assumed to be re-allocated within the DOH budget in this example, Figures 6.2 and

6.6 show an identical distribution of patient services.

Compared to Figure 6.3, the baseline case, Figure 6.7 illustrates that expenditures per unit of services decrease initially, and then resume the baseline growth rate. Because more immunizations, outpatients and inpatients can be served with a larger DOH budget, and the budget increase is larger than the baseline growth rate of inputs and costs, per unit expenditures decline initially.

Figure 6.8 shows that much larger service to population ratios can be achieved for all services over the

projection period with the larger DOH budget when compared to those shown in Figure 6.4. As the population continues to grow, the large initial gains are somewhat moderated.

Reallocating Resources

As an example of the effects of shifting DOH resources toward one of the three types of health

FIGURE 6.9 ● PATIENT BUDGET BY TYPE OF CARE
INCREASE PREVENTIVE CARE

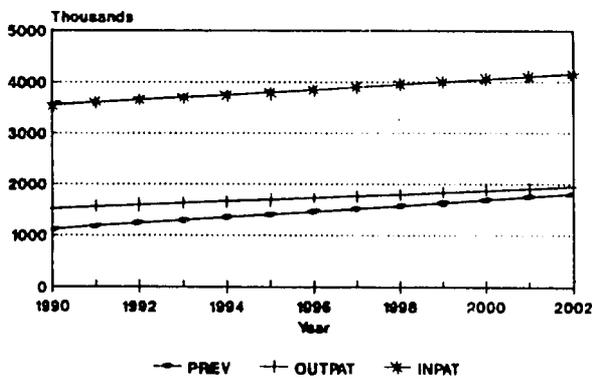


FIGURE 6.10 ● DISTRIBUTION OF PATIENT BUDGET
INCREASE PREVENTIVE CARE

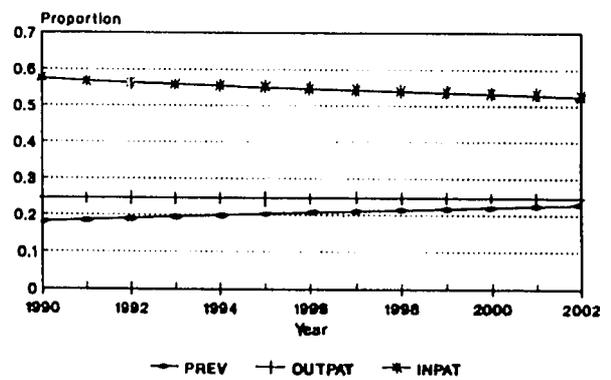


FIGURE 6.11 ● EXPENDITURES UNIT OF SERVICE
INCREASE PREVENTIVE CARE

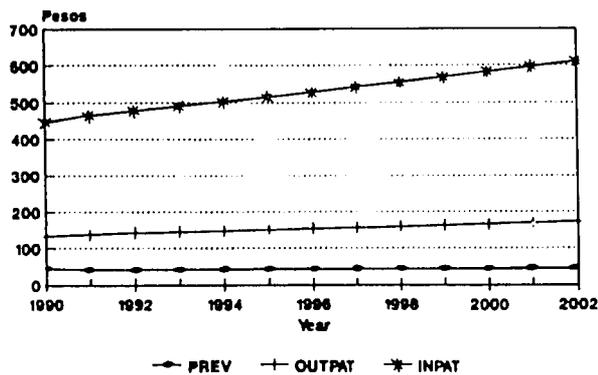
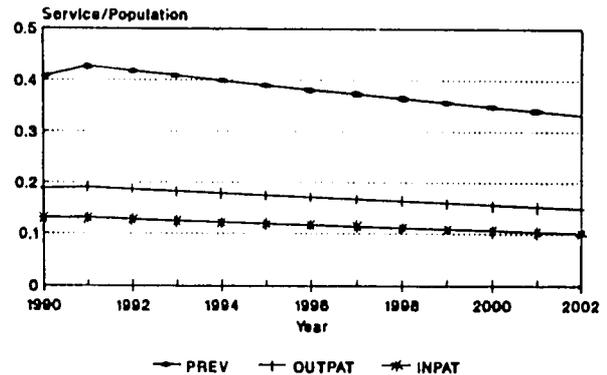


FIGURE 6.12 ● RATIO OF SERVICES TO POPULATION
INCREASE PREVENTIVE CARE



services, a shift toward preventive care is simulated. Given that the baseline assumptions include an increase of 2 percent growth in the DOH budget each year, a larger portion of the share of the increase is allocated to preventive care. The effects of slowly shifting future DOH budget increases toward preventive care is illustrated in Figure 6.9, 6.10, 6.11, and 6.12.

Figure 6.9 illustrates that the amount of the DOH budget allocated to preventive can be increased over time without seriously compromising the resources devoted to other types of health care. By the end of the projection period, the amount of the budget devoted to preventive health care approaches that of outpatient care, but the budget of both inpatient and outpatient care increase over the time frame.

Figure 6.10 shows that while the actual amount of the budget devoted to each of the three services increases over time, only the proportion of the budget devoted to preventive care increases, while that of outpatient and inpatient care decline relative to what they would have been without the reallocation (Figure 6.2).

Expenditures per unit are largely unaffected by the gradual shift of resources toward preventive care relative to

the baseline scenario, as shown in Figure 6.11 and compared to Figure 6.3.

Similarly, the decline in the ratio of services to population due to population growth shown in Figure 6.12 is virtually the same as that illustrated in the baseline graph, Figure 6.4.

Future Simulation Possibilities

The simulations demonstrated above illustrate two basic types of policy changes that are possible with the model in its present form, namely: 1) exogenous changes in the size of the DOH budget, either through increases from GOP, or increases in fees; and 2) changes in the allocation of DOH resources to the three types of patient care currently included in the model.

With program modification and more data, the model could be adapted to simulate policies for achieving specific output goals (number of immunizations, number of outpatients, number of inpatient days) and calculate the budgets required for achieving these goals. Clearly, any increases in

outputs will require increases in the DOH budget, but with modification the program could calculate the rate of growth in the budget required to achieve output goals to be phased in over time.

Efficiency gains that decrease the unit costs of providing services could be simulated by integrating the DOH budget, prices of inputs, and production functions or, conversely, by setting target level of services the model could be adapted to calculate required efficiency gains. Similarly, by changing input prices (salaries of personnel, administration, drugs, other materials) the budget implications could be examined.

Major program modification and a large amount of detailed data is necessary to fully integrate the private demand and supply sides of the health sector. When completed, these modifications would allow simulations of the effects of such policies as privatization of public health facilities, exogenous macroeconomic shocks to the Philippine economy, changes in behavior in the choice of public versus private health care services, and the effect of changes in public (private) fees on the demand for private (public) health services.

■

Notes

- 1 The Health Finance Simulation Model, also known as the HEALTHFISIMO Model, was developed at the World Bank by Manuel Zymelman in 1989.
- 2 Data on macroeconomic indicators are contained in Vol. II Section 1.
- 3 Data for Figure 2.1 are contained in Volume II, Section 1, Table 1.1.
- 4 Data for Figure 2.2 are contained in Volume II, Section 1, Table 1.5.
- 5 Data for Figure 2.3 are contained in Volume II, Section 1, Table 1.7.
- 6 The poverty line in the Philippines is defined as P2709 per month for a six-person household in 1988. See Volume II, Table 1.11 for poverty thresholds and incidence in 1985 and 1988 for the Philippines as a whole, and by region.
- 7 Data on health and population are contained in Volume II, Section 2.
- 8 There are conflicting data on health status indicators, depending on the source of information. See Volume II, Section 2, for estimated trends on morbidity and mortality, leading causes of death, average life expectancy at birth, infant mortality rates, and other health status indicators from various data sources. See also Volume I, Section 5, Health Sector Performance, for analysis of the relationship between health status and health resources.
- 9 See Volume II, Section 2, Table 2.5.
- 10 See Volume II, Section 2, Table 2.1.
- 11 See Volume II, Section 3, Tables 3.2, 3.23, and 3.24.
- 12 See Volume II, Section 3, Table 3.11.
- 13 Source data for Table 2.1 are contained in Volume II, Section 3, Table 3.21.
- 14 Average number of beds shown in Table 2.2 are calculated from data given in Table 2.1.
- 15 Data on health facilities are contained in Volume II, Section 3.
- 16 See Volume II, Section 3, Table 3.6.
- 17 See Volume II, Section 3, Table 3.8.
- 18 Data for Figure 2.4a and Figure 2.4b are contained in Volume II, Section 4, Table 4.8.
- 19 Data on health personnel are contained in Volume II, Section 4.
- 20 Professional Regulation Commission, as reported in CRC *Health Care Factbook*, 1990.
- 21 See Volume II, Section 4, Table 4.2.
- 22 See Volume II, Sections 5 and 6.
- 23 It should be noted that it would be incorrect to count health insurance premiums in addition to health insurance benefits as expenditures made by the private sector. Health insurance premiums are paid into a pool from which benefits are drawn for actual health care received. Premiums in excess of benefits are held in reserve for future health care liabilities, and to pay the costs of administration.
- 24 A similar argument could be made for private health insurance benefits. It is likely, however, that the large majority of individuals who have private health insurance use private health care sources, rather than public sector sources.
- 25 Family health expenditure values were derived from data included in Volume II, Section 5, Table 5.1. Private health insurance data are contained in Volume II, Section 7, Table 7.4.
- 26 Compulsory health insurance benefit data for 1981-1988 are contained in Volume II, Section 7, Table 7.4.
- 27 See Volume II, Section 6, Table 6.9. Public sector health expenditures include national and local government spending, and foreign loans and grants.
- 28 Data for GOP health expenditures are contained in Volume II, Section 5, Table 5.25.
- 29 Data on pharmaceutical sales are contained in Volume II, Section 5, Tables 5.7, 5.8, 5.9, and 5.10.
- 30 Family health expenditure data are contained in Volume II, Section 5, Tables 5.1, 5.2, 5.16, and 5.17.
- 31 Data on family planning expenditures are contained in Volume II, Section 5, Tables 5.3, 5.4, 5.5, and 5.6.
- 32 Financing data for the public health sector for the years 1981-1989 are contained in Volume II, Section 6, Table 6.9.
- 33 Data on public sector health financing are contained in Volume II, Section 6, Table 6.9.
- 34 See Volume II, Section 6, Table 6.9.
- 35 Exceptions include 1) Medicare reimbursements for professional fees which are distributed among hospital employees according to a certain formula; and 2) income from the sales of pharmaceuticals which goes into a revolving drug fund.
- 36 The health insurance section draws heavily on the work of Rhais Gamboa in a companion background report for HED project development. For more detail, see Gamboa, Rhais M., "Background Paper on Health Insurance in the Philippines," Draft Report, USAID Contract No. 389-0249-C-00-1089-00, May 1991.
- 37 Data on the Medicare Program are contained in Volume II, Section 7.
- 38 See Herrin, A. and M. Bautista, "Determinants and Consequences of Health Improvements in the Philippines," in PIDS Survey of Research, Volume 3, Manila: PIDS, 1989, for a review of studies in the Philippines.
- 39 Solon, O. "The Impact of Housing Policies on the Health Status of the Urban Poor," PIDS-IIHP Project Report, 1988.
- 40 International Commission on Health Research for Development, *Health Research: Essential Links to Equity in Development*, 1990.
- 41 See Volume II, Section 6, Table 6.5.
- 42 See Volume II, Section 7, Table 7.2.
- 43 See Volume II, Section 4, Table 4.2.
- 44 See Volume II, Section 2, Table 2.5.
- 45 See Volume II, Section 3, Table 3.6.
- 46 See Volume II, Section 6, Table 6.17.
- 47 See Volume II, Section 8, Table 8.10.
- 48 See Volume II, Section 4, Tables 4.4 to 4.7.
- 49 World Bank, *Philippines: The Challenge of Poverty*, 1988.
- 50 See Volume II, Section 4, Table 4.8.
- 51 The Health Finance Simulation Model was developed at the World Bank by Manuel Zymelman. Details of the original model and its operation are given in *The Health Finance Simulation Model: User's Manual and Program Diskette*, World Bank, 1989. The HFSM is essentially a utility program designed for use with Lotus 1-2-3 on IBM-compatible personal computers with a minimum of 640K memory.
- 52 While there has been some research on own and cross price elasticities of demand for certain types of health services in the Philippines (see, for example, Schwartz, J. Brad, John S. Akin, and Barry M. Popkin, "Price and Income Elasticities of Demand for Modern Health Care: The Case of Infant Delivery in the Philippines," *World Bank Economic Review*, Vol. 2, No. 1, (January), 1988, pp. 49-76.), these parameters have yet to be integrated into a simulation model of this type.