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Explaining Poverty Webs**

by

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Health, Education and the Household: Explaining Poverty Webs

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Abstract

In this paper, we examine the theory and evidence on the various linkages between poverty, health and education. We introduce the idea of *poverty webs* to highlight both the cycles and intricate pathways from adverse health and education conditions to poverty and back, within and across generations. The specific pathways considered are (i) labor productivity, (ii) quantity and quality of human capital investments, particularly health and education, and (iii) complementarities between human capital investments. These pathways are analyzed in the context of the household where the adult members typically decide on the critical human capital investments for the young members. Based on previous studies and data from the Philippines and other developing countries, we report evidence on the number of numerous ways by which health, education and poverty are correlated, whether these are intra- or inter-generational effects. Additional evidence of intergeneration transmission is presented using data from the Quality Improvement Demonstration Study (QIDS) on children under 5 years old residing in the central regions of the Philippines. Several policy implications are drawn, with emphasis placed on demand-side interventions that exploit the complementarities of health and education investments.

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I. Introduction

In this chapter, we examine the various linkages between poverty, health, and education. We look into the channels by which the absence of good health and education outcomes can explain poverty while noting that poverty itself feeds into ill health and poor education. We introduce the idea of “poverty webs” to highlight both the cycles and intricate pathways from adverse health and education conditions to poverty and back. Both poverty cycles and pathways have been studied before, in most cases as separate topics. We study these two aspects together as poverty webs to explain the persistence of poverty within a generation and its transmission to the next. Thus, a person caught in a poverty web does not easily cut loose when one cycle or pathway is broken, since there are several cycles and pathways that can keep one entangled. Poverty webs are more easily discerned in the household context where joint decisions are made affecting many. Consequently, greater focus on household-level interventions may be necessary to free families from the vicious cycles and sticky mesh of poverty.

The pathways considered in this chapter are the following: (i) labor productivity, (ii) quantity and quality of human capital investments, particularly health and education, and (iii) complementarities between human capital investments. Fertility choice, another very important pathway, is discussed extensively in Population and Poverty [Pernia 2008]. We consider the poverty cycles and pathways both within and across generations. A person with poor health or low education attainment is likely to be less productive, and therefore poor. With only low income, the same person cannot seek medication when sick or train to acquire labor skills, which further entraps the person to penury. This poverty cycle within a generation can easily find a path through the next. One obvious reason for this is that health and education are investment goods – i.e., they require an initial outlay, their returns accrue over time, and their benefits can spill over to one’s future children. Furthermore, health and education investment decisions are made early in life, hence, children rely on their parents to make these decisions in their behalf. While it is true that parents want only the best for their children, their preferences, abilities and capacities to raise children are shaped by their health, education and poverty status as well. Hence, the intergenerational aspects of health and education constitute an important dimension the poverty problem.

In our analysis, we focus on household level behavior for a number of reasons. First, health and education outcomes are primarily the results of behaviors and choices that are best understood in the context of household decision making. Particular household members, (i.e., parents) makes health and education decisions, even when the government provides resources for health and education. After all, with a utility maximizing household, the effects of government spending on health and education are seen through the household decision making channel. Second, the household is the natural decision maker when resources are pooled, in the absence of access to credit or insurance. Lastly, individual health and education outcomes have external effects that are more keenly felt within the family, for example, when an infection spreads from a household member to another or when education of younger children are financed by their older siblings who have already completed schooling.

The analysis proceeds with a review of theory and evidence on the webs (i.e., both cycles and pathways) that link health, education, and poverty in various settings, typically in various developing country settings. We report evidence on any of the numerous ways by which health, education, and poverty are correlated, whether these are intra- or inter-generational effects. We then examine both types of linkages using data from the Quality Improvement Demonstration Study (QIDS) on children under 5 years old residing in the central regions of the Philippines.

The rest of the chapter is organized as follows. Parts 2 and 3 review the Philippine health and education situation, mainly pointing out that the poor carry the burden of ill health and poor education. Part 4 provides the organizing framework for the discussion of the interlinkages between health-education and poverty, i.e., the health-education-poverty web. Part 5 discusses health and education as determinants of poverty, focusing on evidence relating to returns to education and health, including indirect effects through health or education. Part 5 also examines how poverty impacts on health and education outcomes. Part 6 discusses the various intergenerational linkages while Part 7 presents the analysis using QIDS data on intra- and inter-generational linkages between poverty, health, and education. Part 8 concludes with implications for policy, highlighting that consideration of the health-education-poverty web opens up new avenues for interventions

II. The Philippine Health Situation

Health Status of Filipinos

Aggregate health status and outcomes¹ have improved significantly over the past five decades. Estimated life expectancy at birth has increased from about 55 years in the early 1960s to about 70 years in 2003 (Table 1.) Females have slightly higher life expectancy than males. Infant and child mortality rates have also declined from about 38 and 64 deaths per thousand in 1993 to about 24 and 32 deaths per thousand in 2006. Maternal mortality rates have likewise declined from 209 to about 162 deaths per thousand from 1998 to 2006 (Table 2).

¹ The health status or health outcomes of a population can be measured in several ways. Traditional public health measures include mortality rates, life expectancy and morbidity measures [Jack, 1999]. Age and sex specific mortality rates indicate the probability that an individual belonging to a certain age and sex will die within the year. Focus is usually given to measures of infant, child and maternal mortality as these reflect the health status of populations especially vulnerable to disease or ill health. Life expectancy of an individual at a certain age, on the other hand, indicates the expected number of years until death, and the most common measure used is life expectancy at birth. This would indicate the cumulative influences of health states over the lifespan of an individual. Utilization of morbidity rates, on the other hand, recognizes that while not all illnesses result in death, they do result in disability, impairment and discomfort. Measures of morbidity may be objective, i.e. based on clinical tests and medical examinations, or subjective, i.e., based on reports of individuals on how sick or well they feel.

A review of the trends in leading causes of morbidity and mortality in the Philippines reveals that while Filipinos are still getting sick of infectious diseases, they are no longer dying from these diseases. The number per 100,000 population of people getting sick of infectious diseases like diarrhea, bronchitis, and influenza have also fallen from 1986 to 2005, although the pattern of decline has not been smooth (Table 3). While these communicable diseases including pneumonia, tuberculosis, malaria, chickenpox and measles remain among the ten leading causes of morbidity, hypertension and diseases of the heart are now among these leading causes. Non-communicable and chronic diseases have likewise emerged as major causes of death [DOH, 2005]. This has resulted with improvements in life expectancy and control of communicable diseases.

Table 1. Life Expectancy at Birth (years)

Year	Both Sexes	Male	Female
1962	54.8	52.9	56.7
1967	56.4	54.6	58.3
1972	58.1	56.4	59.9
1977	60.1	58.3	62.0
1982	62.2	60.2	64.2
1987	64.2	62.2	66.4
1990	65.6	63.6	67.8
1992	66.5	64.5	68.7
1997	68.5	66.5	70.7
2002	69.8	67.9	71.7
2003	69.9	68.1	71.8

Source: World Development Index.

Table 2. Mortality Rates

Year	Source	Infant Mortality	Childhood Mortality ^{1/}	Under-5 Mortality	Maternal Mortality Rate
1993	NDHS	38	26	64	-
1998	NDHS	35	13	48	209
2003	NDHS	29	11	40	172
2006	FPS	24	8	32	162

Notes:

^{1/} CMR is taken by subtracting IMR from U5R.

NDHS – National Demographic and Health Survey

FPS – Family Planning Survey

IMR - infant deaths per 1,000 live births, for 5 years preceding the survey

Source: NSO. 2006 .Family Planning Survey: Maternal and Under-Five Mortality Data Dissemination Forum. May 3, 2007.

Table 3. Morbidity Rate (per 100,000 population)

Illness	1986	1990	1995	2000	2005
Diarrhea	986.70	1694.40	1253.30	1134.82	723.40
Bronchitis	1076.40	5481.76	1500.80	916.99	738.70
Pneumonia	339.60	261.50	972.00	829.01	828.00
Influenza	710.20	866.02	1096.00	658.46	487.10

Sources:

National Statistical Yearbook, 1988-2005

Philippine Statistical Yearbook, 1987-2006

<http://dirp4.pids.gov.ph/ris/dps/pidsdps9806.pdf>

http://www.doh.gov.ph/research_statistics

<http://www.census.gov.ph/data/sectordata/tsvs.htm>

<http://www.nscb.gov.ph>

Filipino children were among those who experienced notable health status improvements. In 2005, nearly one in 4 four children under five years of age was found to be stunted for age. While this stunting ratio is still high compared to other ASEAN countries such as Singapore and Malaysia, this represents an improvement since 2003 when the stunted for age figure was recorded at nearly one in three children. About 22 percent of the population was still undernourished in 2002, down from 26 percent in 1992 [FNRI 2007].

Overall, while significant achievements have been had, the health status of Filipinos still pale in comparison with our ASEAN neighbors. Life expectancy, infant mortality rates and maternal mortality rates are below those of Malaysia, Singapore, Thailand and even Vietnam (Table 4). These aggregate numbers also mask differences in health status across income groups. Table 5 shows estimates of child and adult health indicators broken down by wealth quintiles for 1998 and 2003. Lower wealth groups experience worse health outcomes than the rich. Those belonging to the lowest quintiles have twice the infant mortality, nearly thrice the under five mortality rate and about twice the prevalence of acute respiratory infection that of the rich. The percentages of men and women who had at least one symptom of tuberculosis are also higher for the poor than for the rich.

Table 4. Selected Health Indicators, ASEAN

Country	Life Expectancy	Life Expectancy	Infant Mortality
	(Female)	(Male)	Rate
	2005	2005	2004
Brunei Darussalam	79	76	8
Cambodia	57	51	97
Indonesia	69	66	30
Laos	61	59	65
Malaysia	74	69	10
Myanmar	62	56	75
Philippines	71	64	26
Singapore	82	78	2
Thailand	73	67	18
Viet Nam	74	69	17

Source: World Health Organization. 2006. World Health Statistics

To further gauge the degree of income-related inequality in the distribution of the health status indicators, a concentration curve and the related concentration index can be constructed². The concentration indices indicate little or no improvement in the distribution of adverse health outcomes from 1998 to 2003. This implies that adverse health outcomes have remained concentrated among the poor. The poor carry a disproportionately larger burden of ill health.

The Philippines has committed to achieving the Millennium Development Goals of reducing by two-thirds the under 5 mortality rate (as measured by under 5 mortality rate, infant mortality rate and proportion of one year olds immunized against measles), reducing by three-fourths the maternal mortality ratio (as measured by the maternal mortality ratio and the proportion of births attended by skilled personnel), halving the number of people who suffer from hunger (as measured by the prevalence of underweight children under 5 years of age and proportion of the population below the minimum level of energy consumption) , and halting and beginning to reverse the incidence of malaria and other major diseases (as indicated by prevalence and death rates of malaria and tuberculosis). If the country is to improve aggregate health outcomes toward the achievement of the MDGs, the focus of attention should be toward improving the poor's health status.

Key Institutions in the Philippine Health Sector and Spending Patterns

The Philippine has a dual health system consisting of the public and the private sectors. The public sector consists of the Department of Health (DOH), the local government units (LGUs) and other national government agencies providing health services. The Department of Health is the lead national agency in health whose mandate is to develop plans, provide policy directions, and develop and enforce technical standards and guidelines. The national government through the DOH, however, continues to operate a small percentage of government owned specialty hospitals, regional hospitals and medical centers. These directly provide services and perform some training functions.

² The concentration curve plots the cumulative percentage of the health variable against the cumulative percentage of the wealth or income variable beginning with the poorest. A 45 degree line indicates the same value of the health status indicator irrespective of income. If the health sector variable is a negative (positive) indicator, higher values amongst the poor would result in the concentration curve lying above (below) the 45 degree line. The further the curve is above the line of equality, the more concentrated is the health variable among the poor. The concentration index is defined as twice the area between the concentration curve and the line of equality. The index takes on a negative(positive) value when the curve lies above(below) the line of equality in the case of negative(positive) indicators, and a high negative (positive) value indicates a relative concentration of that indicator among the poor.

Table 5. Selected Indicators of Childhood and Adult Illness and Mortality, by Wealth Quintiles (1998 and 2003)

Indicator	Wealth Quintiles					Concentration Index
	Poorest	2 nd	3rd	4th	Richest	
2003						
Infant mortality rate	42	32.2	25.8	22.2	19.5	-0.1538
Under-five mortality rate	66.3	47.1	31.6	25.8	20.6	-0.2275
Prevalence of fever (Children)	28	25.6	22.8	21.4	17.8	-0.0784
Prevalence of diarrhea (Children)	13.1	11.2	9.4	9.2	9.4	-0.0803
Prevalence of acute respiratory infection (Children)	14.6	11	9	7.6	5.8	-0.1745
Women with one symptom of tuberculosis (Adult)	45.6	42.1	35.3	29.8	28.3	-.1033
Men with one symptom of tuberculosis (Adult)	44.2	42.2	34.9	30.6	26.8	-.1040
	48.8	39.2	33.7	24.9	20.9	-0.1566
1998						
Infant mortality rate	79.8	60.5	49.7	33.4	29.2	-0.1910
Under-five mortality rate	26.4	28.4	27.6	24.9	19.4	-0.0182
Prevalence of fever (Children)	8.8	7.7	7.7	6.2	4.9	-0.0839
Prevalence of diarrhea (Children)	15.3	13.4	13.6	12.6	9.1	-0.0734
Prevalence of acute respiratory infection (Children)						

Source: Gwatkin, et al [2007], National Demographic and Health Survey, 2003

With the adoption of the Local Government Code in 1991 (RA 7160), the direct provision of care especially at the primary and secondary levels became the responsibility of the local government units (LGUs). Financing and management of health care facilities were likewise transferred to the provincial and municipal governments. City health centers/rural health units (CHC/RHU) and barangay health stations (BHS) provide primary consultations and preventive health care services and are under the municipal or city government. These are typically small, manned by a nurse and midwife, and focus primarily on government health programs such as immunization and health education campaigns. Some cities and municipalities also maintain their own hospitals. Provincial and district hospitals provide secondary or tertiary care hospital services and are under the provincial government.

The public sector is largely financed through taxes and operates on a global budget at both the national and local levels. Services delivered by the public sector are usually given free at the point of service or charged highly subsidized user charges. Foreign funding agencies provide supplemental resources to the public sector in the form of loans and grants for specific health programs or general budget support.

An important player in the Philippine health sector is the Philippine Health Insurance Corporation (PHIC or PhilHealth). It is a government agency attached to the DOH. It administers the National Health Insurance Program (NHIP), a first-peso reimbursement scheme for hospital expenditures. PhilHealth is the largest insurance carrier in the country and covers about 79 percent of the country's population. While the program was originally intended for the employed sector, it has introduced in 1997 a program for

indigent members under which premiums are subsidized by the national and local governments.

On the other hand, the private sector consists of for profit or non-profit hospitals, free standing clinics, hospital-based clinics, and diagnostic facilities. They essentially provide personal care services. The private sector also manufactures and distributes pharmaceutical and other medical supplies and equipment, and also finance health care through private insurance companies. Health care goods and services provided by the private sector are paid through user charges at the point of service.

Total spending on health care has reached PhP 165.2 Billion in 2004 from PhP 39.8 billion in 1992. As a proportion of GDP, health spending has increased from 2.9 percent in 1992 to about 3.4 percent in 2004. In real 1985 prices, per capita health spending has just increased from 334 in 1992 to about 494 in 2004. While the 2004 spending level represented a real 48 percent growth over that in 1992, the equivalent per capita spending of \$11 continues to fall short of the WHO-recommended levels for developing countries.

Health spending in the Philippines has remained predominantly supported by private sources. The National Health Accounts (see Table 6) indicate that as of 2004, still about 47 percent of total health care spending was from the out-of-pocket payments of households. Roughly one-third of total health expenditures was accounted for by the government, both national and local, while the social health insurance programs support less than 10 percent of health care spending.

Table 6. National Health Care Expenditures by Source and Use, 1992 and 2004 (in percent)

USE OF FUNDS	SOURCE OF FUNDS								TOTAL BY USE	
	Government		Social Insurance		Private Sector		Others			
	1992	2004	1992	2004	1992	2004	1992	2004	1992	2004
Personal Health Care	21	14	5	8	50	47	7	11	83	80
Public Health Care	7	10	0	0	0	0	0	0	7	10
Others	7	7	1	1	0	0	2	3	10	11
TOTAL BY SOURCE	35	31	6	9	50	47	9	14	100	100

Source: NSCB

Although delivery of health care is a devolved function, the national government still accounts for a substantial portion of public spending on health. Table 7 shows that in 1992 and 2004, national government health spending levels exceeded that of local government units (LGUs). The national government continues to spend heavily on personal health care, with public health accounting for less than 25 percent of government spending in 2004 (Table 8). Personal health services are services for which all the benefits accrue to the person who receives the health care. Only about ten percent are spent on public health care services which are comprised of pure public goods (such as vector control programs) and goods with externalities (such as immunization programs). In the economics literature, public resources are more aptly spent on public

goods and goods with externalities as the market would be spending sub-optimal amounts on these items.

Owing to the devolution of health care services, local health spending has increased from 1992 to 2004. Local governments, especially at the primary level, are now increasingly responsible for public health programs that specifically address the control of infectious diseases. However, funding for health at the local level is primarily dependent on the priorities of the local chief executive as well as on the resource base of the local government unit. This unevenness in local funds could have implications on the sufficiency and quality of facilities and the services provided from these facilities at the local level.

Table 7. National and Local Government Spending, 1992 and 2004, by Use (in PhP B)

USES OF FUNDS	1992		2004	
	National Government	Local Government	National Government	Local Government
Personal Health Care	7.9	0.3	16.3	6.3
Public Health Care	1.9	0.9	5.1	11.2
Others	2.3	0.5	5.0	6.3
Total	12.2	1.7	26.3	23.8

Source: NSCB

III. The Philippine Education Situation

Schooling Participation, Completion, and Outcomes

Most Filipinos are literate. According to NSO figures, functional literacy rate in the country was at least 92 percent between 1990 and 2000. This rate dropped in 2003 to about 84 percent, which is only slightly better than in 1980 or 1970. The high literacy rate is due to the high rate of school attendance, especially at the primary level, among Filipinos. For each academic year since 2000 up to 2004, the participation rate among the children aged 7-12 years has been at least 92 percent and that of children aged 13-16 years has been about 66 percent (Table 9). The enrolment rates for the same age groups are even higher.

Table 8. Basic Education Indicators, 2000-2006

Indicators	Academic Years					
	2000-01	2001-02	2002-03	2003-04	2004-05	2005-06
Participation Rate (in %) ^{1/}						
7-12 years population	96.77	94.31	94.13	91.63		
6-11 years population			90.42	88.74	87.08	84.41
13-16 years population	66.06	69.35	65.06	66.29		
12-15 years population						
Gross Enrolment Rate (in %) ^{1/}						
7-12 years population	113.45	110.08	109.84	107.43		
6-11 years population	98.08					
6-12 years population	113.57	109.85	108.45	106.13	104.21	101.09
13-16 years population	79.49	83.55	84.63	86.28		
12-15 years population		81.39	83.79	84.82	83.94	80.80
Cohort survival rate (old formula; in %) ^{2/}						
Elementary	66.85	67.11	68.11	69.03		
Secondary						
(Based on Grade I)	49.35	48.46	50.31	50.95		
(Based on First Year)	73.39	72.01	74.22	75.39		
Cohort Survival Rate (EFA formula; in %)						
Elementary	63.45	69.05	69.97	60.67	60.89	58.36
Secondary	71.68	71.49	66.00	68.46	69.89	59.10
Completion Rate (in %)						
Elementary						
(Old formula)	66.13*	66.33*	66.85	65.75		
(EFA formula)			66.95	59.32	59.07	56.76
Secondary						
(Based on Grade I)	48.10*	48.39*	50.00	45.74		
(Based on First Year)	70.62*	69.97	59.90	63.14	59.07	54.14
Drop Out Rate (in %)						
Elementary	7.67	6.51	7.30	9.93	9.82	10.57
Secondary	8.50	8.53	13.03	11.96	11.30	15.81
Transition Rate (in %)						
Elementary ^{3/}	95.46	96.24	97.74	97.00		
Secondary ^{4/}	100.02	100.75	105.78	101.71		

^{1/} The school-age population used in computing the participation rate and gross enrolment ratio in SY 2000-2001 and onwards are based on the 2000 Census of Population and Households, NSO.

^{2/} The data of the laboratory schools of SUCs, CHED and TESDA supervised schools are not included.

^{3/} From primary (Grade IV) to intermediate (Grade V).

^{4/} From elementary to secondary level.

*Estimates

** Public only

Source: Department of Education.

Table 9. Mean Percentage Scores in the National Achievement Tests: 2000-2006

Level/Subjects	Academic Years					
	2000-01	2001-02	2002-03	2003-04	2004-05	2005-06
			<u>Grade IV</u>	<u>Grade VI</u>	<u>Grade VI</u>	<u>Grade VI</u>
Elementary	51.73	...	...	...	58.73	54.66
Mathematics	49.75	...	44.84	59.45	59.10	53.66
Science	49.75	...	43.98	52.59	54.12	46.77
English	47.7	...	41.80	49.92	59.15	54.05
Hekasi	53.93	...	a	a	59.55	58.12
Filipino	57.49	...	a	a	61.75	60.68
Achievement Rate (MPS) ^{1/}			<u>1st Year</u>	<u>4th Year</u>	<u>4th Year</u>	<u>4th Year</u>
Secondary	53.39	...	...	44.36	46.8	44.33
Mathematics	51.83	...	32.09	46.2	50.7	47.82
Science	45.68	...	34.65	36.8	39.49	37.98
English	51	...	41.48	50.08	51.33	47.73
Filipino	66.14	...	a		42.48	40.51
Araling Panlipunan	57.19	...	a		50.01	47.62

^{1/}National Education Testing and Research Center (NETRC), NEAT and NSAT were not administered in SY 2001-2002. National Achievement Test (NAT) were given in Grade IV (for elementary) and 1st year (for secondary) for Mathematics, Science and English subjects in SY 2002-2003 and SY 2003-2004. In SY 2004-2005, NAT were given to Grade VI (for elementary) and 4th year (for secondary).

Source: Department of Education.

The greater than 100 percent enrollment rates in the elementary and secondary levels are partly explained by a large number of returning students who quit school in previous years. This is implied by the cohort survival rates of less than 70 percent at the elementary level and less than 76 percent at the secondary level. The rates are even lower based on the new international standard (*Education for All*). Despite the high enrollment rates, only about three in five Filipino children complete elementary or secondary education. Drop out rates in both levels have been rising also since 2000.

While most children attend schools, they appear not to learn very well. This is suggested by their low mean percentage scores in the National Elementary Achievement Test and the National Secondary Achievement Test (Table 10). Generally grade school pupils and high school students got less than 60 percent and 50 percent, respectively, of the correct answers to the questions in key subject areas.

The lackluster performance of school children in national standardized tests in recent years seems to be part of a persistent trend. The low quality of Philippine education has been noted in previous studies [Herrin 1990, Tan 1995]. When Filipino students are compared against their peers in other countries, they come out particularly worse. In particular, the results of the Trends in International Mathematics and Science Study in 1999 show that Filipino eight graders place at the bottom in mathematics and science rankings in a field of 38 East Asian countries (Table 11).

Table 10. Student Performance on Mathematics and Sciences Tests: Ranking among 38 Countries

Country	Mathematics score and rank	Science score and rank
Singapore	604 (1)	568 (2)
Korea	587 (2)	549 (5)
Taiwan	585 (3)	569 (1)
Hong Kong	582 (4)	530 (15)
Japan	579 (5)	550 (4)
Malaysia	519 (5)	492 (22)
Thailand	467 (27)	482 (24)
Indonesia	403 (34)	435 (32)
Philippines	348 (36)	345 (36)

Source of table: The World Bank [2004].

The workers of the future are supposed to be in school today. However, it appears that the children in indigent families lag in key education indicators behind their richer counterparts. Thus, despite the high overall school attendance and completion rates, there are marked differences in these rates across income classes.

At the elementary level, where free public education is provided to all, only about 83 percent of the children aged 6-11 years in the poorest 20 percent of the households attend school. Even a lower percentage of the children in the poorest families attend high school or pursue college education (Table 12). Moreover, the children from the poorest households tend to start primary education later, repeat a grade or drop out more frequently than their age cohorts from the richest families. As expected, the children of poor households generally have lower educational attainment, and are more likely to be out of school earlier and longer than their richer cohorts. In contrast, nearly 98 percent of those in the richest 20 percent of the households attend primary school. Also, the majority of the children in the richest quartile attend high school and college.

Table 11. Education Attainment, by Household Wealth Quintile, 2003

Indicators	Quintiles					Total	Concentration Index
	Poor-est	Q2	Q3	Q4	Riches-t		
<u>School participation</u>							
School participation rate, 6-11	82.7	92.2	94.9	97.3	97.9	92.0	0.0377
School participation rate, 12-14	77.1	84.3	93.7	94.9	95.6	88.5	0.0476
School participation rate, 15-17	50.2	59.5	68.4	75.3	78.0	67.0	0.0879
Gross primary participation rate (%)	103.3	107.0	104.8	104.5	101.5	104.4	-0.0028
Gross secondary participation rate (%)	49.9	76.5	99.0	105.2	107.2	86.2	0.1890
% of Grade 1 students who are older than the official Grade 1 age	67.1	49.7	43.0	34.4	34.9	49.0	-0.1550
<u>Repetition and drop-out</u>							
Primary repetition (%), 6 grades	3.8	3.6	2.7	2.3	1.0	2.9	-0.1859
Primary drop-out rate, age 6-11	3.8	2.4	1.4	0.6	0.1	1.8	-0.4505
<u>Education attainment</u>							
% of 15-19 year olds who have completed primary school	63.4	86.1	93.9	96.3	97.3	88.6	0.0696
% of 15-19 years old attained post-primary	46.2	70.6	85.1	91.0	92.2	78.6	0.1146
Average years of schooling (15-24)	6.2	8.1	9.3	10.1	10.9	9.1	0.0982
Average years of schooling (25+)	4.9	6.8	8.2	9.8	12.2	8.6	0.1708
% of adults completed primary education (age 25+)	45.1	69.3	81.8	88.5	94.8	77.4	0.1255
% of adults completed secondary education (age 25+)	12.2	27.4	43.0	61.0	80.9	47.1	0.3010
% of adults completed tertiary education (age 25+)	3.4	9.7	19.7	34.4	62.3	27.7	0.4367
<u>Out-of-School Children</u>							
% of out-of-school children, 6-14	19.0	10.4	5.4	3.6	2.9	9.1	-0.4048
% of out-of-school children, 15-17	49.7	40.5	31.4	24.7	21.7	32.9	-0.1807

Source: WDI 2007.

The inferior performance in standardized tests of Filipino pupils relative to their counterparts in Indonesia, Malaysia and Thailand would suggest that they may not also be able to compete in the future with their cohorts in global labor markets for technical jobs. It may also suggest that the present pool of Filipino adults may not necessarily be getting the best technical jobs abroad because of the poor quality of their education, inspite of their relatively higher levels of educational attainments. Compared to Indonesia, Malaysia and Thailand, there is a higher percentage of adults in the Philippines who have at least some tertiary education (Table 12). In terms of graduation rations in tertiary education, however, both Malaysia and Thailand have better performance than the Philippines in 2004-2005 [UNESCO Institute for Statistics 2007]. These comparative indicators suggests that the quality of education or educational attainments in the Philippines may be inferior to that other developing ASEAN countries.

Table 12. Educational Attainment of the Adult Population (Distribution of the population aged 25 to 64, by highest level of educational attainment)

Educational attainment	Indonesia (2004/05)	Malaysia (2004)	Philippines (2004/05)	Thailand (2005/06)
No schooling	8.0	7.3	2.4	4.2
Incomplete primary	15.4	...	15.9	40.0
Primary	37.3	27.1	18.2	21.5
Lower secondary	17.4	21.0	12.5	10.3
Upper secondary	16.9	31.8	23.6	10.0
Tertiary (type B) education	2.0	x(A)	13.3	3.1
Tertiary (type A) and advanced research programmes	2.9	12.8	14.0	10.5
Unknown	N	a	N	0.5

Source: UNESCO Institute for Statistics [2007].

Notes:

... - means data are not available.

x (A) - means data included in the next category (Tertiary (type A) and advanced research programmes.

n – means magnitude is negligible.

a – means data are not applicable because the category does not apply.

Key Institutions in the Philippine Education Sector and Spending Patterns

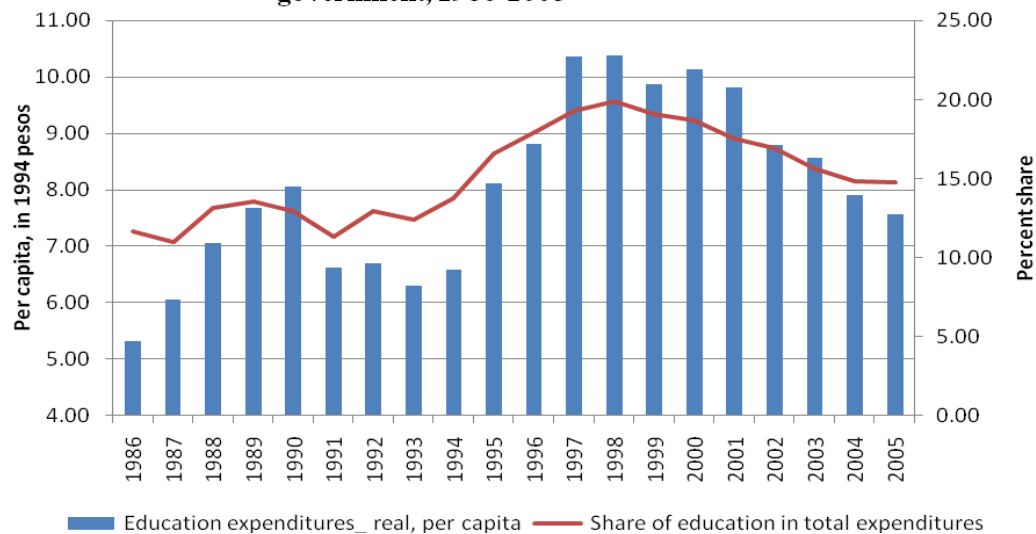
The Philippine education sector is dominated by the government, both in terms of number of schools and enrollments at the basic education level. This is in line with the government policy of providing free elementary and secondary education to all. According to figures from the Department of Education, the number of public elementary schools in the academic year 2005-06 was about 37,000, which accounted for approximately 89 percent of all primary schools in the country. Nearly 93 percent of the 12.9 million grade school pupils in the same year were enrolled in these schools. Also in the same year, the public high schools comprised about 59 percent of the nearly 8,300 secondary schools and provided instruction to nearly 80 percent of the 6.3 million high school students in the country. The private schools have bigger presence at the pre-school level. Approximately two in five toddlers were enrolled private pre-school facilities in 2005-06.

Due to high demand for public provided educational services, the government's education outlays have increased significantly since 1986. In constant 1994 pesos, the education spending per capita of the national government has risen from below 6 pesos in 1986 to about 7.5 pesos in 2005, after a peak of about 11.4 pesos in 1997. Education also appears a high priority of the national government. Its share in the national government's expenditures has risen from about 12 percent in 1986 to 15 percent in 2005 (Figure 1).

In terms of contribution to total education spending, however, the share of the government sector – comprising the national government, local government units and

other public agencies – was only slightly bigger than that of the private households in 1998 (Table 13). But for most years between 1991 and 1998, the share of the government was less than that of the private households.

Figure 1. Education expenditures of the central government, 1986-2005



In terms of uses, the bulk of the total education spending went to basic education – primary and secondary schooling. Less than ten percent of the total education spending went to tertiary education. Note that in Table 13 the total spending reported is lot a less than the total funds raised for education. This is because the total uses of funds only include those spending with available breakdowns. Thus, it is possible that the gap in spending between basic education and higher education may be narrower than is shown in Table 13.

In 2004, the total public and private expenditures on education accounted for 4.6 percent of the country’s GDP. This share is low relative to that in other developing countries. In 2004-05, Thailand allocated 5.7 percent. In 2003-04, India and Paraguay spent 4.9 percent and 5.9 percent, respectively. Greater still is Chile, which in 2005 allocated 6.4 percent of its GDP on education. The country’s education outlays however is higher than that of Indonesia and Peru. The share of education in the GDP was 1.5 percent in Indonesia in 2003 and 3.4 percent in Peru in 2005. [UNESCO Institute for Statistics 2007]

Table 13. Education Expenditures, by Major Sources and Uses of Funds, 1991-1998

Year	Sources of Funds			Uses of Funds ^a		
	All Sources	Government	Households	Total	Basic Education	Higher Education
1991	81,054	39,506	35,547	39,874	21,584	2,254
1992	87,181	39,217	42,346	39,778	24,886	2,099
1993	102,319	46,037	49,673	46,400	30,928	2,093
1994	117,000	50,888	58,827	51,540	35,588	3,780
1995	139,290	63,454	67,401	64,524	46,314	3,950
1996	162,940	73,118	78,629	73,893	47,356	7,474
1997	209,543	101,097	94,296	101,988	70,620	9,947
1998	243,190	116,997	111,381	117,586	83,363	9,024

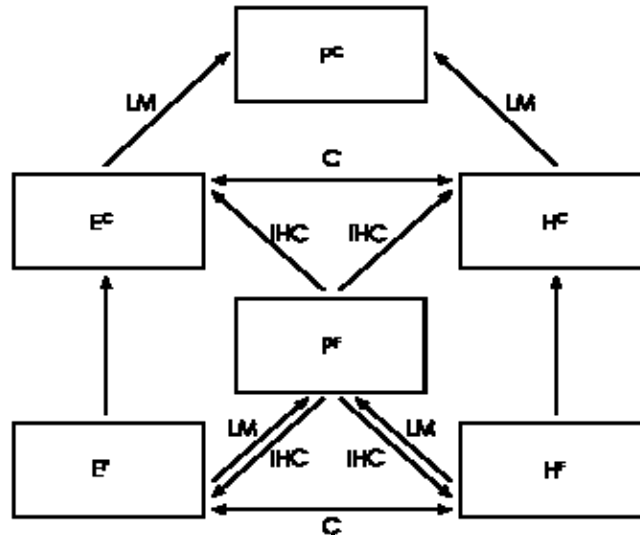
^aThe total only includes expenditures with disaggregation by use of funds. Basic education constitutes formal pre-school, elementary and secondary education, and non-formal and education programs for the same levels of schooling. Higher education includes college education, education that leads to professional degrees and graduate level education. In addition to basic education and higher education, the other uses of education funds are middle-level skills development, job-related training programs, ancillary services and other uses. Source: NSCB.

IV. The Health-Education-Poverty Web

Figure 2 illustrates the pathways through which health status, education and poverty interact. The boxes in the diagram refer to the health, H, education, E and poverty status, P, of different members of the household. In particular, we delineate these outcomes for parents, F, and children, C. Thus, E^C and E^F, refer to the educational status of children and parents, respectively. Distinguishing between members is necessary as it allows us to investigate the intergenerational links between the variables of interest.

Linkages between these outcomes, as denoted by arrows, fall under three major categories. The first pathway, denoted by LM (“labor market”), spans the ability to engage in, the amount of time spent on, and the returns to, market work. Within this broad category we also include the effects of payments for education and health investments on household resources. The second pathway, denoted by IHC (“investments in human capital”), denotes the capacity to purchase goods and services and combine these with household non-market time to augment health and education stocks. This capacity extends to the ability to purchase not just any good or service but goods and services of acceptable quality. The third pathway, C (“complementarities”), recognizes that efficiencies in producing health and education investments depend on the amount of other human capital available. Investments in education and health are complements. (The bold arrows connecting parental health or education status to child’s health or education status refer to the genetic and non-market factors that are not directly amenable to policy interventions.)

Figure 2. The Health-Education-Poverty Web



The links between E^F , H^F and P^F reflect or illustrate the intragenerational links between poverty, health and education. Observed correlations between health, education and poverty reflect the effects of health and education outcomes on participation in and returns to market work and the effects of payments for health and educational investments which in turn affect the amount of income available for household use. The correlation also reflects the effects of household resources on the ability to invest in their own human capital, for instance, the ability to purchase treatment when sick or the ability to retool or invest in training in the case of labor market displacements. The correlation is bolstered indirectly through the effects of educational investments on health investments and effects of health investments on educational investments. Note that within this generation, a poverty cycle can already exist as bad health and education translate to poverty which in turn leads to even worse health and education outcomes.

However, the poverty cycle extends to the next generation. The main pathway is through the effects of parents' health, education and poverty status on the ability to invest in the human capital of their children. As these are compromised by the parent's poverty, the next generation's ability to participate in fruitful market work is hampered, the cycle of poverty within this generation is replicated and breaking out of the poverty trap is more difficult. Thus, we observe that children of poor parents remain poor.

As this figure presents the various cycles and pathways through which poverty is perpetuated, it can also be used to identify interventions necessary to disentangle the current and future generations from poverty webs. In general terms, interventions can be formulated to: (1) prevent or limit the impoverishing effects of bad health and education outcomes within a generation, (2) alleviate the adverse effects of poverty on investments in human capital both within and across generations, and (3) exploit complementarities between education and health.. Note that some interventions may be classified under more than one category as these address multiple pathways. That there may be

interventions that exploit complementarities between education and health may open up new avenues of interventions.

V. Intra-generational Links between Health, Education, and Poverty

As Tables 5 and 11 show, Philippine health status indicators and education outcomes are inversely correlated with income status, i.e., a health-income and an education-income gradient exist. It can be argued that these health- and education-income gradients reflect two-way causal links between income and health or education. Poor people are materially deprived of necessary inputs into the production of health and education outcomes. They typically do not have adequate access to good quality health care and have completed only a few years of schooling. On the other hand, illness and its attendant productivity effects as well as its financial and non-financial costs may have a significant impact on household income and may even be impoverishing. Similarly, being poorly educated that result in lack of skills limit an individual's ability to generate income. These two-way links imply that a cycle of poverty and poor health or education outcomes prevails.

These links span not only the health- and education-income gradient of current generations but also the health- and education-income gradient across generations. Notably, education acts as an important mediating variable between income and health. For example, poorly educated individuals are inefficient producers of health. Similarly, health has a confounding effect on the relationship between education and income. Chronic illness could affect a worker's productivity at work or a child's performance in school.

In what follows, theoretical and empirical evidence are presented explaining the two-way causal link between income and (i) health and (ii) education. It starts with an explanation of economic outcomes as consequences of adverse health and education outcomes. This is followed by a general framework explaining the role of income in determining health and education status.

Health and Education as Poverty Determinants

Health

Poorer health translates to less current and future wealth, and the avenues through which this occurs are both direct and indirect, and the impacts may be immediate or long-term in nature. Among the substantial direct effects include the decrease in income due to lower market productivity of the ill member and the reduction in basic household expenditures (e.g., food) as a result of increased payments for treatment of diseases. Although there are important coping and adjustment mechanisms to minimize the impacts of illness that are undertaken by the individuals, household members, and their friends, these mechanisms also have costs themselves. These adjustment mechanisms may in fact translate to important long-term consequences on the income status of the individual and the family, especially when these coping mechanisms involve the sale of

assets and or disinvestments in both physical and human capital. Aside from these “direct consequences” an important indirect consequence of poor health status manifests through educational achievement. For the sick or unhealthy child, poor health translates to lower educational attainment that may affect both future home and market productivity.

Poor health lowers worker’s productivity and thus, income (LM). A review of the international literature suggests that dimensions of health status and health inputs affect labor supply and productivity and that in several cases, the effects tend to be largest for the poorest [Strauss and Thomas 1998]. Poor health status translates to reduced wages and income for the individual. Haddad and Bouis [1989, as cited in Herrin (1999)] estimated a wage equation for agricultural wage workers in the Philippines using different measures of nutritional status. Results show that height has a significant effect on wage rates, with a ten percent increase in height translating to a 13 percent increase in the wage rate. Deolalikar [1988] (as cited in Herrin 1999) found a wage rate elasticity with respect to weight/height of .28 to .66 for South Asia. The results for height, which is a long term measure of nutritional status, imply that investments in health and nutrition during childhood can have long-term payoffs in terms of increased productivity during adulthood. Body mass index has been shown to affect the proportion of working time spent on physically demanding work [Fachamps and Quisumbing 1999]. Caloric intake was also found to have higher impact on piece rates, presumably a better indicator of productivity, than on time wages [Foster and Rosenzweig 1996, as quoted in Thomas and Strauss 1998].

Estimates of burden of disease of tuberculosis in the Philippines indicate that controlling for those whose wages were not observed due to non-participation in the labor market, men and women who are sick of tuberculosis earn about PhP 451 and PhP 216 less per day, respectively, than those who are not sick [Peabody et al 2005]. Estimates of correlates of wages and illness also indicate that wages of those who are ill are three percent lower than those who are not [Quimbo 2001]. Evidence from international studies include: (1) the correlation between measures of health such as ability to perform “activities of daily living” (ADLs) with labor force participation of older men, (2) the negative correlation between earned income and the incidence of chronic conditions such as heart disease, stroke, asthma and cancer due to reduced probability of being employed and reduction in earnings for those who are employed. Ill workers work less hours [Pitt and Rosenzweig 1986, as quoted in Thomas and Strauss 1998].

The effects of poor health and nutrition status on market productivity are mediated by ceilings imposed on physical effort, lowered physical fitness, increased incidence and severity of morbidity that translate to lowered work performance and decreases in working time. At the extreme, poor health status leads to disability and or death. It must be recognized however that at the individual level, the effects of the mediating factors are different, in part because of time allocation and coping mechanisms within the household. For instance, illness may not result in reduced market productivity because time for home production is reduced instead.

High out-of-pocket payments for health causes large reductions and fluctuations in household expenditures (LM). Not everyone would get sick and thus need not incur the

direct treatment costs of illness. However, when a family member gets sick, payments for health care goods and services, especially in the case of catastrophic illnesses, may well be substantial amounts. In instances when families lack access to credit markets and when the coverage of insurance mechanisms, either through direct provision in government facilities or through the social insurance system, is low out-of-pocket payments for health care can make a dent in household incomes and consumption and can push households into poverty.

A study by van Doorslaer et al. [2006] estimated how measures of poverty incidence and poverty gaps would change if out-of-pocket payments (OPP) for health care were deducted from total household resources, as measured by the value of total household consumption. The Philippines was included in the 11 countries studied. Philippine data used was the 1999 Annual Poverty Indicator Survey (APIS), with out-of-pocket payments computed as the sum of medical fees, user charges for public hospitals and purchases of medicines. The mean and median of the proportion of out-of-pocket payments to household expenses was about 1.94 percent and 0.41 percent, respectively. This indicates that many people incurred little or no expenditures but the few who did had high expenditures.

Based on absolute thresholds utilized by the WB of \$1 and \$2 a day, subtracting out-of-pocket payments increases the Philippine poverty headcount from 15.8 percent to about 16.4 percent, translating to about 445,680 more individuals falling below the poverty line of \$1 a day, and from 50.2 percent to 51.2 percent, or 790,333 individuals falling below the poverty line of \$2 a day. While the Philippines had a large poverty gap, deduction of OPP did not increase this by a large amount, suggesting that the poor were at least better protected from health care costs. However, the study did not take into account those who forego treatment entirely because of unaffordable charges or self-medicate with medicines that have little or no effect.

Private out-of-pocket spending still remains the major source of financing for health care services. Social insurance schemes as a source of financing, while expanding from about five percent in 1992 to about nine percent in 2004, remains small. These imply that the financial burden of health care utilization on individual families remain high as families are least able to pool resources and spread the risks of ill health.

Education

Education affects intra-generational poverty in three ways. The first way is that education improves human capital. Better educated workers are more productive and, therefore, more employable and paid higher wages. The second way is that education has a sheepskin effect, that is, it endows one with the right credentials such as a diploma that employers seek in their prospective employees. Thus, at the very least, a worker with the right educational credentials is more likely to be hired than somebody without. Both ways pertain to the effects of education on one's opportunities and performance in the labor market. With their incomes, employed workers can afford medical services or healthy consumption options. Thirdly, education also affects poverty status through choices and

preferences. An educated person has better cognitive faculties and access to relevant information. A college graduate can make informed investment or employment decision affecting her wealth status.

Some cross- effects between education and health reinforce their intra-generational effects on poverty. Education is found to have a direct and independent influence on health status [Cutler and Lleras-Muney 2006], which suggests that educated persons adopt healthy options in their lifestyles. On the other hand, education also influences one's proclivity to smoke, take risks, or indulge in unsafe leisure activities and other so-called *non-market behavior* [Grossman 2005]. Thus, education's impact on choices and preferences could lead one to or out of penury, or to acquire and disposed of healthy or unhealthy habits.

Similarly, a sickly child is likely to attend school late, be more frequently absent from school, less attentive in class, or face greater difficulty in understanding lessons. All of these deficiencies will translate into lower human capital or lower than average grades that could adversely affect the child's future employment chances. To the extent that sickly children are more likely to be malnourished or live in unsanitary environment because of the family's low income status, then poverty also indirectly affects education this way.

In what follows, we highlight relevant stylized facts leading to basic hypotheses on why poor education outcomes can explain intra-generational poverty.

Returns to education are high (LM). Either because of the human capital or sheepskin effect, education should lead to higher income or favorable employment status. Higher education should also lead to higher returns. In fact, the returns to education accrue both to the individual and the society. There is enough evidence in the Philippines to show that the personal and social payoffs to education are substantial.

In 1988, the private rates of returns are 18.3 percent for primary education, 10.5 percent for secondary education, and 11.6 percent for tertiary education. The corresponding social rates of return are lower, but still significant (Table 14).³ Also, the social rates of returns to education are highest in primary schooling. Later estimates show that in 1998 higher levels of education also yield higher rates of returns, especially for college graduates [Quimbo 2001]. Nonetheless, the returns to primary education remain significant.

While these rates of returns are in themselves high, they need to be compared with the real cost of funds to see if education is a better investment than the alternative. An ideal measure of the real cost of funds in this case is the interest paid by an investment project as long-term as education. Based on a ten-year bond rate, the ADB estimates that the minimum real cost of funds in 2004 is seven percent. When compared to this estimate, the rates of returns to education in 2004 indicate that the funds were well spent. This

³ The social rates of returns are lower because costs of education now include public subsidies to education.

especially true for those who completed college and presumably attained senior-level positions 20-25 years later.

Table 14. Rates of Returns to Investments in Education, 1988, 1991, 1998 and 2004

Category	Year	Primary	Secondary	Tertiary
Social rate of returns ^a	1988	13.3	8.9	10.5
Private rate of returns ^a	1988	18.3	10.5	11.6
Mid-career workers ^b	1991	3.7	16.1	12.6
	2004	7.0	7.5	18.9
Senior workers ^b	1991	n.a.	10.4	11.6
	2004	12.2	9.8	22.2
Overall ^c	1998	16.0	21.2	6.4/28 ^d

Sources: ^aPsacharopoulos (1994) [in WDI 2007], ^bAsian Development Outlook 2007 (<http://www.adb.org/Documents/Books/ADO/2007/part030204.asp>; accessed 25 Aug. 2007); ^cQuimbo (2001). ^dfirst figure for some college, second figure for completed tertiary education. Mid-career workers refer to those who finished college 10-15 years before the sample was drawn. Senior workers refer to those who finished college 20-25 years before the sample was drawn.

Workers with at least some education comprise majority of the labor force (LM). The high rates of returns to education are only one of the direct benefits from education; its other direct benefit is successful entry into the labor market. Other things being equal, an educated worker is more likely to be employed or have relatively shorter unemployment spell than a less educated one. In the Philippines, a significant majority of the labor force comprises workers with at least some elementary education. Surprisingly, however, employment rates of among those with at least elementary education is higher than those with at least some college education. One reason for the high proportion of college educated without jobs is that this population group may be waiting for better paying jobs, possibly abroad, or plan to pursue higher education to improve their employability. Since many of the young college graduates come from well-to-do families, as seems suggested in Table 12, they can afford to be choosy or wait for better job offers. Also, employment is conditioned by factors other than education such as labor laws and institutions, market barriers to labor mobility, overall performance of the macroeconomy, and globalization.

In 2003 there were about 30.4 million employed workers, or about 10.4 million more than in 1986 (Table 15). At least 95 percent of the employed workers in 1986, 1991, 1995, 2000 and 2003 completed at least some years of primary schooling. Employment rates are generally higher among those with only some elementary education and lowest among those with at least some college education. In fact, the employment rate among college graduates hovered between 85-88% during the period, except in 1991 when overall employment rates were record high.⁴

Table 15. Employed Workers, by Highest Grade Completed, 1986 - 2003

⁴ Note that that the employment figures in Table 2 are for one quarter only. It is possible that they would be different from the annualized employment figures for all quarters of the Labor Force Surveys, from which the data in Table 2 are based. The employment figures may be seasonal, especially in the agricultural sector.

Highest grade completed	1986 (January)	1991 (January)	1995 (July)	2000 (January)	2003 (April)
Employed (in thousands)	19,972	22,533	26,090	28,895	30,418
No grade completed	970	835	901	815	629
Grade 1- 5	4,984	4,822	5,158	5,416	5,250
Elementary graduate	4,997	5,204	5,779	5,963	5,777
1 st – 3 rd year high school	2,535	2,911	3,504	3,693	4,209
High school graduate	2,933	1,019	5,218	6,151	6,758
College undergraduate	1,618	1,998	2,707	3,308	3,729
College graduate	1,926	2,711	2,783	3,449	4,066
Not reported	9	33	38	100	-
Employment rate (in percent)	92.98	96.11	91.22	90.73	87.82
No grade completed	98.38	94.99	93.95	93.25	90.24
Grade 1- 5	97.44	96.67	95.15	94.60	92.89
Elementary graduate	96.26	96.73	94.35	93.80	93.15
1 st – 3 rd year high school	93.27	95.91	91.11	89.46	85.43
High school graduate	89.09	85.41	88.35	88.68	85.90
College undergraduate	83.49	95.28	85.94	86.92	82.32
College graduate	86.29	95.59	88.43	88.62	85.44
Not reported	100.0	91.67	82.61	76.92	-

Source: NSO.

In a previous study [Quimbo 2001], it is found that the probability of participation in paid employment increases with the level of education. The increase in probability (39%) is highest with the completion of college education; while the completion of elementary or high school education alone increases the likelihood by 18 percent or 20 percent, respectively. Interestingly, it is also found that college education has the same relatively large effect on the probability of women's participation in paid employment, although the completion of elementary education alone does not increase the chances of women to land a paying job.

Consistent with the results in Table 15, Quimbo [2001] further points out workers with only some years of college and did not finish tertiary education are less likely to be engaged in paid employment. The relatively low employment rates among those with at least some college education may be a reflection of the low quality of tertiary education, mismatches between supply and demand in the labor market or the effects of the minimum wage law. Based on the October round of the 1991 Labor Force Survey, Tan [1995] however finds that college-educated workers have lower full-time equivalent unemployment rate than those with only high school, elementary or no education. That is, a college-educated employed worker is less likely to seek additional hours of work than other types of workers.

The less educated youths do more unhealthy or risky activities (C). Education is also found to affect choices and preferences as manifested in non-market behavior [Grossman 2005; Cutler and Lleras-Muney 2006]. In the Philippines, this effect can be discerned in

the case of the youths (i.e., 15-24 years of age). Specifically, it is found in a series of studies that school attendance is a significant factor in adolescent's risky behavior. Using data from the 2002 *Young Adult Fertility and Sexuality Study*, Raymundo and Cruz [2004] report that being out of school increases the probability that an adolescent is initiated to smoking, drinking, or to both, while being in school reduces the likelihood that an adolescent is initiated to drugs. But if the male child is already initiated to smoking, drinking or drugs, then his being in school does not shield him anymore from getting initiated to other risky activities. Interestingly, the authors also found that while an early initiation to sex is more likely among adolescents who are out of school, the incidence of early sex is higher among those with higher education (i.e., college). Also, female adolescents who stay in school are less likely to engage in pre-marital sex than their male counterparts⁵.

Also based on the 2002 YAFS Study and the earlier 1994 YAFS Study, Kabamalan [2004] finds significant variations across educational status in the cohabitation arrangements among the young (20-24 year old) who have been in union with a partner. In particular, about 43.3 percent of those with lower than high school education, 51.4 percent of those with high school education, and 44.2 percent of those with higher than educational attainment chose either living-in arrangements or live-in and then marry later with their partners. The rest chose to marry at once. By 2002, a lower percentage of the respondents chose to marry at once. Further, those who marry later had been cohabitating previously for 14 months on average, while those who were still living-in were doing so for 30 months already.

Children in poor households are less healthy and thus, their education outcomes are worse (C). Lifetime earnings are indirectly affected by health through schooling achievement. A body of evidence suggests that poorly nourished children tend to start school much later, tend to complete school less rapidly, have lower schooling attainment and perform less on cognitive achievement tests [Alderman, Berhman and Hoddinot 2004]. These occur as physical size is used as a rough indicator of school readiness, as malnourished children have higher rates of morbidity and greater rates of absenteeism from school, and as a hunger leads to shorter attention spans. Nutritional deprivation in older children, specifically deficiencies in iron and Vitamin A, can also lead to a retardation in cognitive development [WHO Commission on Macroeconomics and Health Working Group 1, 2002]. These are borne in Glewwe, Hanoby and King [1999] study of schooling achievement utilizing the Cebu Longitudinal Health and Nutrition Survey. The study found that a one standard deviation increase in height increases achievement test scores by one-fifth of a standard deviation in test scores. A one standard deviation increase in height also leads to parents enrolling their children nearly

⁵ Also based on the 2002 YAFS Study and the earlier 1994 YAFS Study, Kabamalan [2004] finds significant variations across educational status in the cohabitation arrangements among the young (20-24 year old) who have been in union with a partner. In particular, about 43.3 percent of those with lower than high school education, 51.4 percent of those with high school education, and 44.2 percent of those with higher educational attainment chose either living-in arrangements or live-in and then marry later with their partners. The rest chose to marry at once. By 2002, a lower percentage of the respondents chose to marry at once. Further, those who marry later had been cohabitating previously for 14 months on average, while those who were still living-in were doing so for 30 months already.

two months earlier, and a one standard deviation increase in height reduces the probability of repeating first grade by ten percent. Thus, they found that the total effect of a one standard deviation increase in height is equivalent to about six months of school attendance.

Poverty Effects on Health and Education

As poor health and education outcomes explain poverty, poverty in turn causes poor health and education outcomes. We argue that this two-way relationship is an important basis for why poverty webs exist, why poverty, by nature, is cyclical.

Health

Health is produced by factors which the poor do not have or have difficulty acquiring (IHC). The effects of socioeconomic variables, including income, on health operate through various known biological mechanisms or proximate determinants of health [Mosley and Chen 1984]. These proximate determinants can be considered as the inputs into the production of health. Proximate determinants would include factors related to the health of the mother particularly in the case of children's health outcomes, and nutrition, environmental conditions, injuries and health behaviors such as smoking and alcohol consumption. These factors influence the rate of shift from being well to being sick. Health care utilization, on the other hand, is a proximate determinant that influences the rate of shift from health to illness (through prevention) and from sickness back to health (through treatment). In turn, these proximate determinants are the results of choices that are influenced by individual, household, community level and health system variables. The latter can be thought of as the underlying determinants. In this framework, the poor have bad health outcomes because the underlying individual, household, community and health system conditions faced by the poor lead to unfavorable proximate determinants.

The link between the proximate determinants and health status is shown by various studies on child health outcomes that have utilized the Cebu Longitudinal Health and Nutrition Survey. Wagstaff [2000] found that a child living in a household whose drinking water is not a river, stream or rainwater have better prospects of survival after the first birthday while vaccine availability in a local public health facility increases survival during the first year. The Cebu Study Team's [1992] study found that susceptibility to diarrhea is reduced by breastfeeding and increased by water contamination and exposure to feces in urban areas. The likelihood of febrile respiratory infections is negatively affected by preventive health care use and positively affected by household density and exposure to smoky cooking fire. Weight of infants, a measure of growth, was found to be significantly affected by breastfeeding, the intake of supplemental foods, and preventive health care.

Quimbo [2001] estimated the correlates of illness from the 1998 APIS data. The likelihood of getting sick in the reference period was correlated with housing and individual level characteristics. Results indicate that having a strong roof and owning a

water system reduces the likelihood of illness by 3 percent. Not having a toilet increases the probability of illness by 11 percent.

Data in Table 16 from various health surveys have indicated differences in state of the proximate determinants of health in 1998 and 2003. The proportions of individuals and households who undertake the sanitary disposal of stools and received vitamin A supplementation increase the more well-off households are. Smoking and alcohol use are more common among the poor than among the rich. A relative advantage of the poor is in breastfeeding, where exclusive breastfeeding is more common among the poorer quintiles while bottle-feeding is more common among more well-off households. The trends in health service utilization not only show that better off households utilize more care, they also show that better off households utilize better quality care. The proportions of children who receive full immunization coverage, and who get medical treatment for fever, acute respiratory infection and diarrhea increase with wealth quintile. A greater proportion of the poor choose to deliver at home, while almost all of those belonging to the top two quintiles are attended to by a medically trained person. Among men and women who experience at least one tuberculosis symptom, a greater proportion will seek treatment among the higher wealth quintiles.

An important household level variable that influences the proximate determinants is household level income and assets. There can be two ways why income matters for health. Low income implies “poor material conditions” and “lack of social participation” [Marmot 2002]. Incomes of families may be below a threshold level that would allow the purchase or acquisition of clean water, good sanitation, adequate nutrition, and sufficient housing and clothing that are necessary for biological survival. Above the threshold, however, the lack of social participation and control over one’s life circumstances may be operative. Income may reflect psychosocial benefits that reflect optimism and a sense of control over future events. A person’s wealth may reflect the accumulation of good and bad experiences that may affect health and or it may be an indicator of one’s social position. This second aspect has been utilized to explain why there is still an income and health gradient in relatively well off countries. In poorer countries, however, it is the story of material deprivation that may be more relevant.

Community level variables include environmental and geographical conditions, as well as values and norms that are influenced by peer pressure. For example, landless farmers are forced to settle in more remote areas where certain diseases may be endemic. Urban poor families are forced to settle in crowded shanties with inadequate sanitation and access to clean water. Social pressures among teenagers and attitudes toward women tend to be least favorable among the poor

Table 16. Indicators of the Proximate Determinants of Health, by Household Wealth Quintile, 1998 and 2003

Indicators	Quintiles					Average	Concentration Index
	Poor-est	Q2	Q3	Q4	Richest		
2003							
Service Use							
Full basic coverage of childhood immunization	55.5	69.3	77.8	72.4	83	69.8	0.0814
No basic coverage of childhood immunization	15.1	5.9	5	3.9	2.2	7.3	0.4223
Medical treatment of fever in children	44.9	42	50	45.3	55.4	46.3	0.0472
Medical treatment of ARI in children	50.2	49	58.7	61	75.2	54.8	0.0903
Use of oral rehydration therapy	73	81.7	82.6	80.8	84.8	79.3	0.0229
Delivery attendance by a medically trained person	25.1	51.4	72.4	84.4	92.3	59.8	0.2497
Percent with TB symptom seeking treatment – Men	44	48.3	47.2	48.8	51.1	47.6	.0241
Percent with TB symptom seeking treatment – Women	40.1	46.3	47.6	47.1	51.9	46.6	.0426
Individual and Household Behavior							
Sanitary disposal of stool	43	63.9	74.6	84.3	92.9	69.2	0.1540
Exclusive breastfeeding	60.3	47.4	34.6	32.7	20.1	42.2	0.1853
Tobacco use – Women	13.3	8.6	7	5.7	5.3	7.6	-0.182
Tobacco use – Men	67.6	63.2	56.2	49.8	42.1	55.5	0.0907
Alcohol use – Men	39.5	46.1	44	36.9	28.4	38.9	0.0556
1998							
Service Use							
Full basic coverage of childhood immunization	59.8	72.5	76.3	79.6	86.5	72.8	0.0712
No basic coverage of childhood immunization	16.4	8.7	3.6	2.4	1	7.7	-0.483
Medical treatment of fever in children	32.4	37.6	44.6	51.6	41.7	40.3	0.074
Medical treatment of ARI in children	47.3	55	62.9	67.5	74.2	57.9	0.0735
Use of oral rehydration therapy	74.7	64.4	78.8	77.4	77.1	73.7	0.0026
Delivery attendance by a medically trained person	21.2	45.9	72.8	83.9	91.9	56.4	0.2763
Percent with TB symptom seeking treatment – Men	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Percent with TB symptom seeking treatment – Women	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Individual and Household Behavior							
Sanitary disposal of stool	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Exclusive breastfeeding	68.4	54.2	38.6	28.6	37.4	47.9	0.1652
Tobacco use – Women	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Tobacco use – Men	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Alcohol use – Men	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.

Source: Gwatkin et al. [2007], NDHS 2003

Health system variables include the availability, accessibility, quality in both clinical and non-clinical terms, and the money and non-money prices of health care. The Rand Health Insurance Experiment Study found that the demand elasticities for medical care

are nonzero and the response to cost sharing is significant [Manning et al. 1987] in the United States. Travel time has been found to be significant in demand for care estimates in other countries, and its importance increases for individuals who belong to lower income groups [see for instance, Gertler and van der Gaag 1990]. In the Philippines, Ching [1986], in her study of utilization of alternative providers, found that distance to alternative facilities are significant determinants of the utilization of that facility. In his analysis of the choice of obstetric care providers in Cebu, Hotchkiss [1998] found that distance to health facility has a negative and significant effect on facility choice. Indicators of provider quality - crowding, drug availability, and physicians attending to deliveries, are also significant determinants of where to utilize care. Price of care is a significant determinant in the choices of poorer families. Having insurance significantly increases the likelihood of utilizing alternatives with better quality. He found further that improving the quality of public facilities, in particular the availability of drugs, is expected to increase the utilization not only of non-poor households but poor households as well.

Table 17 indicates the percentage of households belonging to different income quintiles who utilize certain health facilities from the 2003 National Demographic and Health Survey. It can be noted that the lowest income quintile has the lowest percentage of households who utilize any health facility. A higher proportion of households belonging to the lower income quintiles utilize lower level public hospitals, municipal and district, relative to the two highest income quintiles. However, it can be seen that a greater proportion of households belonging to the two highest income quintiles utilize provincial and regional public hospitals.

Table 17. Utilization of Various Health Facilities, 2003

Wealth Index Quintile	RHU	Public Hospital				Private		Any Facility
		Municipal	District	Provincial	Regional	Clinic	Hospital	
Lowest	16.03	3.83	3.58	4.15	1.84	5.27	2.13	53.41
Second	19.23	5.02	3.72	6.58	3.39	9.15	4.32	59.71
Middle	18.44	3.47	3.70	5.40	3.82	12.49	8.16	57.96
Fourth	17.94	4.21	3.33	5.73	3.92	19.45	11.79	59.37
Highest	10.06	2.53	2.57	4.38	4.47	25.77	22.56	59.66
Total	16.51	3.85	3.41	5.26	3.42	13.84	9.23	57.90

Source: National Statistics Office. 2003 National Demographic and Health Survey

These trends have implications on the recipients of government subsidies. Public facilities, being largely tax financed offer care at zero or reduced fees to those who utilize them. About two-thirds of the DOH budget is spent for personal care services and these are largely spent on its retained hospitals and medical centers that are located in the NCR and the main urban areas in areas outside the NCR. Benefits of these subsidies would therefore accrue to those utilizing these health care facilities. However, the utilization rates of these facilities indicate that the recipients of subsidies may well be the middle income groups rather than the poorest.

Public facilities have been ranked as inferior to private facilities with respect to aspects of quality such as care, facilities, availability of medicines, personnel and convenience [World Bank 2001]. The same study reports that satisfaction is lowest among barangay health stations and rural health units where repeat visits are necessary because diagnosis is poor, medicines are inferior and often unavailable, staff are often absent and lack medical and people skills, waiting times are long, facilities rundown and schedules inconvenient.

Among the individual level variables, education has been found to have consistently significant effects on health outcomes. These effects are found in international studies that model education's effects through the choice of proximate determinants and in studies that directly estimate the education effects on health. Measured as either completed years of schooling or as categorical variables for passing specific levels, education's effects on health outcomes have been quite large. These results are also robust using different health measures; mortality rates, morbidity rates, physiological or self-evaluated measures [Grossman 2005]. There are also specific spillovers of individual education on the health of others, in particular the effect of mother's education on the health status of infants, children and even spouses. A large part of the effects of education on health operate through education's effects on wages and hence on income. However, there are other mechanisms through which education affects health. One is through a person's outlook about the future - if more education provides individuals with a better future in terms of greater access to income, makes one happier or improves one's outlook, then there would be a greater tendency to invest in one's health to protect that future. The more educated may also be more risk averse and would therefore avoid risky health behaviors. Education can also provide better access to information, improve critical thinking skills, help in decision-making and compliance to discharge and treatment instructions, and facilitate the utilization of more complex technologies, and utilize them more rapidly and effectively. In the latter mechanism, more education makes an individual a better producer of his own health [Cutler and Lleras-Muney 2006]. Initial findings also suggest that there is a strong association between education quality and declines in infant mortality. Utilizing cross country panel data, Jamison, Jamison and Hanushek [2006] found that a one standard deviation increase in test scores in international achievements tests increases the annual rate of decline in infant mortality rate by 0.6 percent. Based on rough calculations and extrapolations, they find that the health effects of appropriate education quality investments can exceed those from increasing the average number of years of schooling.

Education

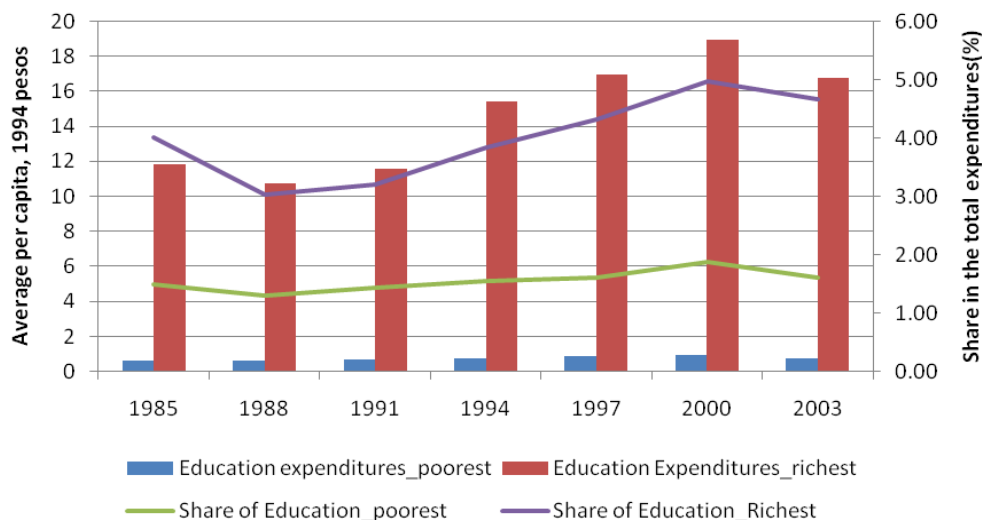
Having limited resources for education is one constraint faced by children of poor families in achieving outstanding school performance. This is one important channel for the intra-generational influence of poverty on education and is easily established in the case of tertiary education. A poor person of legal age cannot take out credit to finance her college education with her future earnings offered as collateral. Banks are unlikely to agree to these terms because of information asymmetry: the bank is unable to ascertain fully the student's cognitive ability and to monitor effort to complete her studies. Thus,

without access to credit or to government subsidy, children from indigent families are less likely to attain college education.

The poor have lower investments in education (IHC). One explanation for the inferior education performance and status of the children from poor households is the low investments of these households in their children’s education. This is noted in many countries [Banerjee and Duflo 2006] and can be seen likewise in the Philippines (Figure 3). Since 1985, the average per capita education spending of the poorest households was consistently less than 1 peso (in 1994 prices). The corresponding spending of the richer households was at least 10 pesos more (also in 1994 pesos), or as much as 18 pesos in 2000. In terms of share to total family expenditures, the bottom 25 percent of the population allocated no more than two percent. In contrast, the top 25 percent of the population apportioned as much 5 percent (in 2000), and not less than 3 percent (in 1988). This suggests that while education is a *normal* good, it is also a *luxury* good. This means that even if all parents would want to invest in their children’s education, it is effectively an indulgence that only the rich ones can afford.

Not only do the poor invest less in education, it is also found that the inequality in education is wider in poor provinces than in non-poor provinces [Mesa 2007]. Specifically, education Gini coefficient in poor provinces in 2000 was 0.276, compared to the 0.212 found in non-poor provinces. However, a larger percentage of the overall inequality in education comes from the inequality within the non-poor provinces (36%), and less from the inequality within the poor provinces (14.9%). This is due to the fact that there are more people residing in non-poor provinces than in poor provinces.

Figure 3. Average family expenditures on education per capita, poorest and richest quartiles, 1985-2003



The poor families are also likely to have children as laborers (LM). In many poor households, children are seen as an additional source of income. Thus, the incidence of

child labor increases with poverty. This is corroborated by some evidence. In his study on the determinants of child labor in the Philippines based on the 1995 National Survey on Working Children (aged 5-17 years), Esguerra [2002] finds that the probability of child labor is higher among poor households and in those with many members. Interestingly, he also reports that the likelihood of child labor is lower in households where the mother or the father finished at least high school and in households where the father works in a private firm, in government or as a domestic worker.

Further evidence is provided in Aldaba, Lanzona and Tamangan [2004] which made use of the 2002 Survey of Children conducted by the NSO. They found that the probability of dropping out of school among the child workers increases with poor health and with poor housing materials (an indicator of wealth). They also found, however, the probability of dropping out as the household monthly expenses increases. Moreover, some evidence on the effect of the family's poverty status on the likelihood of a child member being a worker is also reported.

The 2002 Survey of Children also reveals that about 29 percent of the 4.02 million child workers did not attend school. In addition, about 79 percent of the 170,533 child workers who lived away from home also did not study. Among the principal reasons reported by the child workers are: "to earn money to establish own business", "to supplement family income/important to family well-being", "to gain experience/acquire training", "to help in won household enterprise", and "to appreciate value of work". While some of these reasons may be justified, it is clear that family poverty drove these children to work and drop schooling.

In an earlier study [DECS PEPT Report 1997, as quoted in Philippine Human Development Report 2000], it was reported that there is a very high correlation between the educational attainment of the children who dropped out of schools and that of their parents. For example, those who have attained only up to grade 6 or 7 accounted for about 33 percent of the children and about 22 percent of the fathers and mothers. In contrast, none of the mothers or fathers who have completed at least high school had any children who dropped out of school. Thus upward mobility among the children of poor parents was not likely.

V. Intergenerational Linkages Between Health, Education, and Poverty

Both in theory and in reality, the poverty problem clearly has intergenerational dimensions. Studies in the U.S. and other developed countries indicate that intergenerational correlation of income ranges from 0.2-0.4, although possibly underestimated as a result of measurement error (Solon 1992). In developing country economies, measurement issues aside, mobility is believed to be much lower. In the Philippines, the probability of exiting poverty within a period of 13 years has been estimated in the range of 4-5% for agriculture and 22-25% for non-agriculture (Fuwa 2003). This suggests that there is a strong likelihood of parents passing on their poverty status to children.

What explains this intergenerational poverty link? There are two sets of explanations for the intergenerational correlation of incomes and health and education status (Keane and Wolpin 2001). The first is based on the heritability of traits.

Abilities, personalities, and preferences that led to parents' poverty status are passed on to their offspring (G). Parents with more education and better health are also likely to bear smarter and healthier children. Studies of intergenerational transmission on health and education indicate that the heritability of traits could be an important channel.

Ahlburg (1995), for example, pointed out that as much as 80 percent of variability in educational attainment could be due to genetic influence based on the Berhman et al. (1995) study using U.S. data on twins.

Fuwa (2003) noted that while there is evidence in developed countries such as the U.S. of persistent poverty due to unobserved factors being carried over through time, this does not seem to be case for the Philippines. Poverty dynamics in the Philippines, at least in the context of village economies, can be largely explained by observed factors. These second set of factors relate to parents' investments in their children's human capital.

Low levels of investments in human capital are believed to be one major cause of poverty transmission across generations (IHC, C). For example, it has been pointed out that lower school attendance and poorer health among the youth in low-income households partly explain why poverty tends to be transmitted and perpetuated from one generation to the next (Alonzo et al. 2004).

Parents' preferences over their children's human capital could be dictated by their own experience with returns to schooling and health. A well-known stylized fact in the development literature is that better educated mothers tend to have healthier children. Currie and Moretti (2002) used longitudinal data from the U.S. to test four channels explaining the positive correlation between maternal education and birth outcomes. Educated women tend to be more informed on health production for themselves and their children and thus, are able to use health inputs more efficiently or engage in healthy practices while pregnant (e.g., avail of prenatal care and reduce cigarette consumption). They also have higher income levels which relax budget constraints allowing them to avail of higher quality of care for their children. Educated women also tend to marry men with more education. However, they are also likely to have fewer children which may or may not cause these children to be healthier. While women with fewer children may have more inputs (especially resources other than time) for health-enhancing activities, they also have a higher opportunity cost of time and thus decide to allocate more time in the labor market at the expense of child rearing (Behrman and Rosenzweig 2002).

Gender is another important aspect of parental preferences over investments in human capital for their children. A possible explanation of the intergenerational persistence of poverty is that if households, in allocating health and education resources, discriminate against the sex that is more likely to invest in human capital for their future children, getting out of the poverty cycle becomes more difficult. Research in developing country

settings has demonstrated that women are more likely than men to invest in their children's human capital. For example, Pitt et al. (2001) found that in rural Bangladesh where three group-based credit programs (including that of the Grameen Bank) were evaluated, credit provided to women had substantial health effects on both boys and girls while credit to men had no significant health effects.

Evidence from the Philippines

Some evidence on the various intergenerational pathways have been found in the Philippines. Quimbo (2003), using national data on public elementary school children, found that performance in Math and Science is partly influenced by parental education. Children of college graduates on the average were found to have scores that are higher by about 1 to 3 percentage points.

The Fuwa (2003) study on poverty dynamics using longitudinal household data collected in a Philippine village suggests that poverty exit pathways have changed significantly over the over the thirty year period (1962-94) considered. An examination of mobility among various economic groups, namely, irregularly employed, tenant-farmers, small land owners, and regularly employed, revealed that although macroeconomic growth was the key determinant of poverty exit probabilities in the 1980s, schooling became as important as growth in explaining poverty exits after the 1980s. This was possibly due to the increased returns to schooling as a result of expanded international migration opportunities and overseas employment.

Households with international employment opportunities are perhaps also more likely to encourage use of the same pathway for their children and therefore invest in their children's education primarily because this pathway requires it. Marcelo and Ulep (2004) using data from a national survey on income and expenditures estimated that the marginal propensity to spend on education out of overseas remittances was higher than that out of other income sources. This is not inconsistent with the common belief that a primary motivation for overseas employment is the desire for parents to send their children to school (Bautista 1985, Vasquez 1992, Salvador 1980). Still, it remains to be seen if upward social mobility is indeed stronger among OFW families.

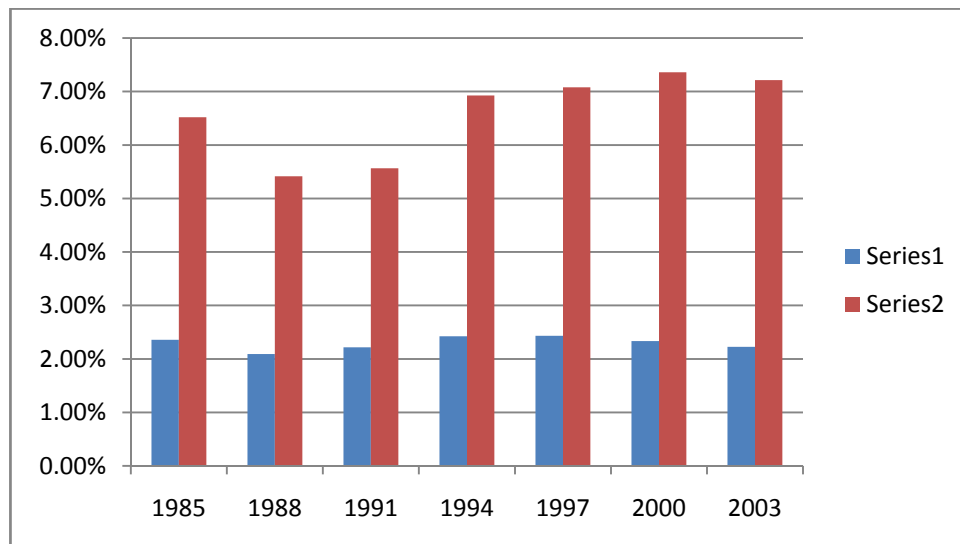
Research on intrahousehold allocation among Filipino families suggests that households are more egalitarian compared to other developing countries. While Quisumbing et al. (2004) found that sons are preferred with respect to land inheritance and daughters are in fact favored with schooling investments. This differential bequest pattern appears to be driven by the objective of equalizing incomes across sons and daughters if sons' and daughters' comparative advantage is in farming and nonfarming activities, respectively. Indeed, they find evidence to support this hypothesis- there were no statistically significant differences in income found between sons and daughters.

That daughters are favored with schooling investments seems to have reflected as well in schooling performance. In an international study on Math and Science achievement conducted among 38 countries in 1999, the Philippines is one of only two countries

where Science scores were higher for girls than boys and one of nine countries where girls outperformed boys in Math (Gonzales et al. 2000). Quimbo (2003) also consistently found higher Math and Science scores among girls than boys in her public school children sample.

Despite the ever expanding international employment opportunities for Filipino workers and the presence of household dynamics that favor girls at least in investments in human capital, one important obstacle is the low overall spending levels of poor Filipino households on human capital. Using data from the 1999 Annual Poverty Indicator Survey and from government budgets, Racelis (2007) found that patterns in per capita spending on education vary significantly across the bottom 3 and top 7 income deciles. On the average, per capita spending (government and household funds combined) on the education of children in the richer households is about 2 times that for children in poorer ones. This difference is even larger for higher education for which spending is as much as 3 times more per child in the richer households compared to those in poorer households. Moreover, while total per capita spending tends to be relatively even across ages up to 21 years for the top 7 income deciles, this declines with age for the bottom 3 deciles beginning at 12 years old. She found a similar pattern for per capita health spending (also government and household funds combined), with the bottom 30 percent households spending less than half of the spending per person in the upper 70 percent of the households. This huge gap in spending on education and health between rich and poor households has persisted in the last two decades. More importantly, the poor has maintained very low relative spending levels on education and health (Figure 4).

Figure 4. Ratio of Health and Education Expenditures to Total Expenditures, by income quartile



[Note: Series 1 = 1st quartile, Series 2= 4th quartile] Source of basic data: Racelis (2007)

While this graph shows non-increasing share in total household expenditures of education and health, there is evidence that educational attainment at least among rural households has improved over time. Quisumbing et al. (2004) conducted 4 surveys in 1985, 1989,

1997, and 1998 on the same set of rural households in two rice producing areas in the Philippines. These surveys provided information, among other things, on the educational attainment of the original respondents, their parents, and their children. They found that the respondents and their siblings completed 2.5 to 4.0 more years of schooling relative to their parents (who were born around 1910, got married in the 1930s, and had completed childbearing in the 1950s). Moreover, there have been significant improvements in the schooling attainment between the respondents and their children. While respondents on the average finished 6 years of schooling (completed primary education), their daughters completed an average of 10 years of schooling (completed secondary education) and their sons completed an average of 8.5 years of schooling. They further note that the gender gap in favor of women has widened in the children's generation possibly as a result of women's education becoming more profitable particularly in the nonfarm sector.

This positive development, however, may not be translated into relative income increases for women so long as the labor market continues to be discriminatory against women. For instance, barriers to female participation in nonfarm employment remain, such as the lack of affordable childcare facilities and time-saving technology for household work. More importantly, although returns to schooling of females have been rising in the Philippines, there is evidence that wage gaps in favor of men continue to exist (Lanzona 1998, Maluccio 1998). Until such labor market distortions have been addressed, we cannot expect the relative schooling advantage of Filipino girls over many of their developing world counterparts to be translated into a proportionate income advantage.

VI. The Case of Filipino Children

The intra- and intergeneration links between health and education discussed in the previous sections are examined using household survey data from 10 provinces in the Visayas and one province in Northern Mindanao. This data set was collected for the Quality Improvement Demonstration Study (QIDS), which was conducted by the UPEcon Foundation and University of California San Francisco in partnership with the PhilHealth and the DOH.

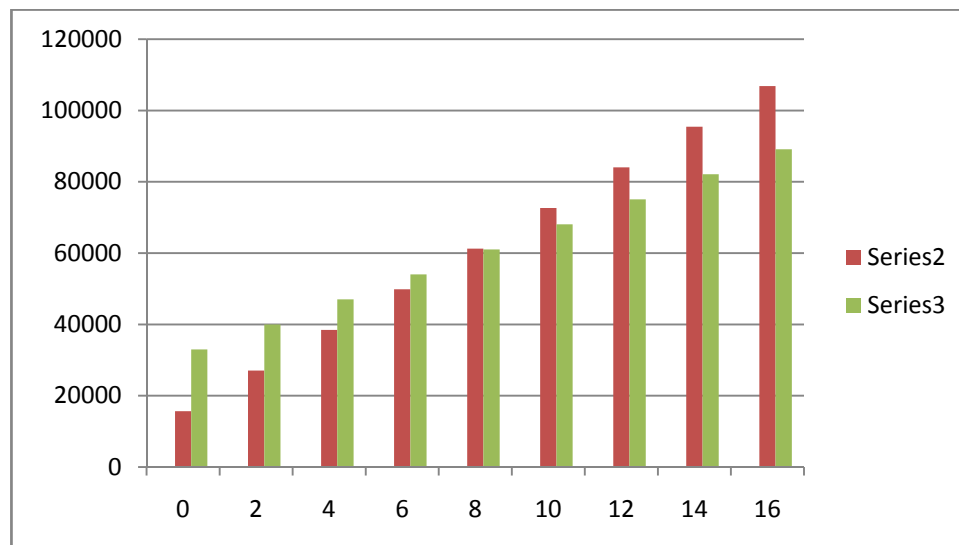
For the QIDS random household survey, children were selected randomly in the catchment areas of 30 pre-selected government (mostly secondary) hospitals. The sample households have an average (reported) annual income of PhP 65,230, about 56 percent less than the national average. Seventy-one percent of these households are located in rural areas. Because the data were collected primarily to evaluate the impact of hospital-based interventions on the health status and cognitive development of children, the data set includes objective measures of health and nutritional status and intelligence, as well as socio-economic characteristics of households such as income and education. Objective measures of health include height, weight, and folate and hemoglobin levels in blood. To measure cognitive development, two types of psychological tests were administered to the sample children depending on their age – the Wechsler Preschool and Primary Scale of Intelligence and Bayley Infant Development Scale. Intelligence quotients (IQs) were computed from the test results. The mean IQ was estimated at 91. Because the sample

children were below 6 years old and most were not yet in school at the time of interview, we use IQ as a proxy for potential schooling performance.

Using a household income model and an IQ model, the following links were examined: parental education and income, parental health and income, and child’s IQ and health, child’s IQ and parents’ education, and finally, child’s health and mother’s health. The income model had annual household income as dependent variable and parental education and health measures as explanatory variables. On the other hand, we modeled child’s IQ as a function of parents’ education (measured in years of schooling) while controlling for child characteristics such as age, sex, and health status as well as household characteristics such as income group. We estimated all models using ordinary least squares. Regression parameters were then used to generate predicted household incomes or children’s IQs.

Our regression estimates show that while parental education had a positive impact on household income (Figure 5), the education-income link appears to be non-linear, with father’s education having a larger marginal effect on household income than mother’s education.

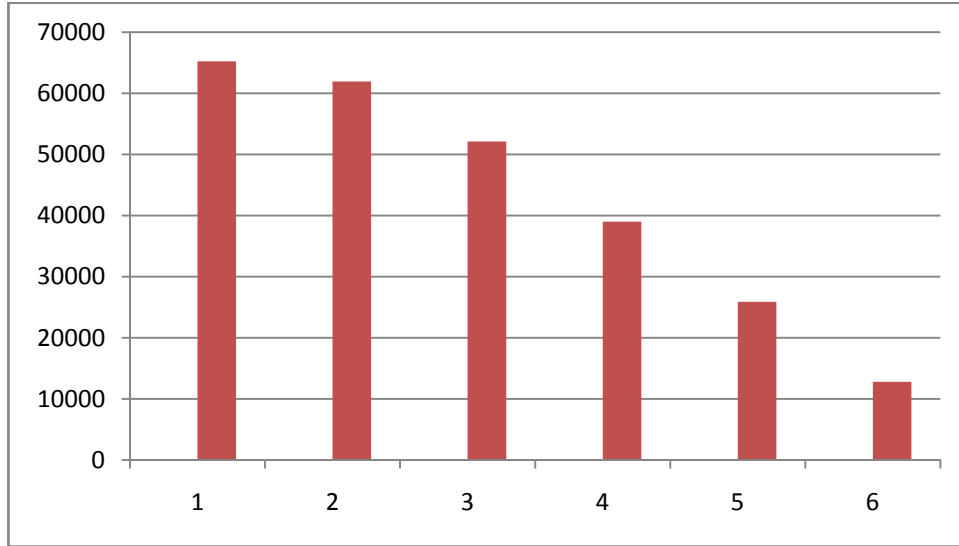
Figure 5. Annual Household Income, by parent’s years of schooling



[Note: X axis = Years of schooling, Y axis = Annual household income (in pesos), Series 2 = Predicted income, simulations based on father’s education, Series 3 = Predicted income, simulations based on mother’s education]

While mother’s health status (measured by number of reported illness in the past year) did not have a significant effect on household income, we found that fathers’ ill health reduced household income through education. That is, being sick reduces the marginal contribution of a father’s schooling on income by about 25 percent. This non-linear effect of father’s health on incomes is evident in Figure 6, where the rate of reduction in income due to illness is higher for fathers experiencing more illnesses.

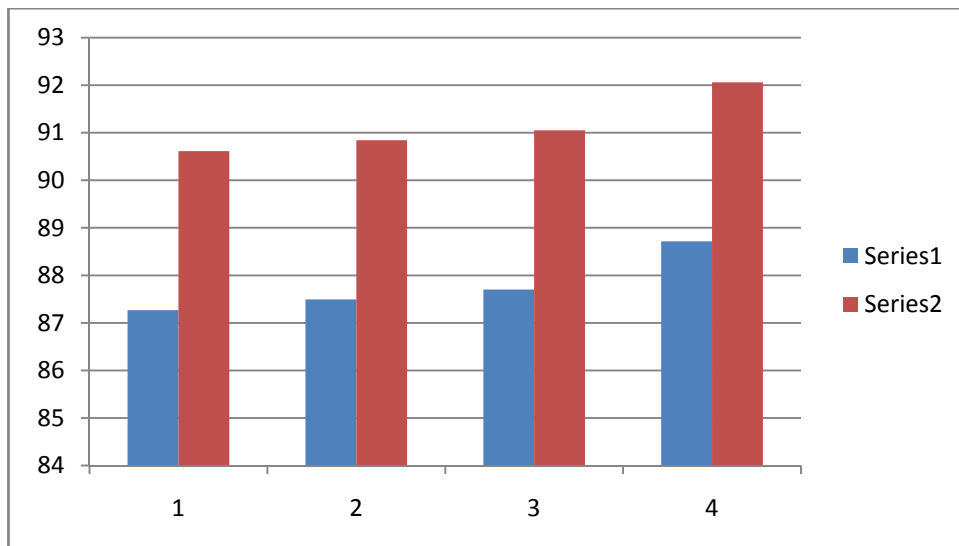
Figure 6. Annual Household Income and Father's Health



[Note: X axis = Number of times father got sick in the past year, Y axis = Annual household income (in pesos)]

A child's IQ is influenced by own health status. Using mother's subjective assessment of her child's health as a proxy for health status, we found that children who were assessed as having fair or poor health have lower IQ levels compared with those given excellent or very good health ratings, controlling for characteristics such as household income, and age and sex of child. This is evident in Figure 7.

Figure 7. Child's IQ and Health Rating, by income quartile

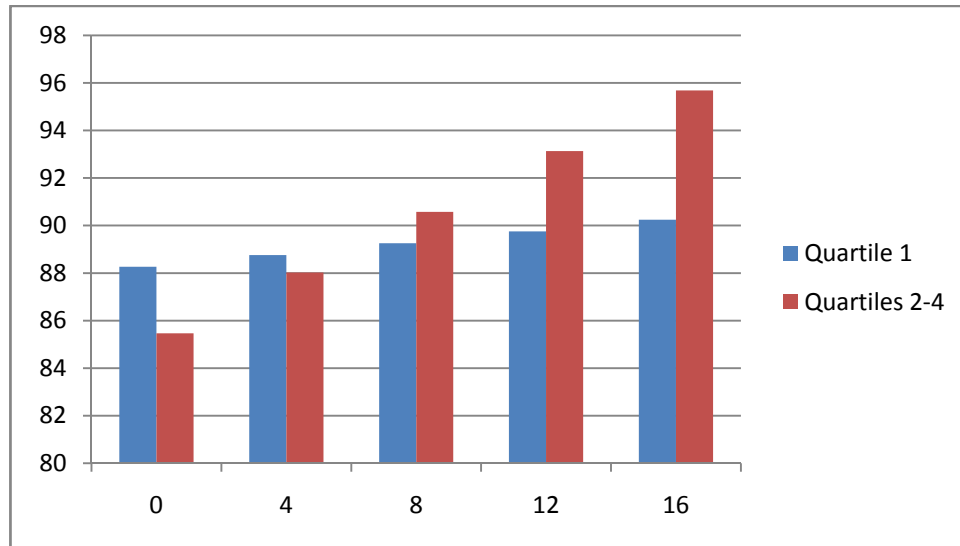


[Note: X axis = income quartile, Y axis = Predicted IQ, Series 1 = Fair/Poor Health, Series 2 =Excellent/Very Good/Good Health]

Figure 8 suggests that a children's IQ is positively correlated with their mothers' years of schooling. One can note however that the marginal contribution of maternal education is

significantly lower for the poorest group. Also, predicted IQ is higher for the higher income quartiles relative to the poorest household, except for children of mothers with no schooling at all.

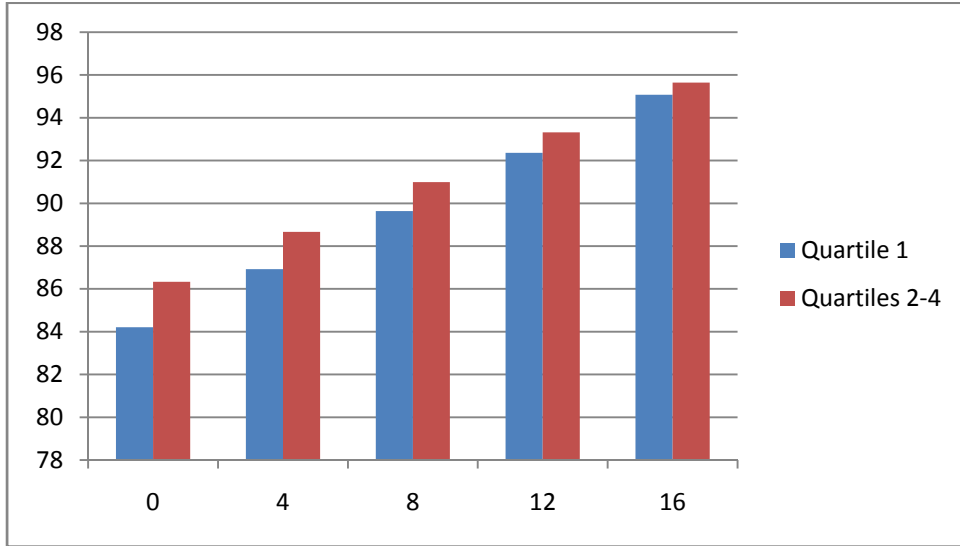
Figure 8. Child’s Predicted IQ, by Mother’s Education and Income Group



[Note: X axis = Mother’s years of schooling, Y axis = Child’s predicted IQ]

A similar pattern can be found for children’s IQ and fathers’ educational attainment. It appears from Figure 9, however, that the marginal contribution of father’s education to children’s IQ does not vary across income groups as much as it does for mother’s education. Thus, children of richer families seem to have a larger IQ advantage compared to poorer children with a more educated mother rather than a more educated father. Put differently, it would seem that poor children might not benefit as much – at least in terms of IQ improvements - from higher maternal than paternal education.

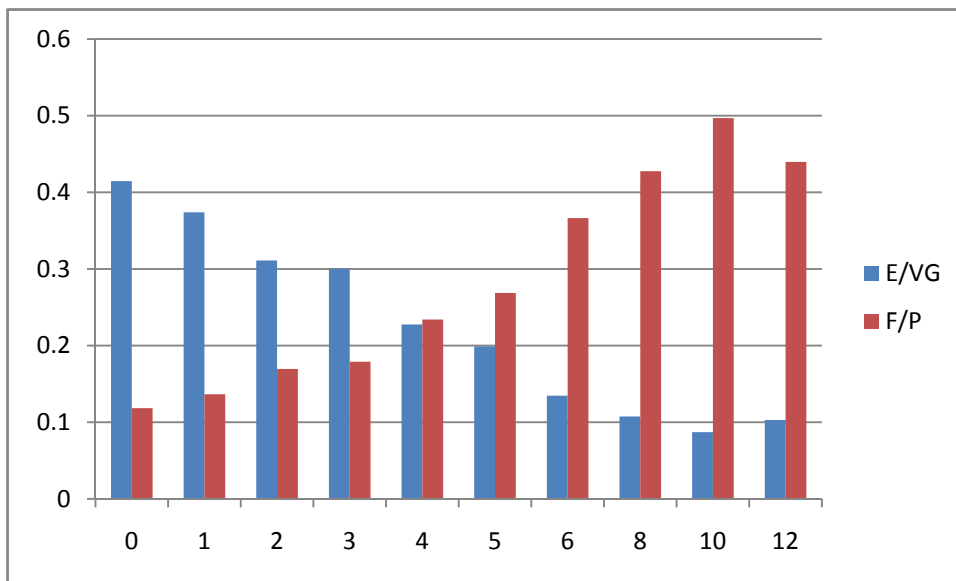
Figure 9. Child's Predicted IQ, by Father's Education and Income Group



[Note: X axis = Father's years of schooling, Y axis = Child's predicted IQ]

Lastly, Figure 10 attempts to illustrate intergenerational correlations of health status. Here, we show that more sickly mothers were more likely to report that their children had fair to poor health rating and less likely to give their children had very good to excellent health status. This subjective health measure has been found to be good proxy for objective health measures or biomarkers (Peabody et al. 2006).

Figure 10. Mother's Health Rating of Child, by Number of Times Mother Was Sick in the Past Year (E=Excellent, VG=Very Good, F=Fair, P=Poor)



[Note: X axis = Number of times mother was sick in the past year, Y axis = probability that a child is given an E/VG or F/P rating]

VI. Policy implications

The Philippine evidence show that poverty webs are real, and that health and education and indigence are inextricably linked at the household level. The evidence concerning these linkages suggests that to break the cycle of poverty, a combination of health, education and anti-poverty measures are best developed and targeted to households, much as one does best by cutting through the mesh to disentangle from the web. In the design and targeting of appropriate policies, it is important to recognize that the households are the ultimate decision makers with respect to health and education decisions. Households and the government may not have the same preferences over health and education. Government investments in health and education, especially when too much emphasis is placed on service delivery and other supply-side aspects, may not necessarily evoke the expected responses from households if preferences sets of households and the government are not the same. Thus, the demand-side interventions are critical.

The policy interventions targeted to households may be identified using the pathways through which poverty is perpetuated as seen in Figure 2 earlier.

Policies to prevent or limit the impoverishing effects of bad health and education outcomes within a generation.

Expansion of PhilHealth. An important element to address the impoverishing effect of out-of-pocket payments for health is the expansion, both of enrollment and effective coverage of services, of the Philippines' social health insurance program, PhilHealth. Expansion of the coverage of the poor in social insurance begun to be emphasized in 1997 with the Indigent Program, now the Sponsored Program of the Philippine Health Insurance Corporation. Data from Table 18 indicate that as of 2003, the proportion of household members who are covered by PhilHealth is still low for all households and even lower for poorer income households. As of 2006, indigent members comprise about 36 percent of PhilHealth members. Estimates using official poverty lines and population projections indicate that the number of enrolled families in 2006 is about 105 percent of the estimated number of poor families [Kraft 2008]. However the same study reveals that there are wide provincial variations in the ratio of enrolled members to the number of poor families.

However, while the number of poor who are enrolled has increased, the effective coverage depends on the sufficiency of PhilHealth benefits. The same table indicates that even if covered, some members do not utilize PhilHealth benefits. While lack of information and documentary requirements count for significant numbers of those who do not utilize, the lack of money to pay for excess billing also figures prominently, especially to those who belong to the lowest two wealth quintiles.

Table 18. Social health insurance coverage and utilization, 2003

Quintile	% PHIC member	% Used PHIC benefits for the past 12 months	% Satisfied with PHIC benefits	No money for excess billing as reason for non-utilization of benefits
Poorest	2.22	17.60	16.90	0.88
Poorer	3.92	23.07	22.73	0.98
Middle	6.64	24.46	25.59	0.13
Richer	10.00	27.96	27.09	0.19
Richest	15.84	32.51	32.62	0.11

Source: NDHS 2003

Payments for medicines comprise a substantial amount of impoverishing health care payments. Drug prices in the Philippines are one of the highest in Asia [Kraft 2006] due in part to the ineffective implementation of the Generics Act. While drugs and medicines are given at subsidized rates in public facilities, shortages and unavailability within the facilities mean that they would have to be purchased outside. This is true for inpatient as well as outpatient drugs. Coverage by PhilHealth of inpatient drugs and medicines is rendered less effective by caps and by unavailability of services and supplies within the facilities.

Policies that alleviate the adverse effects of poverty on investments in human capital both within and across generations.

Current investments in education and health may not be optimal from society's viewpoint given the poor's current resources and income status. Thus, some measures may be forwarded to partly delink investments in human capital with the income status of the household. The expansion of PhilHealth, both in terms of membership and coverage, can also be considered as one such measure. In addition, several other measures can be forwarded that would directly and indirectly address this issue.

Provision of education vouchers and scholarships to children from poor families. In the education sector, vouchers have been used successfully in other countries to promote greater parental participation in child schooling and in the quality of education services. Better scholarship programs that take into consideration the initial disadvantage of the poor should be developed. Current scholarship programs that are based on performance in written exams are necessarily biased against the poor whose literacy, but not cognitive skills are impaired by frequent absences or breaks in schooling. In addition, their access to current scholarship programs may even be limited because of lack of information or resources to go to test centers.

Explore income transfer mechanisms conditional on target behaviors. Income transfer mechanisms have been used in the past to augment general household resources. In recent years however, experiments have been conducted in other countries where income transfers were made conditional on households' investments in the human capital of children [see, for example, Gertler and Boyce 2001]. These include keeping children in school, completing required immunizations or participation in school health nutrition programs. These programs are especially important where the availability of publicly provided services does not guarantee utilization perhaps because of lack of information and differences in preference sets of households and society. Early results from these experiments indicate improvements in target health and education outcomes, such as reduction in drop-out rates and increases in immunization coverage, over a period of time. Early results also indicate that aside from boosting human capital investments, improvements in the general economic conditions of participant families resulted as the transfers were invested in income generating assets and other physical capital.

A similar attempt is now piloted in the Philippines by the Department of Social Welfare and Community Development (DSWCD) in cooperation with the LGUs. Called the *Ahon Pamilya Pilipino*, this program gives direct financial assistance to poor families under two components. The health and nutrition component transfers P 500 a month (Php 6000 per household per year) conditional on children being brought to health centers for check-ups and immunizations among others. The education component is a P 300 child per month (P 3000 a year per child) assistance, for a maximum of three children conditional on their children attending school 85 percent of the time. This was launched in 2007 with a target of covering about 123,186 households (360,000 children) by 2008 and an additional 175,000 households (525,000 children) by 2009. The results of this initiative could very well shape innovative policy interventions along the lines that are advocated here. A careful monitoring of the program's implementation should be undertaken in order that potential benefits would not be derailed by implementation failures. Likewise, careful evaluation of its impacts should be undertaken in order to assess whether it is effective in alleviating poverty as well as mitigating poverty's effects on health and education outcomes, in both the immediate and longer term.

Encourage household participation in the determination of public infrastructures and services related to health and education. An important implication of our framework is that the household is the key decision-maker when it comes to utilization of education and health services. Thus, education and health services that are aligned to household preferences may be more likely utilized. Mechanisms that encourage participation of households in decision making regarding the provision of public infrastructure and services are to be supported.

The KALAHI-CIDDS is the government's main anti-poverty program [Empowering Civic Participation in Governance 2006]. Its key feature is the empowerment of communities through their enhanced participation in governance and project implementation. The DSWCD is managing its implementation in 16 steps that villagers follow. Through these steps, villagers prioritize their development needs, design activities, seek technical assistance, manage resources and implement and operate

development interventions. After the interventions, villagers are expected to be able to be more active in the delivery of other pro-poor services.

However, initial evaluations of the program indicate that while roads, schoolbuildings and day care centers have been established in the target sites leading to improved school attendance and immunization coverage, the participation of households remains limited. Most households continue to rely on local government officials to determine public infrastructures. Likewise, it is unclear whether prioritization of public infrastructure take into account complementarities in health and education services.

Shift emphasis from quantity of services to quality of services. The quality of investments in human capital partly depends on the quality of the goods and services that are combined with household time to produce these investments. Data provided in the discussion indicate that the poor utilize educational and health services from public facilities that are oftentimes of inferior quality to their private counterparts. Thus a shift in emphasis of the public sector from provision of quantity to improvements in quality services can be considered as alleviating the adverse effects of poverty on the capacity to invest in human capital.

There is a need to shift the government's focus from quantity to quality of health and education services. One suggestion made in WB [2004] is worth reiterating: greater decentralization of health services and improved accountability of local education officials to the parents and other local officials. The organizational change in the Department of Education should give district-level education officials greater discretion in planning and executing their budgets based on local needs and conditions, and without waiting for guidelines and directions from the central office. At the same time, their accountability to the parents ensure that the appropriate education inputs are provided, i.e., the optimal combination of teacher, classrooms and books will be selected. Parent-teacher partnerships, which involved parents in the schooling of their children, have been shown an effective approach to reducing dropout rates and improving student learning at the primary level in an experimental study of Philippine schools in 1990-92 [Tan, Lane and Lassibille 1999].

In the health sector, the Department of Health is now implementing its *Fourmula One for Health (F1)* to improve the overall health status and access to quality health care services, especially of the poor. This policy initiatives focus on reforms along the four pillars of service delivery, financing, regulations and governance. As one of the challenges the DOH is facing is how to devise various mechanism to influence health service provision and financing of LGUs, it has embarked on advanced implementation of F1 in selected provinces. This involves technical assistance to LGUs to improve provincial health planning that includes identifying health reforms at the local level along the four pillars of F1 and the provision of additional seed capital to improve health and other health related facilities such as water, sewer and toilet systems. At the national level, the DOH has to administer vertical health programs focused on diseases such as tuberculosis, malaria, HIV-AIDs and some 40 hospitals spread over the country. F1 reforms also

encompass improvements in the conduct of these programs such that not only service delivery is emphasized but sustainable financing, governance and regulations as well.

Thus, the effective and sustained implementation and expansion of these F1 reforms would determine the overall impact on quality of services.

Policies that exploit complementarities between education and health

Prioritization of maternal and child health. Evidence presented in the literature indicate that important complementarities between: (1) the health and education of mothers and the health and educational status of children, and (2) between the health and educational status of children. It was also noted that maternal mortality and infant and child mortality remain high, especially for the lower income groups. Thus, interventions that are directed at improving maternal and child health care are expected to yield significant dividends not only through the health of the current generation but also on the health and educational outcomes of future generations.

Several initiatives in this direction may need to be encouraged. The shift in emphasis from current vertical programs that focus on maternal and child health separately to integrated delivery of maternal and child health care services is one. While the establishment of facilities that are physically equipped to handle pre-natal, delivery and ante-natal services and child health services is an important component, integration also entails several other important elements. One is investments to ensure that providers are trained on the proper protocols and to ensure that they become more proactive in the delivery of services, including family planning counseling and other health advices. Another important element is to ensure that financing at the facility and the household level is available and sustainable. This may entail a clearer delineation of financing sources for such services, for instance budgets vs. PhilHealth, and or strengthening current programs which may be able to include these services, for instance the outpatient benefit package of PhilHealth for indigents. The latter is especially important as financing may be tailored to ensure that incentives to deliver sufficient quantities and qualities of care are present, for instance tying up certain proportions of capitation payments to providers conditional on provision of minimum amounts of services. The latter is also important in that clear financing arrangements may address resource constraints that prevent poor women from utilizing maternal and child health care services.

Bundling health and education interventions. Coordination between health and educational interventions need to be strengthened as there are natural complementarities of specific health and education interventions. For instance, breakfast feeding programs in schools are needed in order to improve cognition, immunization programs in schools will reduce absenteeism. As the target beneficiaries, children, of these interventions are the same, it may make sense to administer health programs in schools to reduce transaction costs.

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