

**Micro Impacts of Macroeconomic
Adjustment Policies on Health,
Nutrition and Education**

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Micro Impacts of Macroeconomic Adjustment Policies on Health, Nutrition and Education

*Alejandro N. Herrin**

I. Introduction

This paper describes a framework for analyzing the micro-level impacts of macroeconomic adjustment policies on health, nutrition and education. In developing the framework, we drew upon the existing body of economic theory and the insights obtained from the empirical work of others (see e.g., Behrman 1990 for a comprehensive review of theoretical issues and empirical evidence). Using the framework as an organizing tool, we examined existing data and analyses for their usefulness in assessing micro-level impacts, and to determine what additional work needs to be done to obtain the necessary information for impact assessment. Section 2 describes a framework for analysis while Section 3 presents selected data that illustrate the types of information needed to make an assessment based on the framework. Section 4 outlines areas for further research.

II. Analytical Framework

A. *Basic Structure*

The framework, summarized in Table 1, may be described as follows. Macroeconomic adjustment policies implemented through a set of instruments directly affect key macroeconomic variables such as the interest rate, exchange rate, wages and prices as well as government revenues and expenditures. Changes in these key variables affect macroeconomic processes, namely, the supply and demand in various markets (labor and other factor markets, goods and services markets), on the one hand, and the public provision and financing of goods and services particularly in the area of health, nutrition and education, on the other. These processes determine the macroeconomic outcomes of employment and output in both private and public sectors and the overall price level.

Within this macroeconomy are individual economic decisionmaking units, in particular households. Households obtain their incomes from the sale of labor and from the use of other household assets. They also face prices for various goods and services. The prices facing households are broadly defined to include the total costs to an individual or household of goods and services supplied by either private producers or by a government agency (Behrman 1990). The total price of a good or service includes not only the money price that the household pays the provider, but also the transportation costs and the value of travel time and waiting time needed to obtain the good or service. The total money price for health services is reduced if the household has health insurance coverage. For educational

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Table 1

Analytical Framework for Assessing the Micro Impact of Macroeconomic Adjustment Policies on Health, Nutrition and Education

Macroeconomic Adjustment Policies	Macroeconomic Processes and Outcomes	Economic Outcomes Facing Households	Household Choices	Human Capital Outcomes
<p><i>Policies on:</i></p> <p>External debt Exchange rate Fiscal and monetary Wage and prices Trade</p> <p><i>Policy instruments affecting:</i></p> <p>Interest rate Exchange rate Wages and prices Government revenues and expenditures</p>	<p><i>Macro processes:</i></p> <p>Operation of:</p> <p>Labor and other factor markets</p> <p>Goods and services markets</p> <p>Public provision of goods and services</p> <p><i>Macro outcomes:</i></p> <p>Employment</p> <p>Output</p> <p>Prices</p> <p>Level and distribution of public goods and services</p>	<p><i>Income:</i> (Returns to labor and other assets)</p> <p>- by source: (wage, rent, interest, profit)</p> <p>- by type of household</p> <p>- by family member contributing</p> <p><i>Prices</i> (Total cost to an individual or household of goods and services)</p> <p>- by type of cost and other influences (money price, transport cost, travel time, waiting time for service; insurance coverage, scholarships and tuition subsidies, food subsidies)</p> <p>- by type of household</p> <p>- by household member affected</p>	<p><i>Human capital production inputs:</i></p> <p>Health service utilization (preventive and curative)</p> <p>Sanitation</p> <p>Dietary/Nutrient intake</p> <p>School participation</p> <p><i>Other choices:</i></p> <p>Fertility and family size</p> <p>Work participation of family members</p> <p>Migration of household or family member</p>	<p><i>Health</i></p> <p>Mortality Morbidity</p> <p><i>Nutrition</i></p> <p>Growth failure Micronutrient deficiency</p> <p><i>Education</i></p> <p>Literacy and functional literacy</p> <p>Schooling attainment</p> <p>School achievement</p>

services, the money price facing the household is reduced if their children receive scholarships or tuition subsidies. For nutrients, the money price facing the household is reduced if it receives food subsidies.

To maximize household welfare subject to income and prices, households make a variety of decisions. In the area of human capital formation, households make choices regarding inputs that produce health, nutrition and education. These inputs include health service utilization, investments in sanitation, nutrient consumption and school participation. With respect to the measures of human capital outcomes, we use common indicators such as: for health, mortality and morbidity; for nutrition, growth failure and micro-nutrient deficiencies; and for education, literacy and functional literacy, schooling years completed, and school achievement (i.e., the amount of learning achieved in school as revealed by scores in standard tests).

The major feature of this framework is its structure in terms of a series of processes and outcomes. One could start with the process of policy formulation leading to the choice of policy instruments. The implementation of the policy instruments affect basic policy outcomes: relative prices and government revenues and expenditures. These initial policy outcomes affect basic economic processes such as the operation of private markets and the provision of public goods by government agencies. These processes work themselves out to produce the macroeconomic outcomes of employment, output and prices. At the household level, these outcomes are seen as incomes of and prices facing households. These economic outcomes in turn affect another set of processes at the household level, namely the decisions regarding human capital inputs and other choices designed to improve household welfare. These decisions eventually influence the human capital outcomes of health, nutrition and education.

The framework emphasizes the importance of two sets of information required for assessing impacts: (1) accurate and detailed measures of outcomes, and (2) identification of the numerous interacting processes involved in producing these specific outcomes. The first would tell us how the impacts manifested themselves, if at all, while the second tells us why the impacts manifested themselves in the way they did. The first would tell us *what* potentially adverse impacts of macroeconomic adjustment policies to avoid; the second would tell us *how* to avoid such potentially adverse impacts by choosing the appropriate mix of policy instruments. This second set of information is clearly important because our interest is not only to see whether policies have adverse (favorable) impacts but also, and more importantly, to see how these policies resulted in more adverse (favorable) impacts so that we can fine-tune existing policies this time or design better policies next time. This is really where the practical contribution of impact assessment comes in.

B. Outcomes and Processes: Macro and Micro Levels

Macro Level. At the macro level, we have a particular set of processes and outcomes. The first is the process of policy formulation that includes the choice of policy instruments. The implementation of these instruments affects the economic processes in the macroeconomy leading to real outcomes in terms of employment, output and prices. While we often think of macroeconomic outcomes in terms of aggregates and we routinely measure them as such, macroeconomic outcomes manifest themselves differently among different households depending on (1) the nature of the macroeconomic processes involved as influenced by policy; and (2) the extent to which specific households participate in such processes as influenced by their initial preferences, endowments and characteristics.

The nature of the processes involved and the extent to which households participate in these processes determine (1) which income component (wages and returns to land and capital that households own) is affected more than others; (2) whose household income is affected more than others (poor households versus rich households, urban households versus rural households; and, (3) within the household, which family member's income is affected more than others (husband versus wife, children versus adults, male versus female). Similarly, the nature of the processes involved and the extent to which households and their members participate in these processes determine (1) which component of price is affected more than others (money price versus time price); (2) what type of households are affected by such price changes more than others (rich versus poor, urban versus rural); and (3) which among family members is affected by such price changes more than others (children versus adults, male versus females). In this phase of the analysis, it is important to consider the processes involved as well as the characteristics of the participants because both determine the household level economic outcomes (income and prices) serving as the starting point for the subsequent micro-level analysis.

To illustrate, suppose the intermediate policy objective is to reduce the budget deficit. This could be achieved either by reducing government expenditures or by increasing tax revenues, or both. The increase in tax revenues could be achieved by increasing the tax rates or by improving tax compliance. Each of these policy instruments can have different impacts on the incomes of and prices facing different households. Suppose the means used is to reduce government expenditures. The effect of this on households would depend on what part of expenditure is reduced and how it is reduced. Suppose further that the decision is to reduce expenditures for social services, in particular health, more than the other components of government expenditures. The effect of this reduction would again depend on both the extent and the manner of the cut. If, for example, expenditures for drugs and transportation allowances of field workers are reduced more than the other components of the health budget, then the price (total cost) of health services facing poor households in rural areas is likely to increase more than the cost of health services facing rich households in urban areas. Suppose that the same reduction in budget deficit is achieved (perhaps with great effort) by improving tax compliance. It is not difficult to imagine an entirely different (more equitable) set of outcomes arising from the use of this alternative policy instrument.

There can be as many outcomes as there are combinations of specific means to effect a particular policy and distribution of households according to initial economic and social characteristics. A highly aggregative analysis is likely to hide the varied impacts on different households. Knowing the specific ways in which a policy action is carried out, and the characteristics of the population likely to be affected, will provide a firmer basis for assessing the socioeconomic impacts on households of government policies. Thus, we need to (1) disaggregate income data by sources of income of various categories of households; (2) document prices of various health, nutrition and educational inputs facing various households, including non-monetary costs; and (3) document the specific ways in which a particular policy package is actually implemented.

Micro Level. The changes in income of and prices facing households (particularly for human capital inputs) are the starting points for our micro-level phase of the analysis. The task is to relate these changes in income and prices to changes in human capital outcomes, i.e., health, nutrition and education. To do this, we need two sets of additional information. The first set consists of measures of human capital outcomes, and the second consists of measures of human capital inputs which households choose depending on their incomes and the prices they face with respect to these inputs. This second

set of variables, which are subject to household choice, is the one that links changes in income and prices to changes in human capital outcomes. In other words, changes in income and prices affect human capital outcomes only through their impact on these variables. We shall call these variables as the proximate determinants of human capital outcomes (See Mosley and Chen 1984; Schultz 1984; and Da Vanzo and Gertler 1991).

There is obviously a need to define and measure a set of human capital outcomes if we are to assess the impact of macroeconomic adjustment policies on such outcomes. Conventional measures of these outcomes are useful starting points. Thus, as earlier pointed out, health status can be measured in terms of morbidity and mortality rates; nutritional status can be measured in terms of growth failure and micro-nutrient deficiencies; and education can be measured in terms of literacy and functional literacy rates, educational attainment (number of years of schooling completed) and learning achieved in school as indicated by scores in standardized tests (e.g., achievement tests in specific subjects such as Mathematics, English and Filipino, or national tests such as the NCEE).

A major consideration in analyzing impact on human capital outcomes is determining the distributional aspects of such impact. In other words, we are interested not only in changes in aggregated measures of human capital outcomes for all households but also in changes in human capital outcomes for specific households (poor versus rich, urban versus rural) and specific members of such households. In the latter case, we want to find out (1) whose health is affected (children versus adults, male versus female, youth versus elderly) and the cause of morbidity and mortality (communicable versus degenerative diseases); (2) whose nutritional status is affected (children versus adults, males versus females) and the type of nutritional deficiency (dietary insufficiency versus micro-nutrient deficiency); and (3) whose schooling is affected (males versus females, younger versus older siblings) and the type of schooling affected (formal versus non-formal and basic education versus higher education). We are interested in disaggregated measures of human capital outcomes because they can reveal changes that might otherwise be masked by aggregation. Moreover, they can reveal more clearly than aggregate measures different types of problems with different short-term and long-term implications. For example, reduced access to basic education would have different implications than reduced access to higher education.

The second set of additional information relates to the intermediate processes that link changes in the income of and prices facing households and the human capital outcomes of interest. Here, the growing body of theoretical and empirical literature provides strong basis for identifying such key processes. (For a review of studies in the Philippines, see Herrin and Bautista 1989 for health; Herrin 1990 for nutrition; and Paqueo 1987 for education). For health, the effect of income and prices is mediated by changes in health services utilization and exposure to contaminated environment compounded by malnutrition; for nutrition, the effect of income and prices is mediated by changes in dietary and nutrient intake compounded by poor health; and for education, the effect of income and prices is mediated by schooling participation compounded by sibling size and birth order.

Moreover, the specific nature of the income and price changes could affect household behavior with respect to these intervening processes in different ways. In the case of income change, household behavior and its consequences could differ depending on whose income among family members changes. For example, a reduced income of the husband resulting from a changing labor market situation could result in increased work participation of the wife and children in the household. For mothers, this could

mean reduced time allocated for child care with potential adverse consequences on the health and nutrition of young children; for children, this could mean reduced schooling participation eventually leading to lowered educational attainment.

In the case of changes in the prices of human capital inputs (nutrients, health services, schooling services), the net effect depends on the balance between two effects: (1) the income effect of the price change and (2) the substitution effect. Increased prices means reduced real income or purchasing power (income effect), and this could lead to reduced health care utilization, schooling participation and nutrient consumption, and they all could have adverse effects on the human capital of the household and its members. However, the increase in prices could lead to substitutions toward lower-priced human capital inputs with the same level (or even higher level) of effectiveness (substitution effect). For example, increased prices of foodstuffs could lead to consumption of lower-priced foodstuffs with the same nutrient value (even higher if the household previously subsisted on high-priced junk foods!) so that nutrient intake and nutritional status are not be seriously affected. Similarly, increased prices of health services in terms of waiting time in crowded hospital out-patient departments could lead to greater use of services offered in primary health units, hence health service utilization may not be seriously affected; indeed, the overall efficiency of the health system might even be improved. Increased schooling costs could lead to transfers from higher-priced private schools to lower-priced public schools closer to home without seriously affecting schooling attainment and quality of learning. Of course, there are limits to how far such substitutions can be made without seriously affecting health, nutrition and education.

C. *A Final Consideration*

To properly answer the question of whether macroeconomic adjustment policies had adverse or beneficial impacts on health, nutrition and education, it is necessary to answer the question: impact relative to what? In impact assessment, we need to know what changes in human capital outcomes occurred as a result of the macroeconomic adjustment policies *net* of the impact of other sources of change concurrently affecting human capital outcomes. This is the most difficult part of the entire assessment. Ideally, to do this in some kind of a laboratory-like situation, we need either (1) to find out and compare the changes in human capital outcomes *with* macroeconomic adjustment policies and the changes occurring *without* such policies, or more realistically, (2) to find out and compare the changes in human capital outcomes occurring as a result of a specific set of macroeconomic adjustment policies and the changes that would occur under an *alternative set* of policies. The latter approach is more realistic and useful since we do not exist in a policy vacuum.

A research strategy that has been suggested to deal with this question is using simulation models to assess counterfactuals. However, to reach this stage we need empirical evidence from actual country situations to correctly specify and measure key relationships. Some simulation can be done starting from crude models and refining them as new evidence becomes available. But for new evidence to become available, we have to conduct such assessments on a regular basis so that evidence can accumulate and the confidence in the conclusions strengthened. If we do this, we shall have results of assessments of a number of different policy packages as policymakers adopt new policy approaches or simply change their minds over time. Each set of results could conveniently serve as a benchmark from which to compare the impact of a subsequent set of policies. The knowledge accumulated in this way could provide a stronger basis for making policy adjustments as well as for making useful simulation models.

III. Types of Available Data Relevant to the Framework

After a review of available published data from various sources, we find certain types that best illustrate the types needed for undertaking an impact assessment. Needless to say, while the existing data in themselves provide insights, some are limited with respect to reliability, others with respect to timeliness, and still others with respect to level of disaggregation. Nevertheless they illustrate what additional analysis (e.g., further disaggregation) of existing data can reveal.

A. *Some Macroeconomic Indicators*

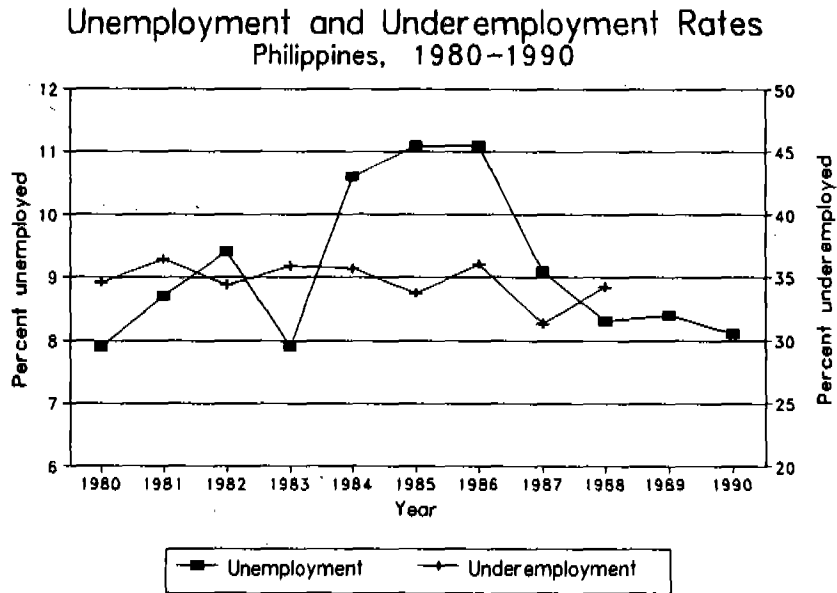
The macroeconomic impacts of adjustment policies are much more visible than the social impacts partly because data on key economic outcomes (output, employment and inflation) are readily available and up-to-date. As such it is possible to quickly test some commonly held assumptions regarding the impacts of adjustment policies. For example, it is often feared that adjustment programs involving cuts in real government annual expenditures would entail not only proportionate cuts in social sector expenditures, in particular health and education, but even deeper cuts relative to other sectors. Studies in other countries reviewed by Behrman (1990) found that on the average social sectors were the most protected and that, in a large majority of cases, social sector expenditures were not cut more than total government expenditures.

Data summarized in Figures 1 to 4 reveal several interesting aspects of recent Philippine macroeconomic experience. We are all familiar with the severe economic crisis in the mid-1980s. These are reflected in rising unemployment (Figure 1), very high inflation rate (Figure 2) and a decline in economic growth rate, even negative in 1984 and 1985 (Figure 3). Of immediate interest, however, is the annual growth of government expenditures. It appears that while total real government expenditures were subjected to large annual changes in either direction, the expenditures for health and education tend to be more stable as measured either as a percent of GNP or, in the case of Figure 4, in terms of per capita spending. What this means is that they neither rise in proportion to the rise in total expenditures nor fall off sharply with a drastic decline in total expenditures. So if there were adverse (favorable) effects on health and education during the period in question (a difficult statement to make with confidence, in view of limited data), it could not have been simply due to cuts (increases) in real government expenditures in the health and education sectors. The answer has to be found elsewhere: (1) in declines (increases) in private spending as a result of declining (increasing) growth of per capita incomes; and (2) in the manner in which public resources in health and education are being spent (i.e., either less efficiently or more efficiently).

B. *Selected Indicators of Social Sector Outcomes*

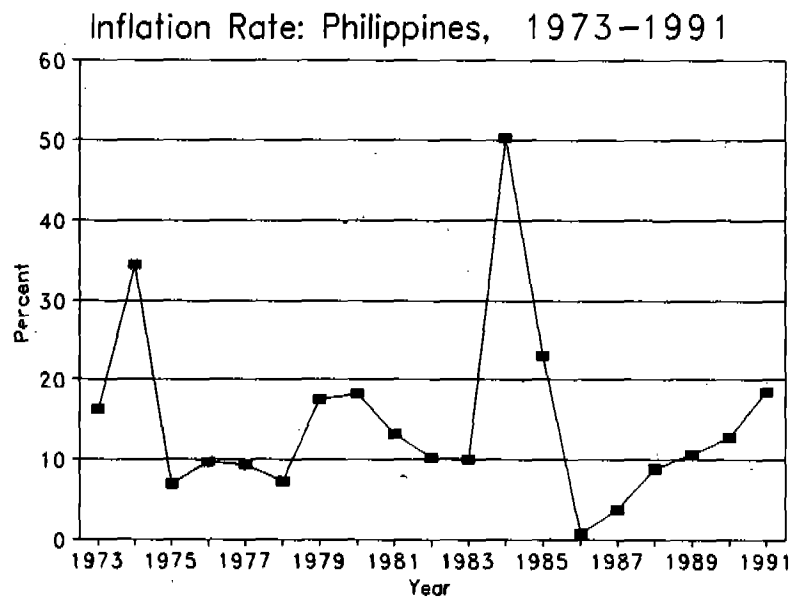
Health. Due to the incompleteness of vital registration, accurate and up-to-date information on mortality rates are difficult to come by. The currently available information on mortality rates are derived from indirect estimation techniques applied to census and vital registration data, or sets of national survey data. Just two years ago, the only set of mortality estimates available for regions and provinces was that of Flieger and associates. (The estimates were based on the application of indirect techniques applied to census and vital registration data). This was published in 1981 but the latest data refer to 1970! (Flieger et. al. 1981). Recently, however, we have a most welcome update of regional and provincial estimates, but the latest data refer to 1980 (Cabigon 1990). Hence, our knowledge of

Figure 1



Source: NSCB, *Philippine Statistical Yearbook 1991*.

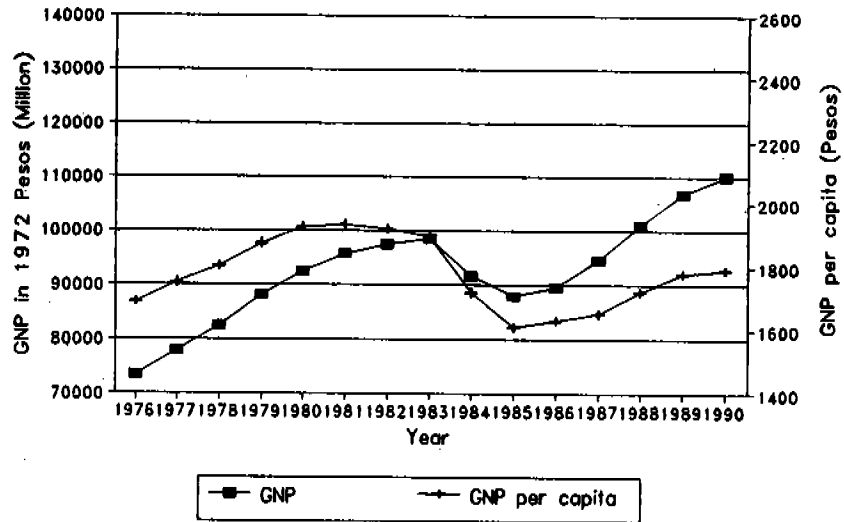
Figure 2



Source: NSCB, *Philippine Statistical Yearbook 1991*.

Figure 3

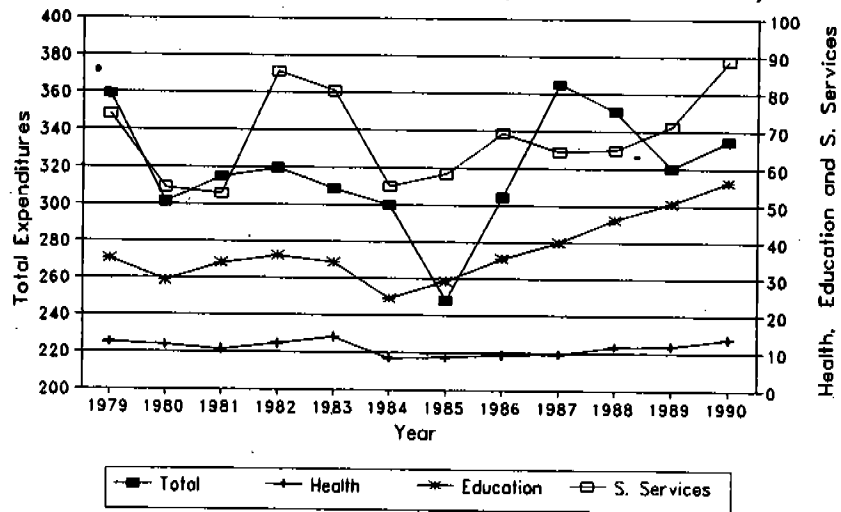
GNP and GNP Per Capita in 1972 Pesos
Philippines, 1976-1990



Source: NSCB, *Philippine Statistical Yearbook 1991*.

Figure 4

Per Capita Government Expenditures
Philippines, 1979-1990 (In 1972 Pesos)



Source: NSCB, *Philippine Statistical Yearbook 1991*.

mortality trends and differentials is virtually nil. We do have occasional estimates of infant mortality based on data from national demographic surveys, but they too are few and far between, and the sample sizes of such surveys, although large enough for the estimation of other demographic variables, are small for mortality estimation at the regional and provincial levels. Annual estimates of life expectancy at birth and infant mortality rates published in statistical yearbooks are actually projected rates and, while useful for planning purposes, are not highly relevant for assessment purposes.

Figures 5 and 6 show regional estimates of life expectancy and infant mortality probabilities for 1960, 1970 and 1980. The data show that, on the average, mortality decline was more rapid in the 1960s than in the 1970s. What is of greater interest are the regional differentials. There are (1) large differentials in mortality by regions (Regions II, V, VIII and the Mindanao regions generally exhibit higher mortality than the other regions) and (2) the differentials persisted without significantly narrowing during the period of two decades. (The deviation of the 1980 pattern for Regions IX, X and XI from the earlier pattern is suspect).

Our interest in looking at these regional mortality differentials point is related to the question of whether, and to what extent, macroeconomic adjustment policies adversely (favorably) affect economic activities and incomes of some regions more than others, and whether such differential impacts widen (narrow) regional mortality differentials. In general, we are interested in looking at differentials in mortality (and changes in these differentials) among as many different categories of the population in order to have a wider field from which to discover how and to what extent the effects of macroeconomic adjustment policies ultimately manifest themselves.

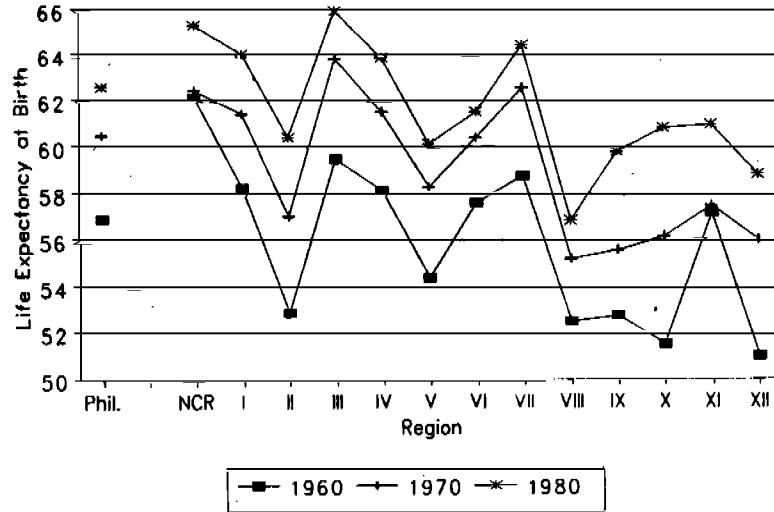
Data on mortality and morbidity rates by cause of death and morbid condition, respectively, classified by age and sex and by regions (and provinces) are regularly published by the Department of Health. These data refer to notifiable (i.e. required to be reported) diseases. Varying degrees of under-reporting of specific diseases as cause of deaths and morbid conditions in specific areas will obviously affect reported levels and trends in these diseases. The effect of different degrees of under-reporting (or changes in reporting procedures) is not known with certainty, making comparisons over time, space and populations groups rather risky. For example, data on death rates from major causes shown in Figure 7 (which show declining trend in deaths from infectious and communicable diseases and increasing trend in deaths from chronic diseases) suggest that, with better reporting over time, mortality from infectious and communicable diseases is declining more slowly while mortality from chronic diseases is increasing more rapidly than is really the case. Such information might do more harm than good if used to justify greater budgetary allocations at the margin for the control of chronic diseases relative to infectious and communicable diseases especially in times when budgetary pressures generated by adjustment policies become more severe.

Nutrition. The most common forms of malnutrition affecting Filipinos are (1) chronic dietary energy deficiency particularly among low income households, and within households, among young children and pregnant and lactating women; (2) protein-energy undernutrition as manifested by growth deficits among preschool and school children; and (3) micronutrient deficiencies particularly in Vitamin A, iron and iodine among a large group of the population of all ages.

Data from national nutrition surveys conducted by the Food and Nutrition Research Institute reveal the inadequacy of energy intake among Filipinos. In 1987, the adequacy of energy intake, on

Figure 5

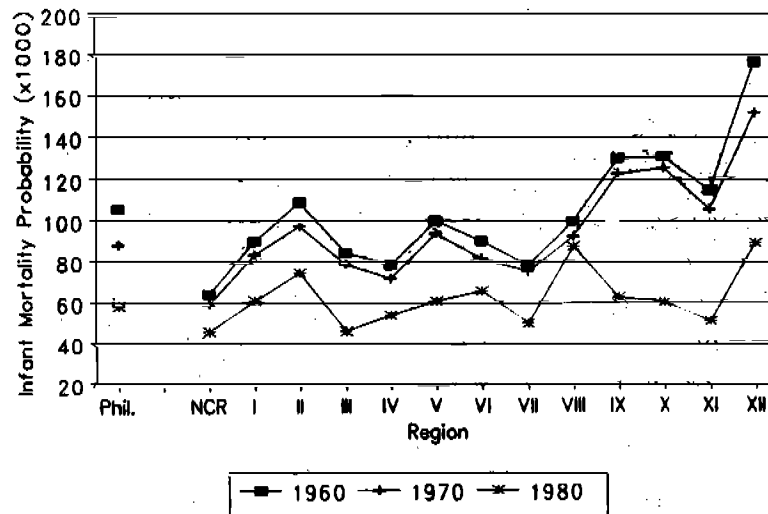
Life Expectancy at Birth, By Region
1960, 1970 and 1980: Philippines



Source: Cabigon (1990).

Figure 6

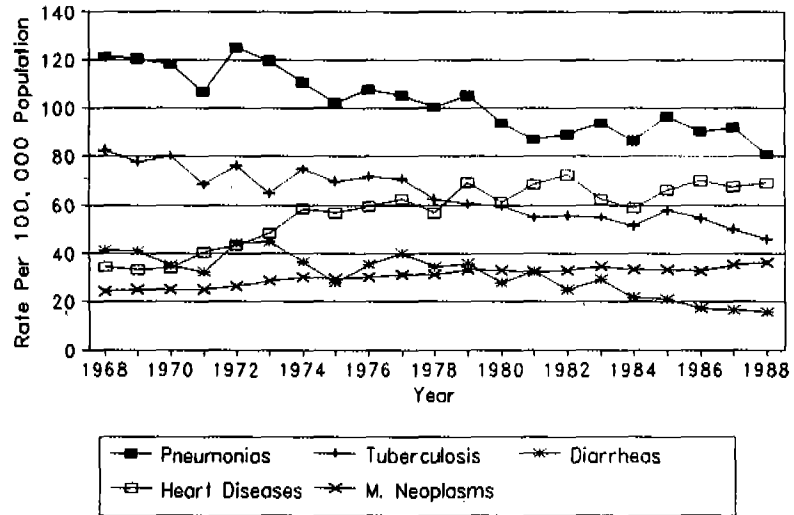
Infant Mortality Probabilities
1960, 1970 and 1980: Philippines



Source: Cabigon (1990)

Figure 7

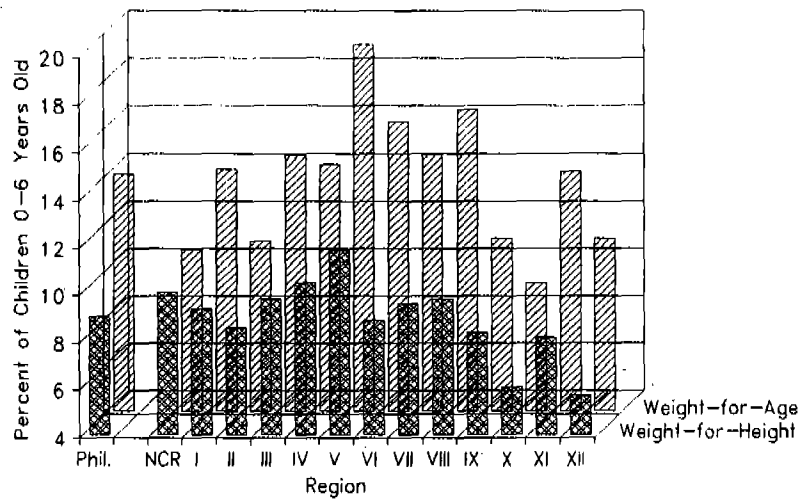
Death Rates From Major Causes: 1968-1988
Philippines



Source: DOH, *Philippine Health Statistics 1988*.

Figure 8

Malnourished Children, 0-6 Years
By Region, 1989-90: Philippines



Source: Florentino, R. F., et. al. (1990).

the average, was only 87 percent, down from around 89 percent in 1978 and 1982 (See Table 2). The low level of energy intake is said to be due to a low proportion of fat in the diet which comprises only 15 percent of dietary intake vis-a-vis the "ideal" proportions of from 20 to 25 percent (National Nutrition Council, 1991).

Chronic dietary energy deficiency is particularly alarming among pre-school children and among pregnant and lactating women. Data for 1987 show that the dietary intake of children 6 months to 6 years old (excluding those who were fully or partially breastfed) was only about 65 percent of daily requirements. The mean dietary intakes of pregnant and lactating women, on the other hand, were only 69 percent and 65 percent adequate, respectively.

Data on the nutritional status of preschoolers and young children shown in Table 3 reveal that although some improvements have been made since 1987, the rates of child malnutrition are still high. For example, the 1989-1990 National Anthropometric Survey conducted by the Food and Nutrition Research Institute revealed that among preschool children, 14 percent were underweight, 11.6 percent were stunted and 9.0 percent were wasted. Moreover, the malnutrition rates among female preschoolers, in terms of these three indicators, are much higher than males indicating possible bias in intra-household allocation of food.

Data from past nutrition surveys were based on limited sample sizes (due to the time and money expense in obtaining detailed food consumption data) and are, therefore, not suited for detailed analysis of differentials by regions. The 1989-1990 survey, however, was able to expand the sample size to allow regional disaggregation because it obtained only anthropometric data that are cheaper to obtain than a full blown food consumption survey. Figure 8 shows the regional distribution of malnourished pre-schoolers, showing higher incidence of malnutrition in some regions than in others depending on the measure used.

Micronutrient intakes are deficient for most micronutrients (See Table 4). However, while involving a large group of the population of all ages, micronutrient deficiencies vary by type of nutrient and specific age groups. For example, in 1987 (the latest year where data are available) 70 percent of preschoolers, 45 percent of pregnant women, 51 percent of lactating women, and 47 percent of the elderly suffered from anemia. Moreover, these same groups of women suffered high prevalence rates of goiter: 12 percent for pregnant women and 11 percent for lactating women.

Education. Available disaggregated measures of educational outcomes include literacy and functional literacy rates by region and mean scores in achievement tests by income decile, and NCEE mean scores by region or by type of schools. Figure 9 shows a wide gap between literacy (ability to read and write) and functional literacy (ability to read, write and compute) based on survey data for 1989. (National level data on literacy comes with the same frequency as population censuses, thus, our information on literacy rates tend to be out-dated). There are also noticeable regional variations but the major surprise is that functional literacy is lower than what many would have naturally expected.

Figure 10 shows mean scores in achievement tests (for Mathematics, English and Filipino) in public elementary education based on a national survey conducted in 1982-1983. While there are slight variations by rural and urban pupils, and mean achievement scores tend to increase slightly with higher

Table 2

Mean One-Day Per Capita Energy Intake from
Carbohydrates, Protein and Fat Sources:
Philippines, 1978, 1982 and 1987

Source	1978		1982		1987	
	Energy intake	% of total	Energy intake	% of total	Energy intake	% of total
Carbohydrates						
MJ (kcal)	5.73 (1369)	75.9	5.67 (1355)	74.9	5.43 (1298)	74.0
Protein						
MJ (kcal)	0.80 (192)	10.6	0.84 (200)	11.1	0.81 (193)	11.0
Fats						
MJ (kcal)	1.02 (243)	13.5	1.06 (253)	14.0	1.10 (262)	15.0
Total						
MJ (kcal)	7.55 (1804)	100.0	7.56 (1808)	100.0	7.33 (1753)	100.0
Percent Adequacy		88.6		89.0		87.1

Source: FNRI, National Nutrition Surveys of 1978, 1982 and 1987
as reported in National Nutrition Council (1991)

Table 3
 Undernutrition Among Children: Philippines, 1978, 1982,
 1987 and 1989-1990

Type of Undernutrition	1978	1982	1987	1989-1990		
				Both Sexes	Male	Female
Underweight (below 75% of standard weight-for-age)						
1-6 years	21.9	17.2	17.7	14.0	9.8	17.0
7-10 years	--	12.4	9.0	5.5	4.1	6.3
Stunted (below 90% of standard height-for-age)						
1-6 years	--	20.6	14.1	11.6	11.8	11.6
7-10 years	--	22.4	12.1	14.2	12.7	15.6
Wasted (below 85% of standard weight-for-height)						
1-6 years	13.8	9.5	12.7	9.0	6.7	11.4

Source: FNRI National Nutrition Surveys 1978, 1982, 1987 and 1989-1990, as reported in National Nutrition Council (1991).

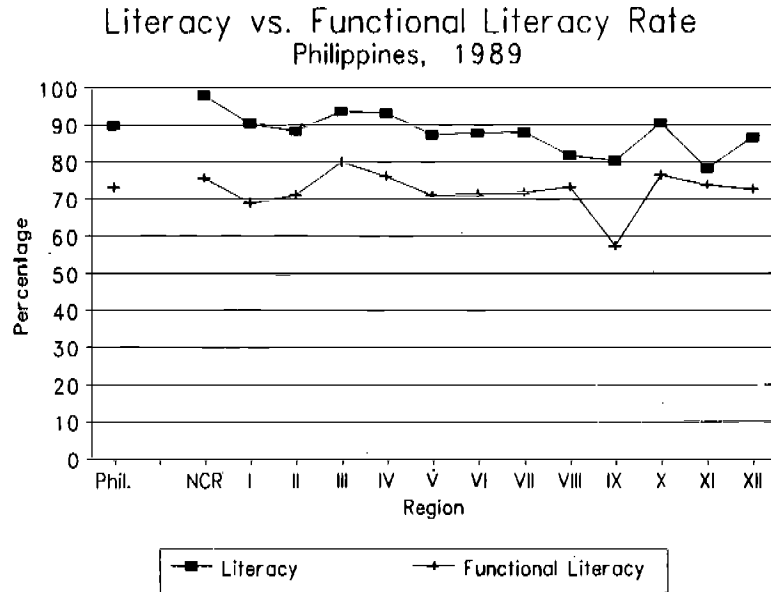
Table 4

Micronutrient Deficiencies By Type of Nutrient:
Philippines, 1987

Nutrient and Population Group	1987
A. Vitamin A deficiency	
1. Nightblindness	
6 months - 6 years	0.7
7 years - 14 years	0.9
15 years - 19 years	1.0
2. Bitot's spot	
6 months - 6 years	0.2
B. Iodine deficiency (with goiter)	
7 - 14 years (male)	0.8
7 - 14 years (female)	6.4
15 - 20 years (male)	0.2
15 - 20 years (female)	6.2
21 years and over (male)	0.7
21 years and over (female)	7.1
Pregnant women (21-49 years)	12.4
Lactating women (21-49 years)	10.7
C. Iron deficiency (with anemia)	
6 - 11 months	70.4
1 - 6 years	38.7
7 - 12 years	41.2
13 - 19 years (male)	26.3
13 - 13 years (female)	36.9
20 - 59 years (male)	21.3
20 - 59 years (female)	38.9
60 years and over	46.9
Pregnant women	45.2
Lactating women	50.6

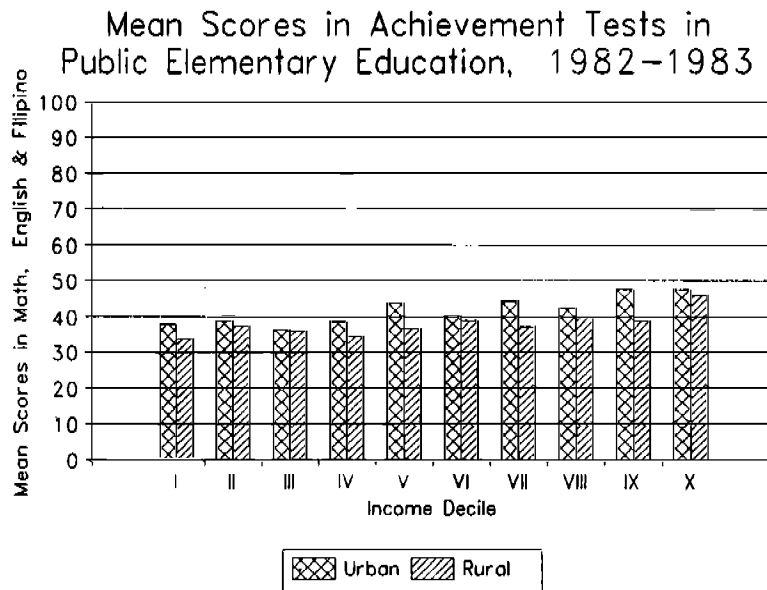
Source: FNRI, National Nutrition Survey, 1987 National Nutrition Council (1991).

Figure 9



Source: NSO, *Survey on Functional Literacy, Education and Mass Media, 1989*.

Figure 10



Source: HSMS as reported in World Bank (1988).

income, the main surprise is that achievement in public elementary education is disturbingly low across all income groups.

C. Indicators Linking Income and Prices and Social Sector Outcomes

From our discussion of the framework, we indicated the need to understand the processes of household decisionmaking with respect to human capital inputs and other household concerns given the initial conditions that households find themselves in. It is through these processes that changes in the incomes of and prices facing households brought about by the effects of macroeconomic adjustment policies get translated into changes in specific human capital outcomes for particular groups. Below we present selected information that provide insights into such processes.

Income Effects on Health Care Expenditures and Facility Utilization. Income and prices affect health status through their impact on health care utilization and exposure to environmental contamination among others, compounded by nutritional status and initial demographic and social characteristics of households such as family size and education of mothers, respectively.

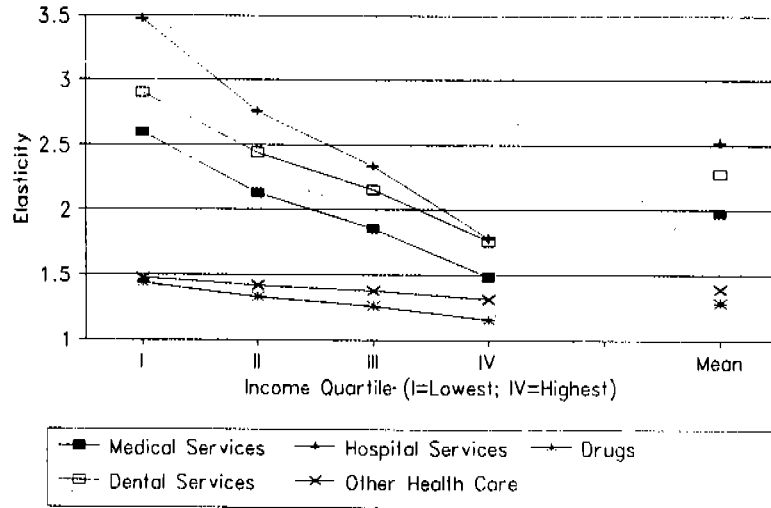
Figure 11 shows estimates of expenditure elasticities of health care expenditures by income quartile and type of health care expenditures based on the 1985 FIES. This information tells us that changes in the incomes of the low income households are likely to result in proportionately larger expenditures for medical, dental and hospital services than changes in the incomes of high income groups. One could use this information to infer that macroeconomic adjustment policies that adversely (favorably) affect the incomes of low income groups are likely to result in significant adverse (favorable) effects on the health status of the population (through reductions in health care expenditures) than if the effects of policies favor only income changes among higher income groups.

Figure 12 shows estimates of predicted probabilities of using health facilities by income quartile based on the 1987 National Health Survey. The data suggest that lower income groups tend to use public health facilities while higher income groups tend to use private health facilities. Thus the pattern of health facility use is likely to change with the pattern of income change generated by macroeconomic adjustment policies. A decrease in real incomes due to the short term effects of adjustment policies could lead to greater use of public health facilities. This could possibly increase waiting time for service and reduce the quality of health service in public facilities, especially if public budgets for health are not increased to deal with such increased levels of utilization.

Price Effects on Service Utilization. Existing Philippine studies on the effect of prices on health service utilization show mixed results pointing to the need for further work. Earlier studies done in the Bicol region and later in Cebu show that outpatient, delivery and other primary care services are not very sensitive to income, money prices or time prices than would normally be expected (See Akin et. al. 1984; Schwartz et. al. 1988). A study using the 1981 National Health Survey, however, reveals substantial price elasticities of outpatient care for children, and that the price elasticities are higher at lower income levels than at higher income levels (Ching 1991). Differences in data and methodology as well as the type of care and population under consideration account for differences in findings. Much more work needs to be done to develop common data sets and methodologies to estimate comparable elasticities for different types of health care services.

Figure 11

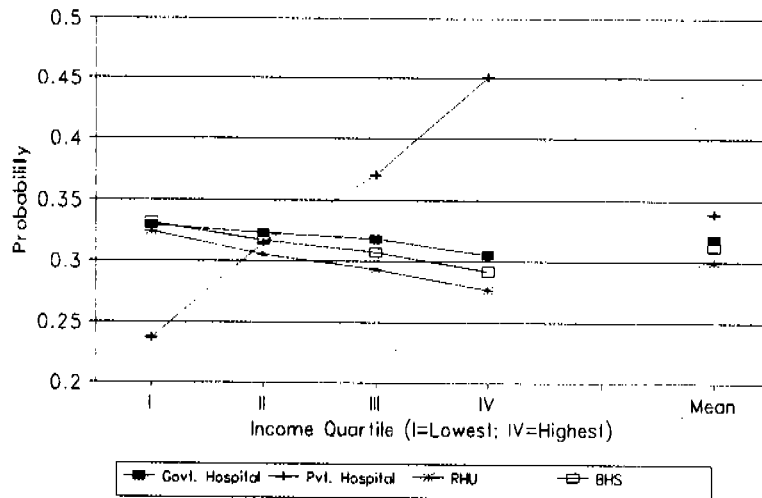
Estimated Income Elasticities of Health Care Expenditures: Philippines, 1985



Source: Russo, G. and A. N. Herrin, (forthcoming); data from 1985 FIES.

Figure 12

Predicted Probabilities of Using Health Facilities: Philippines, 1985



Source: Russo, G. and A.N. Herrin (forthcoming); data from 1987 National Health Survey.

Income Effect on Nutritional Status The Role of Various Filters A review of the determinants of nutritional status suggests that while poverty or low income is often considered as the "major root cause" of malnutrition, increases in income among the malnourished group alone to close the nutrition gap is not feasible nor acceptable. It will take large increases in income to achieve significant improvements in nutrient intakes and improvements in nutritional status. Large increases in income in the short run, however, are not likely to be feasible given the constraints of overall macroeconomic performance. On the other hand, relying on historical income growth of poor households alone to close the nutrition gap will take a very long time, and this is not likely to be socially acceptable.

The reason why income growth alone is not sufficient to significantly improve nutritional status within an acceptable time frame is the fact that the link between income and nutritional status consists of several intervening links. When these intervening links are weak, the overall effect of income change on nutritional status will also be weak. This finding can best be demonstrated by the results of a recent study by Bouis and Haddad (1990). A similar insight is obtained by analyzing the results of the study by Garcia and Pinstrup-Andersen (1987). Both studies are based on Philippine data. Below we describe only the results from Bouis and Haddad. [See also international studies as reviewed by Behrman et al. which show similar results]

Bouis and Haddad (1990) calculated the following elasticities representing the strength of relationship of each link: (1) income and food expenditures, 0.65, (2) food expenditures and household calorie intake, 0.17, (3) household calorie intake and preschooler's calorie intake, 1.18, and (4) preschooler's calorie intake and preschoolers nutritional status, 0.39. The net nutritional status elasticity with respect to income is estimated by multiplying the individual elasticities for each link: $(0.65)(0.17)(1.18)(0.39) = (0.05)$. This overall result implies that a doubling of income (increase of 100 percent) improves preschooler's nutritional status by only 5 percent. Since income is not likely to double quickly, this means that nutritional improvements via the income effect alone will take a very long time. In the meantime millions of preschoolers will suffer the effects of malnutrition with serious short term and long term consequences.

In view of the above consideration, there is a strong case for direct nutrition interventions (to be undertaken with macroeconomic adjustment programs) that serve to strengthen the various links. Such interventions would invariably include nutrition education, more focused health interventions, and family planning.

Price Effect on Nutritional Status It is commonly expected that an increase in food prices would have adverse effects on the nutrient intakes of the poor. This view, however, needs to be qualified. Behrman, Deolalikar and Wolfe (1988) enumerated several conditions under which nutrient intakes would not necessarily decline. The conditions include: (1) if the food subject to a price rise is nutritionally inferior to its substitutes, (2) if the household produces and consumes a food subject to a producer and consumer price rise, a positive effect on the consumption of the food and nutrient is induced through the production effect; thus, it is possible that in a farm household producing some of the food that it consumes, there is a positive nutrient response to food price changes once this income effect is taken into account, and (3) an increase in the price of a farm product that the household does not consume operates directly through income, with an expected positive impact on nutrient demands, conversely, a price rise in a production input would have a direct negative income and nutrient intake

Studies reviewed by Behrman and Deolalikar (1988) provide evidence of positive income-compensated food price effects on nutrient intake, reflecting a strong substitution among foods with different nutrient contents. Thus, when the price of a particular food item increases, the household may shift demand to other relatively nutritious foods so that the decrease in nutrient intake from the food item whose price increased may be more than offset by an increase in nutrient intake from the substituted foods. The studies reviewed included those conducted in Sierra Leone, Bangladesh, rural South India and Indonesia.

In studies conducted in the Philippines, Bouis and Haddad (1990) find no significant effect of price of rice or corn on household calorie intake; while Garcia and Pinstrup-Andersen (1987) find household calorie consumption with respect to price of rice to be only -0.02. This latter finding implies that a doubling of the price of rice results in a reduction in household calorie consumption of only 2 percent.

Income and School Participation. Data on enrollment rates by age of child and household income in both rural and urban areas obtained from the Household and School Matching Survey of the Department of Education, Culture and Sports as shown in Figures 13 and 14, reveal that enrollment rates are lower among poorer households than higher income households. This is true for each age group of children in both urban and rural areas. Enrollment rates in rural areas, however, are lower than in urban areas in each income decile particularly for older children age 11 to 16 years. What this information suggests for us is that the impact of macroeconomic adjustment policies on educational performance would depend in part on whose household's incomes are being affected more than others.

Small area sample survey results suggest that part of the relationship between household income and school participation of these children is due to the greater participation of these children in both paid and unpaid work in order to supplement household income. Such a household survival strategy, of course, has the unintended effect of reducing school participation and eventual schooling attainment of children in these households relative to other children (Herrin 1992).

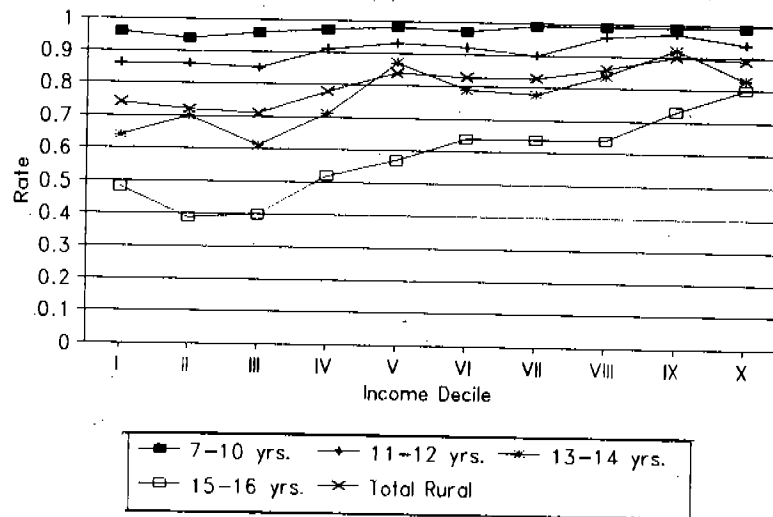
IV. Notes for Further Research

On the basis of the preceding discussion, two major areas for future research readily suggest themselves. First, there is a need to obtain accurate, timely and disaggregated measures of human capital outcomes. Without these information, one cannot proceed much further with any assessment. This requires for the most part analysis of secondary data from several national surveys (demographic, health, family income and expenditures, labor force). The idea is to extract as much information as possible from the regular surveys rather than to design large-scale multipurpose surveys.

Secondly, there is a need for continued analysis of the intervening links between changes in incomes and prices and the human capital outcomes at the micro level. In particular, we need more information on the effect of incomes and prices on health care utilization, environmental sanitation, nutrient intake and school participation. Past studies offer a useful guide but their results need to be updated and made more representative by using existing national data sets where possible. Intensive small area sample surveys implemented as riders to existing surveys can be made to obtain more detailed information that the regular surveys could not obtain for obvious reasons of financial and time costs.

Figure 13

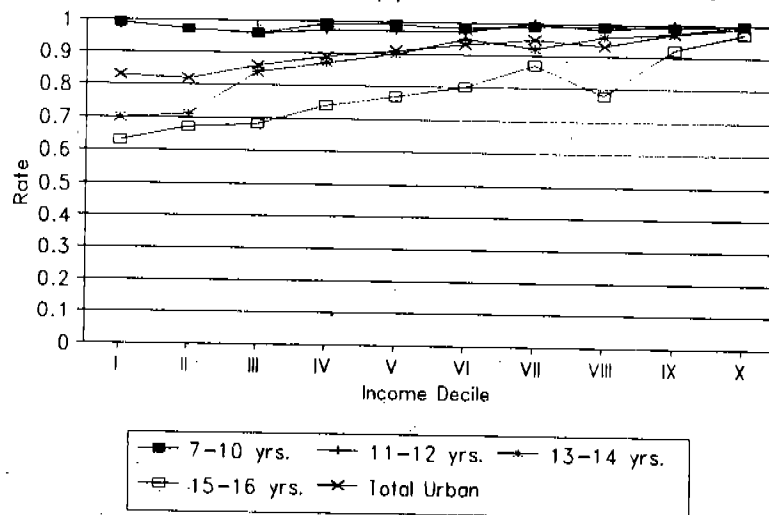
Enrollment Rates By Age and Income Decile: Rural Philippines, 1982-1983



Source: HSMS as reported in World Bank (1988).

Figure 14

Enrollment Rates By Age and Income Decile: Urban Philippines, 1982-1983



Source: HSMS as reported in World Bank (1988).

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