Effects of Public Healthcare Services on Equity and Poverty Reduction in Bangladesh
A Study Using National Surveys

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Dedicated to

My beloved Parents

Declaration

I declare that the Thesis entitled ***"Effects of Public Healthcare Services on Equity and Poverty Reduction in Bangladesh: A Study Using National Surveys"*** submitted by me to the Institute of Health Economics, University of Dhaka is the outcome of my own research work. This thesis has not been submitted earlier in part or full to this or any other university for any degree or award.

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Certificate of the Supervisor

This is to certify that this is an original and bona fide research work done by ***Mohammed Nazmul Huq***, Research Scholar, Institute of Health Economics, University of Dhaka, under my supervision. This research work is carried out for the degree of Doctor of Philosophy in Health Economics and has not been submitted for any degree or award elsewhere.

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Acronyms

ABCN	Area-based Community Nutrition
AIDS	Acquired Immunodeficiency Syndrome
ANC	Antenatal Care
ARI	Acute Respiratory Infection
BBS	Bangladesh Bureau of Statistics
BIA	Benefit Incidence Analysis
BINP	Bangladesh Integrated Nutrition Program
BMI	Body Mass Index
BMMS	Bangladesh Maternal Mortality Survey
CC	Community Clinic
CVD	Cardiovascular Diseases
DALY	Disability Adjusted Life Years
DFP	Directorate of Family Planning
DGHS	Directorate General of Health Services
DH	District Hospital
DNS	Directorate of Nursing Services
DP	Development Partners
EOC	Emergency Obstetric Care
EPI	Expanded Program on Immunization
ESD	Essential Service Delivery
ESP	Essential Services Package
FP	Family Planning
FWA	Family Welfare Assistant
FY	Fiscal Year

GDP	Gross Domestic Product
GGR	General Government Revenue
GoB	Government of Bangladesh
HA	Health Assistant
HDS	Health and Demographic Survey
HEU	Health Economics Unit
HIES	Household Income Expenditure Survey
HIV	Human Immunodeficiency Virus
HNPSP	Health, Nutrition and Population Sector Program
ICDDR,B	International Centre for Diarrhoeal Disease Research, Bangladesh
IMCI	Integrated Management of Childhood Illnesses
IMR	Infant Mortality Rate
MCH	Maternal and Child Health
MCWC	Mother and Child Welfare Center
MDG	Millennium Development Goals
MoF	Ministry of Finance
MoHFW	Ministry of Health and Family Welfare
MSR	Medical and Surgical Requisite
NCD	Non-communicable Diseases
NGO	Non-Governmental Organization
NHA	National Health Accounts
NIPORT	National Institute of Population Research and Training
NNP	National Nutrition Project
OOP	Out of Pocket Payments

PC	Planning Commission
PNC	Postnatal Care
PPP	Public Private Partnership
PRSP	Poverty Reduction Strategy Paper
QoC	Quality of Care
RH	Reproductive Health
ROW	Rest of the World
RTM	Research, Training and Management International
SWAp	Sector Wide Approach
STD	Sexually Transmitted Disease
STI	Sexually Transmitted Infections
TBA	Traditional Birth Attendants
TFR	Total Fertility Rate
THE	Total Health Expenditure
U5MR	Under-five Mortality Rate
UHC	Upazila Health Complex
UHFWC	Union Health and Family Welfare Center
UNDP	United Nations Development Program
USC	Union Sub-centers
VAW	Violence Against Women
WB	World Bank
WHO	World Health Organization

Abstract

The Government of Bangladesh (GoB) is committed to provide quality health care services to improve the health status of the people, especially the poor, through improved access to and utilization of efficient, effective and sustainable health care and hospital services. The Ministry of Health and Family Welfare (MoHFW) provides nationwide healthcare services. Even then, its efforts to provide healthcare services at the various levels free of cost, has, however, not led to desired level of the use of services. Although the allocation of the public healthcare resources has been improved significantly over the years, the current allocation is made neither based on regional health needs nor it takes into account poverty status by geographic locations. Further, public resources allocated to this task are limited. MoHFW spent less than one percent of Gross Domestic Product (GDP) on health care.

Out-of-pocket (OOP) payments for health care has been sufficiently costly in a developing country like Bangladesh. These payments are largely unpredictable and usually have a negative impact on the poor households, while large expenditures have catastrophic impacts on household welfare. A well-off household has to finance medical expenses from savings, or by cutting back on luxury items of consumption. But, a less well-off household is forced to cut back on necessities and may be pushed into poverty. Households that were already poor have been pushed further below the poverty. Further, many have to forgo such expenses, which increase the extent of morbidity and thereby lose their productivity. In Bangladesh, attention has hardly been given to recognize the linkage between health and poverty, which could be the basis for the public investment policies on the condition of health and income. Therefore, the current study is an attempt to this endeavor.

In recent years, a number of studies have stated in favor of public healthcare system while many other studies argue against its role in ensuring equity and poverty reduction process. Under the circumstance, the broad issue of the study is to assess ***to what extent*** the public healthcare system reduces inequity and poverty through reduced disease burden and healthcare expenditure as well as increased productivity. The study also evaluates to what extent out-of-pocket payments for healthcare disrupt level of living standards of the people and push them into poverty. However, the findings of the study would allow the policy makers in designing efficient poverty reduction strategies through improving health status of the people specially in the underserved as well as unserved areas. Further, the impact of health on productivity as well as poverty would help the policy makers to formulate possible multi-sectoral interventions for sustainable economic development in the country.

The present study hypothesized that health interventions especially by the public healthcare system play a significant role in reducing the inequalities prevailing in the health sector by reducing the gap between rich and the poor. As a result, effective expansion of public health care programs has redistributive benefits as poor gets more benefits from public healthcare subsidies. The study also hypothesized that improved health status leads to increase in productivity and significantly reduces poverty. Further, public healthcare system serves as a safety net for the extreme poor through nationwide subsidized program and helps overall poverty reduction process.

The broad objective of the research study was to assess the effects of public healthcare system on equity and poverty reduction in Bangladesh. The study has also focused on the impact of health on productivity as well as poverty and assesses the issues involved in the development of an econometric model for effective distribution of its limited resources towards poor.

The study was based on secondary data. The study has utilized three nationally representative surveys – Household Income Expenditure Survey (HIES) 2005, Household Income Expenditure Survey (HIES) 2000, and Health and Demographic Survey (HDS) 2000. All the surveys were conducted by Bangladesh Bureau of Statistics (BBS). The study also used different published documents, reports, research articles including Bangladesh National Health Accounts (NHA) and Public Expenditure Reviews (PER) conducted by Health Economics Unit (HEU) of Ministry of Health and Family Welfare (MoHFW). Further, the study has utilized a number of analytical tools and adopted a number of econometric/analytical models for data analysis covering (i) geographical resource allocation, (ii) benefit incidence analysis (BIA), (iii) proxy means testing (PMT) model, (iv) progressivity analysis, (v) analysis of catastrophic healthcare payments, (vi) impact of health on productivity, (vii) impact of health on poverty, and (viii) decomposing the redistributive effect of public healthcare payments.

The analysis of the study findings reveals that the utilization rate of public healthcare facilities has been quite low, which is even worst among the poor. The poor of the country have been less likely than the rich to select any modern medical provider when reporting sickness. As a result, they preferred to seek healthcare from any unqualified or traditional providers since they had been comparatively cheaper, easier to access and people are more familiar with these services.

The main source of financing for health care in the country has been the household. From a poverty-related perspective, the most striking aspect of current health care financing in Bangladesh has been the large share of out-of-pocket payments. It is also important to note that a Bangladeshi household, on an average, spent 7.5 percent of its total income for healthcare. OOP payments for health care services have been sufficiently costly for the people of a developing country like Bangladesh, where a significant portion of the population subsists below the poverty. Further, more people have been pushing towards poverty due to healthcare payments in 2005 as compared to 2000 particularly in urban areas. This implies the failure in targeting public resources for the poor in urban areas. In addition, the distribution of the healthcare service provision over the country has not considered the health needs of the people by different geographical regions. As a consequence, the poor coverage of the public healthcare service provision over the country fails to ensure the substantial gain in health sector.

The poor are receiving less public resources allocated to health as compared to the rich people of the country. The poorest 20 percent of the population receive only one-fifth of the total public healthcare subsidy and the richest 20 percent receive approximately one-third of the total subsidy. However, the primary healthcare facilities seem to be more pro-poor as compared to the tertiary level facilities and benefiting the poor to some extent. As a result, public healthcare system serves as a safety net for the extreme poor through its primary health care services. But, the poor do not get benefits from public health care system up to the desired level.

Health is usefully considered to be a component of human capital. Good health has significant positive impact on productivity of the daily wage earners in Bangladesh. Thus, the national policies should give emphasis on the poverty reduction strategies through improved health status of the individuals. The MoHFW should also adopt a pro-poor allocation system so that poor districts receive more resources to maximize equity. As public resource devoted to the health sector is limited, the public healthcare system should adopt an efficient targeting mechanism like Proxy Means Testing (PMT) model for properly identifying the poor and ensure that poor receive maximum benefits from the limited public health sector resources.

Public healthcare system reduces the welfare loss of the people especially the poor. Although it is not successful in benefiting the poor at the desired level, but it plays an important role in reducing the health sector inequalities. As a result, steps should be taken to enhance the utilization of subsidized public health care services. To this end, demand side financing schemes for the poor, especially for the selected crucial cares, should be introduced. It is also expected that such schemes would considerably increase the utilization of public health services by the poor, women and the vulnerable people.

CHAPTER 1: INTRODUCTION

The Government of Bangladesh (GoB) is committed to provide quality health care services to improve the health status of the people, especially the poor, through improved access to and utilization of efficient, effective and sustainable health care and hospital services. In the Health, Nutrition and Population Sector Program[1] (HNPSP) more emphasis has been given in reducing mortality and morbidity by strengthening the Primary Health Care (PHC) infrastructure and its management, and by ensuring that the poor receive good quality preventive, promotive and curative health services. The Ministry of Health and Family Welfare (MoHFW) provides nationwide healthcare services. Even then, its efforts to provide healthcare services at the various levels free of cost, has, however, not led to desired level of the use of services (Huq, M Nazmul; Howlader, Sushil Ranjan; et.al., 2007 and WB, 2001). As a result, private providers as well as growing NGO sector play an important role in the health sector of Bangladesh.

Targeting the poor and attaining effectiveness in targeting the publicly subsidized programs to the poor have always been a big development challenge. In recent years, the Government of Bangladesh has attempted to make a structural shift in resource allocation by focusing more on primary health care service delivery rather than on secondary and tertiary public health service. Presently MoHFW is spending more than a half of its total budget (53%) on primary health care under its Essential Services Delivery (ESD) (Rabbani, A. K. M. Ghulam; Huq M Nazmul; et.al., 2006). To encourage the poor to use public health care facilities, the upazila health complex and lower level facilities are not permitted to charge user fees. At district and tertiary level facilities, a discretionary payment

[1] HNPSP is a sector wide program approach adopted by MoHFW with the long-term, realistic and feasible aim of creating a modern, responsive, efficient and equitable health, nutrition and population (HNP) sector.

exemption system exists. These adjustments are viewed as pro-poor and conforming to the overall national policy goals detailed in the Poverty Reduction Strategy Paper[2] (PRSP).

However, an analysis of the MoHFW's actual expenditures in the last two fiscal years demonstrates an absence of an explicit geographical (or spatial) targeting in resource allocation. In practice, resource allocation does not take into account the poverty status or the needs of the population (Rabbani, A. K. M. Ghulam; Huq M Nazmul; et.al., 2006 and WB, 2005). Further, public resources devoted to this task are limited. MoHFW spent less than one percent of Gross Domestic Product (GDP) on health care (Huq, M Nazmul; Howlader, Sushil Ranjan; et. al., 2007). It is also important to note that the current resource allocation to different geographical region is made considering the distribution of the healthcare facilities. But, these facilities are very unevenly distributed across the districts and upazilas. Currently, nearly 22 percent of the upazilas do not have any health complex facilities (WB, 2005). Apart from these, social, cultural and economic barriers prevent poor from accessing care and predispose them to unnecessary death. Inequities and social/ economic exclusion faced by poor, especially poor women are reflected in worse differentials in maternal health indicators by economic quintiles. Low socio-economic status prevents these women from upholding and claiming their rights and that of their newborns to optimal care.

Equity in the health sector in terms of utilization, finance and delivery is an important system goal. Equity is also required for the sustainable development in the health sector performance. Therefore, identifying the beneficiaries of public health care services by their level of living standards would have a crucial impact

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[2] Poverty Reduction Strategy Paper (PRSP) is prepared by the government through a participatory process involving civil society and development partners. PRSP outlines country's strategy to reduce poverty.

towards reducing overall social and economic disparities (WB, 2005). Recent studies on utilization of health care services in Bangladesh show that more women and children utilize public health care facilities, especially its primary level facilities. It is also evidenced that nearly a half (48.1%) of the patients of the upazila health complex and below level facilities are the poor. Thus poor are more likely to rely on public facilities, particularly the primary level facilities as compared to their non-poor counterpart (Huq, M Nazmul; Howlader, Sushil Ranjan; et. al., 2007). This leads to the statement that public healthcare system plays an important role in reducing the inequalities prevailing in the health sector by reducing the gap between rich and the poor.

Public health care system also plays a vital role in reducing this welfare loss of the people, especially of the poor, as the services are free or nominal fees are charged. The current study, however, examines whether public healthcare system serves as a safety net for the extreme poor through nationwide subsidized program and helps overall poverty reduction process. But, it is also important to note that benefits through public healthcare spending still cover a small part of the healthcare demand. As a consequence, the incidence of household spending on health in proportion to income, however displays a certain degree of progressivity. This shows the potential redistributive benefits associated with effective expansion of public health programs.

The globally observed predisposition regarding poverty reduction strategies considers improvement of health as an important panacea of poverty reduction. Bangladesh also has genuine reasons to launch renewed efforts for poverty reduction through improved health. Since long, over the period of about four decades, the government of Bangladesh (GoB) has been implementing massive interventions for poverty reduction. Undoubtedly, the interventions have been

considerably successful in enhancing food safety, generating employment, empowering the women, and reducing poverty in a vast section of the population. But poverty still remains quite substantially. The main reasons for the low pace of poverty reduction are the failure of the interventions to sufficiently reach the remote and hard-to-reach areas of the country and the steep rate of population growth. Further, resource devoted to the health sector is limited and geographic allocation of the public health care resources is neither based on the health needs not it considers the poverty status of the region.

Despite the fact that the health sector program activities are continuously increasing and have achieved remarkable success in several respects, the overall health status of the population is still low. Supply side barriers, like absenteeism of health care providers, unofficial user fees, lack of complementary inputs, may have remained to a significant extent. In contrast, interventions adopted to reduce demand-side barriers are important in improving access to care but the consumers may not get access to effective, responsive and better quality services without the implementation of better management practices, improved mechanisms for medical supply management, and better training and incentives for providers. Another reason for this is also similar to that for poverty reduction program: the health program could not yield the necessary amount of benefit to the poor and the disadvantaged sections of the population, and the failure is more pronounced in the remote and backward areas. As a result "inverse-care law" has become highly operative in the health sector of Bangladesh (Howlader, Sushil Ranjan; et. al., 2005). The combined facts, failures of the poverty reduction and health interventions and heath status remaining low, poverty have been remaining rampant in the country especially in the remote and backward areas.

It follows that the health sector of Bangladesh is supposed to contribute significantly to poverty reduction. In order to contribute to successful poverty reduction, it is important that the health sector be devised with appropriate strategies and interventions for efficient public resource allocation based on the health needs and benefiting the poor more from public health care subsidies. This, in turn, requires that the sector properly identifies the poor and the disadvantaged groups, rigorously recognize the constraints for providing healthcare to the poor and also establish the relationship between out-of-pocket (OOP) payments for health care[3] and poverty and trace the pathways through which improved health can reduce poverty.

In a developing country like Bangladesh, out-of-pocket (OOP) health care expenditures typically account for the largest component of the Total Health Expenditure[4] (THE). These payments are largely unpredictable and usually have a negative impact on the poor households, while large expenditures have catastrophic impacts on household welfare. The illness and consequent expenditures on health care can severely disrupt living standards (Pradhan, M. and N. Prescott, 2003). A household with a member succumbing to illness may be forced to spend a large fraction of its resources on health care at the cost of other goods and services. For a poor household, even a tiny fraction might have a very high opportunity cost. A household that has the misfortune to succumb to illness and whose spending pattern is disrupted faces a further welfare loss. The magnitude of this welfare loss will depend upon the living standards of that household. A well-off household can finance medical expenses from savings, or

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[3] Out-of-pocket (OOP) payments for health are made directly by a member of a household as a patient for the purchase of a medical goods and service at the point of service.

[4] Total Health Expenditure (THE) includes health expenditures of the nation during the accounting years comprising expenditures on all healthcare functions as well as capital formations of all health care providers and expenditures on education and research during the accounting period.

by cutting back on luxury items of consumption. But, a less well-off household is forced to cut back on necessities and may be pushed into poverty. Households that are already poor may be pushed further below the poverty (Van Doorslaer, E.; et. al., 2003). This strongly provides the statement that low health status of the population is a major factor of persistence of poverty. In contrast, improved health significantly reduces poverty.

Large and unpredictable health care payments can expose households to a substantial financial risk, while many forego such expenses thereby raising the level and extent of morbidity. But standard measures of poverty are not adjusted for these costs. On the contrary, households that sell assets or incur debt to pay for health care will not be counted as poor if high medical expenses raise their total expenditure above the accepted poverty threshold. Failure to recognize variation in out-of-pocket health payments could also result in misinterpretation of trends in poverty over time. For example, a reform of health-financing policy that reduced reliance on out-of-pocket payments could produce an apparent rise in poverty. Failure to account for the impoverishing effect of out-of-pocket health payments could also hinder monitoring of progress toward the first Millennium Development Goal[5] (MDG), which is to reduce by half the proportion of individuals living on poverty by 2015.

The studies of economic growth and the distribution of wealth increasingly emphasize health as one of the important factors in the determination of economic growth and level of wage rates. However, the returns on investment in health have only recently begun to be studied in the developing countries (Cortez, 2000 and

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[5] The Millennium Development Goals, or MDGs, were born out of the UN Millennium Summit held in New York in September 2000. These include a set of eight goals and targets which articulate both the solemn obligations of those who hold the reins of governmental power as well as the legitimate aspirations of the people for faster progress towards a better life.

Shultz 2000). Recent studies confirm the idea that health influences the wage levels of individuals and their capacity to generate sustainable income over time (Schultz and Tansel, 1997; Thomas and Strauss, 1997). In order to make efficient investments in the health sector it is important to understand and assess the relationship between health, productivity and poverty. Further, to devise effective as well as sustainable poverty reduction strategies through health sector, it is important to know the effect of public health care system in overall poverty reduction process. In Bangladesh, attention is hardly given to recognize the linkage between health, productivity and poverty, which could be the basis for the public investment policies on the condition of health and income. The current study is an attempt to this endeavor.

In brief, a number of studies have stated in favor of public healthcare system while many other studies argue against its role in ensuring equity and poverty reduction process. Many researchers have stated that public healthcare system plays an important role in reducing the inequalities prevailing in the health sector. It also reduces the income of the people especially the poor and hence serves as the safety net for the poor and hardcore poor who seek health care services from the public healthcare facilities. In contrast, many studies show that, the overall health status of the population in Bangladesh is still low. Further, in public healthcare system it is not successful in benefiting the poor at the desired level due to low utilization rate. Against this backdrop, the prime goal of the study is to examine ***whether*** public healthcare system serves as a safety net for the extreme poor through nationwide subsidized program and helps overall poverty reduction process. The study also assess ***to what extent*** it reduces inequity and poverty through reduced disease burden and healthcare expenditure as well as increased productivity.

The present study hypothesized that health interventions especially by the public healthcare system play a vital role in reducing the inequalities prevailing in the

health sector by reducing the gap between rich and the poor. As a result, effective expansion of public health care programs has redistributive benefits as poor gets more benefits from public healthcare subsidies. The study also hypothesized that improved health status leads to increase in productivity, while catastrophic payments for healthcare push a significant portion of the population into poverty trap. Further, public healthcare system serves as a safety net for the extreme poor through nationwide subsidized program and helps overall poverty reduction process.

The broad objective of the research is to assess the effects of public healthcare system on equity and poverty reduction in Bangladesh. The study also focuses on the impact of health on productivity as well as poverty and the issues involved in the development of an econometric model for effective distribution of its limited resources towards poor. The specific objectives of the study are:

- to examine the equity in healthcare finance;
- to examine the current resource allocation system and link the existing system with poverty and health needs by geographic locations;
- to develop an econometric model for targeting health care resources for the poor;
- to identify the people getting benefits from public healthcare spending;
- to evaluate the impact of health on productivity;
- to examine the economic burden of out-of-pocket (OOP) payments for healthcare on the impoverishment of the poor; and
- to assess the effect of public healthcare spending on equity and poverty reduction.

This thesis has been arranged into eleven chapters and one annex. Chapter 1 describes the background and objectives of the study. Following the brief introduction, Chapter 2 provides an overview of the population, health, macroeconomic and poverty trends in Bangladesh. Chapter 3 presents the existing healthcare service provision in Bangladesh with the goals and strategies of the Health, Nutrition and Population Sector Program along with its gap between need and current employment of providers at public healthcare facilities. The literature review of the relevant issues is presented in Chapter 4. Strategies for poverty reduction through improved health as well as international comparison of the subject issues are also included in the literature review. Based on the conceptual framework of the study, Chapter 5 explains the methodological and analytical issues adopted for the study.

Empirical findings of the study are presented in five consecutive chapters. Chapter 6 examines the healthcare financing systems of Bangladesh while Chapter 7 assesses the efficiency of the public health resource allocation system. The feasibility of developing a Proxy Means Testing model to identify the poor for public subsidy is also assessed in Chapter 7. The key findings of equity in utilization, financing and delivery of health care are presented in Chapter 8. The impact of health on productivity as well as on poverty is examined in Chapter 9. The redistributive effect of public healthcare spending and its impact in poverty reduction is presented in Chapter 10. Finally, Chapter 11 summarizes the key findings of the study and presents conclusions and policy implications. The detailed analytical tables are also presented in the Annex.

CHAPTER 2: POPULATION, POVERTY AND HEALTH TRENDS IN BANGLADESH

Health, nutrition, population and poverty are intimately related and complementary to other sectors of the economy. For decades, it has been assumed that good health and nutrition are direct outcomes of economic development. However, it is now realized that the reverse is also true: economic development is an important outcome of improved health and nutrition ensuring sound and healthy workforce. Improvements in health and nutrition would translate into higher incomes, higher economic growth and gradual declines of poverty. Population is also the most basic parameter of the performance of the health sector. Change in population size and age-sex composition also has direct bearing on socio-economic development of the country.

Bangladesh is going through significant social and demographic changes, including rapid urbanization, expanding industrialization, rising incomes and improved control of communicable diseases. This chapter, however, provides an overview of the trends and current situation of population growth, achievements in poverty reduction, health and nutrition status in Bangladesh. Progress in achieving health related MDGs is also reviewed in this chapter.

2.1 Population Status and Trends

Bangladesh is one of the most densely populated countries in the world. Its total population was 146.6 million living in 147,570 square kilometers (BBS, 2010). Over the past 30 years (starting from the 1974 Census) the country's population has witnessed remarkable change. But over the coming years the country is likely to face challenges unlike any it has ever faced before. The pace of population change has accelerated dramatically. In the past years between 1974 and 2001, the

time series population of Bangladesh had grown from about 76.0 million to about 130.0 million. The inter-censual population growth rate then stands at 1.48 percent per annum between 1991 and 2001 (BBS, 2001).

Moreover, the total fertility rate (TFR) had decreased from 6.3 in 1975 to 2.7 in 2007. The contraceptive prevalence rate (CPR) had increased significantly in Bangladesh during last two decades from 7.7 percent in 1975 to 55.8 percent in 2007, with an average of 1.5 percent increase each year (NIPORT, Mitra & Associates and ORC Macro, 2007). After declining rapidly in the 1980s, the Total Fertility Rate (TFR) seems to have remained unchanged for most of the 1990s at 3.3 children (NIPORT, Mitra & Associates and ORC Macro, 2005). This went together with steady gains in contraceptive prevalence among currently married reproductive age women mainly by using temporary methods. Although, replacement level fertility had been a GoB target for 2005, but the fertility plateau of the last decade has meant delay to 2010 at the earliest (MoHFW, 2005).

The country had progressed well in its demographic transition over the last three decades. But, according to the Population Census 2001, under-15 population constitutes 43 percent of the total population, which has serious implications for the continuing population growth due to "population momentum[6]". To minimize the impact of this age-structured-mediated "population momentum effect", the following need to be done: (i) more effective enforcement of the minimum legal age at marriage for females, (ii) further raising the female age at marriage, (iii) delaying the age at first birth, (iv) subsequent increasing the space between desired births, (v) meeting unmet need for contraception, (vi) minimizing unwanted fertility, (vii) reducing desired family size, complemented by more widespread

[6] Population momentum implies the fact that, due to the young age structure of the population, the population of Bangladesh is expected to increase for some time even after attainment of replacement level fertility rate.

voluntary acceptance of the "one child" family norm. These need to be addressed through intensified IEC activities, high quality service delivery, and inter-sectoral collaboration for promoting female education and women employment strategies.

2.2 Macroeconomic and Poverty Status

At the time of its liberation, the incidence of poverty in Bangladesh was very high. Since then the country had made significant progress in reducing poverty, from 75 percent in 1973 to 60 percent in 1990. The progress had been spectacular during the nineties. The poverty incidence declined from 56.6 percent in 1991/92 to 48.9 percent in 2000 and further to 40 percent in 2005 (**Table 2.1**). Poverty declined at an annual rate of 1.9 percent during the period from 1991-92 to 2000 and at the rate of 3.6 percent during 2000 and 2005 (Planning Commission, 2008).

The geographical disparity was also evident. In 2005 nearly 43.8 percent of the rural population subsists below the poverty line, while the same was significantly lower (28.4%) in the urban areas (BBS, 2006). Furthermore, during 1991-92 to 2000 the incidence of rural poverty declined at an annual rate of 1.6 percent and 3.3 percent respectively. On the other hand, the rate of urban poverty reduction had been higher in both the periods – 2.5 percent during the period from 1991-92 to 2000 and 3.9 percent during 2000 to 2005. Increase in returns to occupation, increase in remittances and a large decline in family size had contributed to a larger fall in urban poverty (Planning Commission, 2008).

Table 2.1: Head Count Rate of Poverty (in percent), 1991-92 to 2005

Residence	Upper poverty line				Lower poverty line			
	2005	2000	1995-96	1991-92	2005	2000	1995-96	1991-92
National	40.0	48.9	50.1	56.6	25.1	34.3	35.1	41.0
Rural	43.8	52.3	54.5	58.7	28.6	37.9	39.4	43.7
Urban	28.4	35.2	27.8	42.7	14.6	20.0	13.7	23.6

Source: BBS 2006. Household Income Expenditure Survey 2005.

The headcount rate measured by the lower poverty line indicating extreme poverty declined from 41.0 percent in 1991-92 to 34.3 percent in 2000 and further to 25.1 percent in 2005 (**Table 2.1**), implying an annual average rate of decline of 5.9 percent and 5.4 percent in the two time periods respectively. Thus the poverty of the poorer people had declined at a faster rate than that of the less poor ones. This trend was also observed in the cases of both rural and urban poverty.

The poverty gap and the squared poverty gap measures also indicate improvements in poverty reduction. Using the upper poverty line, the poverty gap declined at the rate of 5.9 percent and the squared poverty gap at the rate of 7.4 percent at national level during the period 2000-05 (**Table 2.2**). Further, using the lower poverty line, the poverty gap declined at the rate of 12.6 percent and the squared poverty gap at the rate of 16.9 percent at national level during the period 2000-05. The rate of decline of these measures has been much higher than that of the headcount rate. More rapid declines in the poverty gap and the squared poverty gap imply faster declines in the depth and the severity of poverty. It also indicates greater improvement among the poor at the lower income level, taking them closer to the poverty line. But, the improvement falls short of enabling them to cross the poverty line.

Table 2.2: Head Count Rate of Poverty (in percent), 1991-92 to 2005

Residence	Upper poverty line				Lower poverty line			
	Poverty gap		Squared poverty gap		Poverty gap		Squared poverty gap	
	2005	2000	2005	2000	2005	2000	2005	2000
National	9.0	12.8	2.9	4.6	4.6	7.5	1.3	2.4
Rural	9.8	13.7	3.1	4.9	5.3	8.3	1.5	2.6
Urban	6.5	9.1	2.1	3.3	2.6	4.1	0.7	1.2

Source: BBS 2006. Household Income Expenditure Survey 2005.

Different rounds of Household Expenditure Survey/Household Income Expenditure Survey showed a long-term trend in deterioration of income distribution. In 2005, lower 5% of the population received 0.77 percent of the total income, which was lower from its previous level of 0.93 percent in 2000 (**Table 2.3**). The bottom 40% of the population which coincided with the poverty line received only 14.36 percent of the total income. On the other hand, the top 10% of the population received 37.64 percent of the total income.

Table 2.3: Income Distribution, 2000 and 2005

Income accruing to	2005			2000		
	Total	Rural	Urban	Total	Rural	Urban
Lower 5%	0.77	0.88	0.67	0.93	1.07	0.79
Bottom 40%	14.36	15.84	13.3	15.96	18.31	13.61
Top 10%	37.64	33.92	41.08	38.01	32.81	41.32
Top 5%	26.93	23.03	30.37	28.34	23.52	31.32
Gini co-efficient	0.47	0.43	0.50	0.45	0.39	0.50

Source: BBS 2006. Household Income Expenditure Survey 2005.

Economic growth in Bangladesh has been broad based, benefiting people at large. However, the possibility of unequal distribution of income remains benefiting some groups more than others. It is important to note that the pace of poverty reduction had been neutralized to some extent by the increasing inequality of income in the country – the Gini coefficient increased form 0.39 in 1991 to 0.47 in 2005 (**Table 2.3**), implying an average increase of 1.5 percent during the period.

With an estimated per capita GDP at $684 in FY 2009-10 (MoF, 2011), Bangladesh remains one of the poorest countries in the world and still faces severe deficiencies in the quality of its health, population and nutrition services. Selected macro-economic indicators of Bangladesh are presented in **Table 2.4**.

Table 2.4: Bangladesh Macro-economic Statistics

Indicators	2000-01	2001-02	2002-03	2003-04	2004-05	2005-06	2006-07	2007-08	2008-09	2009-10
GDP (billion US$)	47.0	47.6	51.9	56.4	60.4	62.0	67.8	79.6	89.4	99.9
GDP per capita (US$)	362	361	389	418	441	447	487	559	621	684
GDP growth at current market price (%)	6.9	7.8	10.0	10.8	11.3	12.1	13.7	15.5	12.6	12.3
Real GDP growth (%)	5.3	4.4	5.3	6.3	6.0	6.6	6.4	6.2	5.7	6.0
CPI Inflation (% GDP)	1.9	2.8	4.4	5.8	6.5	7.2	7.2	9.9	6.7	6.9
Total Public Expenditure (% of GDP)	14.8	14.9	14.5	14.8	15.0	14.7	14.1	17.3	15.3	16.0

Source: Ministry of Finance, Bangladesh Economic Review 2010.

2.3 Food Security

The food security issue is a core issue in the struggle against poverty. Given that a large portion of the population subsists below the poverty line it is difficult to address poverty with out addressing food security, particularly for the hardcore poor. Despite significant progress in domestic food grains production, Bangladesh is still facing food insecurity. Nearly, 40 percent of the population lack the resources to acquire enough food. The share of cereals to total dietary energy had decreased from 75.4 percent in 2000 to 73.1 percent in 2005, but still very high. The per capita consumption of edible oil, the high energy good component, had increased from 12.8 gm to 16.5 gm. The consumption of protein has also increased slightly. But, the intra-household food distribution is often unequal where women and girl have less food than men and boys. The per capita consumption of meat and eggs by the urban consumers is almost the same for the rural consumers.

However, consumption of those items falls far short of the requirement (Planning Commission, 2008). The high consumption of cereals but low calorie intake results in a high level of anaemia and other micro-nutrient deficiencies.

2.4 Nutrition Status

Low calorie intake continues to result in malnutrition, particularly for women and children. Malnutrition leads to severe infection and high case fatality among the Bangladeshi children (Black et al., 1984), and it is one of the major causes of morbidity and mortality (Alam et al., 1989; Rahman and Biswas, 2009). Behrman et al. (2004) has found that infants with low birth weight (less than 2.5 kgs.) – partly reflecting malnutrition in the womb – are the face of 2 to 10 times the risk of death compared with normal-birth weight infants. More importantly, the same low-birth weight infants are at a higher risk of non-communicable diseases (NCDs) such as diabetes and cardiovascular diseases in adulthood (World Bank, 2006). In addition, severe vitamin and mineral deficiencies in the womb and in early childhood can cause blindness, dwarfism, mental retardation, and neutral tube defects.

Bangladesh has the highest prevalence of childhood underweight among all countries of the world. It is estimated that the prevalence of underweight was 41 percent, of which 11.8 percent severe and 29.2 percent moderate; the prevalence of stunting was 43.2 percent 16.1 percent severe and 27.1 percent moderate; and the prevalence of wasting was 17.4 percent 2.9 percent severe and 14.5 percent moderate (NIPORT-Mitra Associates and ORC Macro, 2007). It is also estimated that more than 70 percent of the under 5 children were anemic (ICDDRB, 2008). The impacts of these conditions when they occurred in children under two years are permanent. Continued undernutrition is eroding the impacts of maternal and child health, poverty alleviation, and education sector programs because of

compromised mental and physical development of the population affected by undernutrition during early childhood. The damage was irreversible and passed on from generation to generation (Lancet, 2007).

Dietary intakes of both children and adults are severely deficient in multiple micronutrients, particularly vitamin A, iron, iodine and zinc. Bangladesh has made significant progress in reducing vitamin-A deficiency among pre-school children over the past 15 years. However, the consumption of vitamin A rich foods is still low, suggesting that the underlying causes of Vitamin A deficiency require further attention and support. Iron deficiency anaemia affects one-third of adolescent girls and non-pregnant women and is even higher (51%) in pregnant women (MoHFW, 2005).

Maternal undernutrition (body mass index <18.5 kg/m^2) in non-pregnant rural women declined from 54 percent in 1996-97 to 33 percent in 2007, but is still very high (NIPORT, Mitra & Associates and ORC Macro, 2007). Undernutrition both before and during pregnancy causes intrauterine growth retardation and is one of the major factors responsible for the high prevalence of low birth weight (36%) in the country. Low birth weight is more common among adolescent mothers who marry and conceive at a very young age, and has serious consequences for future survival, health, growth and development. When combined with periods of positive energy balance in later life, low birth weight increases the risk of overweight/obesity, diabetes, high blood pressure and coronary heart disease (MoHFW, 2005).

Between 1990 and 2007, child underweight fell from 67 percent to 41 percent, and child stunting fell from 66 percent to 43.2 percent (NIPORT, Mitra & Associates and ORC Macro, 2007). The current prevalence of the anthropometric indicators

in Bangladesh are quite high according to WHO classification and the rate of progress made in the improvement of nutritional status is very low in the latest decade. As a consequence, malnutrition remains a serious public health problem in the country (Rahman and Biswas, 2009).

Child malnutrition, especially at the youngest ages, impedes child development, and is associated with increased rates and increased severity of infectious diseases and contributes to over one half of child deaths. Children and women become malnourished due to inadequate dietary intake and/or infectious diseases. The underlying causes include household food insecurity (inability of households to grow and/or purchase sufficient food for their needs); lack of dietary diversity, inadequate maternal and child care (lack of appropriate caring practices for good hygiene, health and nutrition); low rates of exclusive breast feeding; inadequate access to quality health services, poor environmental hygiene and sanitation as well as poor income and maternal formal education (MoHFW, 2005). All these underlying causes must be addressed in order to improve nutritional status.

2.5 Health Status and Trends

Since liberation, the Government of Bangladesh had invested substantially in the institutionalization and strengthening of health and family planning (FP) services, with special attention to rural areas. Over the last three decades there had been a significant improvement in the health status of the people. Life expectancy at birth had increased from 49.0 in 1980 to 66.9 in 2009 (BBS, 2010 and UNDP, 2008).

In the mid- 1970s, the infant mortality rate (IMR) was 153/1000 live births. By 2007, it had declined to 52/1000. Under-five mortality (U5MR) is estimated to 65/1000 in 2007. Population growth rate had also declined (NIPORT, Mitra &

Associates and ORC Macro, 2007). Immunisation coverage had remained fairly high and the country would attain polio-free status very soon. However, Socio-economic indicators of health in Bangladesh indicates inequality that has to be addressed for meeting MDG targets, e.g., mortality among children in the poorest households is almost twice as high as for the wealthiest children. Leading causes of death among children are still ARI and diarrhoea, followed by perinatal causes. Further reductions in IMR and, by implication, a contribution to the reduction in U5MR, will now largely come from reductions in neonatal mortality rates, adding importance to the emphasis given in this Plan to improving antenatal and obstetric and neonatal care. Injury, severe malnutrition and neonatal tetanus each contribute 7-8 percent of the total child mortality. This represents the deaths of 350,000 children each year.

Maternal mortality had declined by an estimated 36 percent between 1986 and 2000, but remains relatively high at 320/100,000 (NIPORT, 2002). This represents the annual loss of 12,000 women from maternity-related causes. The Bangladesh Maternal Mortality Survey (BMMS) estimate that the MMR in Bangladesh during 1998-2001 was ranged from 320 to 400 per 100,000 live births with total annual number of maternal deaths being around 11,000-12,000. Health seeking behaviour of women during pregnancy and childbirth is far from optimal. Typically the rural woman (girl) is married before turning eighteen and her knowledge and behaviour is based on prevailing wisdom with "tradition" playing a strong role. This contributes to the following (NIPORT 2002; NIPORT, Mitra & Associates and ORC Macro, 2005; NIPORT, Mitra & Associates and ORC Macro, 2007):

- More than half (60.3%) of pregnant women made 1 or more ANC visits and only 19 percent make 3 or more visits. ANC coverage from a medically trained provider showed an increasing trend from 29 percent in 1996-97 to

48.8 percent in 2004 and 51.7 percent in 2007. Around 15.1 percent of mothers of U-5 children had heights of less than 145 cm and 29.7 percent of women have BMI of less than 18.5 indicating serious malnourishment.

- Nearly 85 percent deliveries were conducted at home. Nearly three-fourth of births in Bangladesh were assisted by traditional birth attendants (TBA) with 10.8 percent assisted by trained and 62.6 percent by untrained TBAs. About 18% of births were assisted by medically trained persons.

- Awareness of the danger signs of obstetric complications is extremely low, particularly among the decision makers (mother-in-law and husband). Only 42 percent of women who perceived to have had life threatening complications during their pregnancy sought immediate care from a medically trained provider.

- Only 21.3 percent receive post natal care (PNC) from a medically trained provider. The situation is even worst among the lowest quintile of the population.

Future Health Risks and Changing Epidemiology:

As the epidemiological transition accelerates, non-communicable diseases (NCD) would account for a larger share of the total disease burden. It is estimated that by 2010, the share of non-communicable diseases to mortality would increase to 59 percent, as compared to 40 percent in 1990 (Streatfield et al. 2001). With the increasing incidence of injuries, violence, accidents (drowning being the leading cause of mortality for the 1-5 years old children) and injuries that are expected to increase their share to 11 percent of morbidity. NCDs may no more be ignored. Since adult onset of cardiovascular diseases (CVDs) and diabetes have now been linked with low birth weight, due attention needs to be given to the issue of low birth weight. Analysis of hospital patients data indicates that at this moment the

highest frequency is observed for lung cancer (29.5%) in men followed by cervical (26.1%) and breast cancer (23.3%) in women. A recent WHO study estimated that there are 49,000 oral cancer, 71,000 laryngeal cancer and 196,000 lung cancer cases in Bangladesh among the persons aged 30 years or above.

Reduction of morbidity and premature mortality due to non-communicable diseases will require appropriate action at all levels from primary prevention to treatment and rehabilitation. Since intervention during the clinical stage of the disease has a very limited impact and is very expensive, even for the rich countries, prevention will be a more feasible option (MoHFW, 2005). Four of the major NCDs – cardiovascular disease, cancer, chronic obstructive pulmonary disease and diabetes – are linked by common lifestyle related risk factors. These include tobacco use, an unhealthy diet, and physical inactivity. Action to prevent these conditions thus focuses on controlling these risk factors in an integrated manner.

Further, demographic transition will also create new facets of vulnerability. The number of elderly women in Bangladesh increased from 0.83 million in 1951 to 4.06 million in 2001 (Ministry of Women and Children Affaires and BBS, 2002). Widowhood and poverty are prevalent among this group. Helping this group to get access and utilize health services will pose a particular challenge for service providers.

Bangladesh has made considerable progress over the last decade in improving the health and nutritional status of its citizens and in reducing population growth rates. But it still faces multiple challenges in improving the health status of the poor and vulnerable. It also faces challenges in dealing with the impoverishing effects of ill health. Its people continue to suffer from high levels of preventable morbidity and

mortality from communicable diseases, poor maternal and child health and malnutrition. In addition, it now faces new challenges from a rising incidence of non-communicable diseases and from environmental hazards such as air and water pollution, exposure to agro-industrial chemicals, inadequate waste management, arsenic contamination of drinking water from shallow tube wells, from behavioral causes such as tobacco use and drug abuse, and from accidents and violence (MoHFW, 2005).

Selected development indicators for Bangladesh and other Asian countries:

Although, Bangladesh has comparatively better health outcomes but, the incidence of poverty is higher than in some of our neighboring countries, like India with 34.3 percent, Pakistan with 17.0 percent and Nepal with 24.1 percent (**Table 2.5**). The high incidence of poverty in absolute terms as well as in the regional context indicates lack of accelerated government efforts at achieving higher growth, fostering productive employment, improving human capital and social protection.

Table 2.5: Development Indicators, Selected Countries 2005-06

Country	Income group	GDP per capita (US$)	Poverty headcounts ($1 per day)	Life expectancy at birth (years)	IMR (per '000 live births)	U5MR (per '000)
Bangladesh	Low	423	41.3	63	52	69
India	Low	736	34.3	63	57	76
Nepal	Low	272	24.1	62	46	59
Pakistan	Low	711	17.0	63	78	97
China	Lower-middle	1,713	9.9	73	20	24
Philippines	Lower-middle	1,192	14.8	68	24	32
Sri Lanka	Lower-middle	1,196	5.6	72	11	13
Hong Kong	High	25,592	*na*	82	*na*	*na*
Japan	High	35,484	*na*	83	3	4

Note: *na* = not available

Sources: (i) UNDP, HDI Tables (http://hdr.undp.org/reports/global/2008/), (ii) World Bank, WDI Tables (http://devdata.worldbank.org/data-query/), (iii) WHO 2008.

Mortality rates, especially infant and maternal mortality, are still high. Communicable and poverty-related diseases still dominate the top ten causes of morbidity. Quality of life of the general population is still very low (WHO, 2004).

2.6 Achievement of MDGs

Progress on Millennium Development Goals (MDGs) can be assessed by ascertaining the extent to which the MDGs are mainstreamed in the development agenda; progress towards the MDGs themselves; progress relative to comparator countries; and the likelihood of the MDGs being reached (Planning Commission, 2008). As MDGs encompass all aspects of social development, overall success will be due to the mainstreaming of the MDGs; public finance reforms; economic structure diversification; increasing rates of growth; growing exports and remittances; and social protection programs, including health and nutrition.

Since the launch of the MDGs at the millennium summit held in New York in September 2000, the MDGs have become the most widely accepted yardstick of development efforts by government and NGOs. The health related MDGs with their targets and indicators are given in **Table 2.6**.

Table 2.6: Millennium Development Goals with Targets

Goals	Target	Indicator	Benchmark 1990	Current status (2007)	MDG Target (2015)
Eradicate extreme poverty and hunger	Halve between 1990 and 2015, the proportion of people whose income is less than one dollar a day	Proportion of population below US $ 1 per day (PPP – values)	58.8	41.3 (2005)	29.4
	Halve between 1990 and 2015, the proportion of people who suffer from hunger	Prevalence of underweight children (% of children under 5)	65.8	39.2 (2006)	32.9
Reduced Child Mortality	Reduce by two thirds, between 1990 and 2015, the under five mortality rate	Under five mortality rate (per 1000 live births)	144.0	65.0	48.0
		Infant mortality rate (per 1000 lie births)	94.0	52.0	31.3

Goals	Target	Indicator	Benchmark 1990	Current status (2007)	MDG Target (2015)
		Proportion of infants immunized against measles	65.0	83.1	100
Improved maternal health	Reduce by three quarters, between 1990 and 2015, the maternal mortality ratio	Maternal mortality ratio (per 100,000 live births)	480	194 (2010)[7]	143
		Proportion of births attended by skilled health personnel	7.0	17.8	50.0 (by 2010)
Combat HIV/AIDS malaria and other diseases	Have halted by 2015 and begun to reverse the spread of HIV/AIDS	Prevalence of HIV (% among high risk groups)	-	.57 – .75	halt
	Have halted by 2015 and begun to reverse the incidence of malaria and other major diseases	Proportion of new tuberculosis cases detected	-	72.2	>70.0
		TB cure rate under DOTS	29.2 (1993)	92.0	>85.0

Source: DGHS 2009. Health Bulletin 2009.

Bangladesh has made noteworthy progress in attainment of "Millennium Development Goals" by 2015. In case of majority of the indicators Bangladesh is on track with prospect for earlier attainment of targets of some of the indicators. A recent review of the progress at the aggregate level suggests that the country is "on track" to achieve the targets of halving the proportion of people living below poverty line and suffers from hunger as well as reduction of infant mortality and child mortality.

Bangladesh has also made significant progress in reducing maternal mortality ratio (MMR) in the last one decade. The MMR has gone down to 194 per one lakh live births in 2010[8]. Albeit the success it would require continuous efforts to achieve the MDG-5 target by 2015. Further, it lags behind in case of some indicators like expansion of primary and secondary education, access to safe drinking water by

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[7] Based on the initial findings of Bangladesh Maternal Mortality and Health Care Survey 2010; published in The Daily Star, Monday, February 14, 2011.

[8] MMR was 322 per 100,000 live births in 2001. Based on maternal Mortality Survey 2010 the same is estimated to 1.94 indicating reduction of maternal mortality by 40 percent during the period.

rural people and eradication of hunger proxied by the prevalence of child malnutrition (MoHFW, 2004; MoHFW, 2005).

Another concern for achieving the MDGs by 2015 is to attain the required growth of per capita real income. In order to achieve the MDGs it is important that the income poverty is decreased with an annual rate of 2 percent per annum, which requires a growth of per capita real income of 4 to 5 percent per annum. An overall real income growth rate of 6 to 7 percent per annum on a sustained basis along with a population growth of around 1.5 percent is needed to attain the target per capita income growth and hence reduction in income poverty. However, the recent trend towards plateauing of TFR has been a cause of concern as it may not only hamper the progress of income poverty reduction but may also have a deleterious impact on the attainment of other MDGs, inducing program coverage variations (MoHFW, 2005).

In summary, health, nutrition, population and poverty are interrelated and influence other sectors of the economy as well. Total population of Bangladesh was 146.6 million. Life expectancy at birth had increased from 49.0 in 1980 to 66.9 in 2009. The poverty incidence declined from 56.6 percent in 1991/92 to 48.9 percent in 2000 and further to 40 percent in 2005. More rapid declines in the poverty gap and the squared poverty gap imply faster declines in the depth and the severity of poverty. It also indicates greater improvement among the poor at the lower income level, taking them closer to the poverty line. But, the improvement falls short of enabling them to cross the poverty line. Although economic growth in Bangladesh has been benefiting people at large, the possibility of unequal distribution of income benefits some groups more than others. As a consequence, the pace of poverty reduction had been neutralized to some extent by the increasing inequality of income in the country.

With an estimated per capita GDP at $684, Bangladesh remains one of the poorest countries in the world and still faces severe deficiencies in the quality of its health, food security and nutrition services. However, Bangladesh has made noteworthy progress in attainment of "Millennium Development Goals" by 2015, especially with respect to the achievement of the targets of halving the proportion of people living below poverty line and suffering from hunger as well as reducing infant mortality and child mortality. Bangladesh has also made significant progress in reducing maternal mortality ratio (MMR) in the last one decade. But, it lags behind in case of some indicators like expansion of primary and secondary education, access to safe drinking water by rural people and eradication of hunger proxied by the prevalence of child malnutrition. Another concern is to attain the required growth of per capita real income, which is required to achieve the sustainable poverty reduction in the country.

CHAPTER 3: STRUCTURE OF THE HEALTH NUTRITION AND POPULATION SECTOR IN BANGLADESH

Since Independence in 1971, Bangladesh so far undertook five five-year Development Plans along with a two-year approach plan. During those plans period development activities in health and population sector, until 1998, were implemented through project approach.

SWAp and HPSP: In 1998, the sector wide approach (SWAp) i.e. the program approach was adopted in the health and population sector. When the idea of the sector wide approach was shared with the Government, its operational advantages appeared to be attractive. The shift from a project approach to a program approach was strongly influenced by the international development community's desire to test this new form of development planning. Although, at that time, little empirical evidence was available on the operational weaknesses and strengths of SWAp, the GoB agreed to adopt SWAp even without piloting. The GoB developed the Health and Population Sector Strategy (HPSS) on the basis of consensus between GoB and development partners. Subsequently, the Health and Population Sector Program (HPSP) was formulated based on the HPSS. The HPSP entailed a long list of reform agenda. The five-year Program Implementation Plan (PIP) of HPSP had been prepared and put in place for implementation from July 1998.

SWAp and HNPSP: In order to address these deficiencies, to the extent that this is realistic and feasible, and with the long-term aim of creating a modern, responsive, efficient and equitable HNP sector, the MoHFW started a new program from 2003/04 under the Health, Nutrition and Population Sector Program (HNPSP). The first two years' of HNPSP was more like a bridging period for the

preparation and negotiation with key stakeholders. This plan incorporates the implementation of first two years as well as looks ahead for next five years.

The MoHFW has prepared the Conceptual Framework for the HNP sector (2003-2006) with extensive consultations with the sector's stakeholders, which set out an analysis of the sector's performance and the main issues that needed to be addressed. This was the basis for the MoHFW's Program Implementation Plan (PIP).

Further, in line with Millennium Development goals and targets and PRSP strategies of the Government of Bangladesh, the Strategic Investment Plan (SIP) has been prepared in November 2004 which identifies the key investments required to accelerate the modernization of the HNP sector in Bangladesh so that it becomes more responsive to clients' needs, more efficient in the delivery of services and more effective in providing key services for poor people.

Based on the on the Strategic Investment Plan, Conceptual Framework and PIP of HNPSP (2003-2006), the preliminary document entitled "Health, Nutrition and Population Program Proposal (HNPPP)" was development in January 2005 for aid negotiation with the World Bank as the led organization for pool funding and also the DP Consortium. However, PIP of HNPSP (2003-2006) needs revision to incorporate the key investments required to accelerate the modernization of the HNP sector, developments over the next ten years to ensure that they evolve in a consistent direction and also intended to define the Government's intentions for the HNP sector as the basis for negotiating Development Partner assistance in the medium term. To this end, the revised PIP (2003-2010) has been prepared.

Before examining the effect of public healthcare system on equity and poverty reduction, it is important to understand the structure of the Health, Nutrition and Population Sector in Bangladesh. To this end, this chapter provides the current structure of the HNP Sector as well as its goals and strategies and at the same time evaluates the gap between need and existing health workforce of the sector that has direct implications on health care service delivery.

3.1 Goals and Strategies

The goal of the health, nutrition and population sector is to achieve sustainable improvement in health, nutrition and reproductive health including family planning, status of the people particularly of vulnerable groups including women, children, the elderly and the poor with ultimate aim of their economic emancipation and physical, social, mental and spiritual well being and thus contribute to the poverty reduction strategy. Within the context of poverty reduction strategy paper, the health, nutrition and population sector emphasizes to reduce severe malnutrition, high morbidity, mortality and fertility, reducing risk factors to human health from environmental, economic, social and behavioral causes with a sharp focus on improving the health of the poor and promoting healthy life styles (MoHFW, 2005).

Consistent with the HNPSP Conceptual Framework and the existing policy framework for HNPSP, the MoHFW will continue to receive 60 percent of the sectoral resource allocations for Essential Services Delivery (ESD)[9]. Other prioritization criteria applied are (i) a pro-poor focus in conjunction with a focus on women, young children, the elderly and other vulnerable groups, (ii) a renewed

[9] Essential Service Delivery (ESD) comprises: reproductive health care, child health care, limited curative care, urban health care and health care waste management. Further, behaviour change communication (BCC) is a cross-cutting issue and which is of high priority for the ESD. It was previously known as Essential Service Package (ESP).

commitment to fertility reduction within the broader context of reproductive health, and (iii) responsiveness to emerging health priorities, such as non-communicable disease control, public health concerns and the sectoral reform agenda. In order to achieve the goals of the HNPSP the following long term strategies have been adopted:

Stimulating informed demand for health, nutrition and population services: This will be achieved by a greater concentration of public funds and attention on effective communication, education and information strategies and activities. They will focus on the prevention, early detection and management of key health problems (safe delivery and appropriate new-born care, HIV/AIDS, tuberculosis, diarrhea, malaria, respiratory and cardio-vascular disease, injury and violence against women (VAW) and on promoting healthy life-styles and behaviors (better maternal and childhood nutrition, effective family planning, reduced smoking, improved domestic, road, water and industrial safety fighting dowry and child marriage).

Improving the quality and scope of HNP services: The quality of HNP services will be improved by continued investments in clinical, technical and managerial skills through continuous education, training and by improved clinical quality audits. While the coverage of HNP services will be increased by expanding the provision of government services, taking into account comparative advantage, and by partnerships with private and NGO providers, particularly to expand the volume of MCH/family planning, nutritional, other preventive and promotional, first-level outpatient and some types of secondary services. At the same time, effort will be made to increase the volume of services being delivered from existing government facilities, primarily by making them more attractive and user-

friendly by improving provider attitude and by improving the management of these services.

Restructuring the way of service provision: The pattern of service provision will be adjusted over time by the increasing use of contracts and commissions for NGOs to provide primary care in more remote and under-served areas, where they have a comparative advantage, and for private providers to offer secondary and tertiary services for poor people where they can do so cost-effectively and at high quality.

Mobilizing more resources for HNP services: Resource planning for the sector needs to be strategic and efficient. The following sources for HNP financing, other than from general taxation, will be explored:

- Social (payroll) insurance in urban areas and for large scale employers
- Community financing schemes
- Zakaat-to be used only for the identified poor
- Corporate social responsibility and private donations
- Fees for service

Improving Equity: The inequity in the health sector will be reduced by reaching the poor and ensuring gender equity. Besides gender and income poverty disability, women and children tribal populations, people with disabilities, the elderly, adolescents and HIV/AIDS patients will also be targeted.

Improving HNP service efficiency: The efficiency of HNP services will be enhanced by improving workforce productivity, capturing provider comparative

advantage and improving the efficiency of infrastructure of the health care facilities.

Improving sector governance and management: Over the next ten years, strategies to improve the governance and management of the HNP sector as a whole will concentrate on four priorities: (i) improved budget management, (ii) improved organizational management, (iii) improved staff management, and (iv) improved aid management.

3.2 Brief Description of the Program

The constitution of Bangladesh mandates for basic health care services for its people as one of the fundamental responsibilities of the State. Towards this goal, the government has taken different endeavors to extend health facilities to the population. The Government of Bangladesh is running a program through which the health care services are provided to the people from the grass root to the central level. The program is entitled Health, Nutrition and Population Sector Program. The brief description of the program is presented below:

3.2.1 Health Sub-sector Program

Health services delivery includes Essential Service Delivery (ESD), child health services, communicable disease control, TB and Leprosy control, hospital-based emergency obstetric care, outpatient curative care, health education and promotion, hospital services at the upazila, district, and tertiary level as well as alternative medical care.

The HNPSP strategy for the provision of the Essential Services Delivery (ESD) is to provide health and family planning services and nutrition interventions through a mix service structure at the peripheral level coupled with appropriate domiciliary

services and a functioning referral system. Further, BCC has a pivotal role in influencing health seeking behavior, including increased demand for and utilization of the services.

In Bangladesh, supply side financing has so far been the main strategy for improving the access of poor and vulnerable people to health services. There is growing evidence that the vulnerable people have poor access to public health services particularly maternal health services even though these services are free or subsidized. Under the circumstance, demand side financing would be an appropriate means for enabling poor to access HNP services particularly maternal health services.

By the end of HNPSP, the MoHFW expects to have either basic or comprehensive Emergency Obstetric Care available at all Upazila Health Complexes and to offer Comprehensive Emergency Obstetric Care (EmOC) at all District and Medical College Hospitals. By that time, almost twice as many women in need of EmOC should have access to and be using a GoB health facility for management of a delivery complication (25% compared to only about 13 percent at present).

TB control is one of several MoHFW programs that are implemented in close collaboration with NGOs. During HNPSP, the MoHFW aims to increase the case detection rate from an estimated level of 37 percent in 2002 to 70 percent, which is the global target under MDGs. The MoHFW aims, in addition, to make further progress with leprosy control, which has already been eliminated at the national level, but remains above the elimination threshold in 10 districts or municipalities. The MoHFW also plans to continue and intensify its disease control programs in districts where malaria, kala-azar and filariasis are endemic and will also assist city corporations with more effective control of dengue.

There has been significant improvement in vaccination coverage in recent years. During HNPSP, the Health Directorate plans to give a "big push" to increase child immunization rates to 85 percent and to intensify local-level planning, logistics, and monitoring systems. This will go hand in hand with continuing attention to polio-eradication.

The national ARI control program of MoHFW started in September 1992 on pilot basis and expanded all over the country in the year 2000 with the concept that the ARI control activities will be phased-off with gradual expansion of Integrated Management of Childhood Illness (IMCI) implementation nation-wide. IMCI is currently seen as the major vehicle for reducing mortality and morbidity associated with major diseases of children under five and for promoting children's healthy growth and development.

HNPSP will also respond to the increasing need for prevention and management of non-communicable diseases and will also initiate a more effective response to public health problems. This includes, first and foremost, strengthened arrangements and stepped-up implementation of HIV/AIDS prevention and control so as to curb infection rates among high risk groups and prevent transmission to the general population. With respect to arsenicosis, the health sector response must be complementary to that by the Department of Public Health Engineering (DPHE). During the HNPSP period, the MoHFW will also expand case identification reporting and medical management of symptoms of arsenicosis.

Hospital services are the most visible and major component of the health care delivery system. Under HNPSP more improved hospital services management system would be introduced to ensure the accessibility of hospital services to

women, children and especially the poor. This will introduce standard waste management for the reduction of the diseases amongst the service providers and community people and also to improve the hospital environment. Hospital based eye care by GO-NGO collaboration will also be improved.

The geographical location and the topographical features of the country make Bangladesh vulnerable to natural disasters. In the area of emergency relief and rehabilitation, the Emergency Preparedness and response (EPR) Program of the DGHS is responsible for the health response to natural disasters and man-made emergencies, in close co-operation with other agencies.

GoB has taken different steps for the development of alternative medical care including Homeo, Unani and Ayurvedic medicine and surgery. The targets of the component are to reduce dependency on the allopathic system of medicine and explore people's perceptions on alternative medicine by providing quality service of by the graduate physicians.

Health Education and Promotion (HEP) intervenes in the process of health development through changing lifestyle patterns that affect the health of individuals, families and communities. The major objectives of the program are to (i) improve health seeking behavior of the community with the emphasis on Health Education for the vulnerable groups, (ii) strengthen community participation in health promotion activities and ensure optimum use of health services, and (iii) improve social values that facilitate determinants of health and improve family health development.

Finally, increased and improved health service delivery during HNPSP will be reinforced by increased attention to human resource development, including

increased annual out-puts and improved quality of graduate and post-graduate medical education and nursing education. Other important capacity development initiatives in the health sub-sector during HNPSP include local level planning, Management Information System (MIS), improved capacities for procurement and supply management, and improved financial management.

3.2.2 Nutrition Sub-sector Program

The overall objective is to achieve sustainable improvements in the nutritional status of the population, particularly children and women, through adoption of new behaviors and appropriate use of nutrition services increasingly managed by local communities.

The national nutrition program of HNPSP will have three components (i) area-based community-nutrition interventions including food security (nutrition gardening, poultry for nutrition and VGD-NNP collaboration) (ii) National-level nutrition interventions, (Vit-A supplementation, protection and promotion of breast feeding and BNNC) and (iii) the program support and institutional development component, comprising program management and development, monitoring and evaluation, operations research and training, and Behavior Change Communications (BCC) functions. Nutrition activities are organized by the NGOs around community-donated Community Nutrition Centres (CNCs), established for a population of 1,000 to 1,500, and run by part-time female contract workers, called Community Nutrition Promoters (CNPs).

3.2.3 Population Sub-sector Program

Programs for the HNPSP population sub-sector have been formulated in the context of the constitutional provision, Government commitments to health sector targets of the National Strategy for Economic Growth, Poverty Reduction and

Social Development, the United Nations Millennium Development Goals, the 1994 International Conference on Population and Development and sectoral strategies, including the Bangladesh National Strategy for Maternal Health, the MOHFW Strategy for Contraceptive Security in Bangladesh and the MOHFW's Conceptual Framework for the HNPSP. During the HNPSP period, demographic and reproductive health-related objectives for the population sub-sector are to:

- increase the Contraceptive Prevalence Rate (CPR),
- decrease the total fertility rate (TFR),
- increase the contribution of long-acting and permanent family planning methods to contraceptive method use,
- improves continuation rates of temporary methods,
- counteract "population momentum" by delaying the age at first birth, e.g., by discouraging under-age marriage and childbearing during adolescence,
- initiate implementation of the national policy for iron-folate supplementation of vulnerable groups by providing iron-folate tablets to pregnant women and to female adolescents attending adolescent health and nutrition sessions,
- increase the coverage of antenatal care by a medically trained provider,
- improve access to obstetric first aid,
- increase skilled attendance at birth for midwifery and essential newborn care,
- improve availability of and access to comprehensive emergency obstetric care
- provide vitamin-A supplements to children and newly delivered mothers,
- reduce unsafe abortion practices and provide post-abortion care,
- ensure high quality of RH: FP-MCH care,

- establish RH:FP-MCH facilities as women-friendly, with provision of services for women subjected to violence, and
- strengthen the provision of pro-poor reproductive health, particularly family planning and child health care services by increased deployment of program personnel and resources in disadvantaged geographic areas including urban slums and by reducing recognized access barriers for poor and vulnerable groups.

3.3 Implementation of HNPSP

For the successful implementation of the HNPSP, an implementation manual has been developed. The implementation manual primarily focuses on cooperation and procedures for financial management, procurement, disbursement, monitoring and evaluation and the exchange of information to carry out the program. Some of the important arrangements as mentioned in the draft Implementation Manual are given below:

3.3.1 Institutional arrangements

A sector-wide approach (SWAp) is an approach to support the country-led program for a coherent sector in a comprehensive and coordinated manner. The HNPSP SWAp includes the key elements that are usually found in a SWAp, albeit to a varying degree and sometimes as a result of a gradual and phased process. The institutional arrangements for HNPSP describe

Government ownership and leadership: The Ministry of Health and Family Welfare (MoHFW) is responsible for overall coordination of the implementation of the program and of the contributions of Development Partners (DPs) to the program. To the extent possible, MOHFW will integrate the program activities within its regular administrative structure. It will be accountable for making

program implementation adhere to GoB and DPs' procedures and guidelines, as well as for overall transparency and accountability in using HNPSP funds.

According to the sector framework, the Line Directors are the main implementing agencies or spending units who implement the Program with policy and administrative guidance from the MoHFW.

Partnership between GoB and DPs: In order to be successfully implemented, the HNPSP will require the establishment and efficient working of a strong partnership between the GoB and the DPs. With reference to the basic characteristics of a SWAp, the partnership between GoB and the DPs is built a number of general guiding principles.

The HNP forum: The HNP forum is a GoB-led mechanism established to facilitate the exchange of information and the policy dialogue between the DPs and GoB on all matters related to the HNP Sector. The HNP forum is chaired by the Secretary of MoHFW (or his/her representative) and is attended by relevant senior-level GoB and DP officials. The HNP forum will meet at least once in every quarter to: (i) review the annual progress report, the operation plans, as well as the supporting budgets; (ii) provide overall policy and operational guidance for the implementation of the HNPSP and recommend corrective actions, if needed; and (iii) resolve any other issues and conflicts that may emerge during HNPSP implementation.

The HNP consortium: The HNP consortium consists of all Development Partners (DPs) supporting the HNPSP for the development of the HNP sector. The HNP Consortium represents both the pooled DPs and the non-pooled DPs. It aims to coordinate and streamline actions and procedures amongst the DPs.

The Role of IDA: IDA is a pooled development partner (DP) among other DPs and it does also play to some extent the role of lead financial agency for the Program. The main task of the IDA is to take the lead, on behalf of Development Partners, on financial, procurement and performance audits, and on arrangements for Program supervision including' the mid-term review and the end of Program evaluation.

3.3.2 Annual Planning and Budgeting Cycle

For Program implementation, all DPs will aim at operating under a common framework. MoHFW and pooled DPs will have to adhere to common rules and procedures. The Program will be implemented by public sector and private sector entities. Funds provided by the Development Partners and the Government of Bangladesh are to be used exclusively to finance eligible expenditures under the OP and Budget. Line Directors / Program Managers and other implementing agencies will implement the OP and Budget. After the end of the fiscal year, an Annual Program Implementation Report (APIR) is submitted to the DPs, and a new annual planning cycle starts.

3.3.3 Operational Plans

Each implementing agency (whether a Line Director, or a private sector entity) will prepare its own annual operation plan and budget. All projects and activities included in the HNPSP will, to the extent possible, be reflected in the OP and budget, whether they are financed by pooled funds or by non-pooled funds.

The OP and budget will focus on expected results. For each subcomponent or activity, the OP will identify a few outcome indicators that could be measured every year, either by the Annual Programn1e Review (APR) or through special surveys. National Steering Committee will have the authority to revise the OPs.

The components or the OPs of the HNPSP by MoHFW and its different directorates are presented below in Table 3.1.

Table 3.1: Operational Plans under HNPSP (2003-2010)

Sl. No.	Name of the Operational Plan
Directorate General of Health Services	
1	Essential Service Delivery
2	Communicable Disease Control
3	TB and Leprosy Control
4	Health Education and Promotion
5	Improved Hospital Services Management
6	Alternative Medical Care
7	Public Health Interventions and Non Communicable Disease Control
8	National AIDS/STD Program and Safe Blood Transfusion
9	Pre-service Education
10	In Service Training
11	Procurement, Logistics and Supplies Management
12	Research and Development
13	MIS-Health Services and Personnel
14	Quality Assurance
15	Sector-wide Program Management
16	Human Resource Management
17	Improved Financial Management
18	Micro-nutrient Supplementation
19	National Eye Care
Directorate of Nursing Services	
20	Nursing Education and Services
Directorate of Drug Administration	
21	Strengthening of Drug Administration and Management
Directorate General of Family Planning	
22	Clinical Contraception Services Delivery
23	Family Planning Field Services Delivery
24	Maternal, Child and Reproductive Health Services Delivery
25	Information, Education, and Communication (FP)
26	MIS-Services and Personnel (FP)
27	Training, Research and Development-(FP), NIPORT
28	Procurement, Storage and Supply Management (FP)
29	Sector-wide Program Management
30	Human Resource Management
31	Improved Financial Management

Sl. No.	Name of the Operational Plan
Ministry of Health and Family Welfare	
32	National Nutrition Program
33	Sector-wide Program Management
34	Human Resource Management
35	Physical Facilities Development – Construction, Repair and Maintenance
36	Health Economics Unit
37	Improved Financial Management
38	Policy Reforms

Source: MoHFW 2005. HNPSP - Revised Program Implementation Plan (July 2003-June 2010).

3.4 Providers of HNP Services

The providers of HNP services are pluralistic with extensive public healthcare programs and services, non-governmental organization (NGO) health services, and a growing private sector. The key healthcare service delivery points/providers presently functioning in the country are presented in **Table 3.2**.

Table 3.2: Key Healthcare Service Delivery Points in Bangladesh

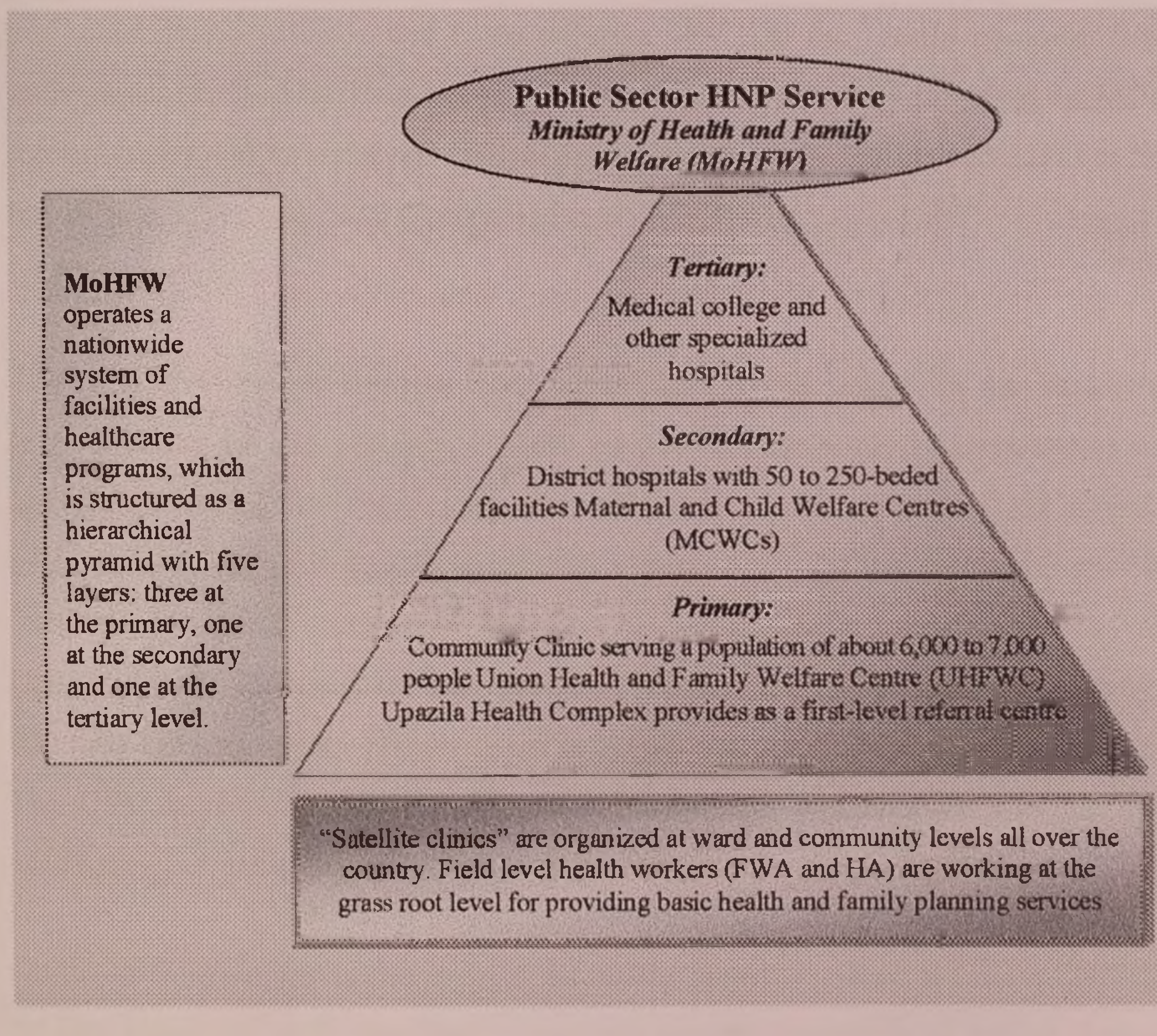
Public	Private	NGOs
• University and medical college hospitals • Specialized hospitals • District hospitals • Upazila health complex • Union health and family welfare center • Community clinics • Satellite clinics • Health facilities in other ministries and autonomous corporations • Bangladesh railway, Police, BDR, Armed Forces etc. • Other facilities	• Private clinics and hospitals • Private practitioners • Traditional providers • Homeopathic providers • Unqualified providers • Drug retail outlets • Retail outlet of other medical goods • Charitable hospitals like Red Crescent, Lions Hospitals, etc. • Private medical College Hospitals, BARDEM, DAB cardiac centres, etc • Other facilities e.g. TBA, SBA, paramedics, nurses, etc.	• NGO hospitals • NGO clinics • Other facilities

Source: (i) MOHFW 2003. Bangladesh National Health Accounts 1999-2001, (ii) DGHS, 2001.

3.4.1 Public Sector HNP Service Delivery

The GoB has overall constitutional responsibility for HNP services mainly through the MoHFW and some other ministries, for example Defense and Railways. The Ministry of Health and Family Welfare (MoHFW) is the largest provider of healthcare services in the country (**Figure 3.1**).

Figure 3.1: Healthcare Delivery Systems of MoHFW



At the base level DGHS Health Assistants and DGFP Family Welfare Assistants, serving a population of about 6,000 to 7,000 people, performing home visits and working from a Community Clinic (CC) (where operational), tasked with family

planning, maternal and child health, including immunizations, communicable disease control, symptomatic curative care for common complaints, and upward referrals.

The next level is the Union Health and Family Welfare Centre[10] (UHFWC), staffed by three paramedics, a Sub-Assistant Community Medical Officer, a Family Welfare Visitor, and a Pharmacist, providing family planning, maternal and child health services and some curative care. On the family planning side, union-level Medical Officers (Family Welfare) have been providing care for MCH referral cases and to supervise and perform clinical contraceptive services. On the health side, a Medical Officer is posted to each of the upgraded UHFWC under the Health Directorate.

The next level is the Upazila Health Complex, which serves as the first-level referral centre for the population in the upazila and the administrative centre for upazila health and family planning services. On the health side, this level consists of nine doctors, two Medical Assistants, a pharmacist, radiographer and an EPI technician and staff nurses and also joined on the family planning side by an Upazila family Planning Officer, medical Officer (MO-MCH), Assistant Family Planning Officer, Senior Family Welfare Visitor and two Family Welfare Visitors. The UHC is responsible for inpatient and outpatient care, family planning and MCH services, including clinical contraception, and for disease control.

On the health side, the fourth layer is the district hospital, which is a 50 to 250-bed facility. Heads of health and family planning services at upazila as well as district level both have technical as well as administrative responsibilities. Maternal and Child welfare Centres (MCWCs) of the Family Planning directorate are staffed

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[10] Formerly known as Union Sub-centers.

and equipped to provide Comprehensive Emergency Obstetric Care (EmOC) and other clinical reproductive health services.

The fifth tier of the public-sector health system is comprised of the medical college and other specialized hospitals, providing tertiary-level referral care. These tertiary level facilities are providing bulk of the surgical services in the country. However, the provision of public health care facilities in Bangladesh is presented in **Table 3.3**.

Table 3.3: Public Healthcare Facilities in Bangladesh

Level of care	Health facility	Number	Services
Tertiary	Specialized Hospital	30	Out door & indoor services, surgical services
	Medical College Hospital	14	
Secondary	District Hospital	61	Out door & indoor services (50-375 beds) with laboratory, radio graphic & ambulance services
	Maternal and Child Welfare Centres	70	EOC and other related services
Primary	Upazila Health Complexes	413	Out patient services, impatient services (31-50 beds) with diagnostic and operative treatments
	Union Health and Family Welfare Centers	1,399	Out patient services : FP, MCH, communicable disease control, clinical care, normal delivery & adolescent health care
	Community Clinic	8,426	FP, MCH, immunization, communicable disease control, treatment of common problems & referral

Source: DGHS 2008, Health Bulletin 2008. (ii) DGHS 2007, Health Bulletin 2007.

Moreover, in every month "satellite clinics" are organized at ward and community levels all over the country to aim at bringing the service facility at the door step of the people to deliver antenatal care, family planning services, health education and EPI services. Besides, Family Welfare Assistants and Health Assistants are working at the grass root level for providing basic health and family planning services (DGHS, 2001). In addition, Bangladesh Railway, Police, BDR and

Armed Forces also maintain their own hospitals especially for the treatment of their employees.

3.4.2 NGO HNP Services

In Bangladesh's healthcare system, Non-Governmental Organizations (NGOs) play an important role next after government. They are largely funded by the government and development partners. In fact, NGOs play a key role in providing healthcare at the grass-root level and complement the efforts of the government. Approximately, 500 NGOs are working in the overall health sector (MoHFW, 2003). NGOs are a significant and growing source of HNP services in both rural and urban Bangladesh. Their services have mainly been in the areas of family planning and MCH. More recently, NGOs have extended their range of services and are now the major providers of urban primary care. NGOs also provide the community nutrition services under NNP. Besides, NGOs are providing services for HIV/AIDS prevention and for the national tuberculosis and leprosy control programs.

NGOs are important sources of innovation in the sector, including differential pricing, targeting of services to the poor and very poor, cost analyses for efficiency improvements, and strategic planning for long-term sustainability. NGO policies of charging for services and for medicines, though essential from a cost-recovery and sustainability perspective, have, moreover, been shown to deter utilization by the poor and very poor, especially among women without access to cash of their own.

3.4.3 Nutrition Services

The Government of Bangladesh has been implementing the National Nutrition Project (NNP) since 2001 in continuation of the Bangladesh Integrated Nutrition

Project (BINP). BINP was established in 1995 to address the problems of maternal and child malnutrition. The NNP was initially operated as a separate development project, but has been integrated into Health, Nutrition and Population Sector Program (HNPSP) from 1st July 2004 (MoHFW, 2004).

Improvement in the nutritional status of the country's population, especially amongst poor children and women, is one of the major concerns of the health, nutrition and population sector in Bangladesh. The nutrition component of HNPSP aims to improve the nutritional status of children under 2 and build the capacity of families and communities to care for children. The NNP aims to significantly reduce malnutrition, especially among poor children and women through ABCN activities. The ABCN activities at community level include: weight monitoring and promotion of pregnant women; growth monitoring and promotion of under-2 children; supplementary feeding of severely malnourished and growth faltered children, and low BMI pregnant women; iron-folate supplementation to pregnant women and adolescent girls; vitamin A supplementation to post-partum mothers; organizing forum meetings of newly wed couples, adolescents, fathers/mothers-in-law, husbands of newly wed and pregnant women for counselling; home visits and referrals.

ABCN activities are implemented by 9 NGOs under contract with NNP through 23,246 community nutrition centres (CNC) in 105 Upazilas of 34 districts of Bangladesh. The Community Nutrition Promoter (CNP) is responsible for the CNC supervised by the contracting NGO (WB, 2008). By 2010, nutrition intervention through NNP will be extended in all Upazilas of the Country (MoHFW, 2004).

3.4.4 Private Sector For-profit Healthcare Services

For earning profit, private sector services, including pharmaceutical outlets, are concentrated in the major cities. Private ambulatory care by qualified modern providers is provided mostly by small clinics and hospitals staffed with private doctors many of whom work off-duty or after retirement from government facilities (Rannan-Eliya, R., et al, 2001). In addition, many of the doctors, paramedics both from private and public hospitals/clinics are delivering healthcare services as private practitioners in the afternoons. Pharmacies and shops are responsible for most of the distribution of pharmaceutical goods. Moreover, traditional unqualified providers including homeopath practitioners, Kabiraj, quacks and others play a significant role in the private healthcare market of Bangladesh, especially in the rural areas. Even among the urban poor, while accessing private healthcare the majority of the patients opt for unqualified practitioners (Data International, 2000). In recent years, 35 private medical colleges and hospitals have been providing healthcare services in the country (DGHS, 2008). Besides, BIRDEM, DAB Cardiac Centre, etc. also provide specialized healthcare services mainly in the major cities. In contrast, a few charitable hospitals provide healthcare services in the country in both rural and urban areas.

3.5 Health Services Provision over Time

In Bangladesh, there has been a major improvement in the number and distribution of healthcare facilities (**Table 3.4**). The number of hospitals in 2010 was 3,078 and the same was 1,273 in 2000. This implies more than 2 fold increase in number of hospitals during the period 2000-2010. The increase in the number of non-government hospitals was also remarkable. The number of non-government hospitals has increased to 2,501 in 2010 as compared to 613 in 2000 indicating 4.1 fold increase over the period.

Further, the number of hospital beds has been doubled between 2000 and 2010 (**Table 3.4**). In 2010, there are 3,078 private and public hospitals with 81,578 beds, of which 48.2 percent are in the public sector and the remaining 51.8 percent in the private sector. The share of hospital beds in public sector in the year 2000 was 74 percent and reduced by 25.6 percent points by the year 2010 confirming the rapid growth of service provision in the private sector.

Table 3.4: Number and Distribution of Healthcare Facilities in Bangladesh (2000-09)

Health Facilities	2000	2001	2002	2003	2004	2005	2006	2008/09	2010
Hospitals*	1,273	1,382	1,362	1,384	1,676	1,676	1,683	2,860	3078
Govt. hospitals	660	670	670	672	671	671	678	589	577
Non- Govt. hospitals	613	712	712	712	1,005	1,005	1,005	2,271	2,501
Hospital beds	43,443	45,607	45,707	46,125	50,655	50,827	51,044	74,415	81,578
Govt. hospital beds (%)	73.8%	73.2%	71.0%	73.5%	68.2%	68.3%	68.4%	51.3%	48.2%
Registered physician	32,278	32,498	34,502	36,576	40,210	41,933	44,632	49,994	51,993
Registered nurse	18,135	18,135	19,066	19,500	20,009	20,097	20,129	23,729	25,018

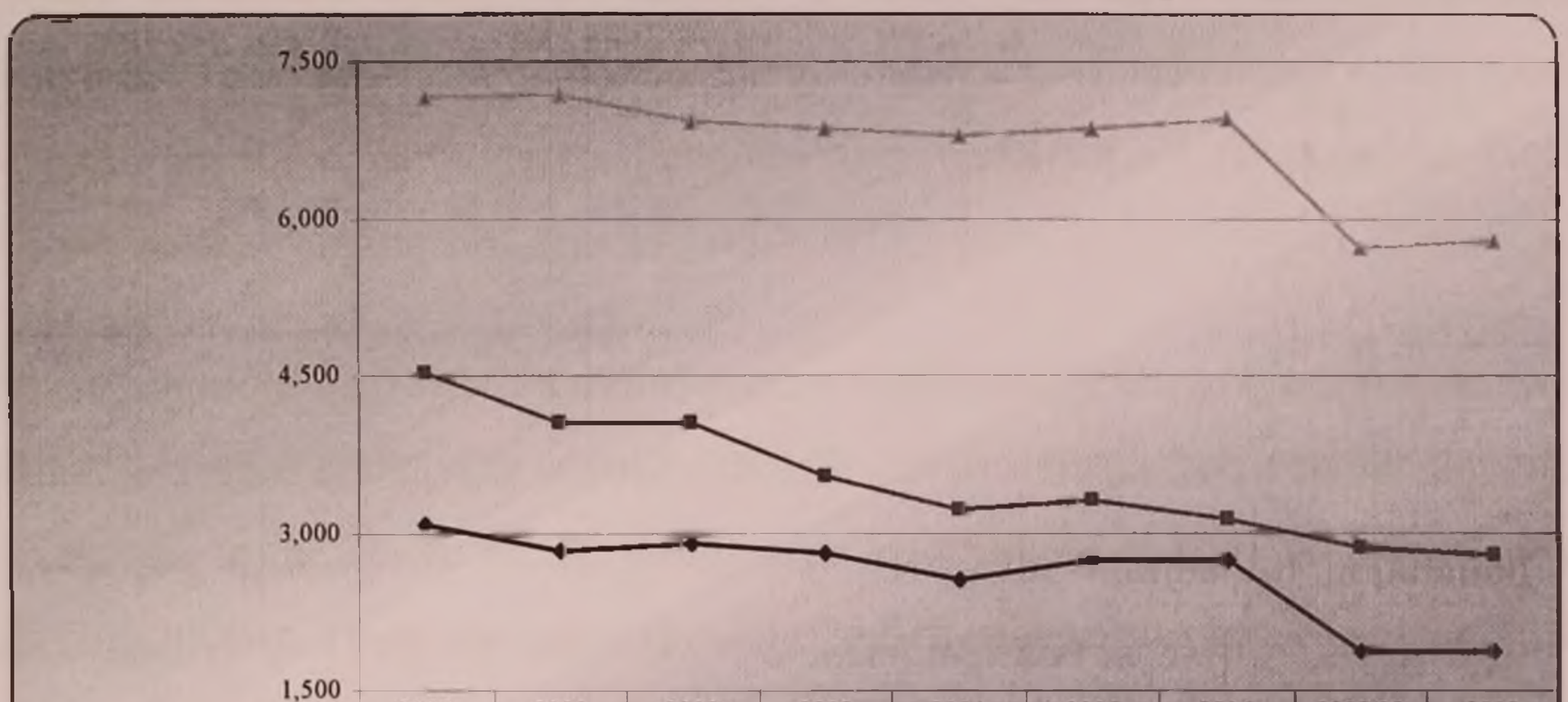
Note: * Including Upazila Health Complex and Rural Health Complex. Data for 2007 not available.

Source: (i) BBS 2006. Statistical Pocket Book 2004, (ii) BBS 2007. Statistical Pocket Book 2006, (iii) BBS 2009. Statistical Pocket Book 2008, (iv) BBS 2010. Statistical Pocket Book 2009, (v) DGHS 2009. Health Bulletin 2009, (iv) DGHS 2010. Health Bulletin 2010.

The number of registered physicians was 32,278 in 2000 and increased to 51,993 in 2010. The resulting doctor-population ratio was nearly 1: 4,521 in 2000 and 1: 2,785 in 2010 indicating significant improvement in the doctor-population ratio between 2000 and 2010 (**Figure 3.2**). On the other hand, the number of registered nurses was 18,135 in 2000 and increased to 25,018 in 2010. The resulting nurse-population ratio was nearly 1: 7,163 in 2000 and 1: 5,782 in 2010. This indicates lower improvement in the nurse-population ratio between 2000 and 2010 as compared to the progress in doctor-population ratio within the same period. The population per hospital bed also shows remarkable improvement in the service

provisions between the period 2000 and 2010. The number of population per hospital bed was 3,083 in 2000, which reduced to 1,860 in 2010.

Figure 3.2: Selected Indicators of Health Service Provision in Bangladesh (2000-2010)



	2000	2001	2002	2003	2004	2005	2006	2008/09	2010
Persons per Hospital bed	3,083	2,832	2,887	2,801	2,550	2,736	2,732	1,860	1,860
Persons per Physician	4,521	4,043	4,043	3,532	3,213	3,317	3,125	2,860	2,785
Persons per Nurse	7,163	7,170	6,920	6,865	6,787	6,853	6,944	5,720	5,782

Source: Bangladesh Bureau of Statistics and DGHS.

3.6 The Health Workforce

Health is an important labor-intensive sector of the economy. Regardless of the resource constraints, the population factor has always been central in making decisions about the provision of services and service providers. The number of available healthcare providers is an important aspect of the workforce and has direct implications on health care service delivery. However, along with the inadequate supply of the healthcare providers, there is an imbalance in the distribution as well. The urban

The health human resource in Bangladesh is in a crisis

Huge shortages of qualified providers and presence of huge body of unqualified providers with unknown quantity are major issues. With a freeze in recruitment of field level health personnel by the government, the future of health in the country is in jeopardy.

Source: Bangladesh Health Watch 2008.

concentration of physicians, nurses and health technologists is a persistent problem in the health system. As health needs are uniform across populations, geographic imbalances, which favor a higher density of providers in urban areas, equate inadequate health care delivery in rural areas and result in poor health outcomes for the rural populations. There is also a great imbalance in the mix of health workforce, with nurses being in very short supply (Bangladesh Health Watch 2008).

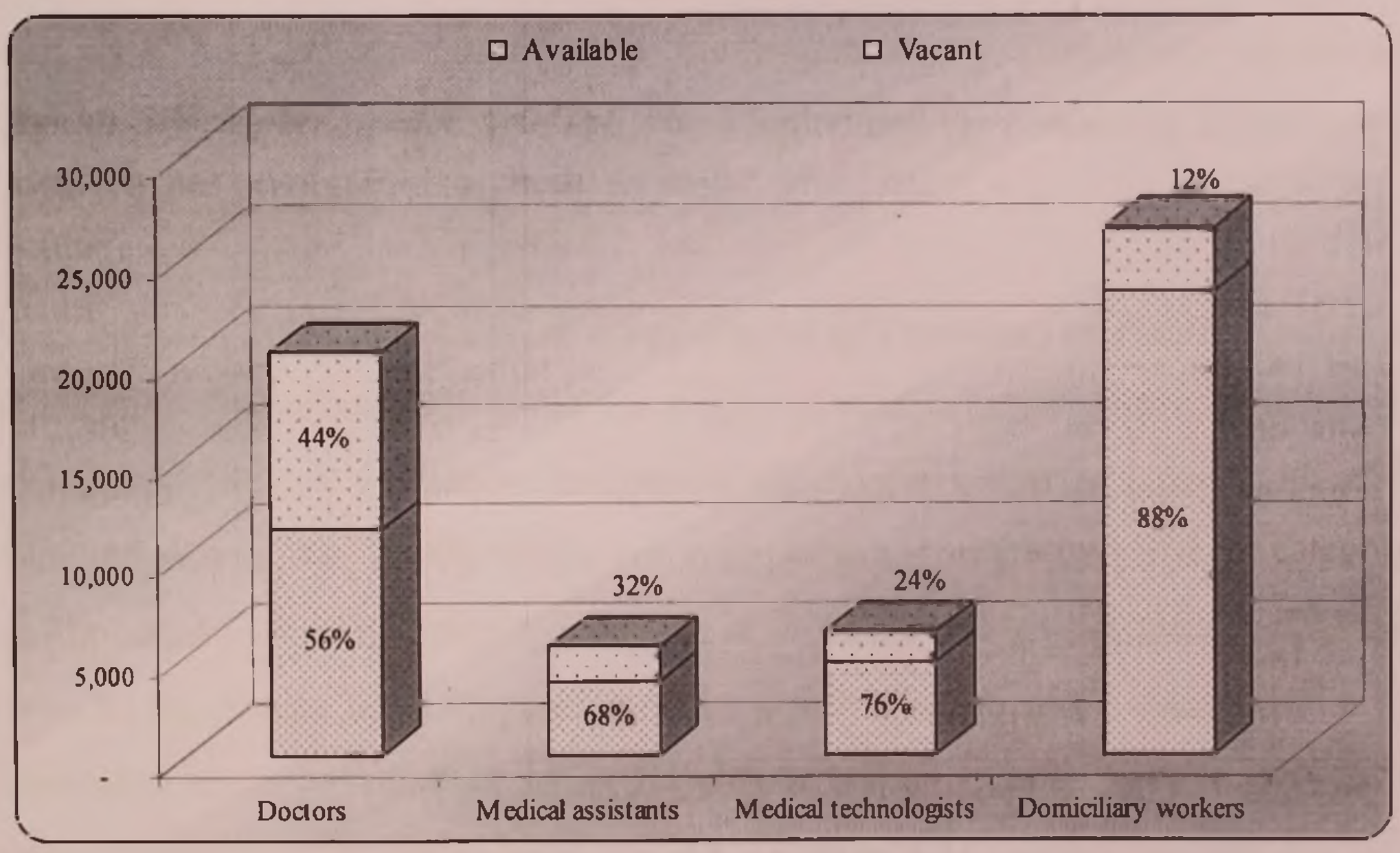
There are more than fifty thousand doctors registered in Bangladesh but many are employed or are studying abroad (DGHS, 2010). Nurses are another important workforce in the health sector. Bangladesh has extreme scarcity of trained nurses (RTM, 2008a). There are approximately 25,018 registered nurses in Bangladesh, fewer than registered doctors (DGHS, 2010). Further, the international standard for nurse-patient ratio is 1:4 for general care and 1:1 for intensive care. In Bangladesh nurse patient ratio is 1:13 for general patients (Aminuzzaman, 2007). Although there is great variation with level of facility, the overall nurse/doctor ratio is surprising. It is generally accepted that the ratio of nurse to doctor should be 2:1, i.e. two nurses for one doctor. Currently, it is estimated that the ratio of nurse to doctor is the reverse of what should have been the case, i.e. there is one nurse for two doctors instead of two nurses for one doctor (RTM, 2008b). Moreover, nurses in Bangladesh have little patient contact due to their largely administrative role.

There appears to be a great shortage of midwives compared with the need exemplified by low ANC and supervised delivery rates. Further, the discontinuation of FWV training through NIPORT for last 11 years jeopardizes the backbone of RH especially FP services in the country. Also lack of clear policies and guidelines to provide training on FWV, MA, Community Paramedics,

HT to potential students either through public and private sector institutions is pushing the health sector program in real shortage of skilled human resources.

Health Workforce under DGHS: The Directorate General of Health Services (DGHS) has in its fold of both technical and non-technical manpower. It has deployed over one lakh personnel and staff throughout Bangladesh to deliver health services to the people, develop manpower and provide support services. The total number of sanctioned posts of different categories under the DGHS was 112,302 as in June 2010. Nearly 77 percent of the posts are filled up and the remaining 23 percent posts are still vacant (DGHS, 2010). The situation of sanctioned, available and vacant posts of the health workers by different categories under DGHS is presented in **Figure 3.3**.

Figure 3.3: Sanctioned, Available and Vacant Posts of Health Workers, 2010



Source: DGHS, 2010. Health Bulletin 2010.

It is also revealed that there are 20,234 sanctioned posts of doctors under DGHS of which 56 percent posts are currently filled up and the remaining 44 posts are vacant (**Figure 3.3**). Moreover, there are 5,411 sanctioned posts of medical

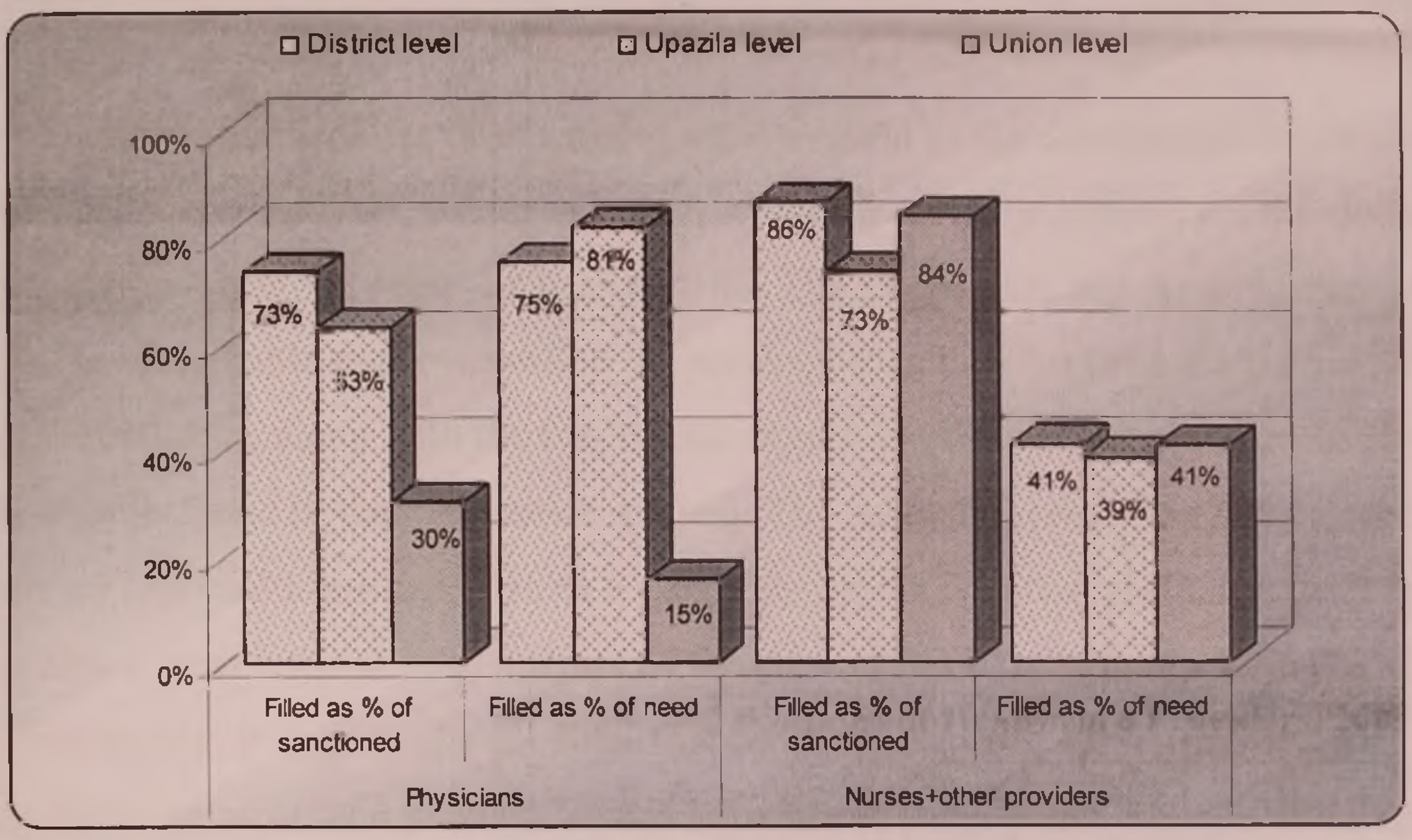
assistants followed by 6,150 posts of medical technologists and 26,416 posts of the domiciliary workers e.g. HA, HI and assistant HI. But, 32 percent posts of the medical assistants are currently vacant. The same for medical technologists and domiciliary workers are 24 percent and 12 percent respectively.

Health Workforce under DGFP, DNS and Directorate of Drug Administration: The total number of sanctioned posts of different categories under the DGFP is 52,337 as in June 2010 of which 92.9 percent of the posts are filled up, while the remaining 7.1 percent posts are vacant. The number of sanctioned, filled up and vacant posts under Directorate General of Drug Administration reveals that in June 2010 there are 370 posts under the directorate of which 35.7 percent of the posts are filled up and the remaining 64.3 percent posts are still vacant. Further, out of 17,183 sanctioned posts of the nurses under Directorate of Nursing Services, 78 percent posts are currently occupied and the remaining 22 percent are vacant (DGHS, 2010).

Gap between Need and Current Employment of Providers at Public Healthcare Facilities: The information about the supply of medical staff relative to demand is anecdotal. But, it is clearly inadequate for health needs[11] (Tulane University SPHTM and ACPR, 2009). While comparing the existing health HR with needs it is important to note that existing number at different levels of facilities are usually low. At the district level 75 percent of the physicians' posts are currently filled as compared to needed number, while the same at the UHC is 81 percent followed by only 15 percent at the union level facilities (**Figure 3.4**).

[11] To estimate the number of physicians needed in a health facility, the study assumed that 10 hospital beds require one full time physician (considering three shifts for 24 hours service provision) and one full time physician can see 24 outpatients in a day. Further, need of nurses is estimated by considering nurse-physician ratio 3 and by assuming that a nurse is in charge of 10 inpatients per eight hour shift.

Figure 3.4: Sanctioned, Needed and Filled Positions of Healthcare Providers, 2009



Source: Tulane University SPHTM and ACPR, 2009.

On the other hand, although overwhelming majority (more than 73 percent) of the sanctioned posts of nurses and other providers (e.g. FWV, SACMO, MA) at district as well as primary levels are filled, but the existing number is noticeably lower as compared to the needed number. At the district level 41 percent of the posts of nurses are filled as compared to the required number. The same at UHCs is 39 percent and 41 percent at the union level facilities.

In brief, Bangladesh HNPSP is a GoB led program supported by a range of multi-lateral and bi-lateral development agencies that supports the implementation of the Ministry of Health and Family Welfares (MOHFW) Strategic Investment Plan. The Program also aims to modernize the health sector and accelerate progress towards the health–related millennium development goals (MDGs). The providers of HNP services are pluralistic with extensive public healthcare programs and

services, non-governmental organization (NGO) health services, and a growing private sector.

In Bangladesh, there has been a major improvement in the number and distribution of healthcare facilities. There has been a significant improvement in the doctor-population ratio between 2000 and 2010. The population per hospital bed also shows remarkable improvement in the service provisions between the period 2000 and 2010. But, along with the inadequate supply of the healthcare providers, there is an imbalance in the distribution as well. The urban concentration of physicians, nurses and health technologists is a persistent problem in the health system. There is also a great imbalance in the mix of health workforce, with nurses being in very short supply. It is generally accepted that the ratio of nurse to doctor should be 2:1, i.e. two nurses for one doctor. Current estimates show that that the ratio of nurse to doctor is the reverse of what should have been the case. Further, the supply of medical staff relative to demand is clearly inadequate as compared to the existing health needs.

CHAPTER 4: EQUITY IN HEALTH AND EFFECTS OF HEALTH ON POVERTY – REVIEW OF LITERATURES

Equity in health is one of the guiding principals for formulating effective and efficient health policies to serve the target population especially the poor with limited resources. Lack of equity in utilization of healthcare, financing and delivering of healthcare services also leads people to poverty. However, it is very difficult to reach a clear and comprehensive definition of equity in health as well as well-being of the people what is, on the other hand, referred to as poverty. To this end, this chapter examines the available relevant literatures on basic concepts of equity as well as poverty relating to health and health care. This chapter also reviews the relevant literatures on equity in the utilization, financing and delivering of healthcare services and considers the literatures that describe the relationship between health, productivity and poverty.

4.1 Basic Concepts and Theories of Equity and Poverty

Concepts of Equity in Health

The optimal use of scarce resources involves two basic issues. One is to secure efficiency and the other is to secure a state of just distribution of income or any payment made by the individuals. If there is a welfare gain for improving the position of any one individual without hurting that of another, the efficiency objective is non-controversial (Musgrave and Musgrave, 1973). But, since there exists an efficient solution corresponding to each and every state of distribution, the question remains: which state should be chosen as fair or just? Here the concept of efficiency helps little as the problem of distribution is one of evaluating changes in which someone gains while someone else loses.

In the market economy, the distribution of income is determined by the scale of factor services. It thus depends upon the distribution of factor endowments. With regards to labor income, this distribution involves the distribution of abilities to earn such income, as well as the desire to do so. With regard to capital income, it involves the distribution of wealth. The distribution of labor and capital endowments is linked by investment in education as well as state of health, which in turn affects the wage rate that a person can command (Musgrave and Musgrave, 1973 and Cortez, 2000). The distribution of income usually shows a substantial degree of inequality. Further, among various forms of income, the distribution of capital income is less equal than that of wage and salary income. But, the problem is to find out what might be considered a fare or equitable state of distribution?

Musgrave and Musgrave (1973) provides three possible criteria e.g. endowment-based criteria, utilitarian criteria and equity criteria for finding a just state of distribution. However, the equity criteria consist of a number of aspects: (a) welfare is equalized, (b) welfare floor is set with the endowment rule, and (c) welfare of the lowest group is maximized. Economists have some rigorous notions involving equity (D. Milne and J. Savage, 1999). There are some common examples, although inevitably the simple exposition has suppressed caveats. *Horizontal equity* refers to two people in similar circumstances being treated exactly the same. Typically the similarity of circumstances includes the same income and similar personal and family characteristics. For instance it would be equitable (i.e. fair) to give two people on the same income, the same health or educational entitlements, even though one was, say, a beneficiary, the other a worker. *Vertical equity* is the principle that people in similar circumstances, except for different incomes, should be treated on the basis of ability to pay. *Intergenerational equity* is a form of horizontal equity, in which the situation of different generations with similar circumstances is compared. It has been

important in recent years with regard to government borrowing which places a burden on future generations. In a broad term, equity means social justice or fairness; it is an ethical concept, grounded in principles of distributive justice (Braveman and Gruskin, 2003).

The terms "equity in health", "health disparities" and "health inequalities" while hardly used terms among the general public, have by now become more familiar to policy-makers, program managers, many health practitioners and as well as researchers around the globe. But, there is a little consensus about what these terms mean and the resulting lack of clarity is not merely of academic concern. How one defines "health disparities" or "health equity" can have important policy implications with practical consequences (P Braveman, 2006).

A concern about equity in health and other distributional aspects of health status and service use has enjoyed varying degrees of attention over the years. During the 1970s and early 1980s, distributional concerns (i.e. a concern for about the health status of different socio-economic groups within society as distinct from the overall societal average) were dominant in thoughts about international health. These concerns then receded for about a decade, from around the mid-1980s to mid-1990s, as attention turned from equity to efficiency. Now, the pendulum has begun to swing back, and distributional concerns are on the rise (Gwatkin DR 2002).

Equity in health has been conceptualized and defined in several ways. Common to most definitions of health equity is the idea that certain health differences (most often called inequalities in health) are unfair or unjust. According to Braveman and Gruskin (2003) equity in health is an ethical value, inherently normative, grounded in the ethical principle of distributive justice and consonant with human rights principles. Equity in Health implies the absence of potentially remediable,

systematic differences on one or more aspects of health across socially, economically, demographically, or geographically defined population groups or subgroups (Macinko and Starfield, 2002). In other words, equity in health means equal opportunity to be healthy, for all population groups. Equity in health thus implies that resources are distributed and processes are designed in ways most likely to move toward equalizing the health outcomes of disadvantaged social groups with the outcomes of their more advantaged counterparts. This refers to the distribution and design not only of health care resources and programs, but of all resources, policies, and programs that play an important part in shaping health, many of which are outside the immediate control of the health sector (Braveman and Gruskin, 2003). However, in many cases equity in health focuses on access, utilization and financing of health services (Van Doorslaer, et al, 2000 and Waters, 2000).

Two main forms of health equity are also identified (Macinko and Starfield 2002); vertical equity - preferential treatment for those with greater health needs, and horizontal equity - equal treatment for equivalent needs. Starfield, B. (2001) describes equity in health services as the absence of differences in health services where health needs are equal (horizontal equity) or that enhanced health services are provided where greater health needs are present (vertical equity). Equity in health also calls for assuring the avoidance of the suffering of poverty (Musgrave and Musgrave 1973).

According to Gwatkin DR (2002) equity is a normative concept and closely associated with the concept of social justice. When applied to health, equity has traditionally been linked to the reduction of inequalities most often. But, equity need not be exclusively a matter of reducing inequalities. It can also be associated with poverty, as one could argue that it is unjust to allow people to continue living in poverty when adequate resources are available within the society at large to lift

them out of it. Such a link figures prominently in general thinking about social justice; and it also appears in writings on health equity. However, regardless of whether one considers health equity to be related more to equality or poverty, the introduction of normative or social justice considerations also raises questions.

When is an inequality unfair? Not always, certainly. It is quite possible to imagine a situation marked by health inequalities that are not necessarily inequitable. An example might be two population groups with similar incomes but marked differences in life expectancy attributable to different lifestyles. If the less healthy group adopts its lifestyle in full awareness of the risks involved, the resulting differences in life expectancy might be said to be simply a reflection of differences in the social preferences of the two groups, rather than any fundamental inequity. Or, to illustrate the same point by a more general example: if two individuals are in fact unequal in capacity, equal treatment would be unfair to the more capable of the two. In such a case, equity might well call for unequal treatment. In other words, equity and equality are by no means synonymous and need to be carefully distinguished from one another.

On what basis can one decide when the resources in a society are adequate to alleviate poverty? "Adequacy" is not a binary concept, such that there is one level of resource availability above which availability is totally adequate, and below which it is completely inadequate. Rather, there is a spectrum running from a total lack to infinite availability of resources, often with no obvious cut-off point along the way. Also, perceptions can differ: resources that seem adequate to one person may not be so to another.

Health Equity and Health Disparities - Concepts and Measurement: Gwatkin DR (2002) in their review recognizes that inequalities in health constitute only one

of the several indicators of interest to those dealing with the distributional aspects of health status and services use. Two others are health equity and the health of the poor. These three indicators or concepts are similar in some ways, different in others. Those concerned with different ones all share a recognition that in health, as in many other fields, societal averages typically disguise as much as they reveal. Their interest is thus not in health conditions that prevail in society as a whole, but in the condition of different socioeconomic groups within society – especially in that of the lowest or most disadvantaged groups.

There are various views about the most appropriate strategies for the reduction of inequalities in health. Illustrative of the issues that arise in discussing the reduction of health inequalities are questions on the following:

The dimensions of inequality that matter most. The most traditional approach has been to think of differences in health status according to an individual's income or economic standing. However, the economic dimension is by no means the only one that matters, and some would consider other dimensions even more important. Gender inequalities in health status have received a great deal of attention in recent years. Ethnic inequalities in health have been of particular concern in many areas. Education and occupation have also been widely used as a basis for dividing populations in assessing intergroup health differentials, although often more as a proxy for economic status than as indicators of interest in their own right. Yet another approach might be called "pure" health inequality – that is, the ordering of people on the basis of their health status, from most to least healthy regardless of income or any other attribute, for the purpose of measuring health diversity in a society (Gakidou et al. 2000). This approach, however, avoids the potentially politically sensitive process of a priori identifying social groups as "most" or "least" advantaged. But, it leaves open the possibility that resources earmarked for

health equity/disparities may be directed to groups who are more privileged overall but happen to do worse on a particular outcome. In health, as in economics, several other disparity indicators are also under consideration (Anand et al. 2001), with no clear consensus in sight.

How inequality is to be measured? There are many definitions of inequality in health and different definitions can produce very different interpretations of the same situation or trend. Each method used to quantify health disparities/equity is related to a number of implicit assumptions about definitions (P Braveman, 2006). When only two groups are compared, the "rate ratio" – i.e., the rate of a given health indicator in one group divided by the rate in another group – is most commonly calculated to measure a particular disparity. Two groups can also be compared by calculating a "rate difference" or absolute difference in rates. Both absolute and relative differences can be meaningful.

More complex methods, such as the population attributable risk, the slope and relative indices of inequality, and the concentration curve and index as discussed in World Bank's Technical Notes on Quantitative Techniques for Health Equity Analysis, also have been used. These methods can be useful for quantifying the magnitude of socioeconomic inequalities in health, reflecting comparisons among more than two groups, addressing changes in the group sizes over time, and/or reflecting absolute levels of a health indicator as well as relative differences across social groups. These approaches and their implications are well explained by Wagstaff et. al. (1991).

Until recently, one particular measure – the Gini coefficient – has been dominant, at least in economic thinking, supplemented by comparisons between the poorest and richest population quintiles (or between people above and below the poverty

line) when the data available were insufficient for the calculation of the Gini coefficient. In non-technical terms, the Gini coefficient can be thought of as reflecting the overall extent of difference between the observed distribution of economic resources (e.g., income) in a given society and a theoretical situation in which everyone has exactly the same economic resources, considering differences in economic resources among individuals without comparing different social groups defined by characteristics other than economic resources. Some authors have examined how income inequalities in specified geographic areas are associated with aggregate levels of health experienced by people residing in those areas.

What aspects of inequality are most important? There are many different views. Some would argue for looking at inequalities in health status as the outcome that counts; others favor focusing on health services, as the determinant of health status which health professionals can most easily influence. Within each of these two streams of thought are further distinctions. Health status, for example, can be determined either through a physical examination or through self-assessment[12]. With respect to health services, there are distinctions: (a) between use and financing; (b) among public, private non-profit and private for-profit services; and (c) between preventive and curative services. People who come out ahead in one of these respects may lag from another perspective.

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[12] These two approaches can produce quite different results, in that people found to be relatively unhealthy through a physical examination do not always consider themselves to be less healthy than people whose health was determined by examination to be considerably better.

The discussions in this section clearly indicate the need for a definition of health disparities/inequalities/equity that explicitly specifies both the relevance of social position (relative advantage and disadvantage in social hierarchies) and the particular kinds of comparisons that should be made between/among groups with different social positions. As attention to "equity in health or health disparities" in Bangladesh has typically been focused on socio-economic differences in health or health care, "health disparities/inequalities" may be defined more briefly as differences in health that are systematically associated with being socially disadvantaged (e.g., being poor, a member of a disadvantaged group, or female), putting those in disadvantaged groups at further disadvantage. Further clarification may be provided by noting that pursuing health equity – that is, striving to eliminate health disparities strongly associated with social disadvantage groups as much as possible, with selective focus on improving conditions for those who have had fewer opportunities.

Poverty and its Linkage with Health

Poverty is a relative concept used to describe the people in a society that cannot participate in the activities that most people take for granted. People living in poverty have to make difficult choices – such as skipping a meal to pay for health care. They commonly suffer greater levels of physical and mental illness. The high stress associated with living in poverty can also contribute to behaviour which leads to health risks such as smoking, substance abuse and poor diet. Increasing costs for patients in the health care system makes it harder for people to afford health care (Australian Council of Social Service, 2009).

What is poverty? Poverty is hunger. Poverty is lack of shelter. Poverty is being sick and not being able to see a doctor. Poverty is not having access to school and not knowing how to read. Poverty is not having a job, is fear for the future, living one day at a time. Poverty is losing a child to illness brought about by unclean water. Poverty is powerlessness, lack of representation and freedom. Poverty is a call to action - for the poor and the wealthy alike - a call to change the world so that many more may have enough to eat, adequate shelter, access to education and health, protection from violence, and a voice in what happens in their communities.

> ***Profile of Poor***
>
> *Poor people in Bangladesh tend to have low levels of education and limited access to land and hold low paying, physically demanding, and socially unattractive occupations, such as casual wage labor. In both urban and rural areas, the poor lack access to modern amenities and services, and they also tend to live in houses of inferior quality.*
> *Households headed by women, who are widowed, divorced, or separated, have a considerably higher incidence of poverty relative to the others.*
>
> *Conversely, households with a member succumb to illness have to reduce their expenditure, reduce the quality of their shelter or move to poorer accommodation.*

Poverty is the state of being without, often associated with need, hardship and lack of resources across a wide range of circumstances (WB, 2010 and Fight Poverty 2010).

Poverty has many causes, some of them very basic. Some experts suggest, for instance, that we have too many people, too few jobs, and not enough food. But such basic causes are quite intractable and not easily eradicated. In most cases, the causes and effects of poverty interact, so that what makes people poor also creates conditions that keep them poor. Primary factors that may lead to poverty include overpopulation, the unequal distribution of resources, inability to meet high standards of living and costs of living, inadequate education and employment opportunities, environmental degradation, certain economic and demographic trends, and welfare incentives (Fight Poverty, 2010).

Measurement of Poverty – Some Fundamental Issues: The measurement and analysis of poverty, inequality, and vulnerability are crucial for cognitive purposes (to know what the situation is), for analytical purposes (to understand the factors determining this situation), for policymaking purposes (to design interventions best adapted to the issues), and for monitoring and evaluation purposes (to assess the effectiveness of current policies and to determine whether the situation is changing). There is by now a vast literature on measurement of poverty. Theoretically, the seminal paper was Sen's 1976 axiomatization and the associated index that attempted to bring together the headcount ratio the income gap ratio and income inequalities among the poor within a consistent axiomatic framework. Since then, Sen and others following him have moved in the direction of a multidimensional approach to poverty as inadequate capabilities (Haider A. Khan, 2004).

The general intuition behind poverty measurement is that 'poverty' exists when a group of people in a particular society cannot attain a 'minimum' level of well-being. The 'minimum' is at least partly dependent upon the prevailing standards of society. However, there are dimensions of well-being such as nutritional requirements that might actually constitute an absolute biological minimum. The idea behind absolute as opposed to relative poverty is that by using generally agreed upon minimum standards of well-being, we can, in fact, define an income poverty line. Such income poverty line gives the cut-off point below which everyone is deemed to be poor (Haider A. Khan, 2004). The key questions in applying this idea of poverty for applied policy issues are: (i) *how do we assess well-being?* and (ii) *how do we decide on a certain poverty line so that when a poor person crosses that threshold s/he is no longer poor?* These are the questions which ask us to identify who the poor are.

Various definitions and concepts exist for well-being. First, it addresses whether households or individuals possess enough resources or abilities to meet their current needs. This definition is based on a comparison of individuals' income, consumption, education, or other attributes with some defined threshold below which individuals are considered as being poor in that particular attribute. Second, the study focuses on inequality in the distribution of income, consumption, or other attributes across the population. This is based on the premise that the relative position of individuals or households in society is an important aspect of their welfare. In addition, the overall level of inequality in a country, region, or population group, in terms of monetary and nonmonetary dimensions, is in itself also an important summary indicator of the level of welfare in that group. Finally, the vulnerability dimension of well-being, defined as the probability or risk today of being in poverty – or falling deeper into poverty – at some point in the future. Vulnerability is a key dimension of well-being, since it affects individuals' behavior (in terms of investment, production patterns, coping strategies) and their perception of their own situation (Aline Coudouel, et. al. 2002).

Once an aggregate income, consumption, or nonmonetary measure is defined at the household or individual level, the next step is to define one or more poverty lines. Poverty lines are cutoff points separating the poor from the nonpoor. They can be monetary (for example, a certain level of consumption) or nonmonetary (for instance, a certain level of literacy). The use of multiple lines can help in distinguishing among different levels of poverty. There are two main ways of setting poverty lines – relative and absolute.

Alternative poverty lines are also sometimes used. They can be set on the basis of subjective or selfreported measures of poverty. Moreover, absolute and relative poverty lines can be combined. This technique allows for taking into account inequality and the relative position of households while recognizing the importance of an absolute minimum below which livelihood is not possible. When deciding on the weight to give to the two lines when combining them, one can use information contained in the consumption or income data and information from qualitative data (if the qualitative data show that people consider a specific good to be a basic need, the elasticity of ownership of that good to income can be used (Madden, 2000).

UNDP measures of poverty

Measure	*Components*
Human Development Index	*Life expectancy at birth, adult literacy, educational enrolment, GDP per capita*
Gender-related development index	*As above, adjusted for gender differences*
Gender empowerment measure	*Seats in parliament held by women, female administrators and managers, female professional and technical workers, women's share of earned income*
Human Poverty Index (developing countries) (HPI -1)	*People not expected to survive to 40, illiteracy, access to safe water, access to health services, underweight children*
Human Poverty Index (developed countries) (HPI - 2)	*People not expected to survive to 60, functional illiteracy, population below mean income, long term unemployment*

Source: UNDP Human Development Report, 1998.

Another recent development of poverty measure is Multidimensional Poverty Index (MPI). The MPI is an index of acute multidimensional poverty. The MPI reveals a different pattern of poverty than income poverty, as it illuminates a different set of deprivations (UNDP, 2010). The MPI has three dimensions: health, education, and standard of living. These are measured using ten indicators. The MPI is the product of two numbers: the headcount or percentage of people who are poor, and the Average Intensity of deprivation – which reflects the proportion of dimensions in which households are deprived. Each dimension is equally weighted; each indicator within a dimension is also equally weighted. The MPI reveals the combination of deprivations that batter a household at the same time. A household is identified as multidimensionally poor if, and only if, it is deprived in

some combination of indicators whose weighted sum exceeds 30 percent of deprivations.

The choice of a poverty line is ultimately arbitrary. In order to ensure wide understanding and wide acceptance of a poverty line, it is important that the poverty line chosen resonate with social norms, with the common understanding of what represents a minimum (Aline Coudouel, et. al. 2002). For example, in some countries it might make sense to use the minimum wage or the value of some existing benefit that is widely known and recognized as representing a minimum. Using qualitative data could also prove beneficial in deciding what goods would go in the basket of basic needs for use in constructing an absolute poverty line.

In Bangladesh Poverty Reduction Strategy Paper (Planning Commission, 2005) poverty has been defined as a broad front. It is about income levels. It is about food security. It is about quality of life. It is about asset bases. It is about human resource capacities. It is about vulnerabilities and coping. It is about gender inequalities. It is about human security. It is about initiative horizons. It is each of these and all of these together.

Just as poverty is multi-dimensional, the battle against poverty too has to be waged on many fronts and with unremitting vigour. The challenge is not only one of budgetary targets. It is as importantly a challenge of better understanding of ground realities, of transforming institutional cultures, of building dynamic partnerships, and above all a challenge of political determination (Planning Commission, 2005). The struggle against poverty will never succeed if it continuously deprives the sense of strategic priority. Poverty is so pervasive that a million priorities will not exhaust the agenda but to get the momentum going,

policy and popular energies have to be galvanized around a few catalytic agendas built on the policy triangle of growth, human development and governance. The overriding consideration for choosing such an agenda will be its relevance to ground realities and its potential to unlock the social and economic energies of the nation. Such a choice must also be built upon an adequate understanding of the poverty process. In real life, the move out of poverty is never a one-step change from being poor to non-poor. The change process is more akin to a ladder built of distinct milestones. Construction of anti-poverty strategies must keep in focus all rungs of the poverty ladder with an overall emphasis on graduation.

Poverty Reduction Strategies in Bangladesh: At the Millennium Summit in 2000, representative from 189 countries committed themselves toward a world in which sustaining development and eliminating poverty would have the highest priority. In relation to the MDGs, the single most important objective of the Government of Bangladesh is to reduce both human and income poverty through achieving accelerated pro-poor growth. Towards that end the Government of Bangladesh produced and implemented its first poverty reduction strategy, the National Strategy for Accelerated Poverty Reduction (NSAPR) and other national goals.

The poverty reduction strategy framework of Bangladesh is based on the reality of multidimensionality of poverty and takes into account the dynamics of the socio-economic factors that reinforce and perpetuate poverty in the country. To fulfill the vision of poverty reduction, five strategic blocks are identified. These five strategic blocks are: (i) macroeconomic environment for pro-poor growth; (ii) critical areas for pro-poor growth; (iii) essential infrastructure for pro-poor growth; (iv) social protection for the vulnerable; and (v) human development (Planning Commission, 2009).

The ***first strategic block*** is about creating a macroeconomic environment for ensuring pro-poor economic growth by maintaining a stable macroeconomic environment for achieving higher economic growth and accelerated poverty reduction. The key aspects of macroeconomic stability include high economic growth, low and stable inflation, a sustainable budget deficit, a sustainable external balance and high productive employment. Macroeconomic stability will be maintained mainly through prudent fiscal and monetary policy and supportive external sector policy focusing on management of both supply and demand sides of the economy.

The ***second strategic block*** is about emphasizing growth in critical areas of focus, for pro-poor economic growth. The highest importance in this regard is given to increasing the productivity of the agriculture sector. The strategic objectives are to enhance agricultural growth through developing and disseminating sustainable eco-friendly technologies; ensure profitability; generate employment, diversify crop and non-crop agriculture; develop agri-business services and ensure food security for all people especially the poor, extreme poor, poor women and other vulnerable poor groups. The Small and Medium Enterprise (SME) sector will be encouraged to become more dynamic in order to be able to play a pivotal role in achieving the national goal of accelerated pro-poor growth, sustained poverty alleviation and a faster rate of economic development and social progress during 2009-2011 and beyond. Economic growth is expected to be led by the private sector and the Government will strive to ensure an enabling environment for the private sector to grow and excel.

The ***third Strategic block*** is about building essential infrastructure to support pro-poor economic growth. Importance is given to improving infrastructure to provide services to poorer people such as the landless, destitute, ethnic minorities, women

and children, the unemployed and poor, and particularly to those who are living in remote areas. Access to services is essential to mitigate their distress and improve their living conditions. Better infrastructure is expected to facilitate increased production, trade and commerce for pro-poor growth. Infrastructure development including the development of electricity, gas, renewable energy, roads, rails, inland waterways, sea ports, land ports, air ports, post and telecommunication links etc. provide essential inputs to agriculture, industries, SMEs and income generating activities for augmenting growth and promoting employment.

The ***fourth strategic block*** is about protecting the vulnerable. In achieving poverty reduction in the fastest possible way, attention must be given to activities that are directly targeted to benefit the extreme poor, women in poverty, the landless poor and other vulnerable groups. To protect these vulnerable poor from falling into further poverty, attention has to be given to at least five areas. These are social safety nets programs; food security; disaster management; micro-credit, rural non-farm activities (RNFA) and rural development.

The ***fifth strategic block*** is about human development. The two most important aspects of human development are having knowledge and good health. Both are equally important for personal development and for the progress of society. Depravation in either of them is a form of poverty - knowledge poverty and health poverty. Addressing knowledge poverty and health poverty are also most essential for overcoming income poverty.

To complement these key strategic blocks, there are five supporting strategies ensuring additional support measures to enhance, sustain and broaden economic development and its impact (MoF, 2009 & Planning Commission, 2009). The supporting strategies, on the other hand, comprise of: (i) ensuring participation,

social inclusion, and empowerment; (ii) promoting good governance; (iii) ensuring efficient delivery of public services; (iv) caring for environment and tackling climate change; and (v) enhancing productivity and efficiency through science and technology. For poverty reduction, it would be critical to address all these areas in order to derive mutually supportive interactions.

However, the important apprehension of the approach is to achieve higher growth and make the growth pro-poor such that the poorer sections get a proportionately greater share of the benefits of growth helping them move out of poverty (Planning Commission, 2009). The reduction of inequality in income and opportunities is required for making growth more pro-poor apart from its value in creating a more egalitarian and stable society. In line with the pro-poor growth strategy of the government, the poverty reduction approach addresses the issues of poverty reduction and equity simultaneously. In this context, the focus is on agriculture and rural life, expansion of social safety nets for the ultra poor and targeted approach towards employment generation.

Further, to accelerate the poverty reduction through health sector, the GoB has formulated the following Medium Term Strategic Objectives (MoF, 2009) to be implemented by the MoHFW:

Improvement of child and mother health: Maternal and child mortality rates will be reduced and mother and child health will be improved through the EPI, ARI, IMCI and MCH programs of Mother and Child Welfare Centers under Essential Services Delivery (ESD) activities. The poor will be given preference in the delivery of all of these services. As a result, the medical expenses will be reduced at national and family levels. A productive workforce will be created

which will help to reduce poverty. Moreover, under the DSF Maternity Voucher Scheme financial assistance is provided to poor pregnant.

Improvement of reproductive health: Reproductive health service programs (family planning, ANC, PNC, EOC, adolescents' health care, men's participation, STD, HIV/ AIDS etc.) will be provided to poor people on a preferential basis. These will improve mother and child health and reduce mortality rates. In addition, 315,177 pregnant women from 33 upazilas will be brought under the Maternity Voucher Scheme. These programs through the individual and integrated activities of the government and non–government organizations will contribute to poverty reduction.

Provision of general health care services: Health care services for the general population will be improved through expansion and strengthening of the health care programs to district and upazila level, providing drugs and equipment, establishment of nursing training institutes, strengthening and improving the quality of nursing care. These are not targeted directly to the poor, but rich and poor will have equal access to such services. As a result, the health of all people will be improved, which will contribute to poverty reduction.

Provision of specialized health care services: The availability of specialized health services will be increased through the establishment and expansion of specialized hospitals and treatment facilities. This will contribute to better health among the general people including the poor. As a result, the size of active manpower will be increased and poverty will be reduced.

Provision of health care services for trauma victims: The construction and expansion of trauma centers will provide facilities for quick and appropriate treatment for accident victims. As a result long term disabilities and sickness

due to accidents will be reduced. Such programs are not directly targeted to poverty reduction; however both rich and poor will be covered by these services.

Improvement of overall health of women and adolescent girls: The expansion of the existing Mother and Child Healthcare Centers, the distribution of required drugs/MSR, the training of health workers for the improvement of women's health, and the provision of appropriate reproductive health services will contribute to the improvement of the health of women and female adolescents. This will enable women and adolescent girls to participate more in economic activities, which will in turn contribute to poverty reduction.

Control of communicable and other diseases: Poor people will be brought under the programs of controlling communicable and other diseases through safe blood transfusions, hepatitis B vaccinations, drug distribution and training. Their access to these health services will be increased; and as a result their health will be improved.

Ensure mother and child nutrition: The community nutrition, area-based nutrition program at rural level and the participation of NGOs to enhance public awareness will help ensure the achievement of nutritional standards of mothers and children. The general people along with the poor will be covered by this nutrition program. This will contribute to poverty reduction.

Increase the efficiency of the drug sector: The quality of drugs will be improved and the supply of essential drugs will be increased through the procurement of raw materials and equipment for producing quality drugs, manpower training and the implementation of the National Drug Policy.

Quality drugs will be made available at a fair price. This program is not targeted directly to the poor, but the cost of medical care for the poor will be reduced through improvements in the quality and the supply of necessary drugs.

Development and promotion of alternative medical care: The quality of Homeopath, Unani and Ayurvedic medical cares will be improved through alternative medical care, the formation of registration council and quality alternative medical care programs. These services will be available to all, including the poor.

Improve the overall health status including health of the elderly people: The overall health status will be improved through the expansion of specific healthcare services for elderly people at district and upazila levels, the distribution of drugs and by training staff in relevant skills. This will create a social safety net for all elderly people, including the poor.

4.2 Equity in Health

In operational terms, and for the purposes of measurement, equity in health can be defined as the absence of disparities in health (and in its key social determinants) that are systematically associated with social advantage/disadvantage. Health inequities systematically put populations who are already socially disadvantaged (for example, by virtue of being poor, female, or members of a disenfranchised racial, ethnic, or religious group) at further disadvantage with respect to their health (Braveman and Gruskin, 2003). A review of recent relevant literatures on equity in terms of access to and utilization of healthcare services, out of pocket payments for health care and benefits from public health care system are summarized below:

A recent study by Huq, M Nazmul (2007) showed that more than 80 percent people in Bangladesh seek healthcare when they reported sick. Al-Kabir, Ahmed; Huq, M Nazmul et. al. 2009 further showed that an exit patient, on an average, had been suffering for 9 days from illness and waited approximately for 6 days before seeking treatment. Roughly 17.4 percent of the exit patients received services at the first day of the start of the symptom. In contrast, approximately one-fifth (18.6%) of the exit patients waited even more than a week for seeking treatment.

Utilization of Healthcare Services. The utilization of healthcare services depends on behavioral phenomenon of the people. The factors like age, sex, education, income status, severity of illness, locality, accessibility and affordability etc. determine the behaviour of the respondents. Huq, M Nazmul (2007) showed that there exists a strong regional disparity for selecting qualified providers. The urban residents are 2 times more likely to visit a qualified provider as compared to their rural counterpart, which implies the fact that rural people relies more on traditional/unqualified providers for their treatment. The lack of access to qualified providers, as well as wrong perception on the cost of qualified providers are the major reasons for such health seeking behaviour. Moreover, residents of Barisal and Sylhet are more than 2 times likely to visit qualified providers while residents of Rajshahi rely more on unqualified providers.

Huq, M Nazmul (2007) in a study observed that the majority of the patients (63.1%) at the primary level public facilities were female and another 22.3 percent of the clients were children aged under five. The utilization of public healthcare services in the selected primary level facilities by age and sex of the exit patients pointed out that although females utilized the selected health care facilities more as compared to their male counterparts but for the children under five years of age and for the elderly the male utilization rate was notably higher. In contrast,

considering the reproductive age group the female utilization was significantly higher (76.4%) as compared to their male counterparts (23.6%). From this analysis it transpired that children under five years of age and elderly male got more priorities in terms of receiving healthcare services as compared to their female counterpart. On the other hand, female dominated the reproductive age group while seeking healthcare services form the primary health care facilities.

It is also observed that 27.1 percent of the service recipients of the PHC facilities were from the poorest quintile. In contrast, 14.7 percent of the service recipients were from richest quintile. In contrast, the utilization of secondary as well as higher level facilities by the poor is notably lower as compared to the rich. As a result, poor people usually rely on the upazila and below level facilities (Huq, M Nazmul, 2007 and Huq, M Nazmul; Howlader, Sushil Ranjan; et.al., 2007).

Although poor rely on the PHC facilities as compared to the rich, the overall utilization of public healthcare facilities remains still low. Huq, M Nazmul (2007) showed that the proportion of ill people going to public provider is significantly lower (14%) than those going to private providers (86%). Further, among those seeking any care, the incidence of choosing unqualified or traditional providers is quite high (63%). People who have been severely sick usually rely more on formal care. Fifty percent of the severely sick people have consulted with an unqualified/traditional provider. This confirms how unqualified/traditional providers play an important role in the health sector of Bangladesh. However, the incidence of consulting qualified (public and private) providers is quite high among the severely ill people as compared to the moderately ill members. Even among those who have reported severely ill, 8 percent have not received any type of care from a formal healthcare facility. In addition, 6 percent of them have not consulted with any provider at all.

Why Do the Poor Have Less Access to Public Health Resources? Since public facilities are not a common destination for healthcare and not everyone seeks care at all, the resulting utilization rates of government facilities are quite low. Moreover, poor quality and difficult access are argued to be major factors that compel households to rely more on private sector facilities (WB, 2001). Nevertheless, the poor of the country are less likely than the rich to resort to any modern medical provider when reporting sick, and when they do so, they are more likely to choose unqualified or traditional providers, especially in the rural areas. Even among the urban poor, while accessing private healthcare the majority of patients goes for unqualified practitioners since they are comparatively cheaper, easier to access and the patients are more familiar with these services (Huq, M Nazmul, 2007 and Rannan-Eliya, R., et al, 2001). Moreover, a large portion of sick people forgo treatment and this figure is much higher for the poor compared to the rich - 30 percent vs. 15 percent (WB, 2005).

Howlader, Sushil Ranjan; Huq, M Nazmul; et.al. (2009) in a study showed that many poor do not utilize the public facilities due to shortage of HR and other inputs, lack of accessibility as well as poor quality of the services:

Shortage of HR and other inputs as supply-side barriers to rapid increase of use of healthcare: In Bangladesh there is an acute shortage of manpower at all levels. At the higher level, a large number of posts of doctors are lying vacant for long. As a result, many Upazila Health Complexes (UHCs) do not have minimum necessary number of doctors and some UHCs have only one or two doctors. Absenteeism of doctors in many UHCs and Family Welfare Centers (FWCs) is exacerbating the shortage. At the lower level, Family Welfare Assistants (FWAs), Medical assistants (MAs)/Sub-assistant Community

Medical Officers (SACMO), Family Welfare Visitors (FWVs) and nurse-midwifes do not exist in over thirty percent approved positions of service delivery points (SDPs).

There is a shortage of equipment and logistics in most SDPs especially in the remote areas. Supply of some FP methods and medicines is not only inadequate but also highly irregular. In addition, difficulty of transportation of drugs and supplies to the UHCs of remote upazilas is adding to the problem. The procurement process is also unusually long and difficult.

Demand side issues and approaches could play a key role in the healthcare services: Although demand for healthcare from the qualified providers has been increasing in all areas, the rate of increase is slow in some regions of the country, in the remote areas and among the poor. The main reasons for the lower rate of increase of demand are: distance and problem/ cost of transport to the facility, persistence of preference for the indigenous providers because of easy accessibility and lower cost involved, non-availability of drugs and diagnostic facilities at UHCs, long waiting time, etc. In urban areas, the slum population is experiencing similar problems.

The demand for delivery care is quite low in the remote areas and among the poor for several reasons: belief in the traditional practice, objection by the in-laws and neighbors, fear of loss of privacy, and high cost. Many households have demand but cannot go to the facility for lack of transport at the time of emergency need. However, in the areas where voucher schemes and skilled grass root service providers for safe delivery are in place, use of delivery care has been rapidly increasing.

Supply-side constraints: A good number of facilities did not have adequate physical space with minimum standards. More than a half of the facilities did not have sufficient private space for physical examination. Majority of the service delivery points were not capable of maintaining privacy during counselling. Clean water supply and clean toilet facilities were also not adequate. The selected public facilities, on an average, had only a half of the listed essential drugs. Although regular supply of medicines was ensured at different facilities but in terms of quantity these were inadequate to meet the needs. Majority of the selected service delivery points had most of the equipment in working condition, but these were not sufficient in number. The sufficiency of the available equipment at the selected UHFWCs was even lower. Moreover, the providers did not use the appropriate equipments due to their negligence.

Quality of care (QoC): Huq, M Nazmul; Howlader, Sushil Ranjan; et. al., (2007) highlighted that an outpatient, on an average, received only 3.3 minutes of consultation time form the providers at district hospitals (DHs), 2.9 minutes at UHCs and 3.1 minutes at UHFWCs. However, the inpatients usually received more time for physical examination at all selected facilities.

Among the clients who utilize public healthcare facilities are not getting benefits satisfactorily. Although, fees charged in government facilities do not represent a large burden for poor households, but informal fees required in the same are comparable or even higher than the official ones. Further, the rules of public resource allocation across regions are not conducive to delivering health subsides to the poor (WB, 2001).

Lack of satisfactory physical accessibility is important for a number of public healthcare facilities. Huq, M Nazmul; Howlader, Sushil Ranjan; et. al., (2007) also showed that an exit patient on an average traveled 5.5 km to reach DH and 3.1 km to UHC and 1.3 km to UHFWC. Moreover, the distribution of the waiting time by different facilities showed that an exit patient on an average had to wait approximately for 54 minutes at DHs, 36 minutes at UHCs and 22 minutes at UHFWCs.

The quality of the service providers was, in general, acceptable to the patients (Huq, M Nazmul; Howlader, Sushil Ranjan; et. al., 2007). However, roughly 50 percent of the patients were not satisfied with the quality of the treatment. Cleanliness is another area of concern for the clients of public facilities. The patients also complained on the non-availability of drugs, lack of privacy of treatment and lack of equipment at all the surveyed facilities. A large number of patients were not satisfied with the waiting time and unavailability of the service providers. A high proportion of providers (67 percent) usually did not explain the problems to the clients.

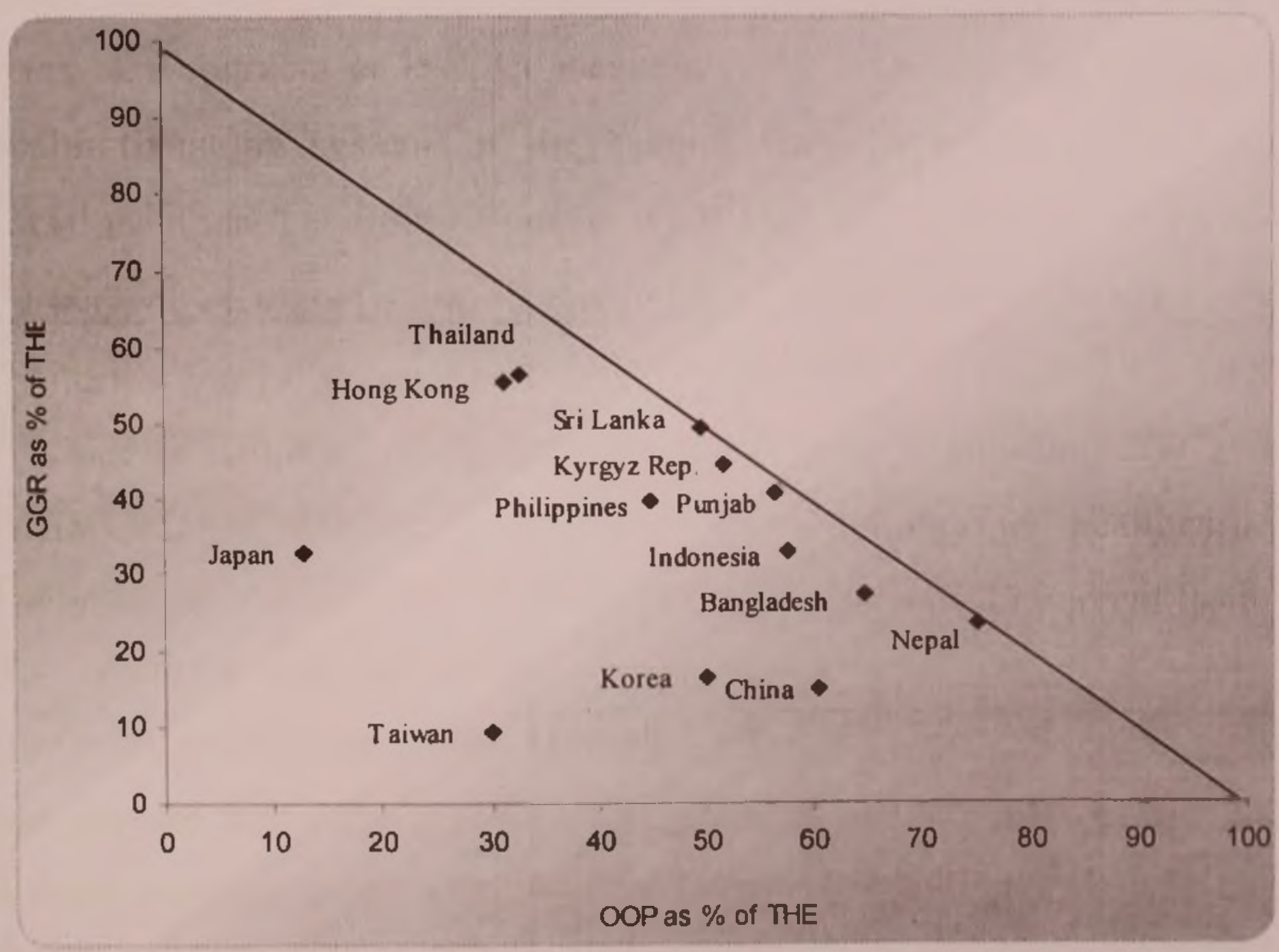
Inefficient Allocation of Public Resources: The government's budget allocations for health services across districts and upazilas are centrally determined. Guidelines used for allocation are primarily driven by the capacity of the public health facilities and historical norms, rather than by per capita needs. Variations in allocation are not based on health needs or on other objective criteria, such as spatial or district distribution of poverty as indicated by poverty mapping and other indicators of poverty, like the human poverty index (HPI) or the human development index (HDI). An analysis of per capita allocations by districts for two consecutive years reveals that allocations follow somewhat of a random walk pattern (WB, 2005).

Cost of Treatment – a Burden on Poor? In per capita terms, on an average, a Bangladeshi spends Taka 398 annually for purchasing health care services. However, the per capita distribution of OOP payments for healthcare by gender reveals equal sharing of healthcare payments among the male and female populations. A significant variation of health care payments has been observed when disaggregated by broad age groups. For the boys aged under 14 years the per capita healthcare expenditures seem to be higher as compared to their girl counterparts. In contrast, in reproductive age group the per capita expenditure is significantly higher for females as compared to the males of the same age group. Moreover, the per capita expenditure is notable for the elderly males as compared to the elderly women. All these indicate the existence of gender disparity in the healthcare system of Bangladesh, especially for younger as well as for elderly people. The per capita expenditure for urban residents (Taka 523) is significantly higher as compared to their rural counterparts (Taka 367). The study also indicated the existence of significant differences of healthcare payments among the urban and rural people when disaggregated by broad age groups. It is noteworthy to mention that the per capita healthcare expenditures for the urban infants (aged below 1 year) as well as for the elderly (aged 85+ years) are more than twice as compared to their rural counterparts (Rabbani, A. K. M. Ghulam; Huq M Nazmul; et.al., 2006).

Rabbani, A. K. M. Ghulam; Huq, M Nazmul; et.al. (2006) showed that poorest 20 percent population who contributed 8.5 percent in income distribution spent approximately 3 percent of their total income for healthcare. In contrast, richest 20 percent of the population who hold almost half of the income spent only 9 percent of their income for purchasing healthcare services. Judged by the Concentration Index (CI) as well as Kakwani index it is revealed that poor spend smaller share of their income for healthcare as compared to the rich.

A recent study by O. O'Donnell, Van Doorslaer, E., M N Huq, et al., (2008) showed that private insurance plays a relatively minor role in most of the health systems considered. It contributes a non-negligible share of THE only in Hong Kong, Indonesia, the Philippines, Taiwan and Thailand. Even in these cases the share is 10 percent or less. Consequently, the main distinguishing factor in these health financing systems is the balance between public pre-payment (tax and social insurance) and out-of-pocket (OOP) payment. The latter accounts for at least 30 percent of the THE in all territories except Japan (**Figure 4.1**). These Asian territories generally conform to the stylized fact that reliance on OOP payments declines as national income rises (Musgrove and Zeramdini, 2001). The poorest country, Nepal, obtains three-quarters of its funding for healthcare from OOP payments, while the richest country, Japan, obtains only 12 percent from this source.

Figure 4.1: Health Financing Triangle



Source: O. O'Donnell, Van Doorslaer, E., M N Huq, et al., 2008. Who pays for health care in Asia?, Journal of Health Economics 27 (2008) 460–475

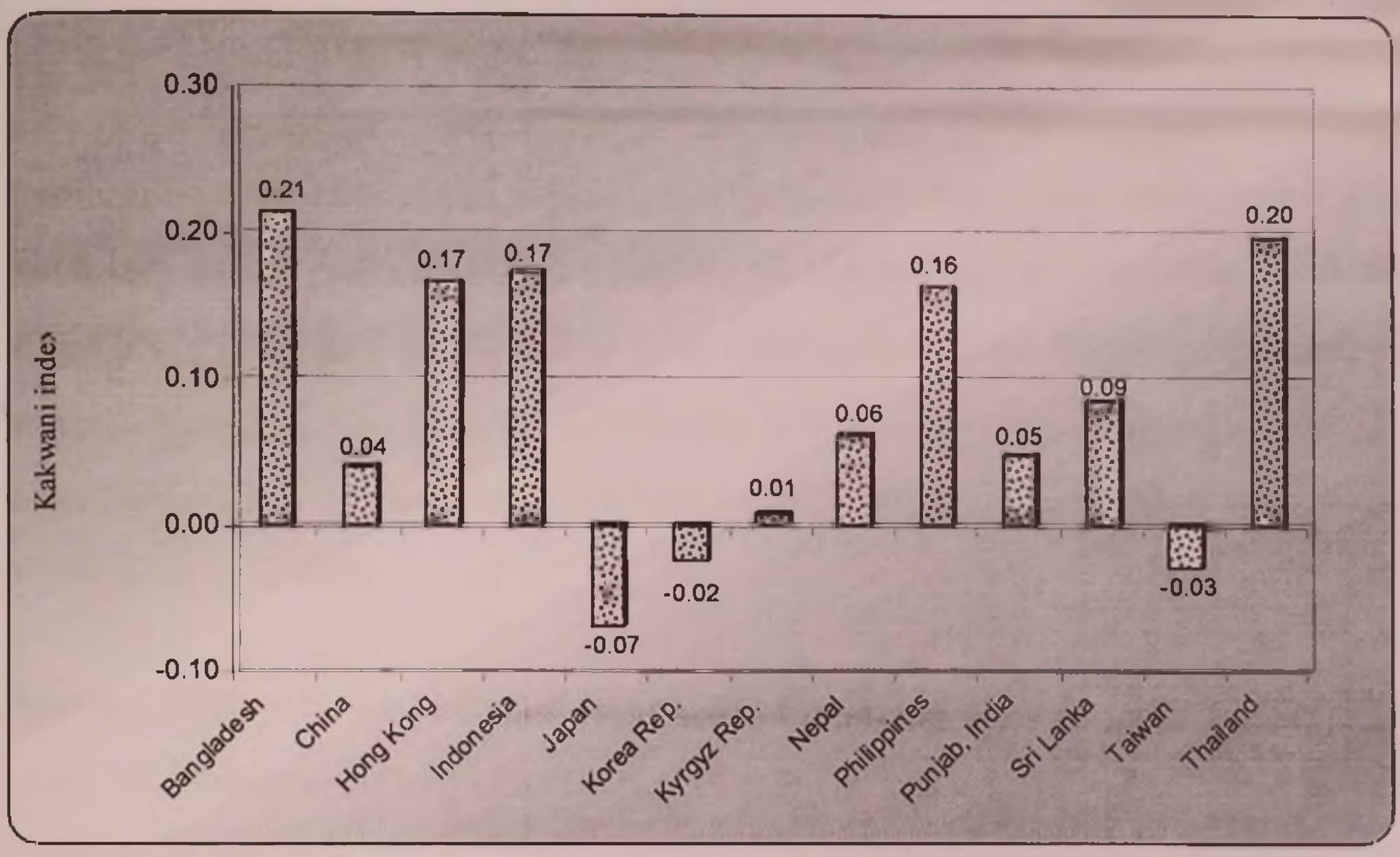
In Nepal, Bangladesh, Kyrgyz, Punjab and Sri Lanka, health care is financed almost exclusively from OOP and general government revenues (GGR). Nepal and Bangladesh rely more heavily on OOP, while the burden is close to being evenly split in Kyrgyz, Punjab and Sri Lanka. Insurance (social and private) makes a relatively modest contribution to health financing in Indonesia, the Philippines, Hong Kong and Thailand and a more substantial contribution in China, Korea, Taiwan and Japan. Hong Kong and Thailand are similar in relying most heavily on GGR followed by OOP, with the remainder made up from private insurance in Hong Kong and both private and social insurance in Thailand. Three of the high/middle-income territories – Japan, Taiwan and Korea – have universal social insurance systems. Hong Kong, the only other high-income economy, also relies predominantly on publicly financed pre-payment, but does this through taxation rather than social insurance. Japan and Taiwan collect more than half of health system funding from social insurance, while high co-payments in Korea mean that it still collects half of all financing from direct payments.

A recent study by O. O'Donnell, Van Doorslaer, E., M N Huq, et al., (2008) indicated that health care financing is most concentrated on the better off people in the Philippines and Thailand, two lower-middleincome countries. Both rely heavily on direct payments but do spread financing across a range of instruments. The payment distributions of the individual sources are broadly similar across the two countries and are always concentrated more on the rich than the poor. However, despite these apparent similarities, the distributional implications of the two systems differ substantially. Thailand collects one half of health care funding through taxation, while in the Philippines the proportion is just over one third. The Philippines relies more on financing instruments that tie access to payment, i.e. partial social insurance, private insurance and direct payments. The better-off not

only pay more for health care in the Philippines, they most probably also obtain more or better care. The same observation applies with even greater force to Bangladesh, where payments are heavily concentrated on the better off but this is achieved through extensive reliance on direct payments. Hong Kong and Indonesia have the same Kakwani index for total payments but in Hong Kong this arises from a system that collects more than half of revenue through the public sector, whereas in Indonesia only just over a quarter of payments are public. These comparisons make clear that to make inferences about the equity of health care financing it is not sufficient to examine the distribution of the total financing burden. The structure of financing, in particular the balance between instruments that make utilisation contingent on payments and those that do not, and the impact of financing on the utilisation of health care should also be considered.

Without exception, the concentration indices for total health care financing are positive. The better-off pay most for health care in Asia. The concentration indices are smallest in the three universal social insurance systems (Japan, Taiwan and Korea) and in Kyrgyz and Punjab. Only in the three high-income countries with effective social insurance systems the Kakwani indices are negative (**Figure 4.2**). In contrast, the predominantly tax financed system of Hong Kong is clearly progressive. Although direct payments account for a substantial share of health financing in Hong Kong, the poor are shielded from these payments and the progressivity of health financing reflects that of taxation.

Figure 4.2: Progressivity of Total Healthcare Financing



Source: O. O'Donnell, Van Doorslaer, E., M N Huq, et al., 2008. Who pays for health care in Asia?, Journal of Health Economics 27 (2008) 460–475

Who pays for health care in Asia? The short answer is that the better-off pay more. In the low- and lower-middleincome countries examined, this is true not only in absolute terms but also relative to ability to pay. In the three high-income territories with universal social insurance (Japan, South Korea and Taiwan), health care financing is slightly regressive.

Out-of-pocket payments are typically perceived to be the most regressive instrument of health finance (Whitehead et al., 2001). In high-income economies, we do indeed find that OOP payments are regressive or are proportional to ability to pay. But in most of the low-/middle-income countries, OOP payments absorb a larger share of the resources of the better-off households. Fee waivers for the poor may contribute to this result in some countries.

Who Benefits from Public Healthcare Subsidy? A study on the efficiency as well as the accountability of the service providers at public facilities revealed that the poor are particularly disadvantaged, receiving less public resources devoted to health as compared to the rich people of the country. However, while investigating efficiency of the different levels of public facilities, it is observed that the subsidy distribution is roughly proportional where the poor receive subsidies in proportion to their income. The primary healthcare facilities seem to be more pro-poor as compared to the tertiary level facilities (Rabbani, A. K. M. Ghulam; Huq, M Nazmul; et.al. 2006).

Another study on the selected secondary and primary level public facilities by Huq, M Nazmul; Howlader, Sushil Ranjan; et.al. (2007) revealed that that the poorest 20 percent of the study population received 18.8 percent of the total subsidy at the District, Upazila and Union level facilities. On the other hand, the richest 20 percent of the study population received 22.5 percent. When distributing the overall subsidy among the different types of facilities, it is also observed that the poorest 20 percent population received only 13.9 percent of the District level subsidy, while the share for the richest 20 percent population was 26.7 percent. Again, at UHCs, the poorest 20 percent population received 23.4 percent subsidy, while the richest 20 percent received 18.7 percent. Moreover, the poorest 20 percent population received 29.4 percent of the UHFWC level subsidy, but the share for the richest 20 percent population was 12.6 percent. The analyses of the Concentration Indices as well as Kakwani Indices also revealed that the poor received more subsidies from the Upazila and below level facilities.

Rabbani, A. K. M. Ghulam; Huq M Nazmul; et.al. (2006) estimated the per capita distribution of MoHFW health care subsidy by rural-urban location and gender and disaggregated by their living standards. From the study it is observed that, on

an average, people from the poorest 20 percent segment of the population receive on average only Taka 145 as health care subsidy, while the same for the people from the richest 20 percent segment is Taka 241. Moreover, the per capita subsidy for rural people is Taka 161 and the same for the urban people is Taka 117.

Although, both the male and female in rural as well as urban areas receiving roughly the same subsidies devoted to healthcare, there exist gender differentials in terms of receiving health subsidy when disaggregated by their living standards. The per capita subsidy for very poor urban-women is Taka 94, which is significantly lower as compared to their male counterpart – Taka 265. Similar difference is apparent in rural areas as well. In contrast, among the richest 20 percent of the population, females receive more benefits from public healthcare spending irrespective of rural and urban areas.

An analysis of who benefits from public healthcare subsidy in Asia by O. O'Donnell, Van Doorslaer, E., M N Huq, et al., (2007) presented comparable evidence on the incidence of public health spending using consistent methods across eight Asian countries (Bangladesh, India, Indonesia, Malaysia, Nepal, Sri Lanka, Thailand, and Vietnam) and three Chinese provinces or regions (Gansu, Heilongjiang, and Hong Kong Special Administrative Region).

The degree to which the public health subsidy is targeted to the poor can be seen more explicitly by examining the share of the subsidy received by the poorest 20 percent of individuals. Public healthcare is clearly most pro-poor in Hong Kong SAR, with the poorest fifth of the population receiving almost two-fifths of the total (**Table 4.1**). In Malaysia the poorest quintile also receives significantly more than 20 percent of the total subsidy, but the pro-poor bias is much less than it is in Hong Kong SAR. In Sri Lanka and Thailand the poorest quintile's share of the

total subsidy does not differ significantly from 20 percent. In the remaining countries and provinces, with the exception of Bangladesh, the poorest 20 percent of individuals receive significantly less than 20 percent of the public health subsidy. The share going to the poorest 20 percent of individuals is lowest in Nepal, at less than 7 percent, followed by the two Chinese provinces, at 8–10 percent. In these cases, and in Bangladesh, India, and Indonesia, the richest quintile receives more than 30 percent of the total subsidy. In all cases but Nepal the share of the subsidy going to the poorest quintile is significantly greater than its share of total household consumption.

Table 4.1: Subsidy Share Received by Poorest Quintile

Countries	Household consumption per equivalent adult (%)	Subsidy share (%)	Concentration Index	Kakwani index
Bangladesh	7.25	16.78	0.1588	-0.2244
Gansu, China	5.24	8.17	0.1970	-0.2758
Heilongjiang, China	5.98	10.47	0.2527	-0.1946
Hong Kong SAR	6.82	38.73	-0.3104	-0.6831
India	10.50	12.49	0.2117	-0.0390
Indonesia	9.77	13.46	0.1822	-0.1245
Malaysia	7.20	22.95	-0.0807	-0.4493
Nepal	8.05	6.64	0.2541	0.0384
Sri Lanka	8.31	20.88	-0.0020	-0.3561
Thailand	6.94	20.06	-0.0404	-0.4361
Vietnam	8.78	14.79	0.0114	-0.2573

Source: O. O'Donnell, Van Doorslaer, E., M N Huq, et al., 2007. The Incidence of Public Spending on Healthcare: Comparative Evidence from Asia, the World Bank Economic Review, Vol. 21, No. 1, pp. 93–123.

The analysis reveals substantial variation across Asia in the incidence of public subsidies for healthcare. Public spending is strongly pro-poor in high-income Hong Kong SAR. The total public health subsidy is more moderately pro-poor in low- to middle-income Malaysia and Thailand and it is evenly distributed in low-

income Sri Lanka. The subsidy is mildly pro-rich in Vietnam. In the remainder of the low-income countries and provinces examined, which account for the far greater share of the Asian population, the better-off receive substantially more of the subsidy than do the poor. In most cases there is pro-rich bias in the distribution of hospital care, while non-hospital care is pro-poor. A greater share of the healthcare subsidy goes to hospital care, and so this dominates the overall distribution. While public health subsidies are typically not pro-poor, they are inequality reducing in all cases except India and Nepal.

4.3 Health, Productivity and Poverty

A recent study by Hossain M and Bayes A 2009 showed that during the last two decades, 25-30 percent of rural households were unable to rise above the poverty line, i.e. always poor; 30 percent remained as non-poor and roughly 40 percent moved up and down the poverty line - mostly led by the 'luck'. Poverty is also associated with higher incidence of sickness and disease. Sen, Binayak (1997) showed several aspects of health-poverty interface. The study revealed that the hardcore poor households currently spend 7-10 percent of their income to cover private expenses which is sizeable burden by any reckoning. If this burden can be relieved through greater targeting and provision of public healthcare, this would have substantial poverty alleviating effects. Another critical aspect of the illness lies in the acute vulnerability of the poor households to sudden and unanticipated health related shocks, leading to the loss of income, employment, and increased indebtedness. Health related shock represents an important determinant of the downward mobility among the poverty spiral as it explain, on an average, 16 percent of causes of deterioration experienced by the households. The importance of health factor is also considerable (explaining 18 percent of causes) for those among moderate poor who descended into hardcore poor in the subsequent period.

Economic burden of health shocks is a major cause of driving people into chronic poverty. Begum S (1996) showed that in cases of acute illness, extreme poor households are able to meet treatment costs out of current income in only 49 percent of cases. For the rest, they have to resort to dissaving or asset sale except for 5 percent of cases in which they secure kin assistance. As regards the non-poor households the situation is much more favorable, as expected. In 62 percent of cases they are able to meet treatment costs out of current income.

There are three main ways that disease impedes economic well-being and development. First, avoidable disease reduces the number of years of healthy life expectancy. The second channel is the effect of disease on parental investments in children. Societies with high rates of infant mortality (deaths under 1 year of age) and child mortality (deaths under 5 years of age) have higher rates of fertility, in part to compensate for the frequent deaths of children. Large number of children, in turn, reduce the ability of poor families to invest heavily in the health and education of each child, a process described by Becker, G., T. Philipson, and R. Soares (2001) as the "quality-quantity tradeoff" in child rearing. The third channel is the depressing effects of disease on the returns to business and infrastructure investment, beyond the effects on individual worker productivity. Moreover, the diseases cause the direct loss of well being to the individual. When economists and public health specialists try to account quantitatively for that loss of well-being, they usually divide it into three parts: (i) the reduction in market income caused by disease; (ii) the reduction in longevity caused by disease; and (iii) the reduction in psychological well-being caused by disease, often labeled "pain and suffering," even when there is no reduction in market income or longevity.

Health affects labor productivity, economic growth and poverty in different ways. Sur M and Senauer B (1999) reveals that among adults current nutritional status affects the duration of labor force and the intensity of work effort. While, past nutritional status predicts the probability of developing chronic diseases and consequently influences labor force participation and expose households to substantial financial risk resulting in impoverishment. In order to assess the relationship between health and poverty more clearly, Howlader, Sushil Ranjan, et al. (2005) computed the disease burden for the poor and non poor people separately. The measure of disability adjusted life years (DALY) has been used as the measure of disease burden. The study revealed that the number of per capita DALY is higher among the poor than among the non-poor.

It is true that health is wealth. But, wealth is health in rural Bangladesh (Hossain M and Bayes A 2009). Therefore, the government needs to intervene in expanding health facilities in the rural areas. It is because about 40 percent of the household income - against 25 percent in the 1980's - is contributed by labor utilization, especially, by self-employment. Hossain M and Bayes A (2009) also revealed that throughout the last two decades, income poverty has reduced from 64 percent in 1988 to 43 percent in 2004. But, poverty level rose to 47 percent in 2008 due to inflation, and natural hazards. Expansion of health, education and improvement in nutritional status is required to remove 'poverty traps'.

In order to comprehend the devastating impact of health care payments on poverty, an international comparison of poverty incidence among the selected countries of Asia Pacific Region has been made by Van Doorslaer, E., O. O'Donnell, M N Huq, et al. (2006) for the year 2000. In a poorer country like Bangladesh, approximately 22.5 percent of the population are living under the poverty line of $1.08 per person per day (at 1993 PPP). Whereas, the

overwhelming majority of the population (73%) are consuming less than $2.15 per person per day. Health care payments push another 3.8 percent population below the poverty line (**Table 4.2**).

Both the poverty incidence and the poverty impact of OOP health care payments are high among the low and lower-middle income group countries. More than 39 percent of households in Nepal, over 22 percent of households in the Bangladesh and almost 16 percent in Philippines are living on less than the equivalent of $1.08 per day. By contrast, less than five percent households in Malaysia, Kyrgyz Rep, Thailand, Vietnam and Sri Lanka are living on less than the equivalent of $1.08 per day. In absolute terms, the poverty impact of OOP payments for health care is greatest where the rates of poverty are highest. Among them, OOP health care payments have the most devastating impact on the poverty of Bangladesh and India (**Table 4.2**).

Table 4.2: Poverty Impact of OOP healthcare Payments, 2000

Country	Income Group	Poverty headcounts (in %)	Poverty Lines	
			$1.08 per capita	$2.15 per capita
Bangladesh	**low**	**Pre-payment headcount**	**22.50**	**73.00**
		Post-payment headcount	**26.30**	**76.50**
		Poverty Impact	**3.80**	**3.50**
China	lower-middle	Pre-payment headcount	13.7	44.6
		Post-payment headcount	16.2	46.4
		Poverty Impact	2.6	1.8
India	low	Pre-payment headcount	31.1	80.3
		Post-payment headcount	34.8	82.4
		Poverty Impact	3.7	2.1
Indonesia	lower-middle	Pre-payment headcount	7.9	58.2
		Post-payment headcount	8.6	59.9
		Poverty Impact	0.7	1.7
Kyrgyz Rep.	high	Pre-payment headcount	2.6	32.2
		Post-payment headcount	2.7	34.1
		Poverty Impact	0.1	1.9

Country	Income Group	Poverty headcounts (in %)	Poverty Lines	
			$1.08 per capita	$2.15 per capita
Malaysia	upper-middle	Pre-payment headcount	1.0	11.8
		Post-payment headcount	1.1	12.1
		Poverty Impact	0.1	0.3
Nepal	low	Pre-payment headcount	39.3	80.4
		Post-payment headcount	41.6	81.7
		Poverty Impact	2.2	1.3
Philippines	lower-middle	Pre-payment headcount	15.8	50.2
		Post-payment headcount	16.4	51.2
		Poverty Impact	0.6	1.0
Sri Lanka	lower-middle	Pre-payment headcount	3.8	39.1
		Post-payment headcount	4.1	40.8
		Poverty Impact	0.3	1.7
Thailand	lower-middle	Pre-payment headcount	2.1	24.2
		Post-payment headcount	2.3	24.9
		Poverty Impact	0.2	0.7
Vietnam	low	Pre-payment headcount	3.6	36.9
		Post-payment headcount	4.7	41.4
		Poverty Impact	1.1	4.5

Source: Van Doorslaer, E., O. O'Donnell, M N Huq, et al., 2006. Effect of payments for health care on poverty estimates in 11 countries in Asia: an analysis of household survey data, Lancet 2006; 368: 1357–64.

At the higher absolute poverty line ($2.15 per capita at 1993 PPP), health payments raise the poverty rate by 3.5 percentage points in Bangladesh, almost 2.1 percentage points in India and 4.5 percentage points in Vietnam (**Table 4.2**). In relative terms, the poverty impact of health care payments in majority of the countries is more pronounced at the higher absolute poverty line where a significant share of population is living below the poverty.

At the $1·08 poverty line, subtraction of out-of-pocket payments from total resources increased the poverty head count by almost four percentage points in Bangladesh (equivalent to almost 5 million people), by a similar proportion in India (over 37 million people), and by nearly three percentage points in China

(more than 32 million people). Only in Malaysia, which has very low poverty rates, did subtracting out-of-pocket health payments from total household consumption not cause a significant rise in poverty rate. The total estimated increase in the poverty head count was 78·16 million people, which is almost 3% of the population of these 11 low-income to middle-income Asian countries (Van Doorslaer, E., O. O'Donnell, M N Huq, et al., 2006).

The adjustment to poverty for health payments was significant in all these 11 countries, but it was the greatest in Bangladesh, China, India, Nepal, and Vietnam, where out-of-pocket payments represent the highest share of health financing. In that these countries are also among the poorest suggests that heavy reliance on out-of-pocket payments and consequent impoverishment due to these payments are linked to the low level of economic development. Development would allow establishment of prepayment mechanisms for public funding of health care, which would certainly reduce the impoverishing effects of out-of-pocket payments for health care (Van Doorslaer, E., O. O'Donnell, M N Huq, et al., 2006).

A recent study in Uganda examined the influence of ill health on persistent and transient poverty (Lawson, 2004). The findings of the study show that households with sick heads in 1992 comprise larger proportions of those chronically poor and moving into poverty. The evidence suggests that disproportionate numbers of the chronically poor (moving into poverty) 21 percent (28.3%) are headed by individuals who were sick in 1992, compared to households moving out of poverty (15% were headed by sick individuals). Descriptive data for the 'long term' sick also indicate similar patterns. More than 8% of households headed by an individual classified as 'long term sick' moved into poverty, compared to a 6.8 percent overall average. Analyzing health and poverty status by row also suggests that the initial health status of the household head and poverty level are potentially

closely associated. In particular, column 3 shows that there is a disproportionately large number of sick headed households moving into poverty (15.6%) relative to the proportion of the total sample moving into poverty (9.9%). The reverse is true for moving out of poverty, with disproportionately low proportions of sick households (25.6%) relative to the sample average (29.4%).

Another study by Gupta and Mitra (2004) analyzed the possible links between economic growth, poverty and health, using panel data for the Indian states indicates that, though growth tends to reduce poverty, significant improvements in health status are also necessary for poverty to decrease. Also, economic growth and health status are positively correlated and have a two-way relationship, suggesting that better health enhances growth by improving productivity, and higher growth allows better human capital formation. Health expenditure is an important determinant of both higher growth and better health status, and is therefore a key tool available to policy-makers. Among other exogenous variables, literacy and industrialization seem to improve both health outcomes and growth, and to reduce poverty.

Wilkins, Adams, and Brancker (1989) indicated that individuals living within the poorest 20 percent of neighborhoods to be more likely to die of just about every disease from which people can die of, than the better-off. These included cancers, heart disease, diabetes, and respiratory diseases among others. In Canada, data on individuals' social status is not routinely collected at death, so Wilkins and his colleagues used residence census tracts to estimate socioeconomic income level. Even with the inevitable slippage that occurs since some poor people live in well-off neighbourhoods and vice versa, it was conservatively estimated that 22 percent of premature years of life lost to Canada could be attributed to income differences.

In a nut shell, equity in health has been conceptualized in several ways and different definitions can produce very different interpretations of the same situation or trend. However, each method used to quantify health disparities/equity is related to a number of implicit assumptions about definitions. A number of techniques are discussed in World Bank's Technical Notes on Quantitative Techniques for Health Equity Analysis. These methods can be useful for quantifying the magnitude of socioeconomic inequalities in health, reflecting comparisons among more than two groups, addressing changes in the group sizes over time, and/or reflecting absolute levels of a health indicator as well as relative differences across social groups. In contrast, a group of researchers who worked at WHO criticized the measurement approaches in standard use, saying that these approaches prejudged causation and obscured differences within groups. They proposed that health inequalities may be measured by assessing overall differences in health among ungrouped individuals, without comparing health across different predetermined social groups. But, the policy makers in Bangladesh are usually interested on socio-economic differences in health or health care. As a result, "health disparities/inequalities" in this study is defined as differences in health that are systematically associated with being socially disadvantaged (e.g., being poor, a member of a disadvantaged group, or female), putting those in disadvantaged groups at further disadvantage. Further, the concepts of vertical as well as horizontal inequity are also utilized in the study.

On the other hand, the general school of thought behind poverty measurement is that 'poverty' exists when a group of people in a particular society cannot attain a 'minimum' level of well-being. Various definitions and concepts exist for well-being. One commonly used definition, which addresses what is typically referred to as poverty, that is, whether households or individuals possess enough resources or abilities to meet their current needs. This definition is based on a comparison of

household level or individuals' income, consumption, education, or other attributes with some defined threshold below which individuals are considered as being poor in that particular attribute. In this study household consumption expenditure adjusted for household age and sex composition is considered as the poverty indicator and compared with Bangladesh Bureau of Statistics defined poverty lines for the poverty impact analysis.

However, the review of recent relevant literatures on equity in terms of access to and utilization of healthcare services, out of pocket payments for health care and benefits from public health care system reveals that rural people relies more on traditional/unqualified providers for their treatment. While, the urban residents are two-times more likely to visit a qualified provider as compared to their rural counterpart. In addition, females relied more on public primary level facilities as compared to males. But, utilization of higher level public facilities by the females is notably low. Although, poor usually rely on the public PHC facilities as compared to the rich the overall utilization of public healthcare facilities remains still low. Further, recent literatures indicate the existence of gender disparity in the healthcare system of Bangladesh, especially for younger as well as for elderly people. There exist significant differences of healthcare payments among the urban and rural people as well. The public health subsidies are typically not pro-poor but they are inequality reducing.

During the last two decades, 25-30 percent of rural households were unable to rise above the poverty line, i.e. always poor; 30 percent remained as non-poor and roughly 40 percent moved up and down the poverty line. Poverty is associated with higher incidence of sickness and disease. In cases of acute illness, extreme poor households are able to meet treatment costs out of current income in only 49 percent of cases and the rest just forgo the health care. The hardcore poor

households currently spend 7-10 percent of their income to cover private expenses which is sizeable burden by any reckoning. If this burden can be relieved through greater targeting and provision of public healthcare, this would have substantial poverty alleviating effects.

The review of the recent, available and relevant literature points out that there has been very little empirical analysis to look into the healthcare system in general and public health care system in particular from equity viewpoint. Further, attention is hardly given to recognize the linkage between health, productivity and poverty, which could be the basis for the public investment policies on the condition of health and income. The effects of public healthcare system on equity and poverty reduction need to be assessed. Therefore, this study is am attempt to this endeavor.

CHAPTER 5: METHODOLOGY

The previous chapters provide different aspects of health equity, productivity and poverty, also analyze the relevant results and at the same time review the methodological issues in relation to health equity and its impact on productivity as well as poverty. As equity in health and poverty are defined and measured in different ways, this chapter provides a brief description of the analytical models that are suitable in the context of Bangladesh. This chapter also presents the conceptual framework and hypothesis of the study, sources of data and discusses the methodological issues that have been adopted for data analysis.

5.1 Conceptual Framework

Improved health and poverty reduction are inevitably entwined and one is conspicuously affecting the other. However, controversy loomed large over the main direction of causation and the relative magnitude and rapidity of effects of the one on the other. With the view that poverty reduction leads to improvement of health of the population, to achieve the goal, a nation has to wait till poverty is fully alleviated. On the other hand, the effects of improved health on poverty reduction are more pronounced and can be relatively easily and rapidly achieved [13]. Improved health redounds more and more rapidly, to poverty reduction than does by poverty reduction to improved health (WHO, 2001).

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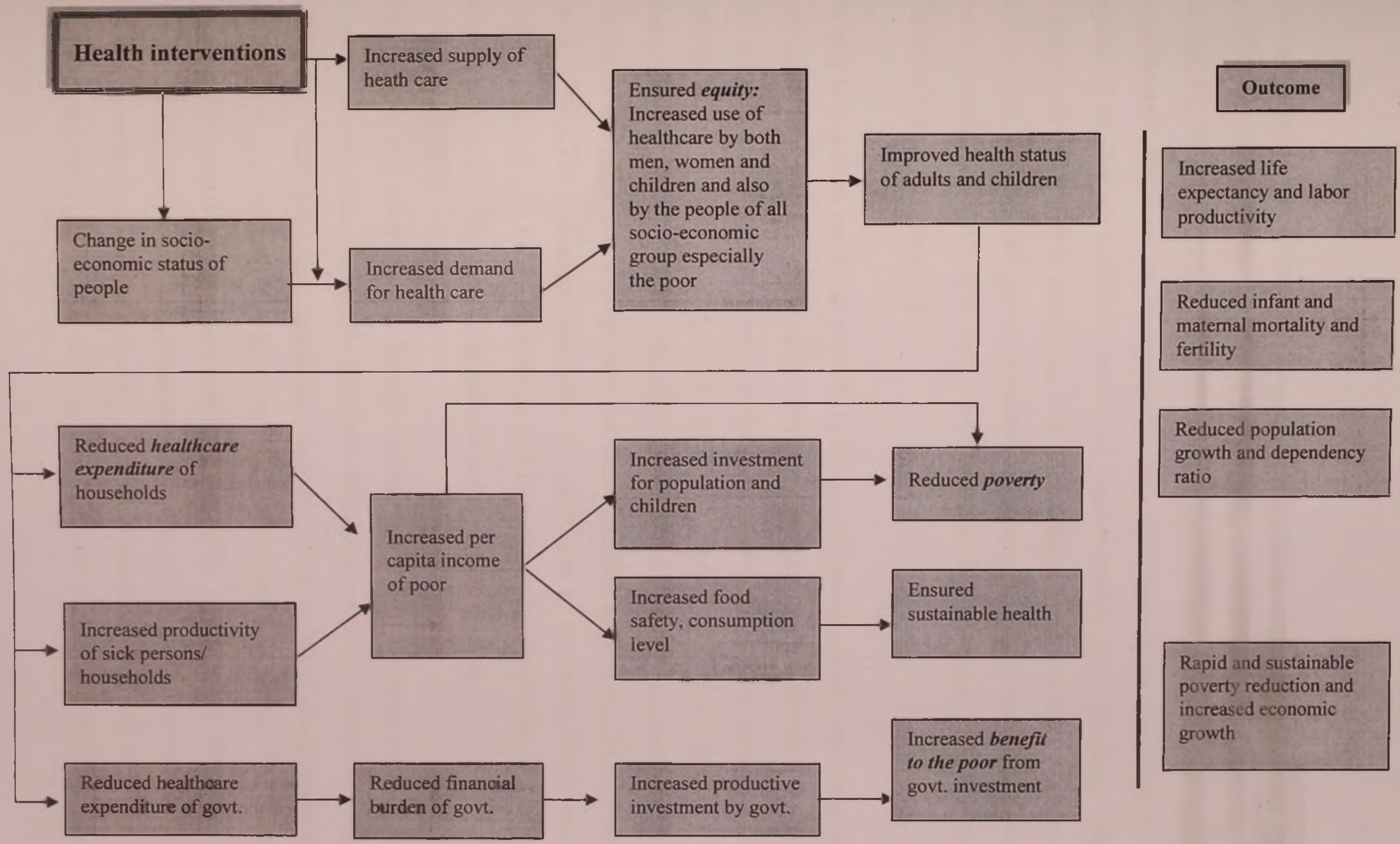
[13] The two-way relationship between health and poverty is discussed comprehensively by Howlader, Sushil Ranjan, et al. 2005 in *Mapping of Poverty and Health at Upazila Level in Bangladesh: A Case Study of Selected Areas* (Report Prepared for World Health Organization, Dhaka). The proposition of poverty reduction through investment in the health sector is also analyzed in the report.

In order to ensure the improved health of the people, health interventions are required. The health program itself can cause some changes in the socio-economic status of the population, specially through its BCC campaign and bringing health services closer to households (through close-to-client delivery system) and thereby reducing cost of healthcare. Improved socio-economic status of households and increased health program interventions jointly raise demand for healthcare and the program interventions increase supply of healthcare, and together these two increase use of healthcare. Increased use of healthcare, including reproductive healthcare, reduces infant and maternal mortality and fertility. Reduced fertility leads to decline in population growth and dependency ratio. Improved health status causes decline in healthcare expenditure and also increase productivity. Reduced household expenditure, coupled with reduced population growth and dependency ratio, lead to increase in per capita income and decline in government healthcare expenditure. Increased in per capita income directly reduces current poverty, and it increases future income through its congenial effects on food safety and consumption, investment for population and investment on children. On the other hand, increased investment of the government for production also benefits the poor households. Finally, reduced current poverty, increased future income of households and increased government investment in productive sectors together will lead to increase in income growth and rapid-sustainable poverty reduction.

However, a simple conceptual framework, which is based on Howlader, Sushil Ranjan, et al. (2005); the Commission on Macroeconomic and Health (WHO, 2001); Wagstaff (2002), Breman et al (2004); and Russell S (2004) and which is expected to suit the present situation of Bangladesh is presented below:

Conceptual Framework: Sustainable poverty reduction and increases economic growth through improved heath



At both a macro level (cross-national and national) and micro level (individual, household, community) the causality between poverty and ill health is bi-directional. In a household where the head or main income earner is sick, this has a subsequent impact on the income and welfare of the household, sometimes to the extent of moving the household below the income poverty line (Wagstaff, 2002). Furthermore, ill health is associated with additional or increased health care costs. Conversely, income and capability poverty also cause ill health. Individuals living in low income groups tend to have worse health outcomes on average, than those living in higher income groups.

Health is a critical input into poverty reduction, economic growth, and long-term economic development at the scale of whole societies. Further, health is the basis for labor productivity, the capacity to learn in school, and the capability to grow intellectually, physically, and emotionally. The burden of diseases impedes the development of a country through reducing the labor productivity, and consequently gross domestic product per capita (Gallup and Sachs, 2001; Breman *et al*, 2004). The increased importance of investment in the health improvement can be realized both by the households and the state in the notion that they play a crucial role in uplifting equally household and aggregate economy.

The growth and development through investment in health sector come from a number of pathways. Household members with good health and well-nourishment can boost their economic conditions through working more days and more intensively, and reducing healthcare expenditure by avoiding illness. The healthy and well-nourished persons also usually have better participation in household production like preparing food, cleaning cloths and giving more time to health and education of the children. Additionally, health and nutrition may have effect on the entrepreneurship capacity. On the other hand, investment in reproductive health,

including family planning and access to contraceptives, is crucial accompaniments of investments in disease control. The combination of disease control and reproductive health is likely to translate into reduced fertility, greater investments in the health and education of each child, and reduced population growth.

Poverty and ill health interact creating a basis for vicious cycles in which households or gradually slide (through stresses or repeated minor shocks) or rapidly fall (through catastrophic shocks) into declining health status, lowering incomes and assets, chronic poverty and, possibly, destitution or premature death. On the other hand, good health reduces out of pocket payments (OPP) for health care, increases individuals' productivity and hence increases the per capita income that has significant impact on the poor households. Thus, health and poverty have a two-way relationship. Good health brings prosperity, and prosperity brings improved and sustainable health.

At the micro level, ill-health leads to depletion of household asset and income loss that cause consumption levels to fall below minimum needs, which can contribute to impoverishment and push households into poverty. The links between ill health and poverty, therefore, implies that a substantial increase in health sector investment would result in marked economic gains through improving access for the poorest people to combat poverty as well as reduce disease burdens. In a nut shell, investment in health, in a long run, will reduce infant and maternal mortality and fertility, reduced population growth and dependency ratio, increase labor productivity and ensure economic development through rapid and sustainable poverty reduction.

The hypotheses of the study that are deduced form the framework are as follows:

- Health interventions especially by the public healthcare system play a vital role in reducing the inequalities prevailing in the health sector by reducing the gap between rich and the poor;
- Effective expansion of public health care programs has redistributive benefits as poor gets more benefits from public healthcare subsidies;
- Improved health status causes increase in productivity;
- Low health status of the population is a major factor of persistence of poverty. Improved health trims down poverty by reducing income loss; and
- Public healthcare system serves as a safety net for the extreme poor through nationwide subsidized program and helps overall poverty reduction process.

5.2 Sources of Data

The research study is based on secondary data. The study primarily utilizes three nationally representative surveys – Household Income Expenditure Survey (HIES) 2005, Household Income Expenditure Survey (HIES) 2000, and Health and Demographic Survey (HDS) 2000. All the surveys were conducted by Bangladesh Bureau of Statistics (BBS). The study also uses different published documents, reports, research articles including Bangladesh National Health Accounts (NHA) and Public Expenditure Reviews (PER) conducted by Health Economics Unit (HEU) of Ministry of Health and Family Welfare (MoHFW). However, a brief description of the methodologies of the three above mentioned nationally representative surveys is given below:

Household Income Expenditure Survey (HIES) 2005

HIES 2005 contains socioeconomic and demographic information on 10,080 households and 48,969 individuals (BBS, 2006). This survey was conducted based on a two-stage stratified random sampling under the framework of Integrated Multipurpose Sample (IMPS) design developed on the basis of Population and Housing Census 2001. The IMPS design consisted of 1,000 Primary Sampling units (PSUs) throughout the country. There were 640 rural and 360 urban PSUs in the sampling framework. Each PSU comprised nearly 200 households. In the first stage 504 PSUs were selected randomly. The PSUs were selected from 16 different strata. There were 6 rural, 6 urban strata, while 4 strata were selected from Statistical Metropolitan Areas (SMAs). In the second stage, 20 households were selected from each of the selected PSUs.

Sample PSUs, Households and Population of HIES 2005

Location	Sample PSUs	Sample households	Sample population
Rural	320	6,400	31,363
Urban	184	3,680	17,606
National	**504**	**10,080**	**48,969**

Source: Bangladesh Bureau of Statistics.

HIES 2005 collected information on income, expenditure and consumption of the individuals/ households as well as on housing conditions through well designed survey tools. It also collected information on individuals' health, education and involvement of economic activities that are used in this study.

Household Income Expenditure Survey (HIES) 2000

HIES 2000 contains socioeconomic and demographic information on 7,440 households and 38,515 individuals (BBS, 2003). Like HIES 2005, the sample of households for the HIES 2000 was selected in two stages. At the first step, 442

PSUs were selected throughout the country. At the second stage, within each selected PSU, households were selected for interviews.

The overall sample for the country is divided into 14 strata or groups: (i) rural areas, (ii) urban municipalities, and (iii) statistical metropolitan areas in each of the 5 divisions were considered as a separate group (there are no SMAs in Barishal Division). Within each PSU, 20 households were interviewed, except in all SMAs, where only 10 households were interviewed in each PSU.

Sample PSUs, Households and Population of HIES 2000

Location	Sample PSUs	Sample households	Sample population
Rural	252	5,040	16,231
Urban	190	2,400	22,284
National	**442**	**7,440**	**38,515**

Source: Bangladesh Bureau of Statistics.

HIES 2000 covered data on household and population characteristics including household income, expenditure and consumption, food and nutrition, poverty, housing condition, education, health, employment, economic activities and selected community characteristics.

Health and Demographic Survey (HDS) 2000

On the other hand, HDS 2000 covered 11,219 households constituting 56,118 individuals. This survey was conducted based on a two-stage random sampling where estimates were made nationally representative through appropriate sampling weights (BBS, 2001).

The HDS 2000 includes information on both the household and individual levels. It covers data on population structure, maternal and child care, use of contraceptives, awareness of community clinics, awareness of causes of HIV/AIDS transmission, morbidity, treatment status, treatment expenditure, sources of drugs and supplies, duration of sickness, disability occurrence of births and deaths, causes of death etc. This study has analyzed information that includes age, sex, education, place of residence, health status and measure of living standard.

5.3 Methods of Data Analysis

The study uses a number of analytical tools and adopted a number of econometric/analytical models for data analysis. These include (i) geographical resource allocation, (ii) benefit incidence analysis (BIA), (iii) proxy means testing (PMT) model, (iv) progressivity analysis, (v) analysis of catastrophic healthcare payments, (vi) impact of health on productivity, (vii) impact of health on poverty, and (viii) decomposing the redistributive effect of public healthcare payments. These tools/models are discussed comprehensively afterward in the respective chapters. However, a brief description of the methods along with their purpose is presented in the following subsections.

5.3.1 Geographical Resource Allocation

The geographical resource allocation has been set as one of the top priorities both in MDG and PRSP goals, which is also one of the main objectives of HNPSP (HEU, 2006; WB, 2005). The purpose of analyzing the MoHFW's resource allocation is to assess whether the existing allocation across districts and lower level facilities is based on the health needs of the respective geographical location.

5.3.2 Benefit Incidence Analysis (BIA)

Subsidization of health care from the public purse is usual in many countries especially in the developing countries. The justification of health sector subsidies rests primarily on distributional arguments; sector specific equity objectives, such as equal treatment for equal need, as well as broader distributional goals. With respect to the latter, administrative constraints on redistribution through cash transfers can make sector specific subsidies an effective means of alleviating poverty and reducing inequality (Besley, T. and S. Coate, 1991). Such a justification requires that subsides are target efficient i.e. the poor and only the

poor receive them. Benefit incidence analysis (BIA) is a methodology for assessing the target efficiency public subsidies. The efficiency as well as the accountability of the services provided at public facilities is assessed by investigating "who gets benefits from public healthcare subsidies?"

5.3.3 Proxy Means Testing Model

Any method to target social programs to the desired population should be judged on the basis of three criteria: i) targeting efficiency, ii) leakage, and iii) administrative costs. Considerations of political feasibility should also be made. A targeting method is efficient when it minimizes the probability of excluding individuals who should be included. Leakage relates to the probability of including people who should be excluded. The trade-off between the cost of leakage and administrative costs should be evaluated, as well as the possibility that programs with a certain level of leakage may display greater political sustainability than programs with no leakage because of wider population support. Other issues affecting the choice of targeting mechanisms include incentive costs associated with distortion of economic behavior, and the stigma associated with participation.

The major challenge in any targeting effort is to identify the eligible and ineligible households accurately and cost effectively. In general, it is true that the per capita income of a household can be considered an accurate measure of its welfare. But, there is a high chance of understating their incomes if they wish to qualify for the subsidy benefits. In addition, verifying income is difficult because of the difficulty of documenting level and sources of income of household members. Finally, because measurement of household income or expenditure requires expensive and time-consuming surveys, such measures of welfare are rarely used to determine eligibility or benefit levels. An alternative method - and the one tested in this study - measures household welfare through a "proxy means test (PMT)". This

technique bases access to program benefits on easy-to-collect household or individual characteristics that correlate with welfare and can proxy for income.

5.3.4 Progressivity Analysis

The distribution of healthcare payments in the form of Out of Pocket Payments (OOP) allows for an examination of the pattern of distribution of payments for healthcare. Progressivity analysis establishes the extent to which the costs of healthcare are proportional to ability to pay (ATP) and hence provides the measure of equity in the health sector (Van Doorslaer, E., O. O'Donnell, M N Huq, et al., 2005).

5.3.5 Catastrophic Healthcare Payments

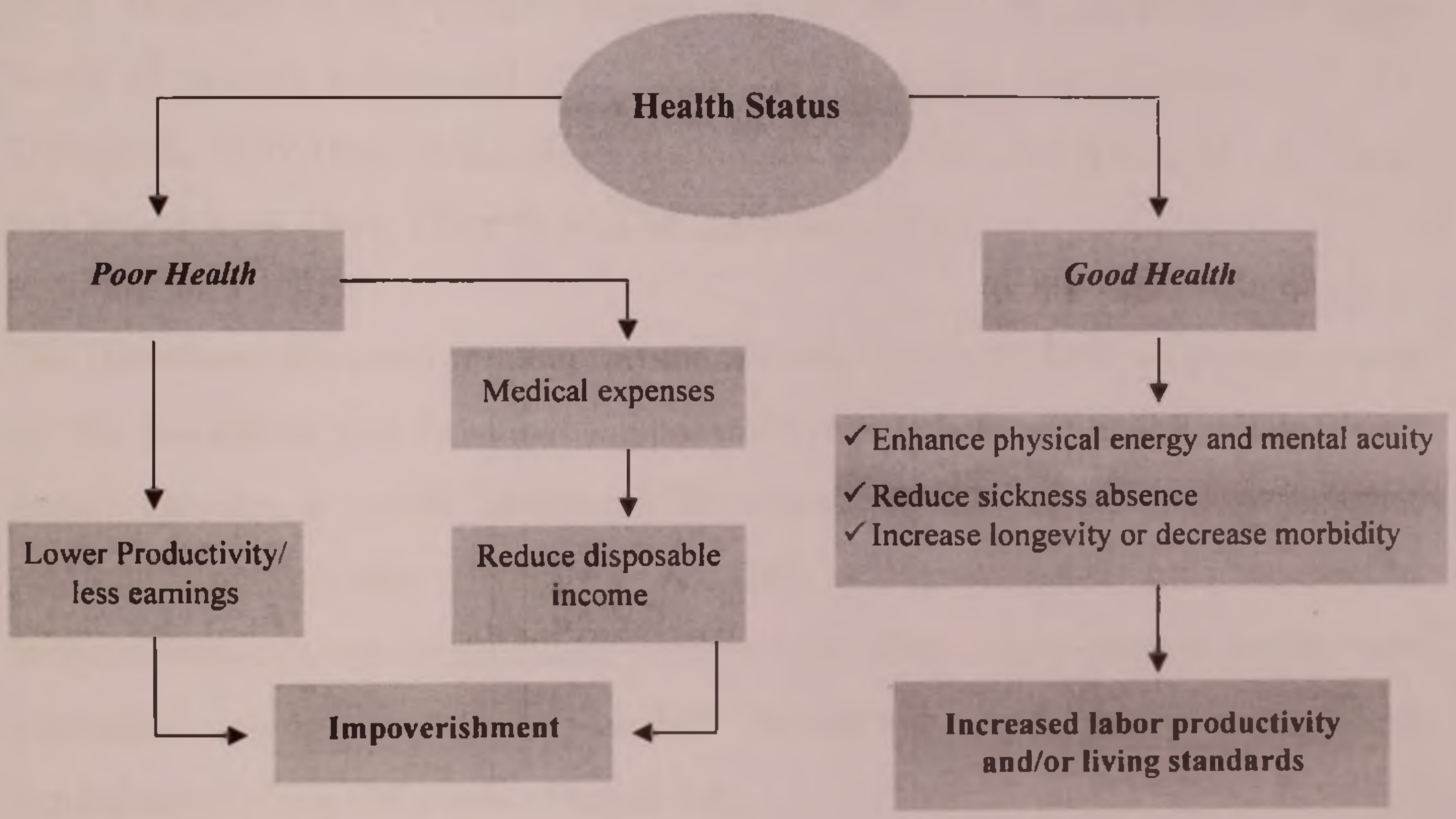
One conception of fairness in payments for health care is that households ought not be required to spend more than a given portion of their income on health care in any given period, and that spending in excess of this threshold can be labeled "catastrophic" (Wagstaff, A. and E. van Doorslaer, 2003). Usually, higher share of OOP health care payments to total consumption implies a higher risk of financial catastrophe. The main purpose of the analysis of financial catastrophe of healthcare payments is to find out the proportion of households spends more than a catastrophic threshold point. It also assesses whether the excess payment is concentrated to the well-off or impose financial burden to the poor.

5.3.6 Impact of Health on Productivity

Health is seen as a relevant component that explains the level of individual productivity and its determinants are multi-factorial -- biological, social and economic (Frank, 1995). A population's health is arguably one of the best indicators of its level of development. At the individual level, good health can directly increase outputs through enhanced physical energy and mental acuity;

reduced sickness absence and decreased morbidity or increased longevity, resulting in a longer career. Moreover, these individual increase in output can translate into increases in labor productivity and/or standard of living (Emile Tompa, 2002). **Figure 5.1** shows the possible linkage between health, productivity and living standards.

Figure 5.1: Individual's Health, Productivity and Living Standards: Possible Pathways



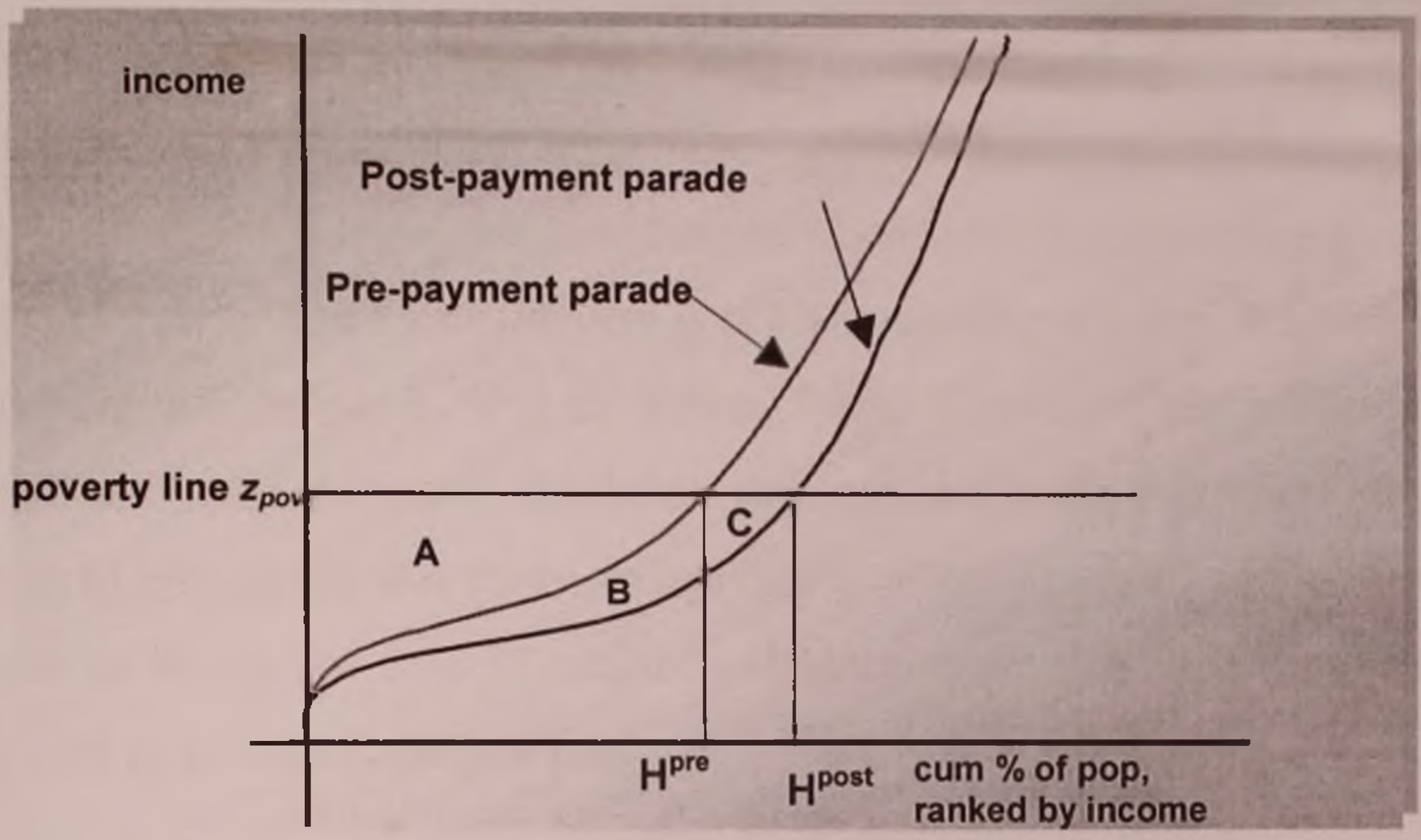
The purpose of analyzing the impact of health on productivity is to establish the relationship of good health of individuals with their productivity. It also provides the magnitude of the impact of health on productivity by investigating whether improvements in health condition would have a greater impact on the productivity of the daily wage earners in both rural and urban areas of the country.

5.3.7 Impact of Health on Poverty

Out of Pocket (OOP) payments for health care is a response to an unforeseen and unsolicited "shock" and can be sufficiently costly to represent a threat to a household's ability to purchase other goods and services that may make a difference to its members' ability to survive and flourish as human beings. One objective that may be set for a health care system is that spending on health care should not push households into poverty – or further into it if they are already there. Measures of the 'poverty impact' can be defined by comparing the mean levels of poverty before and after health care spending (Van Doorslaer, E., O. O'Donnell, M N Huq, et al., 2005; Ravallion, M. 1998; Ravallion, M., S. Chen, and World Bank 1996; Chen, S. and M. Ravallion 2001).

The framework for analyzing the impact of health care payments on poverty status of the household can be shown graphically through Pen's parade. The Pen's parade provides a simple framework for examining the impact of out-of-pocket payments on poverty (Wagstaff A, 2001). The parades plot household income/consumption/ expenditure (before and after out-of-pocket health care payments) along the y-axis against households ranked by prepayment consumption along the x-axis (**Figure 5.2**).

Figure 5.2: Pen parade: Before and After Payments



Reading off the parade at the poverty line gives the number of households living below poverty--the *headcount*. The area below the poverty line above the parade gives the poverty gap--the total shortfall from the poverty line. In the case of the pre-payment parade the headcount is H^{pre} and the poverty gap is equal to area A. In the post-payment parade, assuming the same poverty line is applied, the headcount is H^{post} and the poverty gap is equal to the area $A+B+C$. Area B represents the deepening poverty experienced by households who were already poor before out-of-pocket payments. Area C corresponds to the addition to the poverty gap caused by households who were not poor before out-of-pocket payments but *are* poor after their out-of-pocket payments.

The main purpose of poverty impact analysis is to identify the diminishing effect of OOP payments for health care to households' living standards. It provides the proportion of households added to the poverty due to OOP payments for health care.

5.3.8 Decomposing the Redistributive Effect of Health Care Payments

The rationale for being more concerned with the redistributive impact of payments for health care than with those for many other goods and services appears to stem from the fact that – to a large extent and especially in low income settings – most out-of-pocket expenditure for health care is of an involuntary nature (Wagstaff, A., 2002 and Wagstaff, A. and E. Van Doorslaer, 2003). Decomposing redistributive effect of health care payments provides the impact of the payments on the distribution of income. In this study, redistributive effect of health care payments is analyzed to assess the role of public healthcare system in enhancing health equity as well as poverty reduction process.

5.3.9 Measure of Living Standard

The study requires an appropriate measurement of living standard. There are a number of well-known methods of measuring living standards. For the purposes of the analyses, the preferred measures of living standards are as follows:

1st best - **Household consumption**: the value of goods and services consumed.

2nd best - **Household expenditure**: the value of goods and services purchased.

3rd best - **Household income**: the value of goods and services produced.

4th best - **Household wealth index**: the value of possessions and living conditions.

Household consumption is frequently used method as most of the household surveys collected this information more accurately. In contrast there is a tendency of the individuals to misreport their income. Moreover, for the description of the distributions of health care utilization and outcomes, the wealth index is sometimes a useful measure of living standards. However, the study prefers household consumption as a measure of living standards as HIES provides adequate information required for the calculation.

Measurement of Household Consumption

Measurement of household consumption, as discussed in J. Hentschel and P. Lanjouw, 1996, is based on the following principles:

a. Include both food consumption and non-food consumption.

b. A food consumption sub-aggregate is constructed through the aggregation of (i) food purchased in the market place; (ii) food that is home-produced; (iii) food items received as gifts or remittances from other households; and, (iv) food received as in-kind payment from employers.

c. Include an approximation to the value of goods consumed from home production, received as gifts or remittances from other households and received as in-kind payment.

d. Non-food expenditure includes items such as clothing, footwear, personal care, entertainment and recreation, transportation, housing supplies, housing, furniture, household appliances, other consumer durables, education and health expenditures.

e. Calculate and included "use values" of consumer durables rather than the actual expenditures on such items. The imputation of values is generally done on the basis of data on date of purchase and cost of acquisition, combined with assumptions about the lifetime of the good. Alternatively, depreciation rates can be calculated using reported "current values" (Deaton, A. and S. Zaidi 2002).

f. Include housing expenses, in the form of rent (actual for tenants and imputed for owner-occupiers) and payments for utilities (e.g. electricity, water).

g. Apply monthly and regional price deflators (if available) to allow for temporal and geographical variation in the cost of living.

h. Scale up expenditures reported over less than a one-year recall period to give estimates of the household's annual consumption expenditure on these items.

In this research study, the household consumption is likely to be under estimated as the use value of the consumer durables could not be added as HIES does not provide information required for the calculation.

Adjusting for the Size and Age Structure of Households

For the analysis it is necessary to adjust household estimates of aggregate consumption to reflect household size and composition. This is done by using a deflator, or equivalence scale. In the simplest case, we can simply use the number of household members to convert household consumption into individual consumption. However, while per capita household consumption is a convenient measure of living standards, it ignores household economies of scale which arise because some goods and services that are consumed by the household have public good characteristics – i.e. they generate benefits for other household members beside the primary consumer. There may also be age- or gender-specific differences in consumption needs. Reflecting these concerns, equivalence scales can be constructed as some function of the household size and demographic composition. In this research study the total household consumption is adjusted for the age and size structure of households. The equivalence scale (Deaton, 1997) is defined as:

$$e_h = \left(A_h + 0.5 K_h\right)^{0.75}$$

Where A_h is the number of adults in household h and K_h is the number of children (0-14 years). Furthermore, per capita approach is also used where needed.

Constructing Quintiles and Identifying the Poor

It is often convenient to classify households into living standards quantiles or deciles. For example, to construct a table of health service utilization by living standards, we categorize households into five groups as 'poorest', '2nd', '3rd', '4th' and 'richest'. Each category consists 20 percent of the population.

In this study the population is also classified according to poverty status as 'extremely poor', 'poor' and 'non-poor' based on the poverty HCR. Further, poverty status is measured according to the definition of Lowe poverty line and Upper poverty line by Bangladesh Bureau of Statistics (BBS).

For Statistical Data Analysis, SPSS for Windows, MS Excel and STATA are used. The results of the analysis are presented in the subsequent chapters. Along with the analytical tools described above, the study uses chi-square test statistic as well. Descriptive statistics, such as weighted proportions for categorical data and weighted mean for numerical variables are also calculated.

5.4 Limitations

The study has few limitations. The secondary data analyses based on the BBS conducted household survey are the researcher's own calculation. As a consequence, many indicators of this study may not coincide with the indicators published in different BBS publications. However, the differences are not substantial. Moreover, a few indicators (e.g. number of doctors per capita by districts, standardized mortality rate) used in the need based resource allocation model are not up to date. For these indicators this study relied on a World Bank study published in 2005.

In this study, the first consecutive five chapters have focused on the theoretical issues covering introduction (study background, statement of the problem, rationale, hypothesis and objectives), literature review as well as study methodology (conceptual framework, methods of data analysis and limitations of the study). The next Chapter 6 through Chapter 10 have devoted to the analysis of the imperial findings. Therefore, in line of the objectives of the study, the next Chapter 6 focuses on the analysis of the healthcare financing in Bangladesh.

CHAPTER 6: HEALTHCARE FINANCING IN BANGLADESH

A health system operates in an economically efficient manner when inputs of health care financing system are used optimally to address a particular health care need. In general, the principal choices for financing a health care system are general revenues, social insurance financing, private insurance financing, and out-of-pocket payments (Sherry A. Glied, 2008).

General revenue financing here refers to a system of revenue collection through a broad-based tax. All or a portion of this tax may be allocated to the health care system. Although often associated with progressive financing, general revenues can be raised through tax vehicles that are also more or less progressive. However, social insurance financing system refers to a system in which some group of people, usually workers, is mandated to make contributions to a health care financing program. Social insurance contributions are usually either regressive (a flat per capita mandate) or proportional (a flat payroll tax rate). While, private insurance financing may be individual or operate through employers or other purchasing organizations. Except in highly regulated contexts or in employer-sponsored groups, the price of coverage is related to expected health expenditures – older, sicker people pay more for coverage and premiums rise as health expenditures rise. On the other hand, out-of-pocket payments for health care include the payments for health care made directly by a member of a household as a patient for the purchase of a medical goods and service at the point of service. In this category, full payments as in case of pharmaceuticals or nursing home care for those without insurance coverage, co-payments and deductibles are also included.

The purpose of this chapter is to evaluate the existing health care financing system through analyzing the trend of total health expenditure as well as the pattern of health care finance mix.

6.1 Total Expenditure on Health

The Total Health Expenditure (THE) for Bangladesh is estimated at Taka 160,899 million ($2,331 million) in 2007 and Taka 48,699 million ($1,140 million) in 1997 (**Table 6.1**). This implies more than three fold increase during the period. Further, Per capita spending on health was Taka 393 ($9.2) in 1997 and Taka 1,118 ($16.2) in 2007. Further, cost of living varies between economies, and the relative exchange rate does not necessarily account fully the differences. Such factors as the presence of non-tradable (between countries) goods or services preclude a simple conversion of currencies. Hence it warrants the need for a process which accounts for these differences and provides an equivalent conversion of currencies. The calculation of Purchasing Power Parity[14] (PPP) achieves this goal. Adjusted for Purchasing Power Parity (PPP), per capita expenditure on health was Taka 893 ($20) and Taka 3,178 ($46) for 1997 and 2007 respectively.

Table 6.1: Total Expenditure on Health, 1997 - 2007

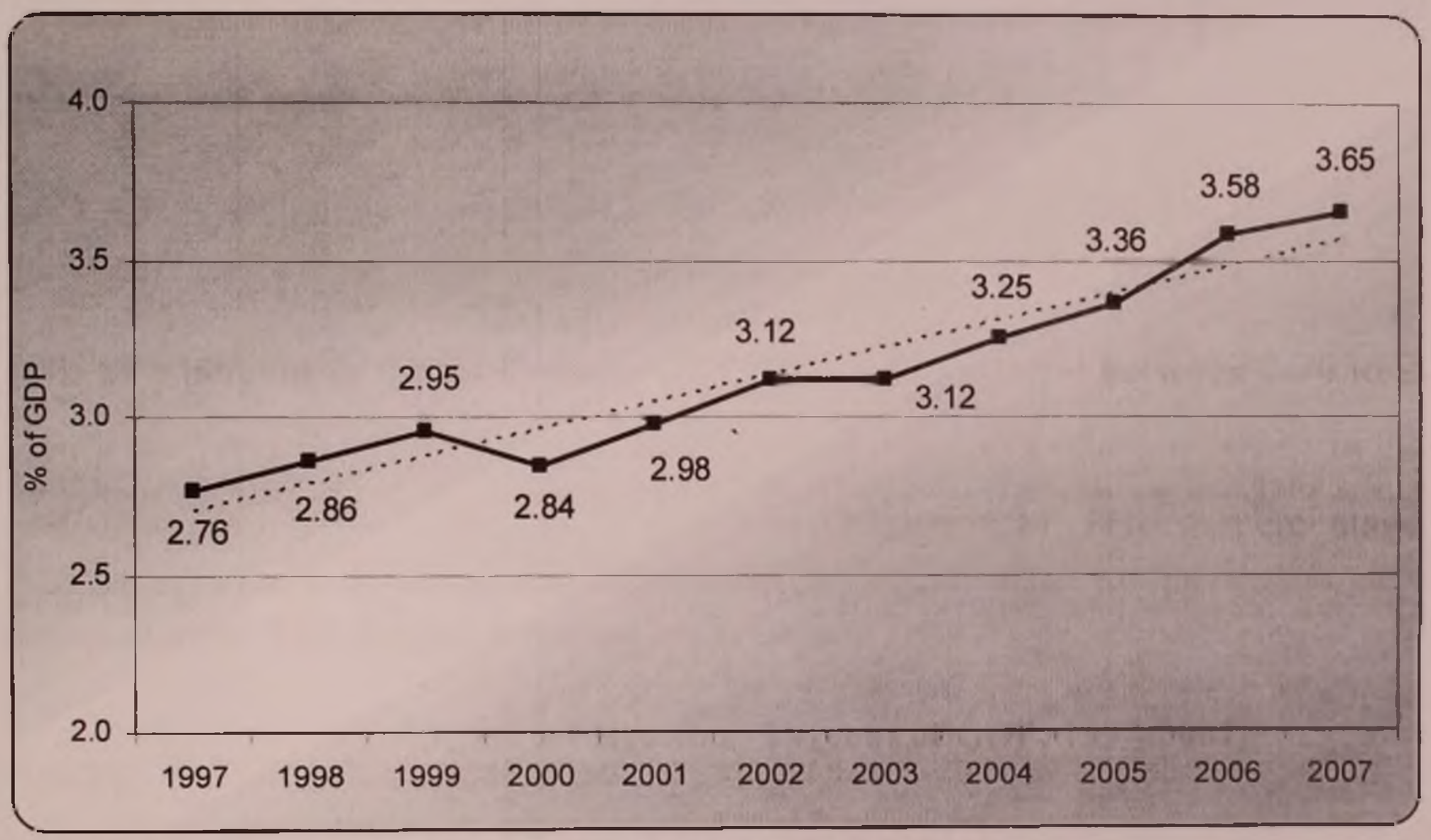
Year	THE (Million Taka)	THE (Million $)	Current market price		PPP adjusted price	
			Per capita expenditure (in Taka)	Per capita expenditure (in $)	Per capita expenditure (in Taka)	Per capita expenditure (in $)
1997	48,699	1,140	393	9.2	843	20
1998	53,602	1,179	426	9.4	938	21
1999	59,433	1,237	466	9.7	1,066	22
2000	65,497	1,302	506	10.1	1,218	24
2001	74,193	1,375	571	10.6	1,472	27
2002	82,978	1,445	624	10.9	1,677	29
2003	89,709	1,549	665	11.5	1,763	30
2004	102,229	1,734	742	12.6	1,971	33
2005	117,085	1,907	845	13.8	2,290	37
2006	138,955	2,071	988	14.7	2,851	43
2007	160,899	2,331	1,118	16.2	3,178	46

Source: MoHFW, 2010. Bangladesh National Health Accounts 1997-2007.

[14] PPP theory is based on the premise that the exchange rates between two currencies (for example, Taka and US$) are in equilibrium when the domestic purchasing powers for goods and services (including health) at that exchange rate are equivalent. It implies that a bundle of goods (e.g. in health) should cost the same in Bangladesh and the United States once the exchange rate is taken into account.

THE as a percent of Gross Domestic Product (GDP) ranged between 2.76 to 2.98 during the 1997-2001 period, which crossed the 3 percent mark in 2002. In 2007, THE as a percent of GDP was 3.65 percent (**Figure 6.1**). THE as percentage of GDP has shown a steady increase during 1997 to 2007.

Figure 6.1: Total Expenditure on Health as Percent of GDP, 1997-2007



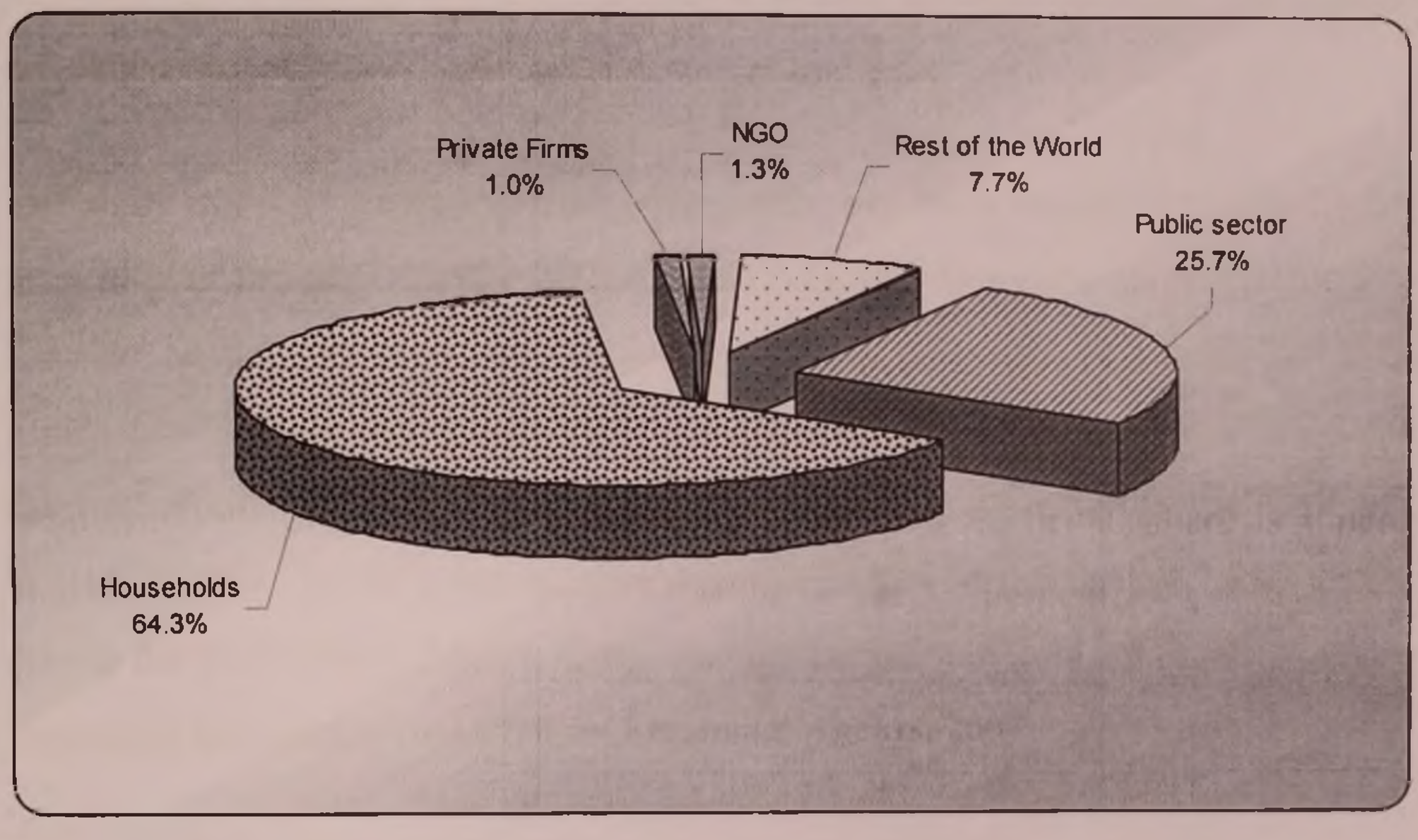
Source: MoHFW, 2010. Bangladesh National Health Accounts 1997-2007.

6.2 Healthcare Financing Mix

The major sources of financing agents in Bangladesh are households, the government (public sector), NGOs and foreign Development Partners (DP). Households remain the main source of financing for healthcare in Bangladesh, comprising 64.3 percent of THE in 2007 (**Figure 6.2**). In 1997, households accounted for 57 percent, increasing steadily over time (MoHFW, 2010). The government is the second largest financing agent making up for 25.7 percent of THE in 2007. Private firms' outlays are primarily in the form of insurance

premiums for employees. As a financing agent, private firms' share is 1 percent followed by NGO 1.3 percent and rest of the world 7.7 percent.

Figure 6.2: Distribution of THE by Financing Agents, 2007



Source: MoHFW, 2010. Bangladesh National Health Accounts 1997-2007.

Among the neighboring countries, households health care expenditure as percentage of THE is the highest (75%) for Nepal. Households contribute 49.6 percent of THE in Sri Lanka, 56.4 percent in India (Punjab), 44.9 percent in Philippine, 60.4 percent in China and only 12.8 percent in Japan (O. O'Donnell, Van Doorslaer, E., M N Huq, et al., 2008).

However, the trend of THE by different financing agents during 1997 to 2007 reveals that in 1997, households accounted for 56.6 percent, increasing steadily over time (**Table 6.2**). The government is the second largest financing agent making up for 25.7 percent of THE in 2007 – a share that was in decline during the preceding decade (36.3 percent in 1997). For public sector financing, the Ministry of Health and Family Welfare (MoHFW) serves primarily as a financial

intermediary of GOB, receiving funds from the Ministry of Finance (MoF). MoHFW utilizes these funds mainly by disbursing them to its healthcare providing units. MoHFW, in addition to its own providers, also implements health, family planning and maternal and child health activities through transfers and grants-in-aid to NGOs.

The share of NGO financing from own source has been ranged between 1.1 to 1.7 percent over the period 1997-2007 (**Table 6.2**). Development partners contribute a sizeable amount of their assistance through the government or through NGOs. Funds provided to the government are included in the government expenditure estimate while direct assistance given to NGOs is reflected in the Rest of the World (ROW). ROW's expenditure through NGOs varied from 4.7 to 9.0 percent during the 1997-2007. Private firms' outlays are primarily in the form of insurance premiums for employees and its share was Taka 1,639 million (1.0%) in 2007.

Table 6.2: Total Expenditure on Health by Financing Agent, 1997–2007

Year	Million Taka					Percentage				
	Public sector	House-holds	Private Firms	NGO	Rest of the World	Public sector	House-holds	Private Firms	NGO	Rest of the World
1997	17,682	27,573	597	548	2,300	36.3	56.6	1.2	1.1	4.7
1998	18,341	31,055	646	685	2,875	34.2	57.9	1.2	1.3	5.4
1999	19,292	35,071	534	849	3,688	32.5	59.0	0.9	1.4	6.2
2000	20,217	38,719	964	1,019	4,578	30.9	59.1	1.5	1.6	7.0
2001	23,128	43,456	690	1,260	5,659	31.2	58.6	0.9	1.7	7.6
2002	25,223	48,944	773	1,265	6,772	30.4	59.0	0.9	1.5	8.2
2003	24,810	54,461	1,013	1,422	8,004	27.7	60.7	1.1	1.6	8.9
2004	29,316	61,078	1,021	1,579	9,235	28.7	59.7	1.0	1.5	9.0
2005	29,918	74,506	1,161	1,765	9,734	25.6	63.6	1.0	1.5	8.3
2006	38,696	86,419	1,356	1,954	10,530	27.8	62.2	1.0	1.4	7.6
2007	41,318	103,459	1,639	2,092	12,391	25.7	64.3	1.0	1.3	7.7

Source: MoHFW, 2010. Bangladesh National Health Accounts 1997-2007.

6.3 Pattern of Public Healthcare Financing

Of the total amount of public sector health financing, the Ministry of Health and Family Welfare's (MoHFW) share was Taka 40,096 million ($581 million) which was 97% of the total public financing in 2007 (**Table 6.3**). MoHFW utilizes these funds mostly by disbursing them to its healthcare providing units. MoHFW, in addition to its own providers, also implements health, family planning and maternal and child health activities through transfers and grants-in-aid to NGOs.

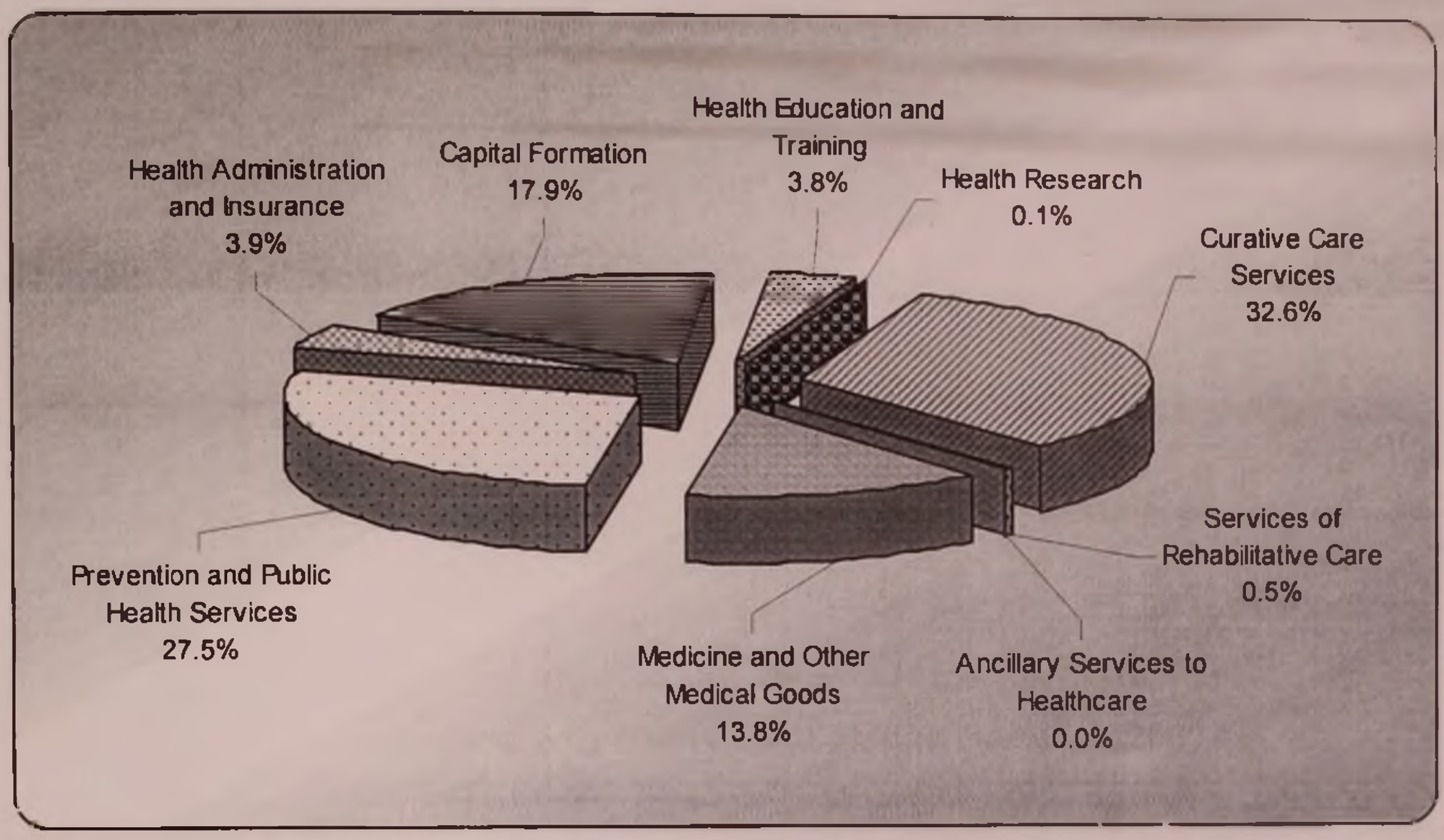
Table 6.3: Health Expenditure in Public Sector by Financing Agent, 2007

Financing Agent	Taka Million	Percentage
MoHFW	40,096	97.0
Revenue Budget	*23,073*	*55.8*
Development Budget	*17,022*	*41.2*
All Other Ministries	1,222	3.0
General Government	**41,318**	**100**

Source: MoHFW, 2010. Bangladesh National Health Accounts 1997-2007.

Prevention and public health services classification covers maternal and child healthcare, family planning services, immunization services, school health services, prevention of communicable diseases, etc. Prevention of HIV/AIDS is also included under this category. Explored through functional disaggregation, curative care services/prevention and public health services account for the two largest shares of public expenditures – 32.6 percent and 27.5 percent respectively in 2007 (**Figure 6.3**). Capital formation, which includes both capital formation and depreciation, comes to about 17.9 percent. Public sector also spent 13.8 percent for purchasing medicines and other medical goods followed by health administration and insurance 3.9 percent, health education and training 3.8 percent, service of rehabilitative care 0.5 percent and only 0.1 percent for health research in 2007.

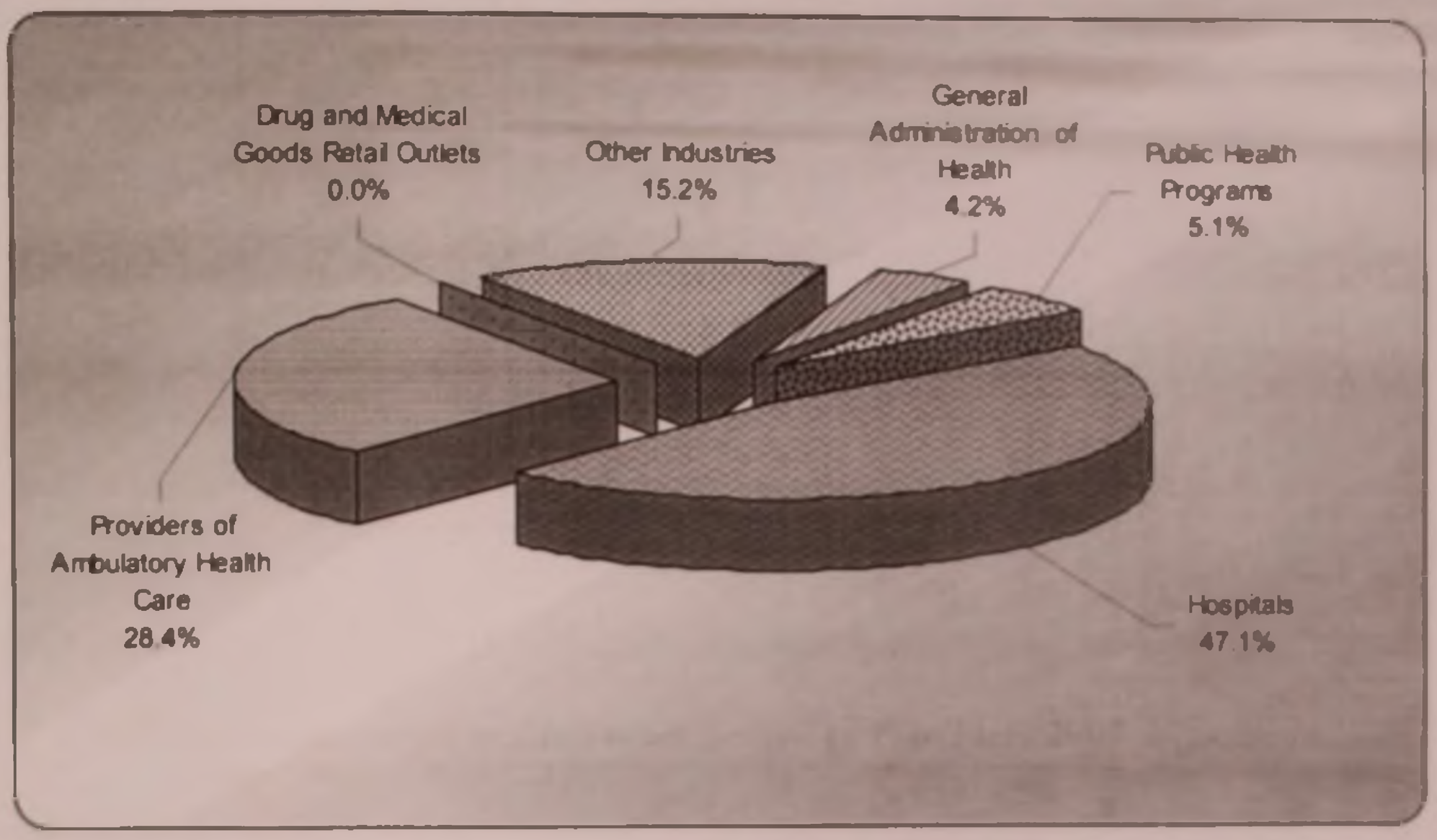
Figure 6.3: Public Expenditure by Function of Health Services, 2007



Source: MoHFW, 2010. Bangladesh National Health Accounts 1997-2007.

Almost half (47.1%) of the GoB's money goes to the hospitals for providing hospital care services and 28.4 percent to the providers of ambulatory healthcare (Figure 6.4). Public health programs, primarily administered by the MOHFW, account 5.1 percent of the total public healthcare spending. Public sector also spent 15.2 percent of its money to other industries and another 4.2 percent to the general administration of health.

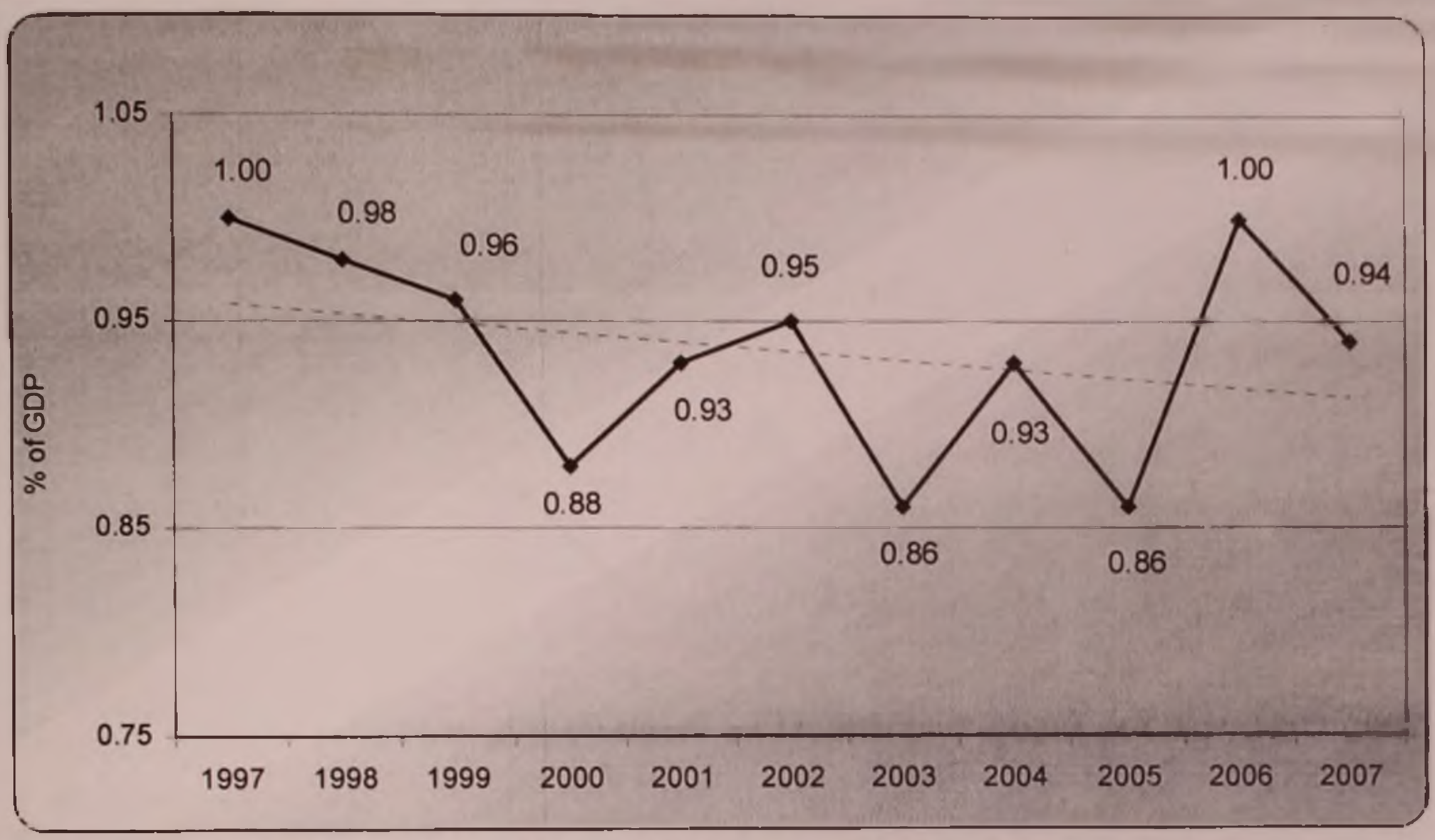
Figure 6.4: Flow of Funds in the Public Sector to Provider, 2007



Source: MoHFW, 2010. Bangladesh National Health Accounts 1997-2007.

Although the constitution of Bangladesh assures equal access to good healthcare to all, public resources devoted to this task are limited. GoB spent only 0.94 percent of Gross Domestic Product (GDP) on health care in 2007 (**Figure 6.5**). Furthermore, the allocation to the HNP sector as share of GDP shows a slight decreasing trend between 1997 and 2007. The minimum share was 0.88 percent in 2000 and maximum was 1 percent in 1997 and 2006. On an average, Public sector spending on health is less than 1 percent of GDP.

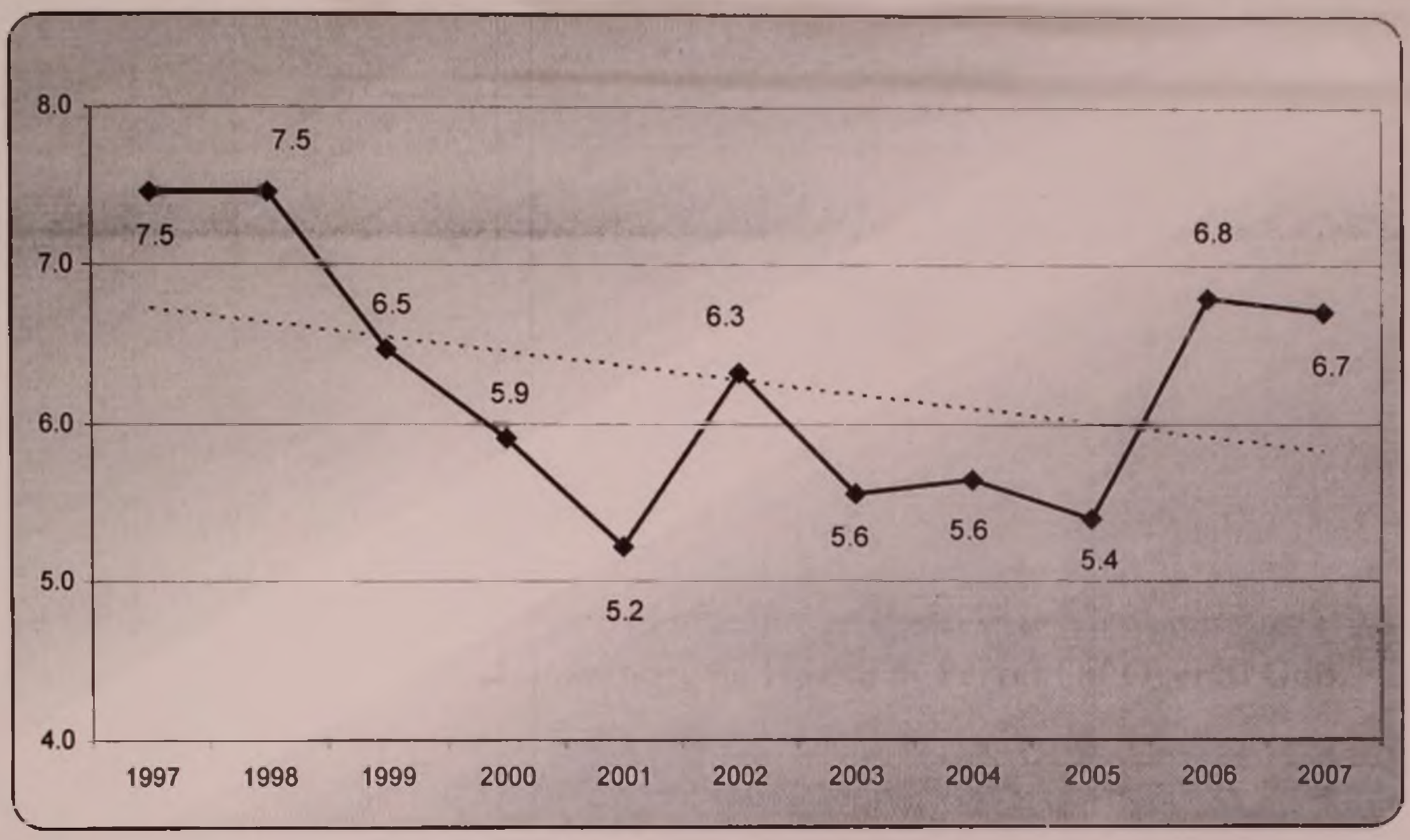
Figure 6.5: Trend of Public Expenditure on Health as Percent of GDP, 1997-2007



Source: MoHFW, 2010. Bangladesh National Health Accounts 1997-2007.

While comparing MoHFW's expenditure with the overall GoB expenditure, it is revealed that in 2007 MoHFW spent only 6.7 percent of the overall GoB spending (**Figure 6.6**). In comparison, MoHFW's share to total GoB spending was 7.5 percent in the year 1997. However, the declined share of MoHFW in overall GoB spending indicates that less priority has been given to the health sector when the health needs of the country are pressing.

Figure 6.6: Trend of Public Expenditure on Health as Percent of Overall GoB, 1997-2007



Source: (i) MoHFW, 2010. Bangladesh National Health Accounts 1997-2007, (ii) MoHFW, 2006. Public Expenditure Review 2003-04, (iii) MoHFW, 2009. Public Expenditure Review 2007.

To sum up, the Total Health Expenditure (THE) is estimated at Taka 160,899 million ($2,331 million) in 2007. In per capita terms, a Bangladeshi, on an average, spent Taka 393 ($9.2) for health care. The distinctive feature of the health care financing system in Bangladesh is that the households act as the main source of financing for healthcare, comprising 64.3 percent of THE, while government's contribution is 25.7 percent of THE. The government spent almost half (47.1%) of its money to provide hospital care and another 28.4 percent on providers of ambulatory healthcare. In 2007, the over all healthcare expenditure (THE) as a percent of GDP was 3.65 percent only. It is also important to note that GoB spent less than 1 percent (0.94 percent) of GDP on health care.

After through examination of the healthcare financing issues, now the question arises as to the resources which have been targeted for the poor. The major

procedures for allocating budgetary resources and effectiveness of such allocation, beneficiaries of public health system and targeting the poor have been examined in the next Chapter 7.

CHAPTER 7: TARGETING RESOURCES FOR THE POOR

Resource allocation in the health sector is subject to specific line items (such as food, medicines and medical supplies) and variation between line items is apparently not possible. Further, the procedure for allocating budgetary resources to a large number of diverse types of facilities is not well documented. No written documentation is attempted by MoHFW or at the levels of Director General (DG) Health and DG Family Welfare, the focal points of such allocations. According to Ensor (2001), the MoHFW recurrent expenditures are funded through the revenue budget of the GoB and are divided into the following categories:

(a) Salary and allowances;
(b) Contingencies (or operational expenses);
(c) Medical and Surgical Requisites (MSR) (funded by revenue budget) and Medical and Surgical Supplies (MSS) (funded by development budget);
(d) Repairs and maintenance; and
(e) Transfers (grants in aid) to Non Profit Institutions (NPI), including NGOs, and contributions to the United Nations (UN) bodies.

In Bangladesh, Government budget allocation on health is centrally determined. Resources are allocated primarily according to capacity of public healthcare facilities and historically determined normatives rather than based on health needs (Rabbani, A. K. M. Ghulam; Huq M Nazmul; et.al., 2006).

Further, targeting health care subsidy to the poor requires effective identification of both poor and non-poor households. To select the target groups, each organization/program defines a set of criteria against which the conditions of potential beneficiaries are measured. These selection criteria depend on the type of people to be targeted. The conditions of potential beneficiaries are defined by using a set of socio-economic indicators developed by each reviewed

organization/program, usually in consultation with the stakeholders and members of the community in which the program works. To determine the conditions of potential beneficiaries, a survey of households in the program area is typically carried out. The survey can take the form of simple interviews with household heads/members using a questionnaire to elicit socioeconomic information, or it can be a participatory rural appraisal (PRA). Once the target groups have been identified, the organization takes steps to target its services towards them for receiving subsidized/free treatment (WB, 2005). One good example of targeting poor is the maternal health voucher program in Bangladesh. The target beneficiaries of the demand side financing (DSF) program are pregnant women on their first or second pregnancy who were considered extremely poor and vulnerable (MoHFW, 2008). The eligibility criteria for the voucher program are (i) permanent residents of the union; (ii) pregnant for the first or second time, and having used family planning prior to the second pregnancy; (iii) functionally landless (owning less than 0.15 acres of land); (iv) earning extremely low and irregular income or no income (less than Tk. 2,500 per household per month); and owning no productive assets, such as livestock, orchards, rickshaw or van.

One of the health policy objectives of Government of Bangladesh is the development of strategic options that would provide for greater and more equitable resource allocation to the poor. In any administrative targeting effort, the major challenge facing policy makers is to create a system to identify the poor accurately and cost effectively. To this end, the per capita income of a household can be considered as a measure of its welfare. However, measurement of household income or expenditure requires expensive and time consuming surveys in a poor country like Bangladesh. An alternative method to measure household welfare is to administer a proxy-means test (PMT) formula (WB, 2005).

To this endeavor, this chapter provides an assessment to see whether the MoHFW's existing resource allocation technique across the administrative districts is equitable or not. In addition, it assesses who benefits from public healthcare subsidies and examines the feasibility of introducing an alternative approach and techniques for administering a more objective, transparent and easily applicable targeting scheme to deliver subsidies to the disadvantaged group especially the poor.

7.1 Resource Allocation: Need vs. Actual

The analysis of the public health sector resource allocation provides the basis to assess whether the existing allocation across districts and lower level facilities is based on the regional health needs. It also examines whether the current resource allocation system takes into account the poverty status by geographic locations.

7.1.1 Methods of Analyzing Resource Allocation System

For allocating public resources to a typical district, the total target allocation is obtained as the product of need and cost factors (Ensor, et. al., 2001). The formula which is adopted from Ensor, et. al. (2001) for obtaining need based resource allocation at the district level is defined as:

District target allocation: $T = Per\ Cap \times PoP\ dist \times (1 + a) \times (1 + n) \times (1 + c)$

Where:

Per Cap - the MoHFW total budget divided by the total national population

PoP dist - the population of the district

'a' - the district age/gender adjustment factor -- proxy by burden population

'n' - the need adjustment factor -- proxy by standardized mortality rate, severe malnutrition and population density

'c' - the cost adjustor -- proxy by poverty head count ratio

Defining Poverty Status of the Districts

The districts are categorized as 'very poor', 'poor', 'less poor' and 'non-poor' districts. The poverty status is defined based on the head count ratio (HCR) that are provided in the poverty maps of 2005 (BBS, WB and WFP 2009). A district is termed as very poor if HCR is >=60% followed by poor if HCR is (<60% and >=48%), less poor if HCR is (<48% and >=20%) and non-poor if HCR is <20%.

Feasible Allocation

As an alternative, an administratively feasible allocation by district has also been derived. The administratively feasible allocation provides minimum additional funds to the poorer districts in such a way that they are at par with the rest on equity consideration. Under feasible allocation the non-poor districts would continue to receive existing allocation although their actual need is less and poorer districts would receive additional resources.

Assumptions

The resource allocation formula principally aims at allocating the recurrent element of the budget - both revenue and development. Allocation of funding for capital development is more complex and thus capital allocation is kept separate from the formula allocation.

In addition, while conducting actual allocation, Dhaka, and three other districts of Chittagong Hill Tracts are excluded. People from other districts travel to Dhaka to receive treatment at the Medical College Hospitals (MCH) and other specialized facilities concentrated in the metropolitan area. From policy consideration the allocation to the Dhaka district needs to be separately determined. The allocations to other three hilly districts of Chittagong are also needed to be done separately

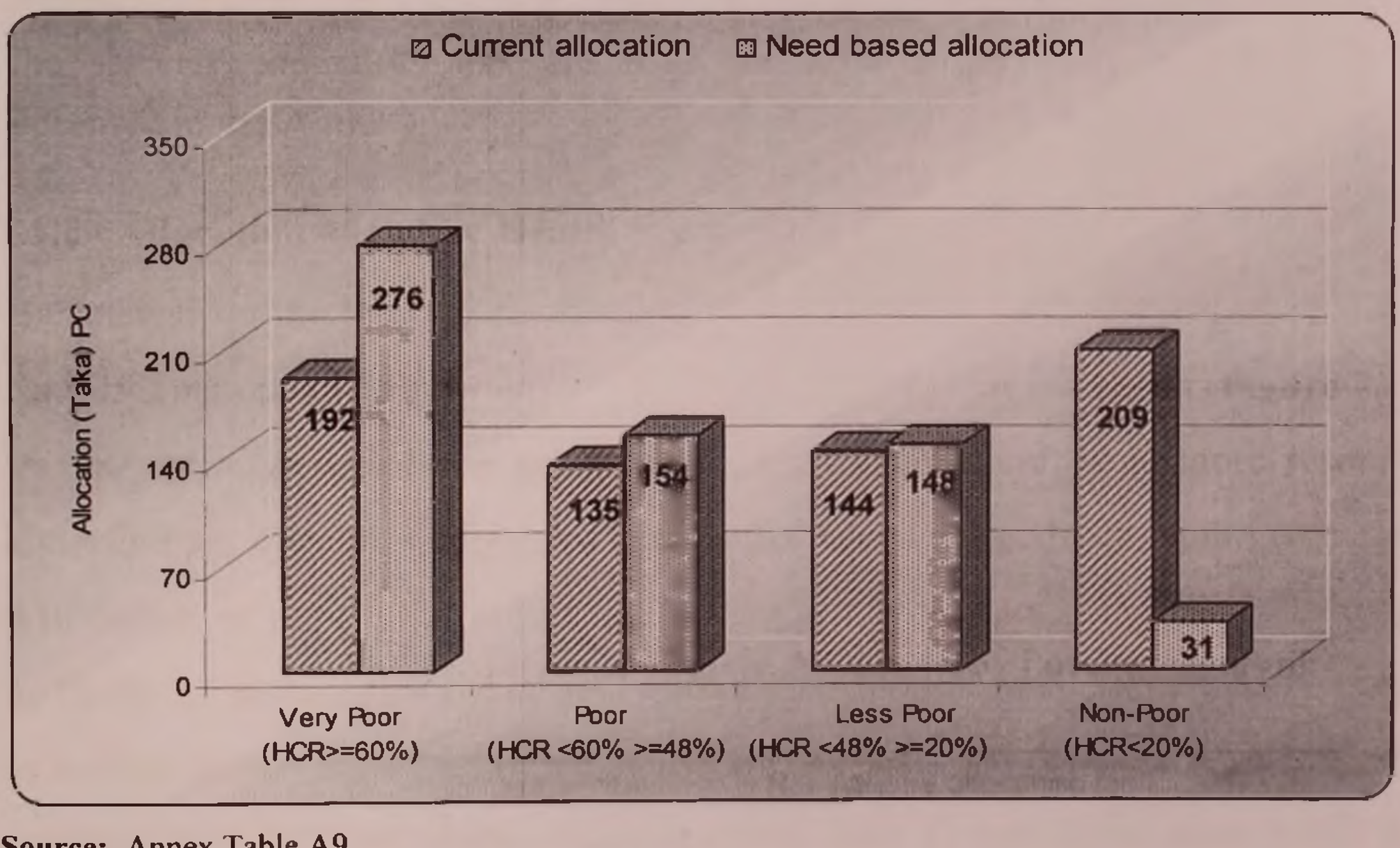
because these areas have already got more facilities and hence receive more resources as compared to their actual needs.

The selected indicators that are used for need based resource allocation is presented in the Annex.

7.1.2 Allocation of Public Health Sector Resource

The analysis of the findings reveals that on an average a very poor district receives Taka 192 per capita only where its actual need is Taka 276 per capita (**Figure 7.1**). On the other hand, a non-poor district, on an average, receives more resource (Taka 209 per capita) as compared to its actual need (Taka 31 per capita).

Figure 7.1: Current Vs. Need Based Resource Allocation by Poverty Status of Districts, 2007

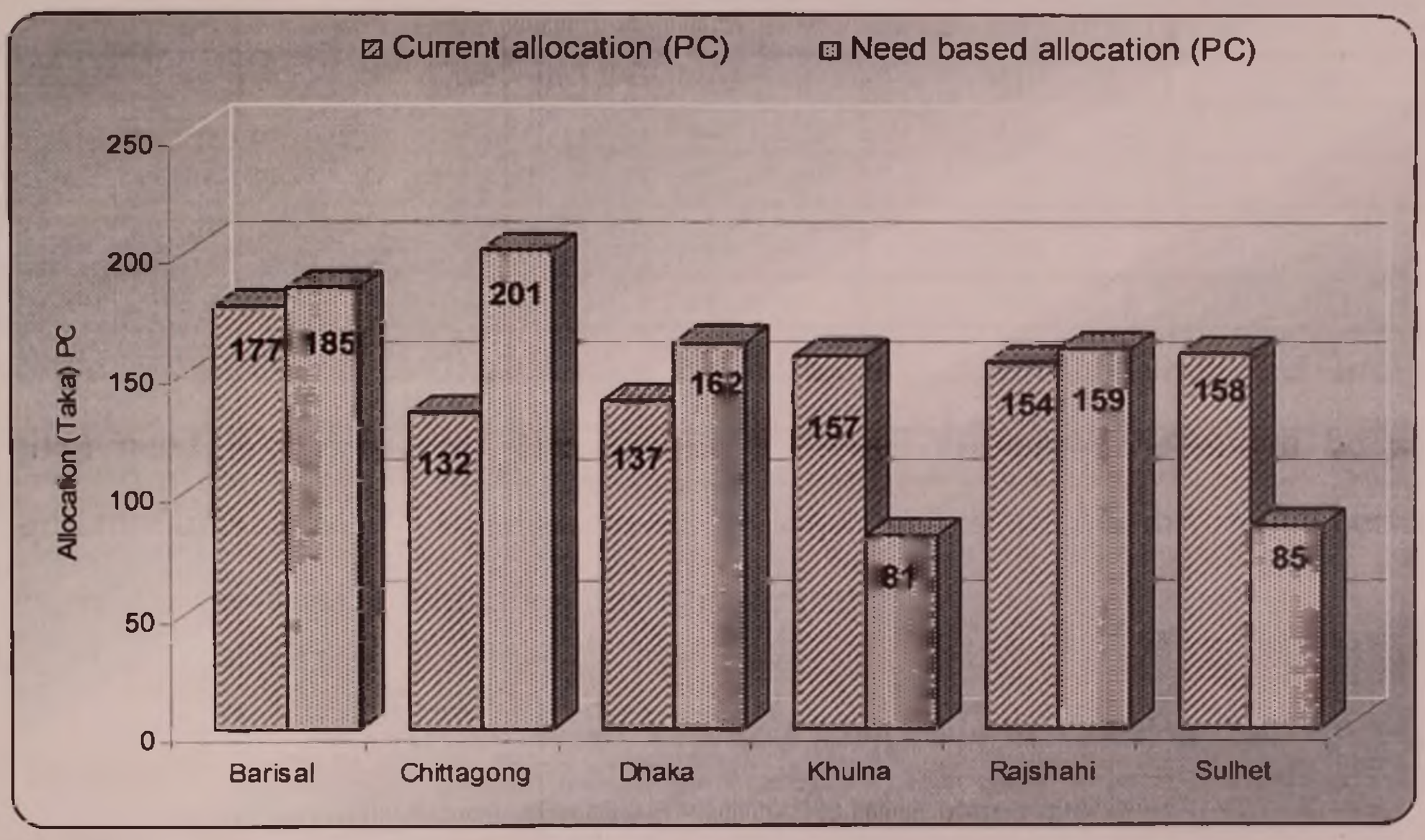


Source: Annex Table A9.

An analysis of the existing and need based resource allocation by division reveals that gap between existing resource and need is noticeable in Chittagong, Khulna and Sylhet divisions (**Figure 7.2**). It is interesting to note that Chittagong division

would require more resources, while Khulna and Sylhet divisions require less when need is considered. The existing resource allocation seems to be more equitable in Barisal and Rajshahi divisions although significant difference between districts within each of the divisions is observed.

Figure 7.2: Current Vs. Need Based Resource Allocation by Division, 2007



Source: Annex Table A9.

In order to understand the gap between the existing and need based resource allocation an in-depth analysis of the district based allocation is also made. The distribution of per capita resource allocation for the selected districts,[15] presented in **Table 7.1** reveals that the current allocation system is not based on health needs as well as on poverty status of the districts. For instance, Sylhet, a non-poor district receives Taka 270 per capita, which deserves Taka 27 per capita when needs are considered. Further, a poor district Khulna receives Taka 243 per capita, but it actually deserves Taka 68 per capita as per need based resource allocation. In

[15] The need based allocation along with administratively feasible allocation for all the districts is also presented in the Annex Table A10.

contrast, a very poor district Rangpur currently receives Taka 248 per capita, where the need is Taka 443 per capita.

Table 7.1: Top 10 Discrepancies in Actual Vs. Need Based Resource Allocation, 2007

Serial	Division	District	Poverty Status	Current allocation (PC)	Need based allocation (PC)
1	Sylhet	Sylhet	Non-poor	270	27
2	Rajshahi	Rajshahi	Less-poor	307	96
3	Khulna	Kushtia	Less-poor	240	54
4	Khulna	Khulna	Poor	243	68
5	Khulna	Bagerhat	Less-poor	159	33
6	Rajshahi	Rangpur	Very poor	248	443
7	Chittagong	Noakhali	Less-poor	109	282
8	Chittagong	Chittagong	Less-poor	158	321
9	Rajshahi	Nilphamari	Very poor	117	267
10	Dhaka	Mymensingh	Poor	185	317

Source: Annex Table A9.

7.2 Beneficiaries of Public Healthcare Spending

The Benefit incidence analysis (BIA) identifies whether the public health care subsidies are well targeted to the poor individuals. BIA describes the distribution of health sector subsidies across individuals ranked by their living standards. On the basis of this distribution, one can assess whether health care subsidization is consistent with narrowing the gap between the living standards of the rich and the poor.

7.2.1 Methods of Analyzing Beneficiaries of Public Healthcare Spending

In order to perform BIA, inpatient days and outpatient visits at public facilities are considered. This is due to the fact that in public health care facilities, the services are usually free or very nominal fees are charged. As a result, whoever visits the facility receives subsidy. The target efficiency of the BIA is assessed by

estimating concentration index and Kakwani index for public services. A negative value of Kakwani index indicates that government subsidies are well targeted to the poor people of the society. On the contrary, a positive value of the index indicates biasness towards rich people.

Computation:

Conducting a health sector BIA involves four principal steps:

1. Categorize individuals according to some measure of living standards.
2. Describe the utilization of public health services in relation to living standards.
3. Weight each individual's use of a service by the value of the public subsidy he/she receives.
4. Evaluate the distribution of the subsidy against some target distribution.

Definition of public subsidy

The set of equations that are used in the analysis are (O. O'Donnell, Van Doorslaer, E., M N Huq, et al., 2005):

Subsidy per capita iXYZ

= [Total Subsidy XYZ /Total visits XY] × (Visits iXYZ)

where

i denotes the individual

X = Type of care (inpatient or outpatient, modern or traditional)

Y = Type of facility (hospital or outpatient provider)

Z = location (urban-rural, division)

Service-specific subsidy received by i^{th} individual: $S_{ki} = q_{ki}c_{kj} - f_{ki}$

Total subsidy to i^{th} individual: $S_i = \sum_k \alpha_k S_{ki}$

where, q_{ki} is utilization of service k, c_{kj} is the unit cost of k in region j where i resides and f_{ki} is the fee paid by individual i.

Unit costs

The starting point for the costing component of a BIA is total public recurrent expenditure on health care. Ideally, this should be disaggregated down to geographic region, then to facility (hospital, health centre, etc) and, finally, to service (inpatient/outpatient, etc.). At this disaggregate level, unit cost is calculated by dividing total recurrent expenditure by total units utilized. The weighted sum of the health services consumed by an individual, where the unit costs provide weights, gives public health expenditure per individual.

Aggregate health accounts data are required to determine total public expenditure on health and its disaggregation to regions and facilities. For accuracy and consistency, the data should come from a unified system of National Health Accounts (NHA).

User fees

The simplest method of allocating user fees divides aggregate user fee revenue reported in official accounts by an estimate of total utilisation and assigns the resulting average payment to all users. It is much preferable to exploit survey data on payments and so allow for variation in fees paid. Some surveys ask the amount paid for each public health service. In this case, the public subsidy can be calculated as in equations above. Alternatively, if the survey only gives the total amount paid for all public health services, then modify equation to,

$$S_i = \sum_k \delta_k q_{ki} c_{kj} - f_i$$

where f_i is the payment for all public health care and δ_k is a scaling factor that standardizes the reference periods for the utilization variables on the reference period that applies to the total payment variable.

Database and Assumptions

The BIA is primarily based on Health and Demographic Survey (HDS) 2000 conducted by BBS. Since changes in the country's healthcare expenditure in the following subsequent years are observed to be gradual, results of the beneficiary analysis for 2007 are likely to be similar to the previous years. Under this assumption the MoHFW's health care subsidy for the year 2007 is apportioned to the HDS households according to the utilization of public facilities. However, utilizing HDS survey for the year 2000 limits the scope of the beneficiary analysis.

7.2.2 Beneficiaries of Public Healthcare Spending

The analysis of the quintile share[16] of public healthcare subsidy reveals that the poor are particularly disadvantaged, receiving less public resources devoted to health as compared to the rich people of the country (**Table 7.2**). The poorest 20 percent of the population receive only 19.1 percent of the total public healthcare subsidy and the richest 20 percent receive approximately one third of the total subsidy. While investigating efficiency of the different levels of public facilities, it is observed that the subsidy distribution is roughly proportional where the poor receive subsidies in proportion to their income. The primary healthcare facilities seem to be more pro-poor as compared to the tertiary level facilities.

[16] Quintiles split the income distribution into five equal parts and each part comprises 20% of the population. These population groups are leveled as 'poorest', 'poor', 'middle', 'rich' and 'richest'.

Table 7.2: Quintile Share of Living Standard and Public Health care Subsidy

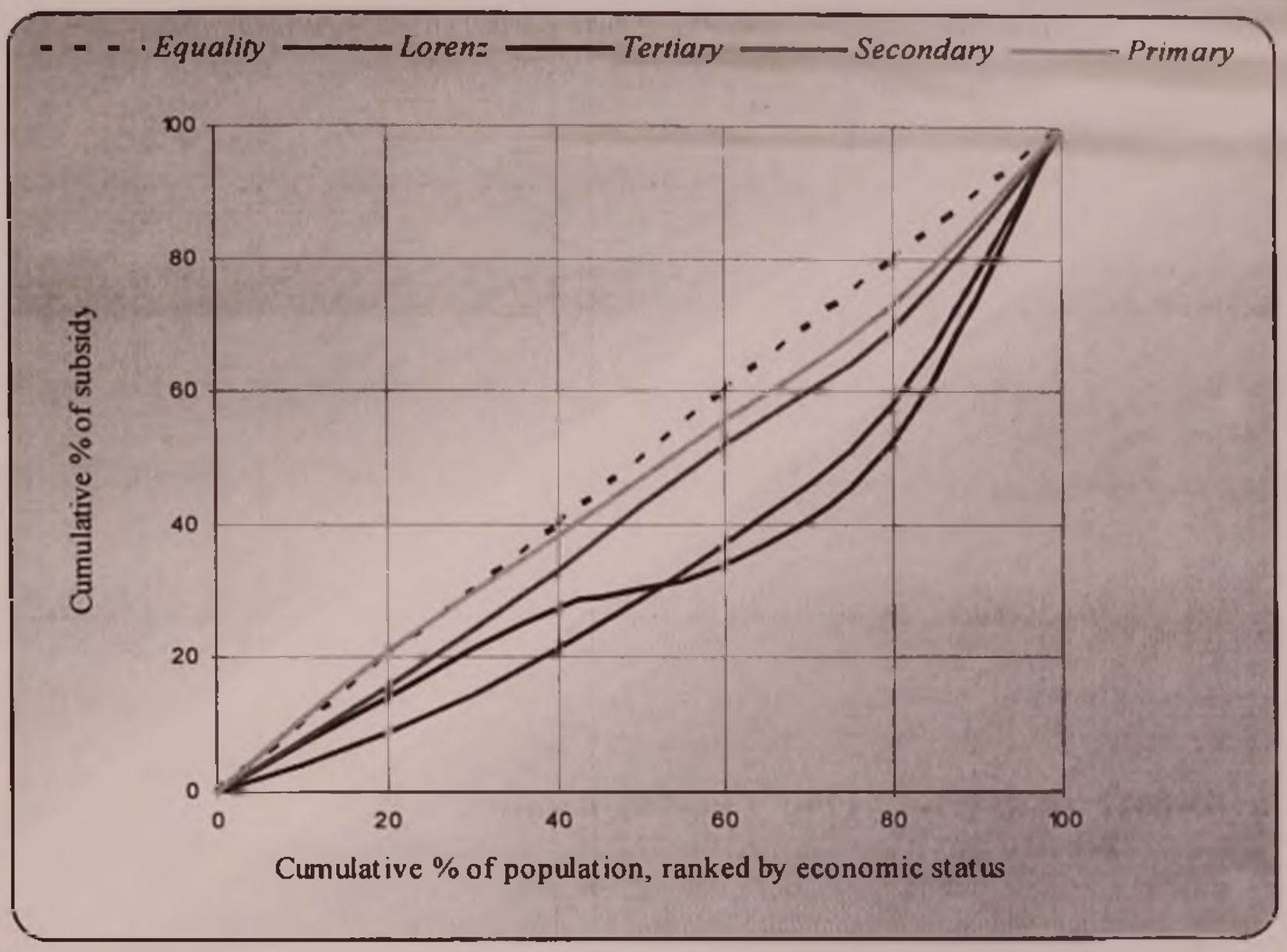
Quintile	% share of living standard	Type of facility			Overall
		Tertiary	Secondary	Primary	
poorest 20%	8.9	14.2	15.9	21.0	19.1
poor	12.4	13.0	17.2	17.1	16.3
middle	15.8	6.8	19.0	17.3	15.3
rich	21.0	18.6	17.4	17.5	17.7
richest 20%	41.9	47.4	30.5	27.1	31.6
Total	100%	100%	100%	100%	100%
Gini Coefficient /CI	0.33	0.32	0.12	0.04	0.11
Kakwani Index	-	-0.02	-0.21	-0.29	-0.22

Source: (i) Health and Demographic Survey 2000 (ii) MoHFW 2010, Bangladesh National health Accounts 1997-2007.

The analysis of Kakwani indices (**Table 7.2**) as well as Concentration curves[17] (**Figure 7.3**) reveals that all the public facilities seem to be proportional and hence benefiting the poor to some extent where the primary facilities are relatively more pro-poor. However, in order to benefit the poor more it is imperative to introduce an efficient targeting mechanism so that the poor can get more benefits from the limited public resources owed to the health sector.

[17] Lorenz and concentration curves for public healthcare subsidy are constructed on the basis of the quintile share of public healthcare subsidy presented in Table 7.2.

Figure 7.3: Lorenz and Concentration Curves for Public Healthcare Subsidy



7.3 Targeting the Poor

In order to reduce the existing inequality in the health sector as well as to have significant effect in the overall poverty reduction process, it is not enough that the current resource allocation system is based on health needs as well as takes poverty status into account. Rather, it is important that the poor are identified properly who really deserve the subsidized health care services. One such model for identifying the poor is Proxy Means Testing (PMT) model.

7.3.1 The Model

Proxy Means Testing (PMT) is a scientific technique that serves as a tool to identify beneficiaries of social programs. Instead of asking about income directly, the approach relies on indicators that are highly correlated with household income yet are easy to collect, observe, and verify.

The PMT model utilized the per capita consumption expenditure as the dependent variable as consumption expenditures are likely to reflect permanent income and are, therefore, a better indicator of consumption behavior. Further, data on consumption expenditure are generally more reliable and stable than income data. In selecting the proxy means test indicators, explanatory variables were selected that were statistically significant in "explaining" per capita household consumption. However, the model is defined as follows:

$$y = \alpha + \sum_{i=1}^{n} \beta_i x_i + e$$

Where:

y = per capita household consumption

x_i = Explanatory variables that explains 'y' significantly

e = Error associated in the model that is normally distributed with constant variance

α and β's are the parameters

Calculation of Score

The PMT formula generates a score for households based on easy to observe characteristics, such as location and quality of dwelling, ownership of durable goods, demographic structure, and education and occupation of households. The resulting total score is nothing but the estimated consumption per capita per day for that household calculated by adding the products of input variables and the corresponding coefficients and the model constant.

This can be formulated as follows:

$$S_i = C_i \times V_i$$

Where:

S_i = Score of i^{th} variable

C_i = Coefficient of i^{th} variable

V_i = Value of i^{th} variable

Finally, the total score is obtained by adding the value of the PMT model constant and the scores for each selected indicators, i.e.

$$Total\ score = Constant + \sum Si$$

Identifying Eligible Persons

The calculated per capita consumption is compared with a predetermined threshold level. Based on an estimated cut-off point of per capita expenditures, individuals interviewed are classified into two categories: (i) the poor who are eligible for the subsidies, and (ii) the non-poor who will not be included in the program. In other words, if the calculated per capita consumption is less than or equivalent to the predetermined threshold level, then the individual will be treated as poor. Otherwise he/she will be treated as unqualified for the subsidized/free health care services.

7.3.2 Developing Proxy Means Tasting (PMT) Model

In order to develop the TMP model suitable for Bangladesh, a wide range of explanatory variables were initially considered. Based on the adjusted R^2, model significance and other criteria a set of indicators were selected for the final model. The estimated model for the PMT in context of Bangladesh is presented in the following **Table 7.3**.

Table 7.3: Estimated Regression Model for PMT from the HIES 2005

Coefficients	B	Std. Error	t	Sig.
Household size	-2.17	0.15	-14.86	0.00
Highest year of schooling of any member of the household	0.90	0.08	11.02	0.00
Any family member aged >15 years never attended school	-2.81	0.70	-4.00	0.00
Number of rooms per capita	18.75	0.86	21.72	0.00
Has electricity	2.39	0.82	2.93	0.00

Coefficients	B	Std. Error	t	Sig.
Has telephone/mobile	18.62	0.99	18.82	0.00
Has freezer	28.43	1.33	21.32	0.00
Has TV	4.22	0.78	5.44	0.00
Has electric fan	1.67	0.90	1.86	0.06
Has dining room furniture	6.33	0.71	8.95	0.00
Has drawing room furniture	2.88	0.72	3.99	0.00
Has hemp/hay/bamboo wall-roof	-2.29	0.60	-3.80	0.00
Has no private toilet	-4.41	0.84	-5.27	0.00
Has supply water	15.80	1.10	14.41	0.00
Constant	29.98	1.18	25.44	0.00

Dependent Variable: Consumption-expenditure per capita per day. *$F = 598.3$, $R^2 = 0.45$, $n = 10,080$*

To illustrate the process, the PMT calculation for two households from the HIES 2005 sample – a needy (lies below poverty line) and a non-needy (lies above poverty line) household is performed. The coefficients are obtained from the final regression model provided in **Table 7.3**. Scores are calculated for both the needy and the non-needy households by multiplying the values of the indicators/variables for the respective households with the coefficient values (**Table 7.4**). The total scores of the two households are compared with the cut-off point[18] to determine the eligibility of the households to a subsidized health service. In the above illustration, since the total estimated score for the first household is Taka 23.4 per capita per day and is less than the predetermined threshold level (Taka 28.7 per capita per day), thus any individual from that household is identified as *eligible* for the public health care subsidy. Similarly, the other household is identified as *non-eligible* as the calculated total score Taka 47.9 is greater than the threshold level.

[18] The cutoff point is the BBS defined upper poverty line translated into per capita per day. In this effort the resulting cutoff point becomes Taka 28.7 per capita per day. The total score of the household is then compared with the cut-off of point to determine the eligibility of that household to be a beneficiary of a health service.

Table 7.4: Proxy-Means Test Result for Two Households from HIES 2005 Sample

Variables in the Model	Coefficients	Poor Household		Non-poor Household	
		Value	Score	Value	Score
Household size	-2.17	6	-13.0	4	-8.7
Highest year of schooling of any member of the household	0.90	6	5.4	5	4.5
Any family member aged above 15 years never attended school	-2.81	1	-2.8	0	0.0
Number of rooms per capita	18.75	0.33	6.2	0.25	4.7
Has electricity	2.39	0	0.0	1	2.4
Has telephone/mobile	18.62	0	0.0	0	0.0
Has freezer	28.43	0	0.0	0	0.0
Has TV	4.22	0	0.0	1	4.2
Has electric fan	1.67	0	0.0	1	1.7
Has dining room furniture	6.33	0	0.0	1	6.3
Has drawing room furniture	2.88	0	0.0	1	2.9
Has hemp/hay/bamboo roof-wall	-2.29	1	-2.3	0	0.0
Has no private toilet	-4.41	0	0.0	0	0.0
Has supply water	15.80	0	0.0	0	0.0
Constant	29.98	-		-	
Total Score	-	23.4		47.9	
Cut-off point		28.7		28.7	
Decision		Eligible		Non- eligible	

Note: Calculation is based on the final estimated model presented in Table 7.3 and two selected households (one lies below poverty and the other lies above poverty line) from HIES 2005.

The introduction of a PMT model nevertheless has its administrative challenges[19]. Predictably, many of those identified as non-poor, and therefore not eligible for the benefits, would express dissatisfaction with such a program. Further, a small percent of deserving poor households may be incorrectly left out of a program employing the PMT model. Local level personal and political pressures may be imposed to include certain undeserving individuals in the program. Strong government and community participation can dissuade such impositions or demands.

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[19] A very few work has been done so far on the PMT model. A handbook of implementing PMT model is outlined in the World Bank (WB) published report "Targeting Resources for the Poor in Bangladesh, Bangladesh Development Series – paper no. 5, The World Bank Office, Dhaka, December 2005". This could be considered as the starting point to implement the model at the beneficiary level.

In summary, the current allocation is made neither based on regional health needs nor it takes into account poverty status by geographic locations. The analysis of the findings reveals that, on an average, a very poor district receives Taka 192 per capita only where its actual need is Taka 276 per capita. On the other hand, a non-poor district, on an average, receives more resources (Taka 209 per capita) as compared to its actual need estimated at Taka 31 per capita.

While investigating the beneficiaries of public healthcare subsidies, it is observed that the poorest 20 percent of the population receive only 19.1 percent of the total public healthcare subsidy and the richest 20 percent receive approximately one third of the total subsidy. The subsidy distribution is roughly proportional where the poor receive subsidies in proportion to their income. The primary healthcare facilities seem to be more pro-poor as compared to the tertiary level facilities. Although poor receive comparatively more benefits from the primary level facilities but the extent of benefits from secondary as well as higher level public facilities does not achieve the desired level.

As a consequence, the need based resource allocation is imperative to reduce the existing inequality in the health sector and also to have significant effect in the overall poverty reduction process. Nevertheless, it is also equally important that the poor are identified properly who really deserve the subsidized health care services. One way of identifying the poor is the Proxy Means Testing (PMT) model. This is relatively easy to administer because of its simplicity, low dependence on multiple sources of information for identifying the targeted beneficiary, and allows limited opportunity for subjective observations. However, for the successful implementation of the PMT model local level community participation needs to be included in the program.

It is not only the need based resource allocation that can reduce the existing inequality in the health sector, but the equity in utilization by the clients, financing and delivery of healthcare is also imperative. However, the present chapter has examined whether the health sector resources have been allocated to different geographical location according to the health need. While, the equity in utilization, financing and delivery of health care is examined in the next Chapter 8.

CHAPTER 8: EQUITY IN UTILIZATION, FINANCING AND DELIVERY OF HEALTHCARE

Equity in health care financing may be judged with respect to its consequences for two distributions – health and income. The distribution of health may be affected through financial disincentives to the utilization of health care. The distribution of income may be altered by taxes and insurance contributions. Living standards may also be disrupted by direct payments for health care that diminish household resources available to meet demand for other goods. In publicly financed health care systems with wide coverage utilization of health care, to a large extent, is not contingent on payment. Then, the impact on the distribution of income is the only equity issue concerning health care finance. The distribution of health care financing contributions can be examined and given an equity, or redistribution, interpretation (Wagstaff and Van Doorslaer, 1992; Wagstaff et al., 1999). However, when direct payments for health care contribute a substantial share of health care finance, the equity issue persists. Payments may deter use, with possibly different effects on the rich and the poor (Gertler et al., 1987; Gertler and Van der Gaag, 1990; Mocan et al., 2004). Assessment of equity in health care financing then requires examination of the distribution of health care utilization in addition to that of payments.

Equity in access to and use of health services is commonly an important goal for policy-makers in Bangladesh. Equity in access to subsidized public health care services is also an important objective from the poverty alleviation perspective. It connects to the related interest that policy makers have in the equity of the financing mechanisms for health care. Health systems and system reforms are often judged not only in terms of their implications for the distribution of access and outcomes, but also in terms of the distributive burden of financing. Thus

evaluation of equity in financing is not only an important objective in its own right, but one which is intimately connected with the evaluation of the provision and supply side of health care systems.

In this context, this chapter examines the existing situation of the equity in the utilization of healthcare services, financing and delivering of healthcare services. This assessment is done through analyzing healthcare seeking behavior of the ill by different selected characteristics (e.g. age, sex, poverty status), who pays for healthcare as well as incidence and intensity of financial catastrophes.

8.1 Choice of Healthcare

The utilization of healthcare services is a complex behavioral phenomenon. Empirical studies have found that the health seeking behaviour is related to the availability, quality, cost and comprehensiveness of services as well as socio-cultural structure, health beliefs and personal characteristics of the users (Chakraborty N. et al., 2003). Hence the health status and selected characteristics in the context of Bangladesh are examined in this section.

The analysis of the health status reveals that approximately 17.6 percent of the country's population has reported illness or injury during 30 days prior to the survey date (**Table 8.1**). Of the respondents reporting an illness, 85.4 percent consulted for healthcare, while the remaining 14.6 percent did not seek any care at all.

Table 8.1: Selected Indicators of Study Population

Indicators	Percent
Reported sickness	17.6
Received any treatment among ill respondents	85.4

Source: Household Income Expenditure Survey 2005.

The percentage distribution of respondents reporting illness/injury by different individual as well as household characteristics that might influence their health status is presented in **Table 8.2**. The significance of the difference of reporting illness is also examined for each selected characteristics. As revealed, the minor, old, women, illiterate, and rural residents are more likely to report an illness as compared to other age, sex, literate and resident groups of the respondents. Dwellers of Rajshahi and Dhaka divisions are more likely to report sickness; while the Barisal's residents are less likely to report the same. Besides, the incidence of illness significantly varies among the respondents in terms of these characteristics.

Table 8.2: Reporting Illness by Selected Characteristics

Characteristics	Reporting Ill (%)	p-value
Age		
0-4	32.5	.000
5-14	15.3	
15-45	13.7	
45-64	19.4	
65+	25.2	
Sex		
Male	16.9	.000
Female	18.3	
Education		
No Education	17.3	.000
Primary	14.7	
Secondary	13.4	
Higher secondary	11.8	
Higher education	9.5	
Residence		
Rural	18.2	.004
Urban	15.9	
Division		
Barisal	10.9	.000
Chittagong	14.0	
Dhaka	18.4	
Khulna	14.7	

Characteristics	Reporting Ill (%)	p-value
Rajshahi	22.9	
Sylhet	16.3	

Source: Household Income Expenditure Survey 2005.

The distribution of poverty and health conditions in Bangladesh reveals that 40.0 percent of the population live in poverty of which 25.5 percent are in extreme poverty[20] (**Table 8.3**). The incidence of illness is higher for the non-poor (18.5%) as compared to the incidence for the extremely poor (16.3%). The percentage of ill respondents who seek healthcare is also high (88.9%) among the non-poor vs. 78.1 percent among the extremely poor. As a consequence, a lower rate of health care seeking is evident among the poor and the extremely poor when they reported illness.

Table 8.3: Health Status, Health care and Poverty Status

Poverty status	Population (%)	Rate of illness reported (%)	Rate of healthcare (%)
Extremely poor	25.5	16.3	78.1
Poor	14.5	16.2	82.0
Non-poor	60.0	18.5	88.9
Total	100.0	17.6	85.4

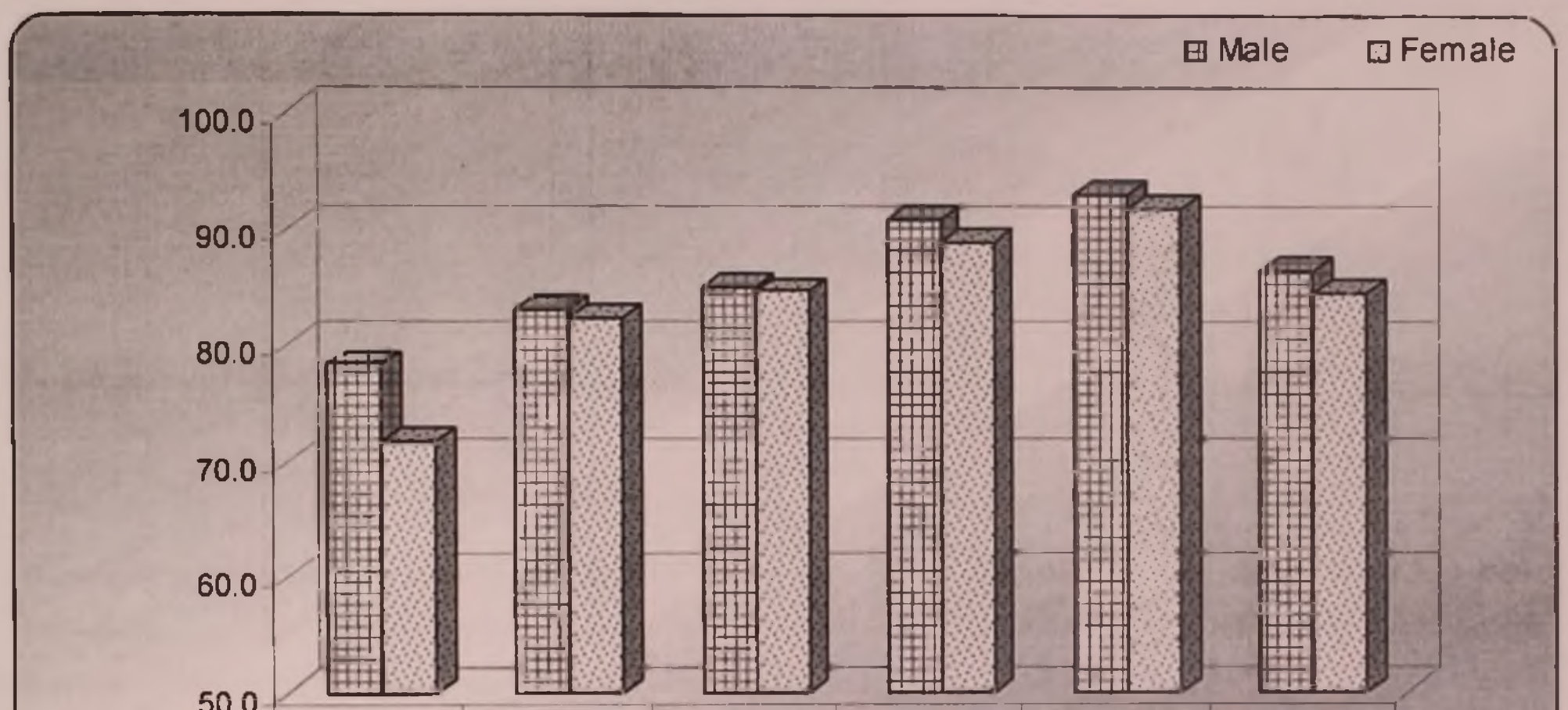
Source: Household Income Expenditure Survey 2005.

It is important to note that 86.4 percent of the male seek any care when they reported sick as compared to 84.5 percent for their female counterpart (**Figure 8.1**). The incidence of seeking any care for female is consistently lower among all income groups. But, the difference is notably higher among the poorest segment of the population. In the poorest quintile nearly 78.4 percent of the male seek any care when they reported sick, while the same is 71.7 percent for their female

[20] Poverty status is measured according to the definition of Lower and Upper poverty lines defined by BBS in HIES 2005.

counterpart. Among the richest segment of the population the same is 93.0 percent for male as against of 91.8 percent for female.

Figure 8.1: Seeking any Care by Sex and Living Standards

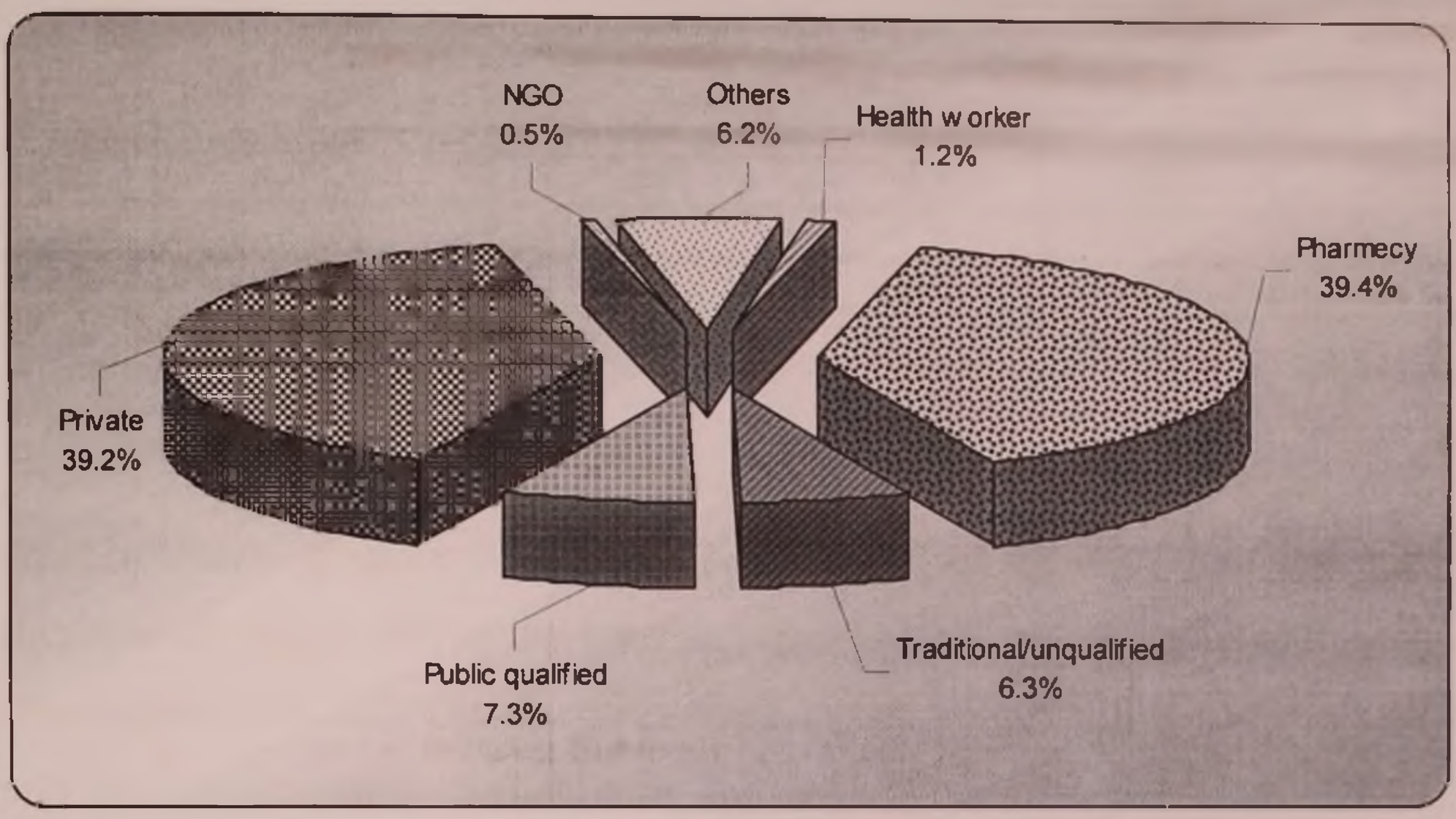


	Poorest	2nd	3rd	4th	Richest	Overall
Male	78.4	83.0	85.0	90.9	93.0	86.4
Female	71.7	82.4	84.7	88.8	91.8	84.5

Source: Household Income Expenditure Survey 2005.

An analysis of healthcare seeking behavior reveals that a significant portion of people of Bangladesh relies on unqualified or traditional providers including pharmacy/drug stores. Nearly 40 percent of the ill people have reported that they sought treatment from pharmacy and another 6.3 percent relied on unqualified/traditional providers (**Figure 8.2**). Another 39.2 percent have consulted with private modern qualified providers and only 7.3 percent of the sick people have reported to go to a public provider. In contrast, only 0.5 percent of the sick people have relied on NGOs, 1.2 percent on grass root level field workers, while another 6.2 percent relied on self medication, family treatment or other mode of treatments.

Figure 8.2: Healthcare Seeking Behavior



Source: Household Income Expenditure Survey 2005.

The economic status of the patients plays an important role in their health seeking behavior. From the analysis of the findings it is observed that the incidence of seeking care from traditional/unqualified providers is higher among the poor people when they reported sick (**Table 8.4**). It is interesting to note that only 5.1 percent of the non-poor people sought treatment form traditional/unqualified providers, while the same is almost double (9.7%) among the extremely poor. The utilization of private providers is significantly higher among the non-poor, while poor and extremely poor relied heavily on pharmacies. The utilization of public facilities is quite low. This incidence is even worst among the poor (6.9%) and the extremely poor (5.5%).

Table 8.4: Health Seeking Behavior by Patients' Level of Poverty

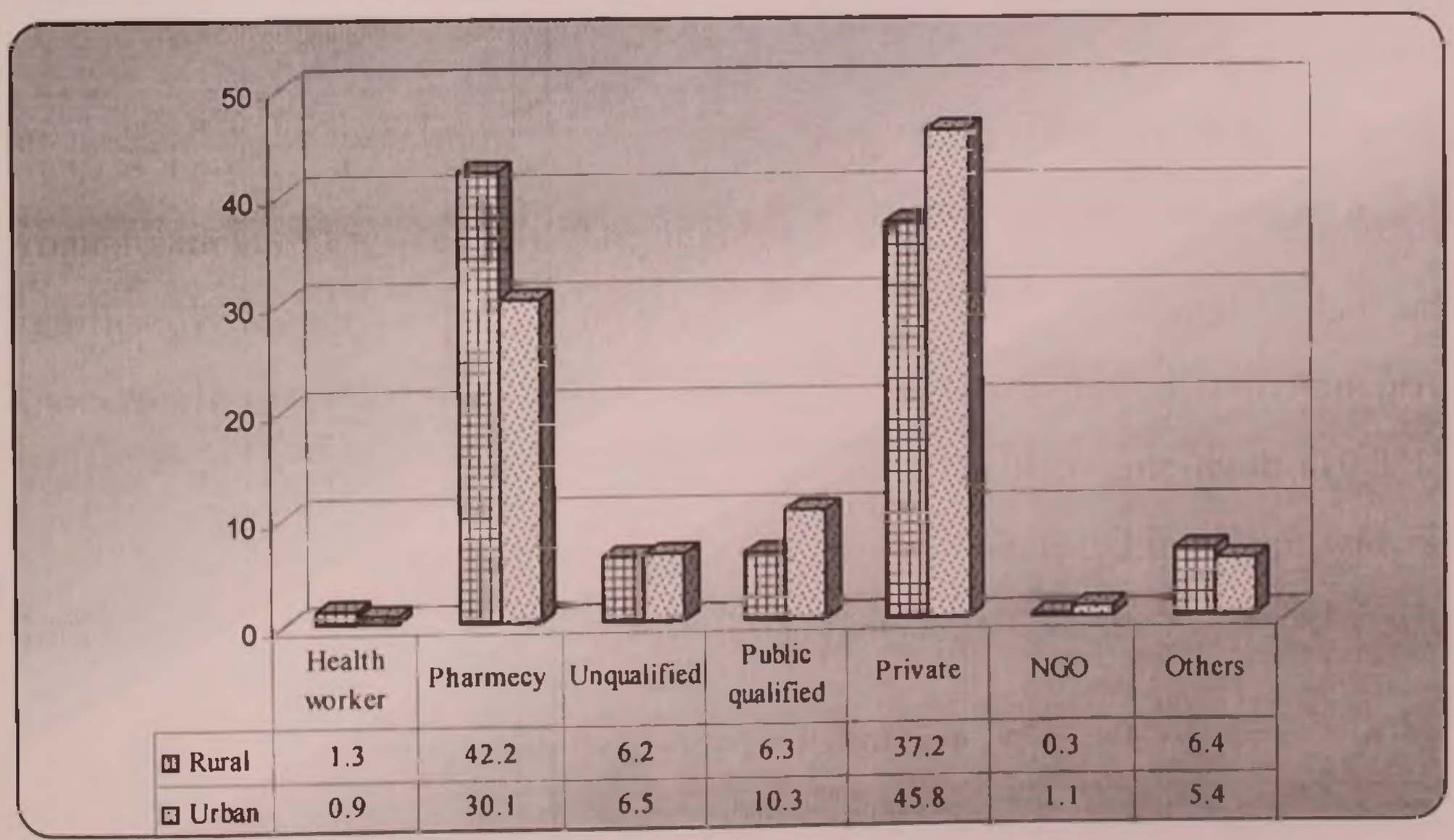
Provider	Poverty status			Overall
	Extremely poor	Poor	Non-poor	
Health worker	1.2	0.5	1.4	1.2
Pharmacy	47.7	41.8	36.3	39.4
Traditional/unqualified	9.7	6.7	5.1	6.3

Provider	Poverty status			Overall
	Extremely poor	Poor	Non-poor	
Public qualified	5.5	6.9	7.9	7.3
Private	29.6	35.5	43.0	39.2
NGO	0.3	0.9	0.4	0.5
Others	6.0	7.5	5.9	6.2
Total	100	100	100	100

Source: Household Income Expenditure Survey 2005.

There is a significant variation in the health seeking behavior among the rural and urban residents (**Figure 8.3**). The incidence of seeking care from pharmacy is significantly higher among the rural residents (42.2%) as compared to their urban counterparts (30.1%). On the other hand, urban people relied more on private providers as compared to their rural counterparts. Further, one-tenth (10.3%) of the urban residents reported to seek health care from qualified public providers, as compared to 6.3 percent among the rural residents.

Figure 8.3: Healthcare Seeking Behavior by Residence



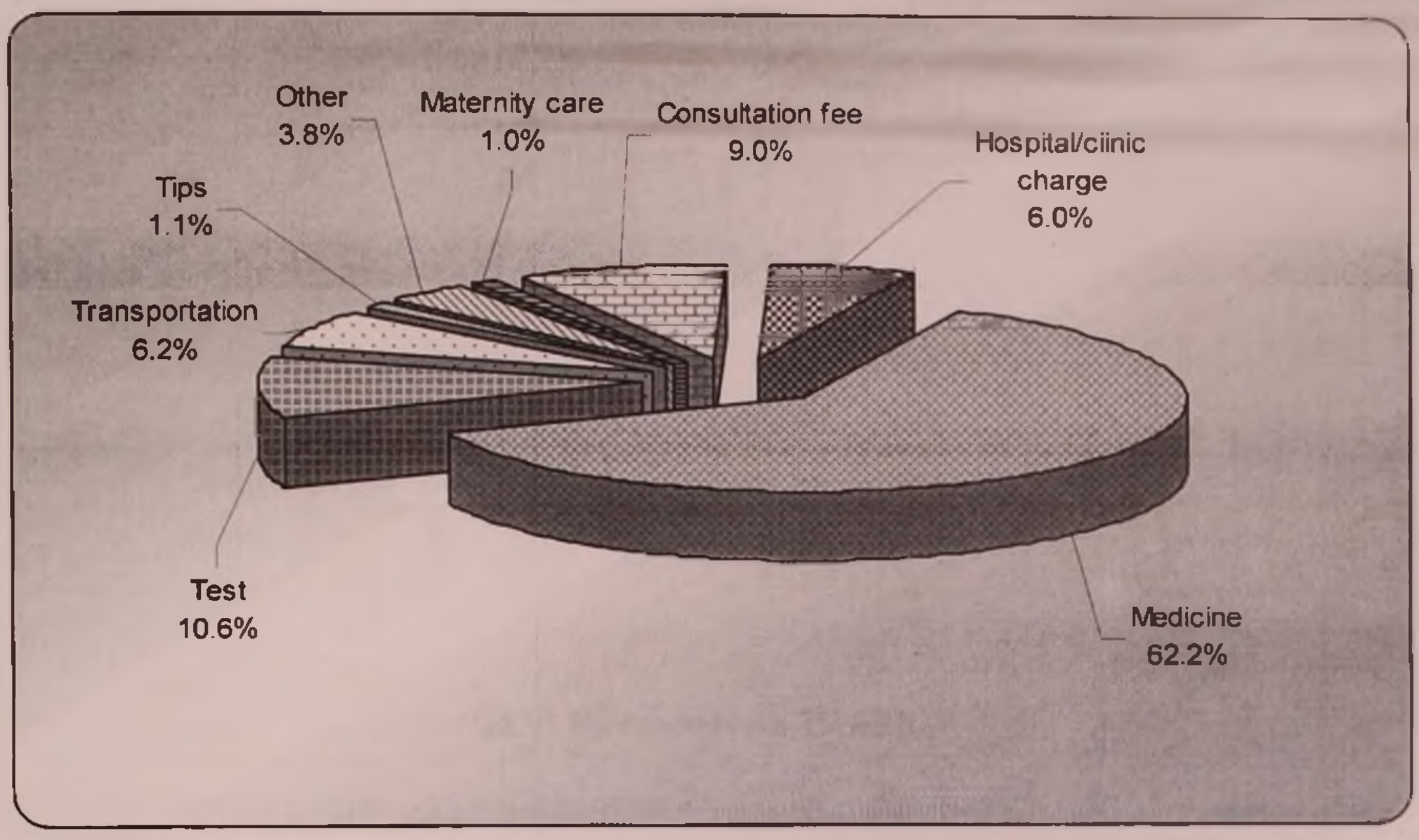
Source: Household Income Expenditure Survey 2005.

As public facilities are not a common destination for healthcare and not everyone seeks care at all; the resulting utilization rates of government facilities are quite low. In practice, public facilities are few and prospective patients are discouraged by crowded facilities, long waiting time and negligence by the provider. Consequently, private providers play an important role in the healthcare sector of Bangladesh. The poor usually prefer to seek healthcare from any unqualified or traditional providers since they are comparatively cheaper, easier to access and people are more familiar with these services.

8.2 Out of Pocket Payment for Healthcare

In Bangladesh, household out-of-pocket (OOP) health care expenditure comprises the largest share of Total Health Expenditure. Bangladeshi households collectively spent approximately Taka 103.46 billion ($1.49 billion) in 2007 on health. Translated into per capita estimate, an average Bangladeshi expends Taka 1,118 ($16.2) annually (MoHFW, 2010). High OOP expenditure on purchasing pharmaceuticals is the most distinctive feature in Bangladesh. Nearly 62 percent of the healthcare expenditure is on purchasing drug (**Figure 8.4**). The high proportion of expenditure on drug reflects high level of self treatment and self medication. A very distant second, in terms of share of households medical expenditure, is diagnostic and imaging (10.6%). Households also spend a significant portion of its income on transportation (6.2%).

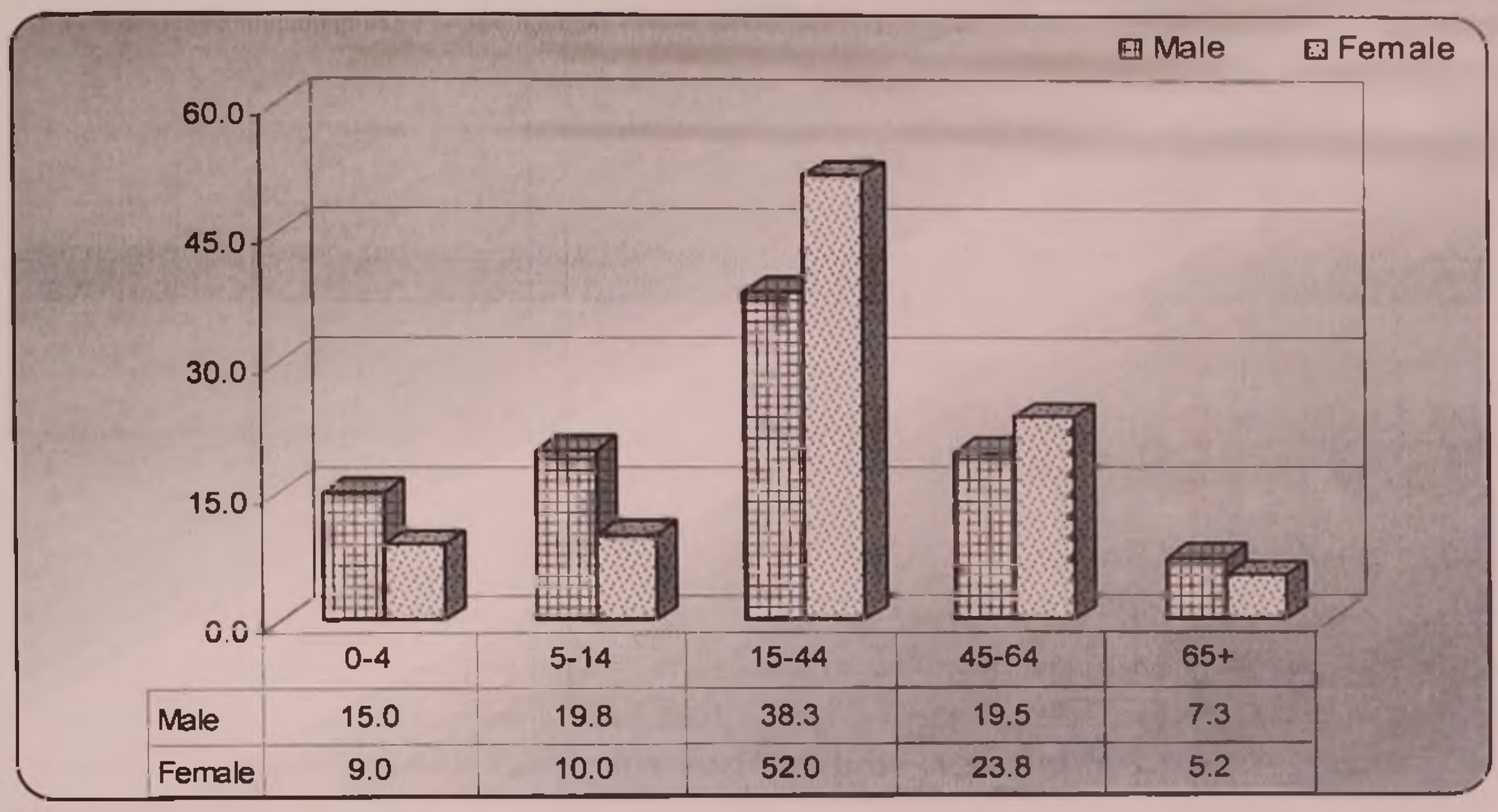
Figure 8.4: Distribution of OOP Payments on Health



Source: Household Income Expenditure Survey 2005.

From the disaggregated OOP payments for health by sex and broad age group (**Figure 8.5**), it is observed that significantly higher proportion (15.0%) of OOP payments on health is spent for their male children under 5 years as compared to their female counter part (9.0%). In general, males' share of OOP payments on health is higher for their children and elderly age groups. On the other hand, OOP payment on health for female of reproductive age group is significantly higher (52.0%) as compared to their male counterpart (38.3%). The disaggregation of the OOP payments on health by sex and broader age groups confirms the gender inequality in the spending for healthcare.

Figure 8.5: Share of OOP Payments on Health by Age and Sex

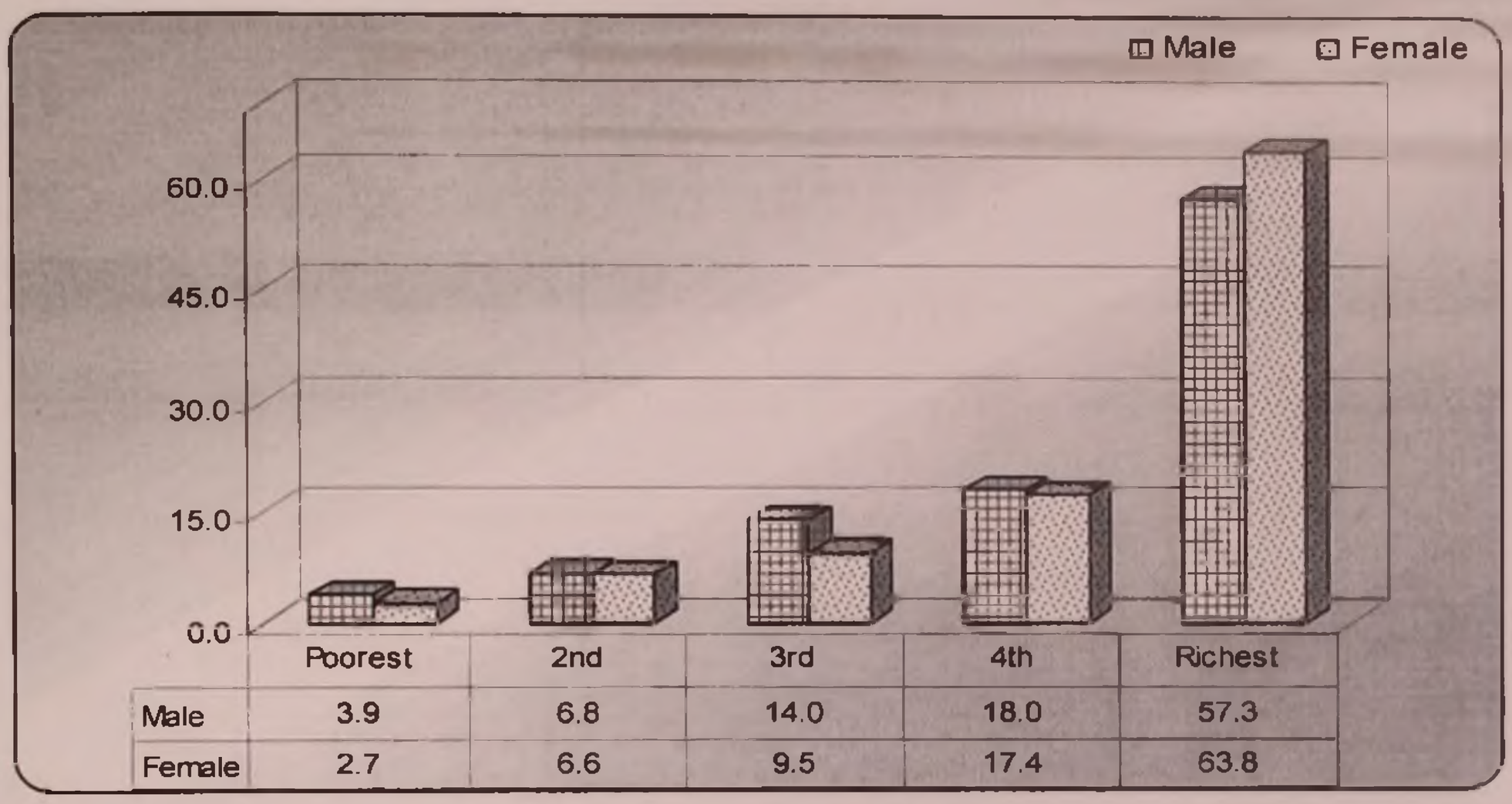


	0-4	5-14	15-44	45-64	65+
Male	15.0	19.8	38.3	19.5	7.3
Female	9.0	10.0	52.0	23.8	5.2

Source: Household Income Expenditure Survey 2005.

The distribution of the OOP payments on health by living standards and sex (**Figure 8.6**) reveals that among the poor households OOP payments on healthcare is higher for male (3.9%) as compared to their female counterpart (2.7%). In contrast, females' share of OOP payments on health for the richest quintile is higher (63.8%) as compared to their male counterpart (57.3%).

Figure 8.6: Share of OOP Payments on Health by Living Standards and Sex

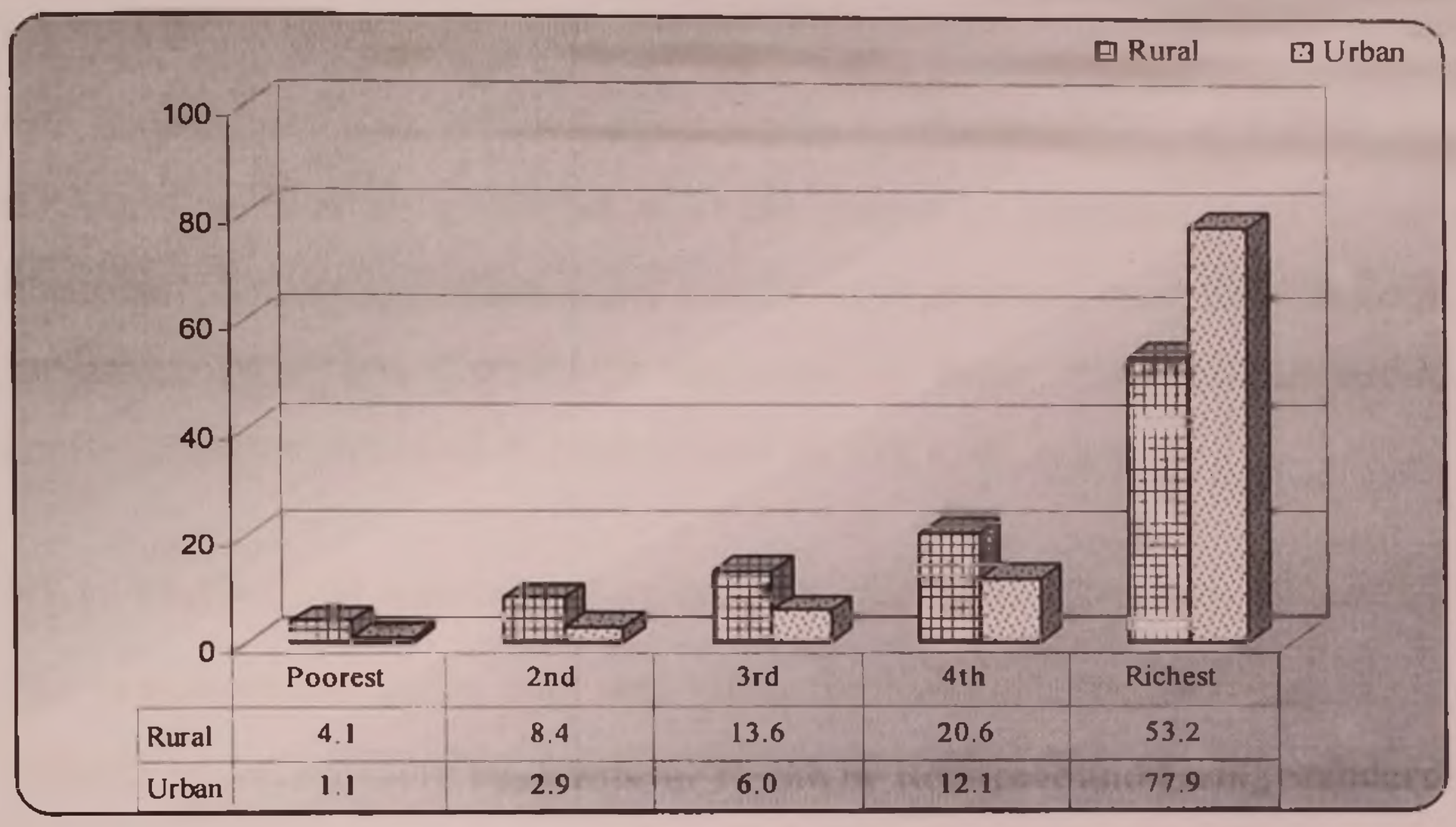


	Poorest	2nd	3rd	4th	Richest
Male	3.9	6.8	14.0	18.0	57.3
Female	2.7	6.6	9.5	17.4	63.8

Source: Household Income Expenditure Survey 2005.

The distribution of the OOP payments on health by residence and living standards (**Figure 8.7**) also reveals that among the poor households OOP payments on healthcare is higher for rural residence (4.1%) as compared to their urban counterpart (1.1%). On the other hand, urban peoples' share of OOP payments on health for the richest quintile is higher (77.9%) as compared to their rural counterpart (53.2%). As a result, OOP payment for health care has greater impact among the rural poor.

Figure 8.7: Share of OOP Payments for Health by Residence and Living Standard



	Poorest	2nd	3rd	4th	Richest
Rural	4.1	8.4	13.6	20.6	53.2
Urban	1.1	2.9	6.0	12.1	77.9

Source: Household Income Expenditure Survey 2005.

From the quintile share of the OOP payments on health as compared to their total income (proxy by consumption-expenditure per equivalent adult) it is observed that a household, on an average, spend 7.5 percent of its total income for healthcare. It is also important to note that the poorest 20 percent people spend approximately 3.5 percent of their income for purchasing health care, while the same for the richest 20 percent people is 10.5 percent. Further the rural people spend 7.7 percent of their income for health care as compared to 7.0 percent by their urban counterpart. Although the healthcare spending for the poor is less but it has greater opportunity cost. As a consequence, the cost of treatment has significant impact on the poor as compared to the rich.

OOP Payments on Health as % of Ability to Pay (ATP)

	OOP as % of ATP		
Quintiles	**Rural**	**Urban**	**Overall**
Poorest	3.5	3.3	3.5
2nd	4.6	4.4	4.5
3rd	5.4	4.7	5.3
4th	6.5	5.2	6.1
Richest	13.4	8.1	10.5
Overall	7.7	7.0	7.5

Source: Household Income Expenditure Survey 2005.

8.3 Equity in Payments for Healthcare

The distribution of healthcare payments in the form of Out of Pocket Payments (OOP) allows for an examination of the pattern of distribution of payments for healthcare. Equity in payments for healthcare is assessed by examining "who pays for healthcare?" and it could be evaluated by using concentration curves, Gini coefficient, concentration indices as well as Kakwani index.

8.3.1 Methods of Assessing Equity in Payments for Healthcare

The concentration index provides the quantitative measure of inequality of the variable under study across income groups, while the Gini coefficient assesses the inequality of income distribution across the entire population. The Kakwani index is defined as twice the area between a payments' concentration curve and the Lorenz curve and is calculated as, K = C - G, where C is the cost of healthcare concentration index and G is the Gini coefficient of the living standard variable. The value of K ranges from –2 to 1.

A negative number indicates regressivity; the payments concentration curve lies inside the Lorenz curve. A positive number indicates progressivity; the payments concentration curve lies outside the Lorenz curve. In the case of proportionality, the concentration coincides with the Lorenz curve and the index is zero (Wagstaff, A. E. Van Doorslaer et al, 1999).

Computation

Graphs are useful for detecting departures from proportionality and identifying their location in the distribution of payments. But visual inspection of progressivity across sources of finance, time or countries becomes difficult when there are a number of comparisons to be made. In such cases, summary indices of

progressivity are useful. Of these, the most widely used is the Kakwani index (Wagstaff, A. E. Van Doorslaer et al, 1999), which is directly related to the graphical method.

The simplest method of computing concentration and Gini indices is to make use of their direct relation to the covariance between the variable whose distribution is being described and households' fractional ranks in the ATP distribution (Jenkins, S., 1988 and Lerman, R.I. and Yitzhaki, S., 1989). Since a Kakwani index is the difference between a CI and a Gini, its value can be computed directly from one convenient regression of the form:

$$2\sigma_R^2\left[\frac{h_i}{\eta}-\frac{y_i}{\mu}\right]=\alpha+\beta R_i+u_i$$

Where h_i is a health payment variable for household i and η its mean, y_i is the ATP variable and its mean, R_i is the household fractional rank in the ATP distribution and σ_R^2 is the sample variance of the fractional rank. The OLS estimate of β is the Kakwani index. Where weighting is appropriate, the weights need to be applied in the calculation of all means, ranks and variances and then applied again in computation of the regression.

Database and Assumption

The progressivity analysis is performed based on Household Income Expenditure Survey (HIES) conducted by Bangladesh Bureau of Statistics (BBS). Since the current available version of HIES was conducted in 2005, we have to rely on the database with the assumption that no significant changes have taken place in the distribution of OOP payments for healthcare. Since changes in the country's healthcare expenditure in the following subsequent years are observed to be

gradual, results of the progressivity analysis for the current year are likely to be similar to 2005.

8.3.2 Who Pays for Healthcare?

Examining the distribution of OOP payments for healthcare by income quintiles, it is observed that the poorest 20 percent population who contributed 8.9 percent in income distribution holds 3.4 percent in the distribution of OOP payments for purchasing healthcare services (**Table 8.5**). In contrast, the richest 20 percent of the population who holds almost half of the income spend 57.5 percent for healthcare.

Table 8.5: Living standards and household OOP Payments for healthcare

Quintile	Living standards	Public	Private	Traditional/ unqualified	NGO	Total
poorest 20%	8.9	1.7	2.1	8.5	1.7	3.4
poor	12.4	5.6	4.7	17.8	3.3	7.6
middle	15.8	12.2	9.7	20.9	18.8	12.5
rich	21.0	15.9	17.9	23.7	34.5	19.0
richest 20%	41.9	64.6	65.6	29.1	41.7	57.5
Total	100%	100%	100%	100%	100%	100%
CI	0.33	0.60	0.62	0.21	0.50	0.57
Kakwani Index		0.27	0.29	-0.12	0.17	0.24

Source: Household Income Expenditure Survey 2005.

Judged by the Concentration Index (CI) as well as Kakwani index it is revealed that poor spend smaller share of their income for healthcare as compared to the rich (**Table 8.5**). While disaggregated the distribution of OOP payments on health by providers, it is observed that spending on traditional or unqualified providers impose more burden on poor as compared to the rich. Moreover, spending on public provider is more regressive as compared to the NGOs but less progressive as compared to private providers.

8.4 Incidence and Intensity of Financial Catastrophes

The term "catastrophic" mainly refers to the fact that falling ill can induce often sizeable and unpredictable shocks to the household's living standards. Clearly, the extent to which illness 'shocks' really result in catastrophic economic consequences for households depends not only on medical care costs, but obviously also on any effects from reduced labor supply and productivity, and on the extent to which households can 'smooth' their consumption over several periods (Gertler, P., 2001).

8.4.1 Methods of Analyzing Financial Catastrophes

The two key variables underlying the approach are: the health care payment variable whose catastrophic impact one wishes to assess; and a variable capturing the living standards of the persons to whom the payment applies.

The data have to be at the household level (e.g. household survey data), in which case one has, for each household, values of both the payments variable T and the living standards variable, which may be measured by prepayment income, x, or in terms of some measure of ability to pay, $y=x-D(x)$, where D(x) indicates necessary expenditure on items such as food. Catastrophic payments are then defined as those expenses for which the fraction T/x or T/y exceeds a pre-specified threshold z. The appropriate level of z is, to some extent, arbitrary and would clearly depend on whether living standards were measured by x or y. In this study results are presented for a variety of threshold values (5%, 10%, 15%, 25% etc.).

We present estimates of both the proportion of the population of households incurring catastrophic payments and the average magnitude of such payments. The former is referred to the catastrophic payment headcount (H_C) - the fraction of households for which $T_i / x_i > z$. The catastrophic payment overshoot or gap (O) is

the average degree by which payments (as a proportion of total consumption) exceed the threshold z. Define the excess or 'overshoot' as, $O_i = E_i ((T_i / x_i) - z)$, where, E_i equals 1 if $T_i / x_i > z$ and zero otherwise. Then the catastrophic payment headcount and average overshoot are given by:

$$H_C = \frac{1}{n}\sum_{i=1}^{n} E_i \text{ and } O = \frac{1}{n}\sum_{i=1}^{n} O_i, \text{ where n is the sample size.}$$

While H_C only captures the incidence of catastrophes, O also captures their intensity, in the form of the mean payment in excess of the threshold over all households incurring such payments. The latter is referred as the mean positive overshoot (MPO). Of course, $O = H_C * MPO$, the overall mean overshoot equals the fraction with catastrophic payments times the mean overshoot amongst those exceeding the threshold.

Limitations of the Approach and Way-out

All three statistics, H_C, O and MPO are computed for both measures of household resources - total consumption. These statistics are insensitive to whether poor or better-off households tend to incur catastrophic payments. This might be considered a weakness. For example, some may wish to place more weight on excess payments incurred by poorer households. In the case that the income elasticity of health care is greater than unity, i.e. it is a *luxury*, health care payments will be an increasing fraction of total household expenditure and it will tend to be the better-off households that exceed the payments' threshold. Then, it would be desirable to distinguish between households spending relatively large amounts on health care because they can afford it and others that are forced to make such expenditures, at the expense of other goods of vital importance, because of the severity of the medical problem they face.

To describe the living standards related distributions of the incidence and the intensity of catastrophic payments, Wagstaff and van Doorslaer (2003) propose to compute concentration indices for E_i and O_i, defined as C_E and C_O respectively. A positive value of C_E indicates a greater tendency for the better-off to exceed the payments' threshold, while a negative value indicates that the worse-off are more likely to exceed the threshold. Similarly, a positive (negative) value of C_O indicates a greater intensity of overshoots amongst the better-off (worse-off).

The statistics H_C, O, C_E and C_O describe the prevalence, the magnitude and the distribution of catastrophic payments. It can be useful to examine summary statistics that reflect both the level and the distribution of payments. One alternative is to multiply the catastrophic headcount or overshoot by the complement of the associated concentration index Wagstaff and van Doorslaer (2003). i.e.,

$$WH = H_C(1 - C_E).$$

It turns out that this statistic is equivalent to a weighted sum of the catastrophic payment indicator variable E_i, with weights declining linearly from 2 to 0 as one move from the worst-off to the best-off household. If households exceeding the threshold tend to be poorer, the concentration index C_E will be negative, and WH will be greater than H_C. By contrast, if the *better-off* tend to exceed the threshold, C_E will be positive, and H_C will overstate the problem of the catastrophic payments as measured by WH. The same approach is used to define a weighted mean catastrophic payment gap as,

$$WO = O(1 - C_O)$$

Database and Assumption

Like progressivity analysis the threshold analysis is also performed based on Household Income Expenditure Survey (HIES) 2005. Since changes in the country's healthcare expenditure in the following subsequent years are observed to be gradual, results of the catastrophic healthcare payments analysis for 2007 are likely to be similar to 2005.

8.4.2 Financial Catastrophes of Healthcare Payments

The analysis of the headcount measures as well as intensity of catastrophic payments for various threshold levels reveals that approximately 29.2 percent of the households spend more than 5 percent of their total resources for health care (**Table 8.6**). Although the headcount of households making catastrophic payment certainly fall with the increase of thresholds, but still a larger number of households making excess payments for health care.

Table 8.6: Headcount and Gap of Catastrophic Out-Of-Pocket Payments

Indices	Threshold level			
	5%	*10%*	*15%*	*25%*
Headcount measures				
Headcount (Hc)	29.2%	15.3%	9.5%	4.5%
Concentration index of headcount (C_E)	0.10	0.20	0.27	0.45
Rank weighted headcount (WH)	26.3%	12.2%	6.9%	2.5%
Gap measures				
Overshoot (O)	3.1%	2.0%	1.4%	0.8%
Mean Positive overshoot (MPO)	10.6%	13.4%	15.1%	17.3%
Concentration index of overshoot (C_O)	0.34	0.43	0.52	0.70
Rank weighted gap (WO)	2.1%	1.2%	0.7%	0.2%

Source: Household Income Expenditure Survey 2005.

Moreover, the MPO statistic also shows that amongst those spending more than 5 percent of total income on OOP health care payments, on an average, the OOP share exceeds this threshold by 10.6 percentage points (**Table 8.6**). In other wards,

the average percentage of total income devoted to OOP payments is 10.6 percent. In contrast, however, 4.5 percent of households devote more than one quarter of their total income to direct payment for health care and, within this group, the average OOP share is 17.3 percent. As a result, it can be said that the excess payments, as a share of the total income, are preliminary concentrated among the well-off households.

In summary, approximately 17.6 percent of the country's population has reported illness or injury during 30 days prior to the survey date. The percentage of ill respondents who seek healthcare is high among the non-poor (88.9%) against 78.1 percent among the extremely poor. The incidence of seeking any care for female is consistently lower among all income groups. But, the difference is notably higher among the poorest segment of the population (78.4% for male against 71.1% for female). A significant portion of people of Bangladesh relies on unqualified or traditional providers (6.3%) including pharmacy/drug stores (39.4%). While, only 7.3 percent of the sick people have reported to go to a public provider.

A household, on an average, spends 7.5 percent of its total income for healthcare. The poorest 20 percent people spend approximately 3.5 percent of their income for purchasing health care, while the same for the richest 20 percent people is 9.3 percent. The OOP payments for healthcare thus showing some degree of progressivity (Kakwani index equals 0.24) and the excess payments, as a share of the total income, are primarily concentrated among the well-off households. Although the share of healthcare spending on household income for the poor is less but it has greater opportunity cost. Further, the cost of treatment has greater impact on the rural poor.

The current chapter examines whether health care payment imposes any burden on the poor. At this stage, it is essential to examine the degree of the impact of OOP payments for health on the economic condition of the poor. The next Chapter 9 analyzes the impact of good health on productivity and also assesses the impact of health on poverty.

CHAPTER 9: IMPACT OF HEALTH ON POVERTY

Healthier people are more productive and they can obtain better goods and services to shape their environment in ways that make them healthier through improvement of their living standards (William and Schultz, 1998). Improving the living standards of population is a widespread societal objective. The basis of living standards is the ability of individuals to earn wages, salaries and profits in order to purchase goods and services for consumption. In turn, wages, salaries and profits reflect the value of the goods and services produced in an economy and the productivity of the factor inputs used to produce them. The correlation between labor productivity and real wages is quite high, indicating the importance of productivity growth rates for the improvement of a country's living standards (Harris, 1999). As a result, researchers have focused much attention on better understanding the determinants of productivity growth in recent days. There is an increasing awareness that human capital is a key factor for the growth of productivity. Although human capital has been interpreted as education and skills, however, increasing attention has also been given to health as a form of human capital (Emile Tompa, 2002).

Good health is not only an end in itself, but also a means of achieving individual and social development goals. 'Health is wealth' is part of the indigenous knowledge of any society; however, it is only recently that health has been put at the centre of the development agenda (Bhuiya A, 2005). Poor health, in contrast, leads to less productivity. Poor health also pushes the individuals into impoverishment and the poverty tramp.

Against the above background, this chapter examines the potential impact of health on productivity and assesses the burden of OOP healthcare expenditure

towards poor through the degree to which payments for healthcare disrupt level of living standards and/or impoverish households.

9.1 Selected Indicators of the Study Population

The assessment of the potential impact of good health on poverty as well as productivity are conducted for the years 2005 and 2000 based on the two available nationally representative Household Income Expenditure Surveys (HIES) for the respective years. According to HIES 2005, the total population of Bangladesh in 2000 has been 138.8 million of which 50.3 percent are male and the remaining 49.7 percent are female (**Table 9.1**). On the other hand HIES 2000 reveals that the total population of Bangladesh in 2000 was 126.1 million of which 51 percent are male and the remaining 49 percent are female. Bangladesh is pre-dominantly rural - nearly 75 percent of the total population live in rural areas; which was 79 percent in 2000.

Table 9.1: Population, Working Age Population and Average Household Size

Sl. #	Indicators	HIES 2005	HIES 2000
1	Population (in million)	138.8	126.1
2	Rural population (in %)	75.3	79.3
	Male population (in %)	50.3	50.7
3	Sex ratio (males per 100 females)	101.3	103.2
4	Population aged 15-64 years (in %)	58.9	56.3
5	Average household size	4.84	5.18

Source: Household Income Expenditure Survey 2005 and 2000.

Table 9.1 also shows that the working age group population constitutes 58.9 percent of the total population in 2005, while the same was 56.3 percent in 2000 representing 4.6 percent increase between 2000 and 2005. The average household size in 2005 has been estimated to 4.8, which was 5.2 in 2000.

Literacy rate is notably higher in urban areas as compared to the rural areas of Bangladesh (**Table 9.2**). In urban areas, 67.6 percent of the urban population (7

years and above) in 2005 were found literate. In contrast, only 46.7 percent of the rural population were literate. However, the literacy rate has improved by 7 percent point in 2005 as compared to 2000. It is important to note that the employment rate in 2000 was 47.6 percent, which has decreased to 44.2 percent in 2005. Access to sanitation is also high in urban areas as compared to the rural areas. Although access to sanitation has improved in 2005 as compared to 2000, but it is still very low as only 24.4 percent of the countries population has access to sanitary latrine throughout the country.

Table 9.2: Literacy Rate, Employment rate and Access to Sanitation

Sl. #	Indicators	HIES 2005	HIES 2000
1	Literacy rate (% of population 7 years and above)		
	National	51.9	44.9
	Rural	46.7	40.9
	Urban	67.6	60.2
2	Employment rate (in %)	44.2	47.6
3	Access to sanitary latrine (in %)		
	National	24.4	14.3
	Rural	20.1	9.9
	Urban	36.2	31.5

Source: Household Income Expenditure Survey 2005 and 2000.

Both the household income and expenditure have increased in 2005 as compared to 2000 (**Table 9.3**). In 2005, the household income was estimated at Taka 7,203 as compared to Taka 5,842 in 2000, thereby indicating 23.3 percent increase during the period. It is interesting to note that more than a half of the income is concentrated to the top 20 percent of the population (richest quintile) in both the years 2000 and 2005. Further, Gini coefficient has not changed remarkably between 2000 and 2005.

Table 9.3: Comparison of Selected Economic Indicators

Sl. #	Indicators	HIES 2005	HIES 2000
1	Average monthly household income (in taka)		
	National	7,203	5,842
	Rural	6,096	4,816
	Urban	10,463	9,878
2	Average monthly household consumption expenditure (in taka)		
	National	5,964	4,542
	Rural	5,165	3,879
	Urban	8,315	7,149
3	Income share of top 20% population (in %)	52.7	52.0
4	Income Gini Co-efficient	0.467	0.451
5	Land less (in %)	45.8	48.0
6	OOP payments on health as % of income (in %)	7.5	6.7

Source: Household Income Expenditure Survey 2005 and 2000.

The poverty incidence is significantly higher in the rural areas as compared to the urban areas in both the years 2000 and 2005. In 2005, 40.0 percent of the population subsist below the national poverty line (upper poverty line defined by BBS); while the same was 48.9 percent in 2000, indicating 1.8 percent decrease per annum during the same period (**Table 9.4**). Although poverty headcount has decreased between 2000 and 2005, the average calorie intake per person per day had not been changed at all.

Table 9.4: Comparison of Poverty Status

Sl. #	Indicators	HIES 2005	HIES 2000
1	Population below lower poverty line (in %)		
	National	25.5	33.7
	Rural	29.3	37.4
	Urban	13.7	19.4
2	Population below upper poverty line (in %)		
	National	40.0	48.9
	Rural	43.8	52.3
	Urban	28.4	35.2
3	Average per capita per day Calorie (K.Cal.) intake	2,238	2,240

Source: Household Income Expenditure Survey 2005 and 2000.

9.2 Health and Productivity

The potential participants in the labor market aged between 15 and 64 years are included in the multivariate analyses. Corrections are made for participation in the labor force using the censored Tobit model. Finally, the impact of health is evaluated through internal rate of return to health.

9.2.1 Methods of Analyzing the Impact of Health on Productivity

Measurement of Health

In comparison with other forms of human capital, measurement of an individual health status is particularly difficult. The state of an individual's health (H*) can be measured through a hidden variable that is not observed and is only approximated by health indicators (H). Presumably, the illness to an individual occurs when the individual is more susceptible to poor health. In other wards, if H* is the real and unobservable measure of health status, then:

$$G = \begin{cases} 1 & if \quad H^{*} < H^{c} \\ 0 & if \quad H^{*} \geq H^{c} \end{cases}$$

where, G is the proposed dichotomized health variable and H^{C} is a certain critical level of physical strength of an individual constitution. Below H^{C}, the individual falls ill.

In most of the household surveys, health indicators such as reported illness; number of days ill and/or days when an individual is too ill to work are usually considered. One of the simplest ways of measuring health status of the individuals is to consider the reported illness or the length of illness (D). However, this simplest indicator of health does not capture inter personal health differences at

all. It is, however, important to take into account that the description of health based on days ill would be censored for values greater than H^C. Despite differences between the health conditions of individuals who have not fallen ill, the indicator D attributes to the same value zero to all of them. An additional distortion associated with days of illness is that individuals tend to round off their responses, thereby erasing differences between individual whose illnesses are similar in length. The tendency of rounding off is stronger for longer illness while, accurate responses are more probable for short illnesses. In addition, the severity of recent illness will be necessarily under-estimated since the particular episode may not have conducted at the time of the survey interview.

A dichotomous variable recording episodes of recent illness avoids this potential distortion; however all sensitivity to the severity or type of illness is lost. In any event, the longer the interval defined in the survey (e.g.', the past month vs. the past week), the more reliable is its approximation to the true health condition. The usefulness of turning to the past is also explained by the importance of previous health conditions. Since, due to the intra-personal variations, the human organism can, in the short term, maintain productivity despite adverse health condition (Behrman, 1990). The longer the recall period, it reduces the sensitivity of the indicators.

However, all these indicators are usually subject to measurement errors. Such measurement errors bias the estimated impact of health towards zero. Measurement errors are especially significantly when the available information about health status is self-reported by individual respondents (Cortez, 2000). Perception of individual's health could be inconsistent across a population set in ways that are systematically correlated with other characteristics. For instance, individuals with more education ore greater access to health facilities may be more

likely to detect and report symptoms of illness. In an equation designed to explain the determinants of health, these effects could confuse the impact of such determinants. The subjectivity of self-reported data can also generate heteroskedasticity in health equation because the variability of the measurement error could depend on some of its explanatory variables as well.

In practice, the selection of the best indicator of state of health is usually "resolved" by the absence of better alternatives in most of the available household surveys (Cortez, 2000). Even so, a number of studies find that the most frequently used indicators are usually highly correlated. Moreover, cross-country comparisons between the databases from the Philippines, Brazil, Ghana and Mexico reveals that the occurrence of illness as well as number of days ill are "useful" approximations of indicators based on weight and height (Haddad et al., 1994).

Simultaneity between Health and Productivity

The estimate of the impact of health on productivity is complex because the relationship between wages and health is not one-way. While health is a form of human capital that promotes productivity, wage (W) also affects health in at least three ways. First, and most obviously, higher income favors positive health conditions when these are considered as normal consumer goods. That is, the capacity to earn more permits greater consumption of heath "inputs" like food or medicine.

Second, higher productivity can generate incentives to alter specific behaviors. For example, productivity can lead to an individual to overwork until it undermines the person's health. Alternatively, the family might decide to dedicate

a greater portion of its available resources for strengthening the health of the most productive member of the household.

Third, individuals may have specific characteristics that affect both their health and productivity. These might be unalterable traits (e.g., physical situation) that are exogenous and random. If these characteristics are not observed in the estimation and controlled for, then they will enter into the respective error terms of the estimated equation – e_W for the wage equation and e_H for the health equation. However, when the equations are viewed as simultaneous and estimated together, those two errors are corrected but the resulting estimates become biased. This is an inherited problem of simultaneity.

The errors may be systematically correlated if the same "endowment" or characteristic that facilitates greater productivity also permits the individual to conserve a batter state of health. Such a systematic correlation can also arise from individual choices. For example, any characteristic that increases productivity and earnings also creates incentives to make additional investment in strengthening health. Those characteristics that are unobserved will influence the error term in the health equation and introduce further bias.

Household Model Incorporating Health

Due to measurement errors of health and their simultaneity with respect to wages or the endogenous character of health variable, it is necessary to correct health with instrumental variables. The form of health production function considered in this study is:

$$H = b_0 + b_1 X_H + b_2 X_W + e_H$$

where, the error term e_H includes the measurement error. Furthermore, the explanatory variables are divided into those X_H that affect only health status and

not wages and those X_W that affect both health status and wages. Unless sufficient good variables are found for X_H, the instrumental variable technique will be ineffective.

Moreover, the wage equation presents selectivity bias that has to be corrected by the Heckman two-stage estimation procedures (Heckman, 1979 and Lee, 1983). The equation that predicts the decision to participate in the labor market (LM) includes the explanatory variables of market wage, health and a set of variables (X_L) that identify the system. The wage is not directly included in the estimation since it is not observed when the individual does not participate in the labor market and it is endogenous when the individual is employed. As a consequence, wage is replaced by its predicted value based on the variables (X_W).

Similarly, health is replaced by its expectation based on a set of variables (X_H). Thus the wage equation is corrected for the selection bias by the Heckman term derived as:

$$LM = LM(W, H^*, X_L) \qquad or \qquad LM = LM(X_W, X_H, X_L)$$

Finally, in order to include health as a form of human capital in the wage function, the final model[21] for measuring the effect of good health on productivity leads to:

$$\ln(W) = \alpha_0 + \alpha_1 X_W + \alpha_H H^* + \varepsilon_W$$

in which X_W is a set of variables that affect wage, H* denotes the corrected state of health of an individual and ε_W is a random error term. A semi-logarithmic

[21] Detailed derivation as well as explanation of the model is provided in Cortez, 2000: *"Health and Productivity in Peru: Estimates by Gender and Region"*. In Wealth from Health: Linking Social Investments to Earnings in Latin America. Latin American Research Network. Inter-American Development Bank. 2000.

specification is used since it is the most common specification found in the empirical studies of returns to human capital.

Strategy of Econometric Estimation

In this empirical study, the sample is divided by location to estimate separate wage and health equations for urban and rural areas. To consider the geographical differences, the wage and health functions are also estimated separately for each geographical area. The dependent variables used in the simultaneous equation system are 'days of illness' and 'Natural logarithm of individual hourly wage'. Moreover, the explanatory variables used in the analysis include: (i) age, education, sex, socio-economic status and OOP payments for health care at the individual level (ii) living standards, residence, sanitation, access to electricity and other utilities at the household level and (iii) unemployment rate, health subsidy and number of doctors at the upazila/district level. The determination of the explanatory variables X_W, X_H and X_L also follow the usual method in the literature. The definition of all the variables used in the analysis is presented in the Annex Table A17.

However, the health variable is rather critical to estimate. It is used both as the independent variable in the first-stage regression and as an explanatory variable in the wage equation. In the study, health is indicated as the number of days ill reported in past 30 days prior to the Household Income Expenditure (HIES) interview. Even since this variable is truncated at 0, it is not easy to distinguish health status among the respondents who reported no days ill. Rather than assuming a linear relationship between days ill and the explanatory factors, and extrapolating these relationships through the entire sample, a transformation with declining marginal impact is adopted. The transformation is:

$$H = \frac{1}{(1+D)}$$

where D is equal to the reported number of days ill. For 0 days ill, this health status variable is equal to 1. Since the variable is necessarily censored at 0, a censored Tobit estimation is used for estimating the determinants of health (Tobin, 1958).

The proposed health indicator has the advantage of showing a marginally decreasing impact for days of illness. This characteristic is convenient because of the tendency to round off when individuals cannot remember the exact number of days of illness, which as previously mentioned, is more likely for prolonged illness. The indicator (H) reduces the importance of variations in the reported days as this number increases.

In addition to the health variable, the wage equation includes age, years of education and the quadratic terms of both. These terms consider possible nonlinear effects. The wage variable X_W also incorporates two additional variables: residence in the capital city and the local unemployment rate. The latter variable is intended to capture inter-district differences in labor markets. However, the wage equation is estimated without the health variable. Then the health variable is included without and with corrections.

In order to analyze the impact of public health investments on individuals, it is important to consider the access to medical care by the individuals. Even though, the access to health services is not considered because the person or family endogenously determines this. Utilization of such services are obviously determined by personal income, the opportunity cost of time, personal health status, perception of the quality, effectiveness of the services, among other thinks

that are known by the individuals. But not all of these determinants of health services are known from the survey. As a consequence, the number of doctors per person in each district proxies the availability of health services independent of the individual decisions to utilize those or not. The quadratic term of the same variable is also included to observe the possible nonlinear effects.

The inclusion of district level number of doctors per capita solves the problem of endogeneity with regards to families and individuals, but presents another problem of endogeneity at the community level. Moreover, in Bangladesh, the public healthcare establishments appear to have been built and concentrated at particular locations. Such distribution of public healthcare facilities throughout the country is due to the problems of political viability and the strength of powerful interest group beyond the interest in beneficiating the poorest, (Rosenzweig and Wolpin, 1986 and Pitt et al., 1995). This would generate a downward bias in the estimated impact of public health services on individuals' health. This bias is not possible to correct in the analysis due to the lack of effective instrumental variables. As a result, the results have to be viewed cautiously due to the possibility of downward bias.

Internal Rate of Return

In the study the health (H) is measured by:

$$H = \frac{1}{(1+D)}$$

where, D is equal to the reported number of days ill. As a result, the return to health is measured as the percentage impact on hourly wages of one less day of illness at the mean. The Internal Rate of Return (IRR) to health[22] is then given by:

[22] For further detail please refer to Cortez, 2000. "Health and Productivity in Peru: Estimates by Gender and Region". In Wealth from Health: Linking Social Investments to Earnings in Latin America. Latin American Research Network. Inter-American Development Bank. 2000.

$$\frac{\delta w}{\delta D} = \frac{\delta w}{\delta H} \times \frac{\delta H}{\delta D} = \frac{-\alpha_H}{(1+D)^2}$$

or equivalently,

$$\frac{\delta w}{\delta D} = w \times \frac{\delta \ln w}{\delta H} \times \frac{\delta H}{\delta D} \quad = \frac{-\alpha_H}{(1+D)^2} \times w$$

where,

α_H = coefficient of health indicator (H) in the wage equation,

D = sample average of number of days ill, and

w = sample average of individuals' hourly wage.

9.2.2 Impact of Health on Productivity

The impacts of health on the productivity are estimated independently for urban and rural residents who are likely to participate in the labor force. In the beginning, Weighted Least Squares Regression analyses for both the rural and urban areas were conducted to establish the relationship between productivity (natural logarithm of hourly wage) and health (number of days ill) keeping other explanatory variables e.g. age, sex, education, residence, etc. controlled. But, the coefficient of health was found insignificant[23]. This is probably due to the simultaneity between health and productivity. In order to overcome the situation, the health variable is corrected through instrumental variables and the determinants of health are obtained by using Censored Tobit model. Finally, the coefficients in the wage model are corrected by using Heckman two-stage estimation procedure. The results of health determinants based on the corrected model and the impact of health on productivity for the years 2005 and 2000 are discussed below.

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[23] The results are presented in the Annex Table A18.

Health and Productivity, 2005

The analysis of the determinants of health shows that age is inversely associated with health status in both the rural and urban areas in the year 2005 (**Table 9.5**). As a consequence, the impact of age is always negative with respect to health. Moreover, the health condition of women is significantly inferior among both rural and urban residences. Education has a positive impact that could be associated with better use of knowledge and available inputs, leading to better health. On the other hand, poverty has negative impact on health. As expected, use of sanitary latrine has positive impact on health status both in rural and urban areas. In contrast, access to supply water in urban areas has unexpectedly negative impact on health.

Public healthcare subsidies seem to have positive impact on the health status of both rural and urban residents. Besides, number of qualified doctors per capita is highly significant in both rural and urban areas for explaining health status of the individuals. The negative coefficients of number of doctors per capita may confirm the fact that the poor quality and low coverage of the public healthcare provision does not explain a substantial part of the gain in health. Further, community conditions are relevant determinants of individuals' health status. Surprisingly, people living in Dhaka tend to have worse health condition. This tendency could be the result of living conditions of the study population. Most of the daily wage earners in the Dhaka city leave in the slum areas lacking access to healthy living conditions.

Table 9.5: Censored Tobit Estimates of Health Determinants by Region, 2005

Independent variables	Rural		Urban	
	Coefficient	p-value	Coefficient	p-value
Constant	2.67	0.00	2.94	0.00
Individual characteristics				
Age	-0.68	0.00	-0.01	0.01
Sex	0.25	0.00	0.27	0.00
Household head	-0.23	0.00	-0.25	0.00
Variables of Human Capital				
Education	0.01	0.00	0.02	0.00
Household living standards				
Number of rooms per capita	-0.20	0.00	-0.10	0.13
OOP payments for healthcare (10^-2)	-0.02	0.00	-0.03	0.00
Non-labor income (10^-4)	0.53	0.00	0.13	0.03
Measure of living standards	-0.03	0.00	-0.02	0.00
Housing infrastructure				
Access to supply water	-0.38	0.06	-0.27	0.00
Use sanitary latrine	0.22	0.00	0.08	0.05
Regional Variable				
Residence in Dhaka	-	-	-0.44	0.00
Health infrastructure				
Public health subsidy (10^-2)	0.12	0.00	0.43	0.00
Number of doctors	-2.62	0.00	-6.14	0.00
Number of doctors squared	4.19	0.00	6.73	0.00
Model summary				
Number of observation	17,982		10,968	
LR Chi-square	746.7		1041.1	
Prob > chi^2 (p-value)	0.00		0.00	

Note: Dependent variable is H = 1/(1+number of days ill).

While analyzing the determinants of health it is observed that health has significant positive impact on productivity in both the rural and urban areas (**Table 9.6**). Further, the younger people are more likely than the elders to report higher wage. In contrast, education has significant negative impact on the productivity in both rural and urban areas. Moreover, high unemployment rate is unexpectedly associated with high wage in the labor market. These positive effects are also statistically significant. The analysis of the findings also reveals that women are

more likely to report higher hourly wage as compared to their men counterpart. and the difference is comparatively more evident in the rural areas. Moreover, the residence in the capital city has significant negative impact on the productivity.

Table 9.6: Wage Determinants of Rural and Urban Residents, 2005

Independent variables	Rural		Urban	
	Coefficient	p-value	Coefficient	p-value
Constant	5.00	0.00	3.07	0.00
Individual characteristics				
Age	-0.07	0.00	-0.04	0.00
Age squared (10^-2)	0.06	0.00	0.04	0.01
Sex	-4.52	0.00	-1.54	0.00
Variables of Human Capital				
Education	-0.07	0.00	-0.06	0.00
Education squared (10^-2)	0.32	0.05	0.06	0.46
Health indicator	0.25	0.04	0.19	0.00
Variables of local market				
Residence in Dhaka	-	-	-0.27	0.00
Unemployment rate	4.50	0.00	1.03	0.09
Selection term	-3.12	0.00	-1.68	0.00
Model summary				
Number of observations	17,982		10,968	
Chi-square	5313.1		2473.5	
Model significance (p-value)	0.00		0.00	
Rate of return on health	***8.2%***		***5.5%***	

Note: Estimates are OLS corrected by the Heckman two-stage estimate for participation in the labor force; the dependent variable is the natural logarithm of hourly wage.

The magnitude of the impact of health on productivity for the year 2005 is positive in both rural and urban areas (**Table 9.6**). The rate of return on health in rural areas is higher (8.2%) as compared to 5.5 percent in urban areas. As a result, improvements in health conditions have a greater impact in rural areas when corrected for endogeneity as well as for measurement errors.

Health and Productivity, 2000

The analysis of the findings for the year 2000 also reveals that age is inversely associated with health status in both the rural and urban areas, while education has a positive impact on the same (**Table 9.7**). On the other hand, poverty has negative impact on health. Non-labor family income per capita is significant only for rural residents. The access to sanitary latrine has positive impact on health of urban residents, while access to supply water in the urban area has an unexpectedly negative coefficient.

People living in Dhaka tend to have better health. Moreover, public healthcare subsidies seem to have negative impact on the health status of rural residents, but insignificant for urban people. Number of qualified doctors per capita is negatively associated with the health status of the individuals both in rural and urban areas.

Table 9.7: Censored Tobit Estimates of Health Determinants by Region, 2000

	Rural		Urban	
Independent variables	**Coefficient**	**p-value**	**Coefficient**	**p-value**
Constant	1.44	0.00	1.91	0.00
Individual characteristics				
Age	-1.60	0.00	-0.02	0.00
Sex	-0.19	0.00	-0.20	0.00
Household head	-0.17	0.00	-0.17	0.00
Variables of Human Capital				
Education	0.05	0.00	0.06	0.00
Household living standards				
Number of rooms per capita	0.00	0.84	0.05	0.12
OOP payments for healthcare (10^-2)	-0.02	0.00	-0.01	0.00
Non-labor income (10^-4)	0.14	0.00	-0.01	0.67
Measure of living standards	-0.01	0.00	-0.02	0.00
Housing infrastructure				
Access to supply water	0.20	0.00	-0.52	0.00
Use sanitary latrine	0.00	0.87	0.05	0.01
Regional Variable				
Residence in Dhaka	-	-	0.27	0.00
Health infrastructure				

Independent variables	Rural		Urban	
	Coefficient	p-value	Coefficient	p-value
Public health subsidy (10^-2)	-0.01	0.00	-0.01	0.26
Number of doctors	-0.25	0.04	-0.76	0.01
Number of doctors squared	0.33	0.02	0.56	0.08
Model summary				
Number of observation	14,470		7,440	
LR Chi-square	7954.5		3473.3	
Prob > chi^2 (p-value)	0.00		0.00	

Note: Dependent variable is H = 1/(1+number of days ill).

Similar to the findings for the year 2005, good health has significant positive impact on productivity in 2000 (**Table 9.8**). Further, the younger people are more likely than the elders to report higher wage, while education is adversely associated with the productivity in both rural and urban areas. The analysis of the findings also reveals that men are more likely to report higher hourly wage as compared to their female counterpart, and the difference is comparatively more evident in the rural areas.

Table 9.8: Wage Determinants of Rural and Urban Residents, 2000

Independent variables	Rural		Urban	
	Coefficient	p-value	Coefficient	p-value
Constant	1.41	0.05	3.21	0.00
Individual characteristics				
Age	-0.14	0.00	-0.13	0.00
Age squared (10^-2)	0.17	0.00	0.17	0.00
Sex	3.64	0.00	2.16	0.00
Variables of Human Capital				
Education	-0.10	0.00	-0.08	0.01
Education squared (10^-2)	0.55	0.01	0.59	0.00
Health indicator	0.85	0.02	0.52	0.05
Variables of local market				
Residence in Dhaka	-	-	0.09	0.35
Unemployment rate	4.21	0.00	1.49	0.16
Selection term	-3.09	0.00	-2.77	0.00
Model summary				

Independent variables	Rural		Urban	
	Coefficient	p-value	Coefficient	p-value
Number of observations	14,470		7,440	
Chi-square	3246.4		1123.0	
Model significance (p-value)	0.00		0.00	
Rate of return on health	***10.4%***		***10.0%***	

Note: Estimates are OLS corrected by the Heckman two-stage estimate for participation in the labor force; the dependent variable is the natural logarithm of hourly wage.

The magnitude of the impact of health on productivity is positive in both rural and urban areas. This implies that fact that improvements in health conditions would have a greater impact on the productivity of the daily wage earners in both rural and areas.

9.3 Catastrophic Impact of OOP Payments for Healthcare on Poverty

In recent days, analysis of health care payments has been getting importance due to their potentially impoverishing effect. OOP payment for health care is unpredictable by nature and large expenditure can be sufficiently costly for the poor as it disrupts living standards. Due to health care payments many people are pushed into the poverty and for those who are already poor may be pushed further below the poverty line. Poverty impact analysis provides the intensity of catastrophic impact of OOP payments for healthcare on the living standards.

9.3.1 Methods of Measuring Incidence and Intensity of Poverty Impact

The basic ingredients for poverty impact analysis are a measure of living standards, a poverty line and a measure of out-of-pocket (OOP) payments for health care. Living standards are measured by the value of household consumption per capita. The national poverty lines – both lower and upper are used to assess the poverty impact of household health care payments.

As a part of computation, at first we compare household consumption including OOP health care expenditure with the poverty line that allows for health care needs. This gives an estimate of pre-payment poverty. At the second step, we repeat the comparison but netting out health care payments from household consumption. This provides a measure of post-payment poverty. Comparison of prepayment and post-payment poverty gives an estimate of the poverty impact of health care payments.

In order to estimate the impact of the OOP health care expenditure we calculate the poverty headcount ratio. The head count ratio is simply the fraction of households falling below the poverty line (H_P) defined as follows:

$$H_P = \frac{1}{N}\sum_{i-1}^{N} P_i$$

where, P_i is equal to 1 if the i^{th} household's consumption is less than the value of poverty line; PL and is zero otherwise. The average poverty gap is therefore defined as:

$$G = \frac{1}{N}\sum_{i-1}^{N} P_i\left(PL - x_i\right)$$

To facilitate comparison of poverty gaps computed for different poverty lines, it is useful to express the mean gap as a multiple of the poverty line. This is known as the normalized poverty gap and defined as:

$$NG = \frac{G}{PL}$$

The final statistic that have examined is the mean consumption shortfall of the poor – the mean positive poverty gap that is defined as:

$$MPG = \frac{G}{H_P}$$

Each of the four statistics H_P, G, NG and MPG are computed twice. Once on the basis of a measure of household living standards gross of OOP payments for health care and again net of such payments. Measures of poverty impact (PI) of health payments are then simply estimated by the difference between the respective poverty headcount and gap statistics gross and net of health payments.

Database and Assumption

The poverty impact analysis is performed based on Household Income Expenditure Survey (HIES) 2005 as well as HIES 2000 both conducted by Bangladesh Bureau of Statistics (BBS). As a measure of poverty line, both the national poverty lines based on the HIES are used. The national poverty lines are based on Cost of Basic Needs (CBN) method. In the CBN method, the poverty lines represent the level of per capita expenditure at which the household members are expected to meet their basic needs of both food and non-food requirements.

9.3.2 Impact of Health on Poverty

The assessment of the catastrophic impact of OOP payments for health care on poverty is also conducted for the years 2005 and 2000. The analysis is based on the two available nationally representative Household Income Expenditure Surveys (HIES) for the respective years.

The analysis of the findings for the year 2005 shows that at national level approximately 25.5 percent of the population are living on less than the equivalent of lower poverty line (**Table 9.9**). For the upper poverty line the poverty incidence is 40 percent. Health care payments push more than 4.2 percent population below the lower poverty line. An apprehensive difference of poverty impact is also apparent in urban and rural locations. In rural 29.3 percent of the population are already living below lower poverty line. Health care expenditures push another 4.5

percent population below the poverty line. On the contrary, only 13.7 percent of the urban population are lying below the lower poverty line and OOP health care payments push reasonably a smaller fraction (3.5%) to the poverty. However, household OOP payment for health care has notable impact on poverty in rural areas as compared to the urban.

Table 9.9: Poverty Impact of OOP Payments by Region, 2005

Region		Poverty headcounts (in %)	
		Lower PL	Upper PL
Rural	Pre-payment	29.3	43.8
	Post-payment	33.8	49.2
	Poverty impact	4.5	5.4
Urban	Pre-payment	13.7	28.4
	Post-payment	17.2	33.1
	Poverty impact	3.5	4.7
National	Pre-payment	25.5	40.0
	Post-payment	29.7	45.3
	Poverty impact	4.2	5.3

Source: Household Income Expenditure Survey 2005.

In the year 2000, approximately 33.7 percent of the population at the national level are living below the lower poverty line, while 49.8 percent are living below upper poverty line (**Table 9.10**). Health care payments push 4.4 percent population below the lower poverty line and add another 4.9 percent population to the upper poverty line. In rural 37.4 percent of the population are already living below lower poverty line. Health care expenditures push another 5.0 percent population below the poverty line. On the other hand, 19.1 percent of the urban population are lying below the lower poverty line and OOP health care payments push another 2.4 percent to the poverty. Like 2005, household OOP payments for health care also have a notable impact on poverty in rural areas as compared to the urban in 2000.

Table 9.10: Poverty Impact of OOP Payments by Region, 2000

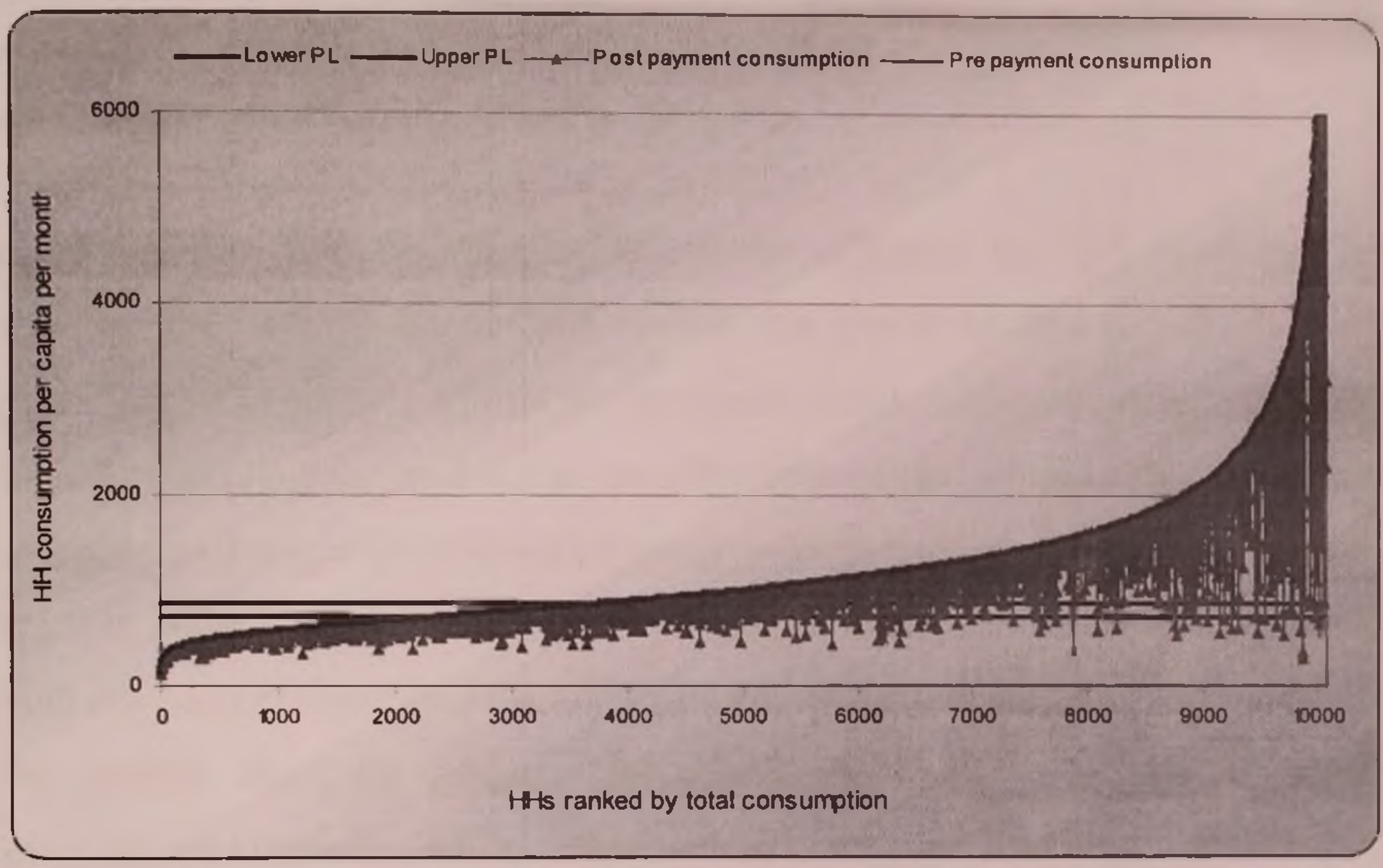
Region		Poverty headcounts (in %)	
		Lower PL	Upper PL
Rural	Pre-payment	37.4	53.1
	Post-payment	42.4	58.6
	Poverty impact	5.0	5.5
Urban	Pre-payment	19.1	36.6
	Post-payment	21.5	39.4
	Poverty impact	2.4	2.8
National	Pre-payment	33.7	49.8
	Post-payment	38.1	54.7
	Poverty impact	4.4	4.9

Source: Household Income Expenditure Survey 2000.

The gaps, normalized poverty gaps and poverty impact of OOP healthcare payments for both the years 2005 and 2000 are also presented in the **Annex**.

The impact of health care payments on poverty for the year 2005 is also shown graphically (**Figure 9.1**), which plots household consumption (before and after out-of-pocket payments) along the y-axis and the cumulative percentage of households ranked by pre-payment income along the x-axis. Reading off the pre and post- payment parade at both the lower and upper poverty line gives the fraction of people living below poverty.

Figure 9.1: Pen Parade: Pre-payment and Post-payment Consumption, 2005



Source: Household Income Expenditure Survey 2005.

The Pen's parade demonstrates how households at different levels of living standards are affected by OOP health payments (**Figure 9.1**). Some are pulled below the poverty line, some stay above while others who were below are pushed further below and made poorer. The figure also shows that out-of-pocket spending occurs across the entire consumption distribution but the greater payments occur primarily among the better-off households. This reconfirms the fact that, the poor just can not spend so much on OOP health payments simply because they cannot manage to pay for and thus forgo the medical treatments.

In brief, individual characteristics (e.g. age, sex), education, living standards, public healthcare subsidies as well as number of qualified doctors per capita are highly significant for explaining health status of the individuals. The public healthcare subsidies seem to have positive impact on the health status. But, the

negative coefficients of number of doctors per capita may confirm the issue of absences of the doctors in their duty locations and thus does not explain a substantial part of the gain in health.

A comparative analysis of the determinants of health for both rural and urban residents between 2000 and 2005 reveals that public healthcare subsidies in the year 2005 have positive impact on the health status, while the same was negative in 2000. This implies the fact that the allocation of the public healthcare resources in 2005 has been improved significantly as compared to the resource allocation made in 2000. Further, the negative coefficients of number of doctors per capita in both the years confirm that the distribution of the healthcare service provision over the country does not consider the health needs of the people by different geographical regions. As a consequence, the poor coverage of the public healthcare service provision over the country fails to ensure the substantial gain in health sector.

In both rural and urban areas, good health seems to have significant positive impact on productivity. In contrast, education has significant negative impact on the productivity in both rural and urban areas. The analysis of the findings of 2005 reveals that the rate of return on health in rural areas is higher (8.2%) as compared to 5.5 percent in urban areas. Moreover, from the comparisons of the rate of returns in health between 2000 and 2005 it is observed that the rate of return in health has notably decreased in 2005 as compared to 2000. On the other hand, investment in health still has a greater impact to increase the productivity in rural areas.

In 2005, approximately 25.5 percent of the population are living on less than the equivalent of lower poverty line. For the upper poverty line, the poverty incidence

is 40 percent. Health care payments push another 4.2 percent population into the extreme poverty. On the other hand, in 2000, approximately 33.7 percent of the population at the national level are living below the lower poverty line, while 49.8 percent are living below upper poverty line. Health care payments push 4.4 percent population in to extreme poverty. In rural 37.4 percent of the population are already living below lower poverty line. It is also important to note that OOP payment for health care has a devastating impact on poverty in rural areas as compared to the urban. Further, a comparison of poverty impact of OOP payment for healthcare between 2000 and 2005 shows that more people have been pushing towards poverty due to healthcare payments in 2005 as compared to 2000 particularly in urban areas. This implies the failure in targeting public resources for the poor in urban areas.

The current chapter concludes that health care payments have adverse impact on the poverty. Since public health care system provides free or subsidized services, it should be served as the safety net for the people especially for the poor and disadvantaged groups. Therefore, the next Chapter 10 deals with the effects of public health care resources on equity as well as poverty reduction.

CHAPTER 10: EFFECTS OF PUBLIC HEALTHCARE RESOURCES ON EQUITY AND POVERTY REDUCTION

Payments towards health care, apart from securing access to health services, may also redistribute income. While such redistribution may be intended or unintended, it is important to know the degree to which it occurs because of consequences for the distribution of goods and services other than health care. Keeping this in mind, this chapter examines the impact of the public healthcare system on equity as well as poverty reduction through the redistributive effect of public healthcare spending.

10.1 Redistributive Effect of Public Healthcare Spending

Evaluation of the redistributive effect of public healthcare spending provides the basis to examine whether public health care resources have any significant role in reducing the inequality prevailing in the health sector of the country. However, the redistribution can be vertical and horizontal. The former occurs when payments are disproportionately related to ability to pay. The extent of vertical redistribution can be inferred from measures of progressivity. Horizontal redistribution occurs when persons with equal ability to pay contribute unequally to health care payments.

10.1.1 Methods of Decomposing Redistributive Effect

One way of measuring the redistributive effect of any payment on the distribution of incomes is to compare the inequality – as measured by, for instance, the Gini coefficient – of pre-payment income with the inequality in post-payment incomes. The redistributive impact can be defined as the reduction in the Gini coefficient caused by the payment. Thus

$$RE = G^{X} - G^{X-P}$$

where G^X and G^{X-P} are the pre-payment and post-payment Gini coefficients respectively, where X denotes pre-payment income, or more generally some measure of ability to pay (cf Wagstaff, A. and E. Van Doorslaer, 2001), and P denotes the payment. Aronson, Johnson and Lambert (1994) have shown that this difference can be written as:

$$RE = V - H - R$$

where, V is vertical redistribution, H is horizontal inequity and R is the degree of reranking. In order to be able to distinguish and compute these components, one needs to artificially create groups of pre-payment equals. This is done by defining certain pre-payment income intervals, and then labeling all households with incomes in that range as equals. All households within an interval are attributed to the mean within interval income, x_j. Then V itself can be decomposed into a payment rate effect and a progressivity effect,

$$V = \left(\frac{g}{(1-g)}\right) K_E$$

with g the sample average payment rate (as a proportion of income), and K_E is the Kakwani index of payments computed under the assumption of within-group equality, i.e. that all households in the same (pre-defined) bandwidth of (equal) pre-payment income everyone pay the same amount (i.e. under horizontal equity conditions).

Horizontal inequity H is measured by the weighted sum of the group (j) specific post-payment Gini coefficients, G_j^{X-P}, where weights are given by the product of the group's population share and its post-payment income share, α_j.

$$H = \sum_j \alpha_j G_j^{X-P}$$

Note that, because the Gini coefficient for each group of prepayment equals to non-negative, H is also non-negative. This simply implies that any horizontal inequity will always make a post-payment distribution of incomes more unequal than it would have been in its absence. Finally, R captures the extent of re-ranking of households which occurs in the move from pre-payment to post-payment income distributions. It is measured as the difference between the post-payment Gini coefficient G^{X-P} and the post-payment concentration index C^{X-P}. The latter differs from the former in that households are ranked by their pre-payment income, not by their post-payment income.

$$R = G^{X-P} - C^{X-P}$$

Note again that R cannot be negative, because the concentration curve of post-payment income cannot lie below the Lorenz curve of post-payment income. The two curves coincide (and the two indices are equal) if no re-ranking occurs. The arbitrary choice of income grouping will not affect the total H+R but it will affect the relative subdivision between both. In general, the larger the intervals (or the smaller the number of groups), the more horizontal inequity (i.e. greater H) but the less re-ranking (i.e. smaller R) (Wagstaff, A. and E. van Doorslaer, 1997).

In all, the total redistributive effect can be decomposed into four components: an average rate effect (g), the departure-from-proportionality or progressivity effect (K_E), a horizontal inequity effect H and a re-ranking effect R. While the distinction between H and R proves to be arbitrary, and therefore less relevant, since it is dependent on the choice of grouping intervals, more relevant for policy purposes is the distinction between the two components (g and K_E) of the vertical effect V. In effect, the vertical redistribution generated by a given level of progressivity is 'scaled' by the average rate g.

Database and Assumption

The assessment of redistributive effect of OOP payments for healthcare is based on the Household Income Expenditure Survey (HIES) 2005 and 2000 by BBS. In order to assess the impact of public healthcare spending on equity the redistributive effect of OOP payments for healthcare in the absence of public healthcare spending is assessed. As the healthcare services in the public facilities are free or nominal fees are charged, it is assumed that the household healthcare payments would be increased in the absence of public healthcare facilities. As a result, to find the impact of the public healthcare spending, the district level public healthcare expenditure per capita is added with the household OOP payment for healthcare.

Individual or Household Level?

Like an analysis of income inequality and poverty impact, a decomposition analysis can be performed either at the level of the individual or at the level of the household. While the household is taken as the sharing unit for incomes and payments (and both are therefore assumed to be shared equally among household members), the number of people affected by a household's income and payments differs depending on the household size. If the objective of the analysis is to measure the inequalities in incomes between households irrespective of their size, then it suffices to use household sample weights in the analysis (Van Doorslaer, E., et.al., 1999). All households with the same sample weight then only count for one, independent of the size of the household. If, on the other hand, the objective is to take varying household sizes into account, then all household observations may be weighted (i.e. multiplied) by household size. This is simply achieved by using either the household size or – if sample weights are available – the product

of the sample weight and the household size as weights in the analysis. This procedure will ensure that larger households carry more weight in the analysis.

This decomposition analysis is performed at the household level and population weights are used to ensure that each household gets appropriate weight based on the household size. The population weight is measured as the product of the sample weight and the household size.

10.1.2 Effect of Public Healthcare Spending on Equity

A demonstration of the total redistributive effect of out-of-pocket payments for health care indicates that health outlays induce a positive total redistributive effect (**Table 9.7**). This confirms the fact that the public finance of health care brings about redistribution from rich to poor and hence inequality reducing. It is important to note that vertical redistribution is very large in comparison with the total redistribution. If there were no horizontal inequity, redistribution from rich to poor would be 73.5 percent greater than its actual magnitude. The positive value of the Kakwani index also indicates that the OOP payment for health care is progressive.

When public healthcare subsidy per capita is deducted form the households, it is observed that OOP payments are regressive i.e. poor would pay more in relation to their income. In the absence of public healthcare financing its redistributive effect would be negative (i.e. inequality-increasing) because the remaining variability in such payments at similar levels of income would induce some horizontal inequity and re-ranking (**Table 10.1**). It implies that the vertical redistribution would be from poor to rich, and horizontal inequity and re-ranking would add a further 27.3 percent of the redistribution in that direction.

Table 10.1: Decomposition of Redistributive Effect of Public Healthcare Finance, 2005

Indices		With Public Spending	Without Public Spending
Redistributive effects	RE	0.0097	-0.0446
Mean fraction of prepayment income spent on health care	g	7.5%	18.6%
Kakwani index	KE	0.208	-0.142
Vertical redistribution effect	V=[g/(1-g)] *KE	0.017	-0.032
Horizontal inequity	H	0.000	0.001
Re-ranking	R=Gx-p - Cx-p	0.007	0.011
V as % of RE	(V/RE)*100	173.5%	72.7%

Like the redistribution effect in 2005 the public finance of health care in 2000 is also found to be inequality reducing and thus brings about redistribution from rich to poor (**Table 10.2**). If there were no horizontal inequity, redistribution from rich to poor would be 68.3 percent greater than its actual magnitude. The positive value of the Kakwani index also indicates that the OOP payment for health care is progressive. Further, in the absence of the public health care finance, its redistributive effect would be negative (i.e. inequality-increasing) and the poor would pay more in relation to their income. It implies that the vertical redistribution would be from poor to rich, and horizontal inequity and re-ranking would add a substantial portion (68.7%) of the redistribution in that direction. As a consequence, persons with equal ability to pay would contribute unequally to health care payments.

Table 10.2: Decomposition of Redistributive Effect of Public Healthcare Finance, 2000

Indices		With Public Spending	Without Public Spending
Redistributive effects	RE	0.0093	-0.0287
Mean fraction of prepayment income spent on health care	g	6.7%	14.4%
Kakwani index	KE	0.218	-0.054
Vertical redistribution effect	V=[g/(1-g)] *KE	0.0157	-0.0090
Horizontal inequity	H	0.000	0.001
Re-ranking	R=Gx-p - Cx-p	0.006	0.018
V as % of RE	(V/RE)*100	168.3%	31.3%

10.2 Effect of Public Healthcare Spending on Poverty Reduction

In order to assess the impact of public healthcare spending on poverty the per capita subsidy of MoHFW is deducted from the households and the pre and post payment poverty headcount ratios are compared (**Table 10.3**). The analysis of the findings reveals that OOP payments for healthcare add 4.2 percent of the population below the lower poverty line and the same is 5.3 percent for the upper poverty line. When MoHFW's per capita spending is subtracted from the households' welfare, poverty impact of OOP payments for healthcare increase to 5.4 percent and 5.9 percent for the lower and upper poverty lines respectively. As a consequence, in the absence of the public healthcare system, another 0.7 percent of the population would be pushed into the lower poverty and 0.6 percent into the upper poverty lines. This implies the fact that, public healthcare system serves as a safety net for the extreme poor.

Table 10.3: Incidence of Poverty and Poverty Impact of MoHFW's Spending, 2005

Poverty headcounts		Poverty headcounts (in %)	
		Lower PL	Upper PL
With MoHFW spending	Pre-payment	25.5	40.0
	Post-payment	29.7	45.3
	Poverty impact	4.2	5.3
Without MoHFW spending	Pre-payment	25.5	40.0
	Post-payment	30.4	45.9
	Poverty impact	5.4	5.9
Impact of MoHFW's spending		0.7	0.6

The impact of public healthcare spending on poverty is also assessed for the year 2000 (**Table 10.4**). The analysis of the findings reveals that in 2000 OOP

payments for healthcare add 4.4 percent of the population below the lower poverty line and the same is 4.9 percent for the upper poverty line. It is also important to note that in the absence of the public healthcare system, another 0.8 percent of the population would be pushed into extreme poverty, while 0.6 percent would be added to the upper poverty line.

Table 10.4: Incidence of Poverty and Poverty Impact of MoHFW's Spending, 2000

Poverty headcounts		Poverty headcounts (in %)	
		Lower PL	Upper PL
With MoHFW spending	Pre-payment	33.7	49.8
	Post-payment	38.1	54.7
	Poverty impact	4.4	4.9
Without MoHFW spending	Pre-payment	33.7	49.8
	Post-payment	38.9	55.3
	Poverty impact	5.2	5.5
Impact of MoHFW's spending		0.8	0.6

In summary, the demonstration of the total redistributive effect of out-of-pocket payments for health care in both the years 2000 and 2005 indicates that healthcare system induce a positive total redistributive effect. In the absence of public healthcare financing its redistributive effect would be negative i.e. inequality-increasing. This confirms the fact that the public finance of health care brings about redistribution from rich to poor and hence reduces inequalities in the health sector. Further, the out of pocket payments for healthcare seem to be more regressive in 2005 as compared to 2000 and, in the absence of public health care subsidies, the out of pocket payments for healthcare would be more regressive in 2005 as compared to the situation in 2000.

It is important to note that in the absence of the public healthcare system, another 0.7 percent of the population in 2005 would be pushed into the lower poverty and 0.6 percent into the upper poverty lines. In contrast, in the absence of the public healthcare system, another 0.8 percent of the population would be pushed into extreme poverty, while 0.6 percent would be added to the upper poverty line. As a result, public healthcare system serves as a safety net for the extreme poor in both the years. But, the magnitude of the impact of public healthcare spending on poverty reduction is hardly changed between 2000 and 2005. This also confirms the fact that poor do not get benefits from public health care system up to the desired level.

CHAPTER 11: SUMMARY, CONCLUSION AND RECOMMENDATIONS

This chapter concludes with a discussion on the summary of the key findings, conclusions, recommendations, policy implications and scope for further research. Before focusing on these aspects, a brief description on the justification, objectives, hypothesis and methodology of the study needs to be made so that the readers may have an overview of the whole study at a glance.

11.1 Background

The Government of Bangladesh (GoB) is committed to provide quality health care services to improve the health status of the people, especially the poor. Despite public resources devoted to this task are limited. Further, its efforts to provide healthcare services at the various levels free of cost, has, however, not led to desired level of the use of services. As a result, out-of-pocket payments for healthcare become sufficiently costly in Bangladesh. A well-off household can finance medical expenses from savings, or by cutting back on luxury items of consumption. But, a less well-off household is forced to cut back on necessities and may be pushed into poverty. Households that are already poor may be pushed further below the poverty line. In addition, many forgo such expenses, which increase the extent of morbidity and thereby lose their productivity.

In the recent years, many researchers stated that public healthcare system plays an important role in reducing the inequalities prevailing in the health sector. It also reduces the income loss of the people specially the poor and hence serves as the safety net for the poor and hardcore poor who seek health care services from the public healthcare facilities. However, many researchers also argue against its role in ensuring equity and poverty reduction process. According to them, the overall health status of the population in Bangladesh is still low. Further, public healthcare

system is not successful in benefiting the poor at the desired level due to low utilization rate. Against this backdrop, the prime intention of the study was to examine ***whether*** public healthcare system serves as a safety net for the extreme poor through the nationwide subsidized program and helps overall poverty reduction process.

11.2 Issue and Its Importance

The broad issue of the study was to assess ***to what extent*** the public healthcare system reduces inequity and poverty through reduced disease burden and healthcare expenditure as well as increased productivity. The study also evaluated to what extent out-of-pocket payments for healthcare disrupt level of living standards of the people and push them into poverty.

The findings of the study would allow the policy makers in designing efficient poverty reduction strategies through improving health status of the people specially in the underserved as well as unserved areas. Further, the impact of health on productivity as well as poverty would help them to formulate possible multi sectoral interventions for sustainable economic development in the country.

11.3 Hypothesis and Objectives

The present study hypothesized that public healthcare system plays a vital role in reducing the health sector inequalities. It also serves as a safety net for the extreme poor and helps overall poverty reduction process. As a result, effective expansion of public health care programs has redistributive benefits as poor gets more benefits from public healthcare subsidies. The study also hypothesized that improved health status causes increase in productivity, while

catastrophic payments for healthcare push a significant portion of the population into poverty trap.

The broad objective of the study was to assess the effects of public healthcare system on equity and poverty reduction in Bangladesh. The specific objectives of the study were to: (i) examine the equity in healthcare finance; (ii) examine the current resource allocation system and link the existing system with poverty and health needs by geographic locations; (iii) develop an econometric model to identify the poor for health care resources; (iv) identify the people getting benefits from public healthcare spending; (v) evaluate the impact of health on productivity; (vi) examine the economic burden of out-of-pocket payments for healthcare on the hardship of the people; and (vii) assess the effect of public healthcare spending on equity and poverty reduction.

11.4 Methodology

The study was based on secondary data. The study primarily utilized three nationally representative surveys – Household Income Expenditure Survey (HIES) 2005, Household Income Expenditure Survey (HIES) 2000, and Health and Demographic Survey (HDS) 2000. All these surveys were conducted by Bangladesh Bureau of Statistics (BBS). The study also utilizes different published documents, reports, research articles including Bangladesh National Health Accounts (NHA) and Public Expenditure Reviews (PER) conducted by Health Economics Unit (HEU) of Ministry of Health and Family Welfare (MoHFW). Further, a number of analytical tools and econometric models were used in the study. They include: (i) geographical resource allocation, (ii) benefit incidence analysis (BIA), (iii) proxy means testing (PMT) model, (iv) progressivity analysis, (v) analysis of catastrophic healthcare payments, (vi) impact of health on

productivity, (vii) impact of health on poverty, and (viii) decomposing the redistributive effect of public healthcare payments.

An analysis of public health sector resource allocation has been made to assess whether the existing allocation of MoHFW across districts and lower level facilities were based on the health needs of the respective geographical location. For allocating public resources to a typical geographical location/district, the total target allocation of that district was obtained as the product of need and cost factors (e.g. burden population, mortality rate, severe malnutrition, population density and headcount ratio). In addition, the benefit incidence analysis (BIA) has identified whether the public health care subsidies are well targeted to the poor individuals. BIA described the distribution of health sector subsidies across individuals ranked by their living standards. The target efficiency of the BIA has been assessed by estimating concentration index and Kakwani index for public services. Proxy Means Testing (PMT) is a scientific technique that serves as a tool to identify beneficiaries of social programs. It has identified the program benefits by asking easy-to-collect household or individual characteristics other than income as there is a high chance of understate their incomes if they wish to qualify for the subsidy benefits.

The main purpose of the progressivity analysis was to establish the extent to which the costs of healthcare are proportional to ability to pay (ATP) and hence provides the measure of equity in the health sector. The equity has been assessed by using concentration curves, Gini coefficient, concentration indices as well as Kakwani index. While, analysis of financial catastrophe of healthcare payments provides the proportion of households spends more than a catastrophic threshold point and whether the excess payment is concentrated to the well-off or impose financial burden to the poor.

The analysis of the impact of health on productivity has established the relationship of good health of individuals with their productivity. The impact of health on the productivity has been estimated for the citizens who are likely to participate in the labor force. In this analysis, the health variable has been corrected through instrumental variables and the determinants of health are obtained by using Censored Tobit model. Further, the coefficients in the wage model had been corrected by using Heckman two-stage estimation procedure. Finally, the impact of health on productivity has been assessed by estimating the internal rate of return (IRR) to health.

The main purpose of poverty impact analysis was to identify the diminishing effect of OOP payments for health care to households' living standards. The basic ingredients for poverty impact analysis have been: a measure of living standards, a poverty line and a measure of out-of-pocket (OOP) payments for health care. Measures of poverty impact (PI) of health payments have been then simply estimated by the difference between the respective poverty headcount and gap statistics gross and net of health payments.

Finally, decomposing redistributive effect of health care payments have provided the impact of the payments on the distribution of income. In this study, redistributive effect of health care payments has been analyzed to assess the role of public healthcare system in enhancing health equity as well as poverty reduction process. The redistribution can be vertical and horizontal. The former occurs when payments are disproportionately related to ability to pay. The extent of vertical redistribution can be inferred from measures of progressivity. Horizontal redistribution occurs when persons with equal ability to pay contribute unequally to health care payments.

The study has few *limitations*. The secondary data analyses based on the BBS conducted household survey are the researcher's own calculation. As a consequence, many indicators of this study may not coincide with the indicators published in different BBS publications. However, the differences are not substantial. Moreover, a few indicators (e.g. number of doctors per capita by districts, standardized mortality rate) used in the need based resource allocation model are not up to date. For these indicators this study relied on a World Bank study published in 2005.

11.5 Summary of Findings

The findings of the study are expected to contribute significantly to the planners and policy makers as a theoretical framework and would guide for effective future policy making in health sector of the country. The main findings of the study are summarized below:

The Total Health Expenditure (THE) for Bangladesh was estimated at Taka 160,899 million ($2,331 million) in 2007. The per capita spending on health was Taka 393 ($9.2) in 1997 and Taka 1,118 ($16.2) in 2007, implying nearly three fold increase during the period. Further, THE as a percent of GDP was 3.65 percent in 2007. The main sources of financing for health care in the country have been the household (64.3%) followed by public sector (25.7%) in 2007. From a poverty-related perspective, the most striking aspect of current health care financing in Bangladesh has been the large share of out-of-pocket payments. For those who seek health care when they are ill, the direct costs of getting such care have accounted for a considerable portion of total households' income. From the analysis of the share of OOP health care payments as compared to their total

income, it is observed that a household, on an average, spends 7.5 percent of its total income for healthcare.

Although the constitution of Bangladesh assures equal access to good healthcare to all, public resources devoted to this task are limited. GoB spent only 0.94 percent of Gross Domestic Product (GDP) on health care in 2007. Further, the current allocation of public healthcare resources is made neither based on regional health needs nor it takes into account poverty status by geographical locations. The analysis of the findings reveals that on an average a very poor district receives Taka 192 per capita only where its actual need is Taka 276 per capita. On the other hand, a non-poor district, on an average, receives more resources (Taka 209 per capita) as compared to its actual need estimated at Taka 31 per capita.

While investigating the beneficiaries of public healthcare subsidies, it is observed that the poorest 20 percent of the population receive only 19.1 percent of the total public healthcare subsidy and the richest 20 percent receive approximately one third of the total subsidy. The subsidy distribution is roughly proportional. Although poor receive comparatively more benefits from the primary level facilities but the extent of benefits from secondary as well as higher level public facilities does not achieve the desired level. Targeting health care subsidy to the poor requires effective identification of both poor and non-poor households. To this end, the per capita income of a household can be considered as a measure of its welfare. However, measurement of household income or expenditure requires expensive and time consuming surveys in a poor country like Bangladesh. An alternative method to measure household welfare is to administer a proxy-means test (PMT) formula. The PMT model developed for Bangladesh suggests that it can identify the poor with a 94 percent degree of accuracy. The ability of the model to correctly identify such a high percentage of the poor implies that the

model can be replicated with considerable confidence for offering public health care services to the poor.

In Bangladesh, there has been a major improvement in the number and distribution of healthcare facilities. There has been a significant improvement in the doctor-population ratio and population per hospital bed, between 2000 and 2010. But, along with the inadequate supply of the healthcare providers, there has been an imbalance in the distribution as well. The urban concentration of physicians, nurses and health technologists is a persistent problem in the health system. There has been also a great imbalance in the mix of health workforce, with nurses being in very short supply. It is generally accepted that the ratio of nurse to doctor should be 2:1, i.e. two nurses for one doctor. Current estimates have showed that that the ratio of nurse to doctor is the reverse of what should have been the case. There also appears to be a great shortage of midwives compared with the need exemplified by low ANC and supervised delivery rates. Further, the supply of medical staff relative to demand has been clearly inadequate as compared to the existing health needs.

The utilization rate of public healthcare facilities has been quite low – only 7.3 percent of the patients reported to seek treatment from the public facilities. This incidence is even worst among the poor (6.9%) and the extremely poor (5.5%). As public facilities are not a common destination for healthcare and not everyone seeks care at all; the resulting utilization rates of government facilities are quite low. In practice, public facilities are few and prospective patients are discouraged by crowded facilities, long waiting time and negligence by the provider. The time and expense of transportation to public facility and relatively high price of allopathic medicine have led to self-treatment, services from homeopaths, traditional healers and quacks of the poor. Consequently, private providers play an

important role in the healthcare sector of Bangladesh. Moreover, the poor of the country are less likely than the rich to select any modern medical provider when reporting sickness. As a result, they preferred to seek healthcare from any unqualified or traditional providers since they are comparatively cheaper, easier to access and people are more familiar with these services.

Typically, both the incidence and the intensity of catastrophically high OOP payments have concentrated among the better-off, when measured as a proportion of total income. But a larger number of households still make excess payments for health care. This implies the fact that payments must be made not only for initial contact but large payments must be incurred for the treatment of serious conditions. As a result, the risk of financial catastrophe incurred because of health problem is much greater. However, Bangladesh manage to maintain a higher concentration of both the incidence and intensity of OOP payments among the richer households, thereby shielding the poorer segments of their population against the risk of financial catastrophe because of illness. Alternatively, the pro-rich incidence of higher OOP expenditure may be due to the rich only being able to afford higher shares of health care (mainly drug) expenditure. But, it is not clear to what extent the pro-rich distribution of catastrophic incidence in Bangladesh is due to the exemption schemes for lower income groups for public care user charges.

A comparative analysis of the determinants of health between 2000 and 2005 reveals that public healthcare subsidies in the year 2005 have positive impact on the health status, while the same had negative impact in 2000. This implies the fact that the allocation of the public healthcare resources in 2005 has been improved significantly as compared to the resource allocation made in 2000. Further, the negative coefficients of number of doctors per capita in both the years confirm that

the distribution of the healthcare service provision over the country does not consider the health needs of the people by different geographical regions. As a consequence, the poor coverage of the public healthcare service provision over the country fails to ensure the substantial gain in health sector.

Health has significant positive impact on productivity of the daily wage earners in Bangladesh. The negative values of the coefficients of the education variable indicate the lack of linkage between the labor market and the educational qualification in both the rural and urban areas. Moreover, high unemployment rate is unexpectedly associated with high wage in the labor market. In a normal labor market model, slack labor markets with high unemployment rate appear to be associated with lower wages. The positive effect of unemployment indicates significant migration to areas with stronger labor demand and high wages, with queuing for those better-paying jobs. However, verification of this hypothesis would require more in-depth analysis of the labor market. Further, the higher rate of return in rural areas as compared to the urban areas justifies the rationale of investing more on health of the rural residents for sustainable economic development.

OOP payments for health care services have been sufficiently costly for the people of a developing country like Bangladesh, where a significant portion of the population subsists under the poverty line. Healthcare payments push a significant portion (4.2% in 2005 and 4.4% in 2000) into extreme poverty. It is also important to note that OOP payments for health care have a devastating impact on poverty in rural areas as compared to the urban areas. Further, more people have been pushing towards poverty due to healthcare payments in 2005 as compared to 2000 particularly in urban areas. This implies the failure in targeting public resources for the poor in urban areas.

The out of pocket payments for healthcare seem to be more regressive in 2005 as compared to 2000 and, in the absence of public health care subsidies, the out of pocket payments for healthcare would be more regressive in 2005 as compared to the situation in 2000. As a result, the public healthcare system can play a vital role in reducing this welfare loss of the people especially the poor as the services are free of cost at the public facilities or nominal fees are charged. It can also play an important role in reducing the gap between rich and poor to some extent. But, the magnitude of the impact of public healthcare spending on poverty reduction is hardly changed between 2000 and 2005. This also confirms the fact that public healthcare resource allocation fails to target the poor properly and hence poor do not get benefits from public health care system up to the desired level.

11.6 Conclusions

In Bangladesh, there has been a major improvement in the number and distribution of healthcare facilities. Even then, the urban concentration of physicians, nurses and health technologists is a persistent problem in the health system. Further, health care services from any unqualified or traditional providers appear to be comparatively cheaper, easier to access and people's familiarity with these services, the utilization rate of public healthcare facilities has been quite low. It is also important to observe that a larger number of households still make excess payments for health care. As a result, the risk of financial catastrophe incurred because of health problem is much greater. The OOP payments for health care services have been sufficiently costly for the people, where a significant portion of the population subsists below the poverty. Healthcare payments push a significant portion into extreme poverty.

Further, public healthcare system reduces the welfare loss of the people especially the poor. Although it is not successful in benefiting the poor at the desired level, but it plays an important role in reducing the health sector inequalities. It also contributes, to some extent, in the overall poverty reduction process by providing free or subsidized healthcare services throughout the country.

11.7 Recommendations

Health is usefully considered to be a component of human capital. It is observed that public policies, by improving individual health conditions, raise household wages and thereby improve the living standards. Simultaneously, improved living standards also improve the health condition of the individual through better access as well as utilization of modern facilities and hence increase the productivity. Poverty and poor health are almost synonymous and are related in a bi-directional way. Children of a mother from a poor family are most likely to be undernourished to begin with and vulnerable throughout their lives. Poor health also increases vulnerability to financial loss and poverty limits access to modern services. Thus the vicious cycle of poverty and poor health continues. As a result, the national policies should emphasis on the poverty reduction strategies through improved health status of the individuals. This also calls for investment in the health sector as a continuing process. The main recommendations and policy implications of the study are discussed below:

Improving health sector resource allocation based on equity considerations:

Although the GoB is committed to provide quality healthcare services to its citizens especially the poor and disadvantaged groups, the resource allocated to the health sector is limited. Further, the existing method of resource allocation of

MoHFW is primarily based on the capacity of public healthcare facilities and historically determined normatives. As a result, there is a definite need for improved allocation system based on equity considerations. To this end, the MoHFW should adopt a pro-poor allocation system so that poor districts receive more resources to maximize equity. In the case where a district/upazila has no or inadequate public healthcare facilities, MoHFW should adopt GO-NGO collaborative afford or public private partnership (PPP) to maximize the benefit to the poor. MoHFW should develop a guideline that would be strictly used for resource allocation of HNP sector.

Targeting health sector resources for the poor:

To achieve spatial equity, the concept of geographical targeting simultaneously with the current practice of resource allocation by facilities should be promoted within the MoHFW. In turn, geographical targeting should be used as an instrument to strengthen the targeting of health care resources to the poor. One of the means to achieve spatial equity is through formula allocation by geography as analyzed in this study. To strengthen direct targeting to the poor, geographical allocation could also be linked with Proxy Means Testing (PMT)-based targeting at the facility levels within a specific geographical area. Formula allocation would identify and rank the areas and PMT could be used to allocate resources at the facility level within the identified area.

Although, the PMT model can identify the poor with a high degree of accuracy, but a small percent of deserving poor households may be incorrectly left out of a program. Predictably, many of those identified as non-poor, and therefore not eligible for the benefits, would express dissatisfaction with such a program. Further, local level personal and political pressures may be imposed to include certain undeserving individuals in the program. Strong government and

community participation can dissuade such impositions or demands. Institutional arrangements and policy options are suggested to ensure that such participation is subsequently included in the program.

Increase utilization of health care services from qualified providers:

Bangladeshi households collectively make up more than a half of the total health expenditure. High OOP expenditure on purchasing pharmaceuticals is the most distinctive features in the country. The high proportion of expenditure on drug reflects high level of self treatment and self medication. Furthermore, the utilization of homeopath and traditional providers is not insignificant. This might be because of difficulties in accessing qualified medical providers, as well as lack of confidence in them. Relying on households to select medical services highlights the need for a stronger government financing role in ensuring adequate use of modern medical services.

Increase utilization of public health care services:

It is alleged that a significant proportion of existing household expenditure of the poor is associated with visits to nominally free government facilities. How much of this is due to the unavailability of services and supplies in the facilities, and how much is due to the payment of unofficial fees to government providers is unclear, but this should be an area of concern.

However, appropriate measures should be adopted to increase the utilization of public healthcare services by the poor. The possible measures to increase the utilization of public healthcare facilities include: more time and attention paid by a provider to each patient, reduction of waiting time through reduction of absenteeism of the providers, availability of essential drugs and ensuring privacy for females and enhancing clients friendly behavior. Further, the vacant posts of

providers including doctors, nurses, anesthetists, health technologists, FWAs, HAs, MAs, FWVs and nurse-midwifes are to be filled in on an urgent basis. Bedsides, additional posts need to be created wherever necessary.

Reduce economic burden of disease on the poor:

A considerable number of households make excess payments for health care implying the fact that large payments are incurred for the treatment of serious conditions. As a result, the risk of financial catastrophe is incurred because of greater health problems. In order to reduce the economic burden of disease on the poor, demand side financing schemes for the poor, especially for the selected crucial cares, should be introduced. It is also expected that such schemes would considerably increase the utilization of public health services by the poor, women and the vulnerable people.

Benefiting the poor trough public health care services:

Although, poor receive more benefits from public healthcare system at the primary level but benefiting the poor through public healthcare resources all together could not achieve its desired level. In order to benefit the poor more it is important to introduce an efficient targeting mechanism so that poor can get more benefits from the limited public resources earmarked to the health sector. Some user fees can be introduced for the rich at all types of facilities keeping sufficient safety-net provisions for the poor.

Need for further investment in the health sector specially in the rural areas:

It is important to note that health has significant positive impact on productivity of the daily wage earners in Bangladesh. Poor health and consequently the catastrophic OOP payments for healthcare also influence the impoverishment of the households. In a developing country like Bangladesh a significant portion of the population subsists below the poverty line, while healthcare payments push

more a significant portion into poverty. It is also important to note that OOP payments for health care have a devastating impact on poverty in rural areas as compared to the urban areas. In contrast, the rate of return on health is notably higher in rural areas as compared to the urban areas. This implies that investment in the health sector specially in the rural areas will considerably contribute to sustainable economic development.

Scope of further academic research:

The current study is conducted based on the cross sectional data sets gathered in two different years. It would be worthwhile if information for more years could be added so as to trace the trends of selected indicators. The trend analysis would help the policy makers in understanding the health sector performance over the years in terms of reducing inequalities, benefiting the poor as well as impact of public health sector financing in the overall poverty reduction process.

For successful implementation of the PMT model, close monitoring and accountability are essential. However, the main administrative challenge of the PMT is the sustainability and cost of supervision and monitoring of the model development and its implementation. In all cases, adequate institutional arrangements at the community and central government levels are required to ensure successful implementation of the tool. On technical as well as administrative grounds, the proxy-means test model should first be tested in a limited geographic location, and not on national scale. At the first step of implementation of the model, a baseline study should be undertaken to determine whether the model is suitable for identifying the poor households or not. During the inception, it is also important to measure exclusion and inclusion errors, and which are the suitable institutional arrangements for effective and transparent functioning of the pro-poor strategy.

Further, this study could not establish the direct pathway between health, productivity and poverty due to non availability of the requisite information. As Household Income Expenditure Survey (HIES) by BBS does not compel all the required information, a separate in-depth study could be undertaken to establish the relationship between health, productivity and poverty.

As poverty reduction through health sector is the priority agenda for the Government of Bangladesh, an Operation Research (OR) should be undertaken to examine the impact of health on poverty. This study will help the policy makers to indicate whether investment in the health sector yields any positive impact or not.

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Annex

Table A1: Healthcare Services Provision, Bangladesh 2000-2010

Health Facilities	2000	2001	2002	2003	2004	2005	2006	2008/09	2010
Hospitals*	1,273	1,382	1,362	1,384	1,676	1,676	1,683	2,860	3078
Govt. Hospitals	660	670	670	672	671	671	678	589	577
Non-Govt. Hospitals	613	712	712	712	1,005	1,005	1,005	2,271	2,501
Hospital beds	43,443	45,607	45,707	46,125	50,655	50,827	51,044	74,415	81,578
Govt. hospital beds	32,072	33,368	32,459	33,886	34,550	34,722	34,939	38,171	39,341
Govt. as % of total	73.8%	73.2%	71.0%	73.5%	68.2%	68.3%	68.4%	51.3%	48.2%
Registered Physician	32,278	32,498	34,502	36,576	40,210	41,933	44,632	49,994	51,993
Registered Nurse	18,135	18,135	19,066	19,500	20,009	20,097	20,129	23,729	25,018
Persons per bed	3,083	2,832	2,887	2,801	2,550	2,736	2,732	1,860	1,860
Persons per Physician	4,521	4,043	4,043	3,532	3,213	3,317	3,125	2,860	2,785
Persons per Nurse	7,163	7,170	6,920	6,865	6,787	6,853	6,944	5,720	5,782

Source: (i) BBS 2006. Statistical Pocket Book 2004, (ii) BBS 2007. Statistical Pocket Book 2006, (iii) BBS 2009. Statistical Pocket Book 2008, (iv) BBS 2010. Statistical Pocket Book 2009, (v) DGHS 2009. Health Bulletin 2009, (iv) DGHS 2010. Health Bulletin 2010.

Table A2: Sanctioned, Available and Vacant Posts of Health Workers, 2010

Positions	Sanctioned posts	Available posts	Vacant posts	% available	% vacant
Doctors	20,234	11,300	8,934	55.8	44.2
Medical assistants	5,411	3,694	1,717	68.3	31.7
Medical technologists	6,150	4,658	1,492	75.7	24.3
Domiciliary workers	26,416	23,285	3,131	88.1	11.9
Nurse	17,183	13,483	3,700	78.5	21.5

Source: DGHS, 2010. Health Bulletin 2010.

Table A3: Sanctioned, Needed and Filled Positions of Healthcare Providers

Facility type	Physicians					Nurse+other providers (FWV, SACMO, MA)				
	Needed	Sanctioned	Filled	Filled as % of sanctioned	Filled as % of need	Needed	Sanctioned	Filled	Filled as % of sanctioned	Filled as % of need
Upazila Health Centers	4,700	6,089	3,830	62.9	81.5	14,100	7,425	5,437	73.2	38.6
MCWC	347	177	132	74.6	38.0	1,042	402	348	86.6	33.4
Un HFWCs	1,602	742	170	22.9	10.6	4,805	3,045	2,490	81.8	51.8
UnHFWC, upgraded	1,052	624	115	18.4	10.9	3,157	1,909	1,599	83.8	50.6
USC	1,912	952	416	43.7	21.8	5,736	1,738	1,513	87.1	26.4
Total	11,348	10,356	5,963	57.6	52.5	34,046	17,004	13,528	79.6	39.7
Union level facilities	4,566	-2,318	701	30.2	15.4	13,698	6,692	5,602	83.7	40.9

Source: Tulane University SPHTM and ACPR, 2009. Bangladesh Health Facility Survey 2009[24].

[24] The Bangladesh Health Facility Survey 2009 is a nationally representative survey of 38 District Hospitals, 80 Upazila Health Complexes, 47 Maternal and Child Welfare Centers, and 691 Union level public health facilities.

Table A4: Key Indicators, 1997-2007

Year	Population (Million)	1 US $ = Taka	PPP conversion rate	GDP (Million Taka)	THE (Million Taka)	THE as % of GDP
1997	124.0	42.70	19.88	1,764,457	48,699	2.76
1998	125.9	45.46	20.63	1,874,196	53,602	2.86
1999	127.7	48.06	20.98	2,014,678	59,433	2.95
2000	129.5	50.31	20.89	2,306,232	65,497	2.84
2001	130.0	53.96	20.92	2,489,698	74,193	2.98
2002	132.9	57.44	21.39	2,659,551	82,978	3.12
2003	134.8	57.90	21.86	2,875,288	89,709	3.12
2004	137.7	58.94	22.2	3,145,508	102,229	3.25
2005	138.6	61.39	22.65	3,484,673	117,085	3.36
2006	140.6	67.08	23.25	3,881,425	138,955	3.58
2007	143.9	69.03	24.31	4,408,192	160,899	3.65

Source: MoHFW, 2010. Bangladesh National Health Accounts 1997-2007.

Table A5: Distribution of THE by Financing Agents, 2007

Financing Agents	Taka Million	% share
Public sector	41,318	25.7
Households	103,459	64.3
Private Firms	1,639	1.0
NGO	2,092	1.3
Rest of the World	12,391	7.7
THE	***160,899***	***100.0***

Source: MoHFW, 2010. Bangladesh National Health Accounts 1997-2007.

Table A6: Public Expenditure by Function of Health Services, 2007

Function of health services	Million Taka	% share
Curative Care Services	13,463	32.6
Services of Rehabilitative Care	188	0.5
Ancillary Services to Healthcare	0	0.0
Medicine and Other Medical Goods	5,690	13.8
Prevention and Public Health Services	11,348	27.5
Health Administration and Insurance	1,627	3.9
Capital Formation	7,396	17.9
Health Education and Training	1,577	3.8
Health Research	28	0.1
Total	***41,317***	***100.0***

Source: MoHFW, 2010. Bangladesh National Health Accounts 1997-2007.

Table A7: Flow of Funds in the Public Sector to Provider, 2007

Providers	Million Taka	% share
General Administration of Health	1,754	4.2
Public Health Programs	2,097	5.1
Hospitals	19,464	47.1
Providers of Ambulatory Health Care	11,717	28.4
Drug and Medical Goods Retail Outlets	0	0.0
Other Industries (Rest of the Economy)	6,285	15.2
Total	***41,317***	***100.0***

Source: MoHFW, 2010. Bangladesh National Health Accounts 1997-2007.

Table A8: Public Expenditure on Health, 1997-2007

Year	Public expenditure on health (Million Taka)	Overall GoB expenditure (Million Taka)	Public expenditure as % of GDP	Public expenditure as % of overall GoB
1997	17,682	237,095	1.00	6.6
1998	18,341	245,758	0.98	7.2
1999	19,292	298,346	0.96	7.2
2000	20,217	341,800	0.88	7.5
2001	23,128	442,637	0.93	7.5
2002	25,223	398,977	0.95	6.5
2003	24,810	446,013	0.86	5.9
2004	29,316	519,451	0.93	5.2
2005	29,918	554,037	0.86	6.3
2006	38,696	569,059	1.00	5.6
2007	41,318	616,687	0.94	5.6

Source: MoHFW, 2010. Bangladesh National Health Accounts 1997-2007.

Table A9: Selected Indicators Used for Need Based Resource Allocation

Division	District	Poverty Status	Population 2007	MoHFW Exp. 2007 (in Taka)	Head count ratio, 2005	Burden people	Population density
Barisal	Barguna	Very poor	968,064	152,633,275	0.6094	516,043	529
Barisal	Barisal	Very poor	2,690,271	749,974,036	0.6008	902,126	966
Barisal	Bhola	Poor	1,951,112	204,936,224	0.4885	673,891	573
Barisal	Jhalokati	Less-poor	793,504	121,858,735	0.4713	773,190	1,059
Barisal	Patuakhali	Very poor	1,678,012	231,896,792	0.6301	637,151	521
Barisal	Pirojpur	Less-poor	1,259,860	192,700,938	0.2788	440,431	963
Chittagong	Bandarban	Very poor	344,514	124,306,194	0.6476	524,783	77
Chittagong	Brahmanbaria	Less-poor	2,724,111	261,085,589	0.3710	993,510	1,414
Chittagong	Chandpur	Less-poor	2,567,216	276,968,563	0.2875	887,279	1,507
Chittagong	Chittagong	Less-poor	7,496,363	1,184,936,988	0.2671	2,724,301	1,419
Chittagong	Comilla	Less-poor	5,259,641	859,020,042	0.3006	1,649,195	1,705
Chittagong	Cox's Bazar	Poor	2,015,675	196,277,653	0.5172	967,651	809
Chittagong	Feni	Non-poor	1,381,518	174,876,884	0.1248	651,890	1,489
Chittagong	Khagrchhari	Less-poor	592,138	149,909,659	0.3734	481,899	219
Chittagong	Lakshmipur	Less-poor	1,702,917	179,874,221	0.3468	742,476	1,170
Chittagong	Noakhali	Less-poor	2,944,815	322,297,481	0.3449	1,235,226	818
Chittagong	Rangamati	Less-poor	601,532	199,446,726	0.4018	637,046	98
Dhaka	Dhaka	Non-poor	9,873,210	198,375,541	0.1682	2,473,598	6,744
Dhaka	Faridpur	Less-poor	1,996,384	482,190,137	0.4465	749,913	963
Dhaka	Gazipur	Less-poor	2,317,759	210,000,362	0.3741	1,613,031	1,288
Dhaka	Gopalganj	Less-poor	1,319,452	206,436,389	0.4241	609,325	886
Dhaka	Jamalpur	Poor	2,412,589	284,108,087	0.5865	461,581	1,187
Dhaka	Kishoreganj	Less-poor	2,929,464	355,981,526	0.2481	1,001,314	1,089
Dhaka	Madaripur	Less-poor	1,294,411	160,875,786	0.3874	730,506	1,130
Dhaka	Manikganj	Less-poor	1,491,401	231,315,419	0.3746	603,990	1,082
Dhaka	Munshiganj	Less-poor	1,476,737	210,652,897	0.2718	636,753	1,546
Dhaka	Mymensingh	Poor	5,109,321	945,786,839	0.5894	1,689,604	1,171
Dhaka	Narayanganj	Less-poor	2,486,707	268,655,409	0.2308	1,783,126	3,547
Dhaka	Narsingdi	Less-poor	2,178,666	232,567,867	0.3470	857,768	1,909
Dhaka	Netrokona	Less-poor	2,258,168	273,504,340	0.3169	889,912	804
Dhaka	Rajbari	Less-poor	1,090,891	146,324,370	0.4338	866,200	975
Dhaka	Shariatpur	Less-poor	1,237,980	156,709,670	0.3289	604,268	1,047
Dhaka	Sherpur	Less-poor	1,452,497	156,310,642	0.4792	1,031,506	1,065
Dhaka	Tangail	Less-poor	3,736,348	450,204,720	0.4046	1,264,721	1,094
Khulna	Bagerhat	Less-poor	1,737,604	277,086,116	0.4599	531,339	439
Khulna	Chuadanga	Less-poor	1,151,491	121,752,821	0.3298	492,717	978
Khulna	Jessore	Poor	2,829,159	346,833,165	0.5665	736,435	1,102
Khulna	Jhenaidaha	Less-poor	1,796,737	196,352,253	0.3586	564,966	916
Khulna	Khulna	Poor	2,701,154	656,478,335	0.5306	952,120	615
Khulna	Kushtia	Less-poor	1,990,245	477,519,968	0.2785	561,025	1,243
Khulna	Magura	Less-poor	941,465	133,220,905	0.2875	575,525	897
Khulna	Meherpur	Non-poor	673,151	76,574,408	0.1240	444,596	940

Division	District	Poverty Status	Population 2007	MoHFW Exp. 2007 (in Taka)	Head count ratio, 2005	Burden people	Population density
Khulna	Narail	Less-poor	796,048	114,611,619	0.4454	680,801	804
Khulna	Satkhira	Poor	2,113,690	218,570,410	0.5912	767,544	548
Rajshahi	Bogra	Less-poor	3,454,312	629,781,916	0.4731	944,524	1,183
Rajshahi	Dinajpur	Poor	3,025,347	440,141,136	0.4982	946,060	880
Rajshahi	Gaibandha	Poor	2,439,692	284,373,361	0.5250	778,283	1,120
Rajshahi	Joypurhat	Less-poor	981,239	151,513,282	0.4370	539,742	1,017
Rajshahi	Kurigram	Very poor	2,019,524	244,890,195	0.6818	886,966	880
Rajshahi	Lalmonirhat	Poor	1,265,107	141,471,871	0.5313	735,387	1,019
Rajshahi	Naogaon	Poor	2,733,184	322,632,706	0.4875	730,468	795
Rajshahi	Natore	Poor	1,737,810	196,096,240	0.4973	701,823	917
Rajshahi	Nawabganj	Less-poor	1,628,685	174,518,600	0.4267	721,894	956
Rajshahi	Nilphamari	Very poor	1,789,543	210,160,478	0.7018	811,847	1,132
Rajshahi	Pabna	Poor	2,480,084	371,064,873	0.4927	855,155	1,046
Rajshahi	Panchagarh	Poor	959,953	126,772,032	0.5587	732,733	683
Rajshahi	Rajshahi	Less-poor	2,605,385	800,356,947	0.4129	702,656	1,082
Rajshahi	Rangpur	Very poor	2,894,891	717,247,596	0.6188	1,022,397	1,223
Rajshahi	Sirajganj	Poor	3,062,142	323,455,478	0.5272	556,437	1,226
Rajshahi	Thakurgaon	Poor	1,391,462	162,523,288	0.5221	696,615	769
Sylhet	Habiganj	Less-poor	2,004,930	204,546,484	0.4688	906,731	760
Sylhet	Moulvibazar	Less-poor	1,843,041	197,255,774	0.2957	736,446	658
Sylhet	Sunamganj	Poor	2,280,070	236,470,539	0.4885	1,005,971	621
Sylhet	Sylhet	Non-poor	2,918,100	787,727,203	0.1252	1,157,013	836

Table A10: Need Based and Administratively Feasible Allocation by Districts, 2007

Division	District	Poverty Status	Current allocation (PC)	Need based allocation (PC)	Feasible allocation (PC)
Barisal	Barguna	Very poor	158	52	158
Barisal	Barisal	Very poor	279	326	326
Barisal	Bhola	Poor	105	196	196
Barisal	Jhalokati	Less-poor	154	237	237
Barisal	Patuakhali	Very poor	138	105	138
Barisal	Pirojpur	Less-poor	153	43	153
Chittagong	Brahmanbaria	Less-poor	96	187	187
Chittagong	Chandpur	Less-poor	108	80	108
Chittagong	Chittagong	Less-poor	158	321	321
Chittagong	Comilla	Less-poor	163	123	163
Chittagong	Cox's Bazar	Poor	97	126	126
Chittagong	Feni	Non-poor	127	66	127
Chittagong	Lakshmipur	Less-poor	106	174	174
Chittagong	Noakhali	Less-poor	109	282	282
Dhaka	Faridpur	Less-poor	242	221	242
Dhaka	Gazipur	Less-poor	91	171	171
Dhaka	Gopalganj	Less-poor	156	187	187
Dhaka	Jamalpur	Poor	118	146	146

Division	District	Poverty Status	Current allocation (PC)	Need based allocation (PC)	Feasible allocation (PC)
Dhaka	Kishoreganj	Less-poor	122	143	143
Dhaka	Madaripur	Less-poor	124	49	124
Dhaka	Manikganj	Less-poor	155	39	155
Dhaka	Munshiganj	Less-poor	143	37	143
Dhaka	Mymensingh	Poor	185	317	317
Dhaka	Narayanganj	Less-poor	108	204	204
Dhaka	Narsingdi	Less-poor	107	216	216
Dhaka	Netrokona	Less-poor	121	68	121
Dhaka	Rajbari	Less-poor	134	139	139
Dhaka	Shariatpur	Less-poor	127	132	132
Dhaka	Sherpur	Less-poor	108	194	194
Dhaka	Tangail	Less-poor	120	66	120
Khulna	Bagerhat	Less-poor	159	33	159
Khulna	Chuadanga	Less-poor	106	71	106
Khulna	Jessore	Poor	123	201	201
Khulna	Jhenaidaha	Less-poor	109	55	109
Khulna	Khulna	Poor	243	68	243
Khulna	Kushtia	Less-poor	240	54	240
Khulna	Magura	Less-poor	142	69	142
Khulna	Meherpur	Non-poor	114	23	114
Khulna	Narail	Less-poor	144	130	144
Khulna	Satkhira	Poor	103	36	103
Rajshahi	Bogra	Less-poor	182	129	182
Rajshahi	Dinajpur	Poor	145	97	145
Rajshahi	Gaibandha	Poor	117	177	177
Rajshahi	Joypurhat	Less-poor	154	33	154
Rajshahi	Kurigram	Very poor	121	228	228
Rajshahi	Lalmonirhat	Poor	112	56	112
Rajshahi	Naogaon	Poor	118	109	118
Rajshahi	Natore	Poor	113	176	176
Rajshahi	Nawabganj	Less-poor	107	138	138
Rajshahi	Nilphamari	Very poor	117	267	267
Rajshahi	Pabna	Poor	150	66	150
Rajshahi	Panchagarh	Poor	132	143	143
Rajshahi	Rajshahi	Less-poor	307	96	307
Rajshahi	Rangpur	Very poor	248	443	443
Rajshahi	Sirajganj	Poor	106	132	132
Rajshahi	Thakurgaon	Poor	117	150	150
Sylhet	Habiganj	Less-poor	102	96	102
Sylhet	Moulvibazar	Less-poor	107	30	107
Sylhet	Sunamganj	Poor	104	207	207
Sylhet	Sylhet	Non-poor	270	17	270

Table A11: Seeking any Care by Sex and Living Standards, 2005

Living standards	Male (%)		Female (%)	
	Yes	No	Yes	No
Poorest	78.4	21.6	71.7	28.3
2nd	83.0	17.0	82.4	17.6
3rd	85.0	15.0	84.7	15.3
4th	90.9	9.1	88.8	11.2
Richest	93.0	7.0	91.8	8.2
Overall	86.4	13.6	84.5	15.5

Table A12: Seeking any Care by Age and Sex, 2005

Age (years)	Male (%)		Female (%)	
	Yes	No	Yes	No
0-4	89.0	11.0	88.9	11.1
5-14	87.6	12.4	83.8	16.2
15-44	84.9	15.1	84.2	15.8
45-64	84.8	15.2	83.6	16.4
65+	83.6	16.4	77.4	22.6
Overall	86.4	13.6	84.5	15.5

Table A13: Healthcare Seeking Behavior by Location, 2005

Provider	Location		Total (%)
	Rural (%)	Urban (%)	
Health worker	1.3	0.9	1.2
Pharmecy	42.2	30.1	39.4
Traditional/unqualified	6.2	6.5	6.3
Public qualified	6.3	10.3	7.3
Private	37.2	45.8	39.2
NGO	0.3	1.1	0.5
Others	6.4	5.4	6.2
Overall	100.0	100.0	100.0

Table A14: Share of OOP Payments on Health by Age and Sex, 2005

Age (years)	Male (%)	Female (%)	Overall (%)
0-4	15.0	9.0	11.7
5-14	19.8	10.0	14.4
15-44	38.3	52.0	45.8
45-64	19.5	23.8	21.9
65+	7.3	5.2	6.2
Overall	100.0	100.0	100.0

Table A15: Share of OOP Payments on Health by Living Standards and Sex, 2005

Living standards	Male (%)	Female (%)	Overall (%)
Poorest	3.9	2.7	3.2
2nd	6.8	6.6	6.7
3rd	14.0	9.5	11.5
4th	18.0	17.4	17.7
Richest	57.3	63.8	60.9
Overall	100.0	100.0	100.0

Table A16: Share of OOP Payments on Health by Residence and Living Standard, 2005

Living standards	Rural (%)	Urban (%)	Overall (%)
Poorest	4.1	1.1	3.2
2nd	8.4	2.9	6.7
3rd	13.6	6.0	11.5
4th	20.6	12.1	17.7
Richest	53.2	77.9	60.9
Overall	100.0	100.0	100.0

Table A17: Definition of the Variables used in Analysis of Health and Productivity

Variables	Definition
Dependent variables	
Days of illness	Number of reported days of illness during 30 days prior to interview
Illness reported	1 = reported illness in the 30 days prior to the interview, 0 = otherwise
Ln (Wage)	Natural logarithm of individual hourly wage
Independent variables	
Age	Age in full years (not including fractions of years)
Years of education	Highest grade completed
Head of household	1 = individual is head of household, 0 = otherwise
Sex	1 = individual is male, 0 = otherwise
Marital status	1 = individual is married, 0 = otherwise
Wage earner	1 = individual is a wage earner, 0 = otherwise
Poverty status	Poverty status of the individuals' household
Urban	1 = residence in urban or semi-urban area, 0 = otherwise
Residence in Dhaka	1 = residence in capital, 0 = otherwise
Living rooms	Number of living rooms per capita
House ownership	1 = Own house, 0 = otherwise
Type of latrine	1 = household use sanitary latrine, 0 = otherwise
Supply water	1 = household use supply water, 0 = otherwise
Electricity	1 = household has electricity from grid, 0 = otherwise
Telephone	1 = household has phone/mobile, 0 = otherwise
Automobile	1 = owner of automobile, 0 = otherwise
Non-labor income	Income (labor + Non-labor) received by all household members in the preceding month, excluding labor income of individuals in observation, divided by family size in Taka
OOP payments for healthcare	Individual OOP payments for healthcare in the preceding month in Taka
Unemployment rate	District unemployment rate
Health subsidy	District allocation of GOB expenditure on health per capita in Taka
Number of Doctors	District doctors per 10,000 inhabitants

Table A18: Estimated Weighted Least Squares Regression Model for Measuring Impact of Health on Productivity

Model Summary – Urban Residents

R	R Square	Adjusted R Square	Std. Error of the Estimate
.442	.195	.195	29.92254

ANOVA

Source of variations	Sum of Squares	df	Mean Square	F	Sig.
Regression	2383475.946	8	297934.493	332.754	.000
Residual	9812233.076	10959	895.358		
Total	12195709.022	10967			

Coefficients

Variables		Coefficients		t	Sig.
		B	Std. Error		
	(Constant)	.328	.111	2.947	.003
Age	age	-.004	.001	-7.310	.000
Gender	sex	.277	.016	17.134	.000
Educational qualification	education	-.039	.001	-29.571	.000
Head of household	hoh	.382	.020	19.501	.000
Health indicator	**H**	**-.017**	**.024**	**-.699**	**.485**
Residence in Dhaka	dhaka	-.110	.024	-4.666	.000
Unemployment rate	unemployed	.040	.202	.197	.844
Public resource allocation per capita	pcexp07	.001	.000	4.221	.000

a Predictors: (Constant), pcexp07, H, hoh, edu, unemploy, age, sex, dhaka
b Dependent Variable: lnwage
c Weighted Least Squares Regression - Weighted by HH weight

Model Summary – Rural Residents

R	R Square	Adjusted R Square	Std. Error of the Estimate
.523	.274	.273	43.98833

ANOVA

Source of variations	Sum of Squares	df	Mean Square	F	Sig.
Regression	13103789.792	7	1871969.970	967.440	.000
Residual	34779212.929	17974	1934.973		
Total	47883002.722	17981			

Coefficients

Model		Coefficients		t	Sig.
		B	Std. Error		
	(Constant)	.819	.085	9.680	.000
Age	age	-.009	.001	-18.107	.000
Gender	sex	.556	.014	38.535	.000
Educational qualification	education	-.057	.001	-39.991	.000
Head of household	hh head	.477	.017	27.734	.000
Health indicator	**Health**	**.046**	**.020**	**2.309**	**.021**
Unemployment rate	unemployed	-.624	.150	-4.158	.000
Public resource allocation per capita	pcexp07	3.36E-005	.000	.345	.730

a Predictors: (Constant), pcexp07, H, hoh, edu, unemploy, age, sex
b Dependent Variable: lnwage
c Weighted Least Squares Regression - Weighted by HH weight

Table A19: Poverty Gaps, Normalized Gaps and Poverty Impact of OOP Payments, 2005

		Poverty gaps		Normalized gaps	
		Lower PL	Upper PL	Lower PL	Upper PL
National	Pre-payment	33	77	4.6%	8.9%
	Post-payment	42	92	5.8%	10.7%
	Poverty impact	8	15	1.2%	1.8%
Rural	Pre-payment	38	81	5.4%	9.9%
	Post-payment	47	97	6.7%	11.8%
	Poverty impact	9	16	1.3%	1.9%
Urban	Pre-payment	19	62	2.6%	6.7%
	Post-payment	24	76	3.2%	8.2%
	Poverty impact	5	13	0.7%	1.4%

Table A20: Poverty Gaps, Normalized Gaps and Poverty Impact of OOP Payments, 2000

		Poverty gaps		Normalized gaps	
		Lower PL	Upper PL	Lower PL	Upper PL
National	Pre-payment	45	88	8.2%	13.1%
	Post-payment	53	101	9.5%	15.0%
	Poverty impact	7	13	1.3%	1.9%
Rural	Pre-payment	50	90	9.0%	13.4%
	Post-payment	59	104	10.5%	15.5%
	Poverty impact	8	14	1.5%	2.0%
Urban	Pre-payment	27	81	4.8%	12.1%
	Post-payment	31	91	5.6%	13.5%
	Poverty impact	4	10	0.8%	1.5%

Table A21: Decomposition of Redistributive Effect of Public Healthcare Finance, 2005

Indices		With Public Spending	Without Public Spending
Gini for pre-payment income	Gx	0.330	0.330
Gini for post-payment income	Gx-p	0.320	0.374
Redistributive effects	RE	0.0097	-0.0446
Mean out-of-pocket payments	P	91.7	228.1
Mean prepayment income	X	1224.9	1224.9
Mean fraction of prepayment income spent on health care	g=P/X	7.5%	18.6%
Conc Index post payment income	Cx-p	0.313	0.363
Conc Index payments	Cp	0.537	0.188
Kakwani index	KE	0.208	-0.142
Vertical redistribution effect	V=[g/(1-g)] KE	0.0168	-0.0324
Horizontal inequity	H	0.000	0.001
Reranking	R=Gx-p - Cx-p	0.007	0.011
V as % of RE	(V/RE)*100	173.5%	72.7%

Table A22: Decomposition of Redistributive Effect of Public Healthcare Finance, 2000

Indices		With Public Spending	Without Public Spending
Gini for pre-payment income	Gx	0.334	0.334
Gini for post-payment income	Gx-p	0.324	0.362
Redistributive effects	RE	0.0093	-0.0287
Mean out-of-pocket payments	P	57.3	122.4
Mean prepayment income	X	851.5	851.5
Mean fraction of prepayment income spent on health care	g=P/X	6.7%	14.4%
Conc Index post payment income	Cx-p	0.318	0.344
Conc Index payments	Cp	0.551	0.280
Kakwani index	KE	0.218	-0.054
Vertical redistribution effect	V=[g/(1-g)] KE	0.0157	-0.0090
Horizontal inequity	H	0.000	0.001
Reranking	R=Gx-p - Cx-p	0.006	0.018
V as % of RE	(V/RE)*100	168.3%	31.3%