

# Universal Health Coverage for the Poor in Southwest Coastal Region of Bangladesh and Linkage between Ethics and Economics of Responsibility

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## Abstract

Poor people in general get poor quality of health services. The situation is much worse for the poor who live in the remote areas as health care facilities and services are often less complete, farther away and therefore, most costly to reach compared to urban hospitals and physician. To ensure good health service for the poor, it is essential to examine the effectiveness of Universal Health Coverage from the view point of ethical and economics of responsibility. To fulfill the research objective, this study followed a purposive sampling technique and carried out household interviews through survey questionnaire. This study applied Probit model to generate empirically supported assessments. Provision of government and private sector intervention through social safety net program and corporate social responsibility (CSR) for the poor and cost sharing through universal health coverage can help to improve health service. The findings of this study justify improved, equitable and quality health care system for the poor people of the southwest coastal region of Bangladesh and try to meet the main target (good health and human well-being) of SDGs.

*Keywords:* Universal Health Coverage, Ethics, Economics of Responsibility, Diseases of Poor People, Bangladesh

## 1. Introduction

Poverty and disease go to the same direction. Most of the disease burden finds its roots in the consequences of poverty, such as poor nutrition, indoor air pollution and lack of access to proper sanitation and health education (Stevens, 2004). The World Health Organization (WHO) reported that diseases associated with poverty account of 45 per cent of the disease burden (WHO, 2002). Poverty creates ill-health because it forces people to live in harmful environments that make them hungry and sick, without decent shelter, clean drinking water, proper nutrition and adequate sanitation which in turn push them vulnerable to disease. Illness and disease can reduce household savings, lower learning ability, reduce productivity and lead to diminish of life, thereby creating or perpetuating poverty and hence, poor people are therefore more at risk of both illness and disability as a whole (Roy, 2014). Poor people do not get access to reliable health services and affordable medicine. In addition, financial hardship is the

common for very poor people. Poverty creates illiteracy and leaving people poorly informed about health risks. Poor health is a common consequence of poverty and poverty can be a consequence of poor health and it is work as a vicious cycle (WHO, 2000).

The currently large variation in morbidity and mortality are more in underdeveloped countries or regions compared to those of developed countries and regions due to the differences in living standards, social-economic factors e.g. unemployment, exhaustion from overwork, domestic violence, isolation, income inequality, illiteracy, breakdown of social network and impacts of climate change, (Forsdahl, 1977; Mormot, 2005; Wilkinson and Pickett, 2012; Zaidi, 1988). Poor people in the low-income countries live in the remote areas e.g. hilly areas, coastal regions, isolated villages, island, river bank sites, embankments and riverine island (char land), state (khas) land in underdeveloped countries as health care facilities and services are often less complete, farther away and therefore mostly costly to reach than in urban hospitals and physician (Jensen and Saupe, 1987). Lives of poor are very vulnerable to health risk and there exist high health costs relative to their income. Poor people in the low-income countries are frequently suffered by poverty-related diseases causing higher levels of mortality which are comparatively less in high income countries (see Table 1 for more details).

**Table 1**

Deaths caused by poverty-related diseases

% of deaths caused by/in	Mortality	
	Low-income countries	High-income countries
Infectious and parasitic disease	34.1	2.1
Respiratory infections	9.9	3.7
Parental and maternal conditions	8.4	0.4
Nutritional deficiencies	1.3	0.0
Tropical diseases	0.5	0.0
Total 'poverty-related' diseases	54.1	6.2

(Source: WHO, 2002)

Poor people (landless, marginal farmer, beggar, day laborer, fisherman, small trader, rickshaw puller and other small income groups) of southwest coastal region of Bangladesh are frequently suffered by climate induced diseases and they have no ability to pay for proper treatment. Heat waves, scarcity of drinking water, saltwater intrusion, drought-related food insecurity, cyclones, storm surges, upstream withdraw of freshwater and more utilization of brackish water in the shrimp ponds are responsible for enhancement, spread out, and outbreak of different diseases. The most common diseases of this region are identified as watery diarrhea (with or without presence of blood in stool), high blood pressure,

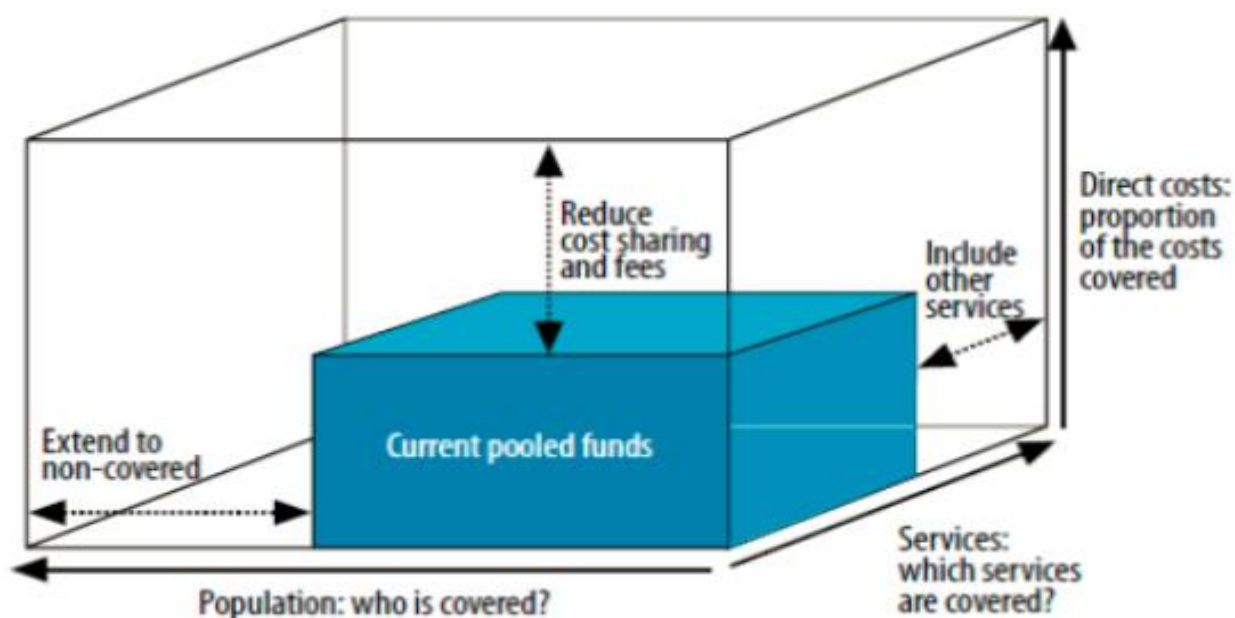
(pre)eclampsia and gestational hypertension of pregnant women, adverse pregnancy outcomes, risk of injuries, causalities, malaria, sleeping sickness, cholera, encephalitis, meningitis, measles, eye infection, skin diseases, fever, malnutrition, and micronutrient deficiency and mental health (Bhattacharjee et al., 2010; Sharma, 2012; Khan et al., 2011, Confalonieri et al., 2007; McMichael and Lindgren, 2011; Tanser et al., 2003 ). Public health status along with health care system (e.g., availability of services, accessibility to services, utilization to services, adequate coverage, and effective coverage) in this region are sub standard and under threat compared to those of the other parts of the country, since more than half of inhabitants are poor , ultra poor, day laborer, small traders, marginal farmer, and landless. This situation is very much worsening in the remote areas as health care facilities and services are often less complete, farther away, and therefore mostly costly to reach than in urban areas (Jensen and Saupe, 1987). Along with the socio-economic deprivation, relentless efforts to cope with the numerous coastal hazards have enhanced their vulnerability to health (Parvin, 2008).

### 1.1 Universal Health Coverage (UHC) for the Poor

Assessing the potential health impact of poor people of the southwest coastal region requires an understanding of the vulnerability of populations, their capacity to respond and adopt to cope with new conditions (Sharma, 2012). The Universal Health Coverage (UHC) can be the leading and alternative measure rather than the existing and traditional health care system in the southwest coastal region of Bangladesh. Universal Health Coverage is surrounded by three dimensions which are shown in Fig. 1.

**Figure 1**

Three dimension of Universal Health Coverage

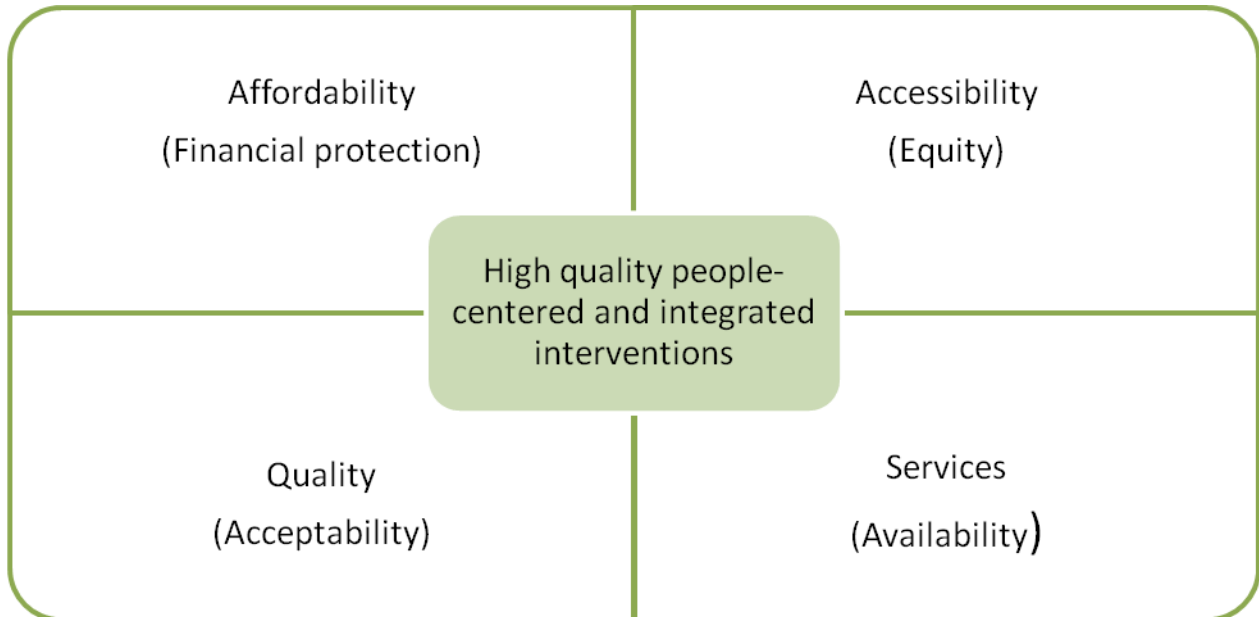


(Source: WHO, 2010)

Universal Health Coverage has four interrelated components (see Table 1 for more details). Full spectrum of quality health services address quality and efficiency, financial protection from direct payment for health services; address high out of pocket by households, coverage for entire population; address equity and efficient medical workforce and infrastructure; address good service.

**Table 2**

Components of Universal Health Coverage



(Source: Prepared by the author, 2016)

It's a means to promote the human rights to health. All people, including the poorest, and most vulnerable coastal people will get benefit from the UHC. It can help to reduce out-of-pocket (OOP) expenditure during the catastrophic period through cost sharing (pre-payment and risk-pooling). But it is impossible to imagine in the traditional health care services in Bangladesh. Traditional health care services require high OOP payments that restrict long-term economic survival and lead to further poverty and impoverishment. On the contrary, UHC can enhance the health care services in Bangladesh and particularly in the southwest coastal region. It can ensure the political benefits (vote winner), health benefits (broader health coverage leads to better access to, and use of, necessary care and improved population health), and economic benefits (reducing high OPP/catastrophic health expenditure, alleviation of poverty, less need of saving, and more resources available for investment).

### 1.2 Ethics and Health Service for the Poor

Health service for the poor is concerned with the allocation, distribution and use of health related resources. It is possible to give importance to our attention on answering questions of the general form 'If we provide more health benefits and facilities for the poor with respect to humanist moral philosophies,

what are the implications for price mechanism of existing market? Analyses of this form constitute what is sometimes described as 'positive' economics. It is strongly argued that anybody can answer this question with restrictive form. In addition, many economists wish also to do 'normative' economics, to address questions about what should be done in a particular set of circumstance. To do this, it is necessary to use ethical criteria derived from humanist moral philosophy about how persons, institution and government ought to behave. In humanist philosophies, rights and duties are accorded exclusively to human beings, either as individuals or as communities-while humans may be willing to give them consideration, non-human things have no rights or responsibilities in themselves (Perman et al., 1996). Under this ethical point of view, values are derived exclusively from human beings and rights can be defined only with respect to human beings. According to Kant, values and rights should be guided by valid rule or universal rule. Under the universal rule, people are made valid by their universality and property can be applied consistently to every individual. The basis of ethical behavior is found in the creation of rules of conduct that each person believes should be universalized. This principle is known as Kant's categorical imperative. One categorical imperative suggested by Kant is the principle of respect for persons. Kant philosophy is strongly supported by the libertarian moral philosophy. Libertarian moral philosophy begins from the Kantian imperative of respect for person, but amends it to the principle of human rights. Libertarianism is a humanist moral philosophy takes as its central axiom the human rights, such as the rights to life, liberty, security and livelihoods (Perman et al., 1996).

The principal goal of industry, firm and organization of modern globalization era is to maximize profits by damaging environment. Carbon emission and water pollution are the concern issues of industrial activities and rapid urbanization process as a whole. More specifically, emitted carbon from the industrial sector can enhance greenhouse gas (GHG) and lead to increase environmental degradation and later loss of security of public health for the poor. Consequently, poor people are becoming double losers e.g. loss of livelihood and reduce capacity for participation of working activities. But in reality industrial sector and corporate level are not giving more importance to moral dignity and respect and welfare for the poor.

### **1.3 Economics of Responsibility**

The presumption that health care costs are the responsibility of individuals is supported by orthodox economics which treats health care as a consumer good (Cooper and Vladeck, 2000). Under this principle, there is no shared responsibility for health care and hence it is said that health care is entirely an individual's responsibility, while the contributions of government and the private sector are basically optional matter of benevolence rather than responsibility (Champlin and Knoedler, 2008). But this proposition was directly opposed by the humanist moral philosophy and libertarian moral philosophy. Problems like disease, poverty, unemployment and accidents are systemic in nature and beyond the reach

of individual choice and personal responsibility. It is also the responsibility of corporate levels or industrial sectors, NGOs, development partners, local or central government. They can provide health coverage for the poor through the principle of corporate social responsibility (CSR) from corporate level and social safety net program from government with ethical point of view. They play an important role to make ethical commitment and contribution for enhancement the economic, social and environmental conditions and improving the human well-being or quality of life of the local community especially for the poor and poor society at a large. They can construct hospital for the poor, provide health cards and provide quality medicine through rationing system. Health care for the poor is treated as a social good and it is fundamentally a matter of collective responsibility (Champlin and Knoedler, 2008).

J. M. Clark first introduced the term “economics of responsibility” in his article entitled “The Changing Basis of Economic Responsibility” published in 1936. Clark argues free market individualism and the public interest that will be adequately served by an absence of intentional action an “economics of irresponsibility” (Clark, 1936). Later, Clark and others suggested that health care especially for the poor is a matter of joint or collective responsibility (Chasse, 1994). Thus, it is clear that responsibility is a social construct. It is not concern issue of mainstream economics. The degree to which corporate levels or industrial sectors, NGOs, development partners, local or central government and poor people have a responsibility for health costs is a matter of custom and evolves over time. Responsibility based health care is able to boost up quality health care for the poor, human well-being and welfare.

The findings of this study ensure improved and quality health care system with low cost for the poor people of the southwest coastal region. Government of Bangladesh (GoB) gets relevant R & D based health policy from this study as GoB is obligated to ensure provision of basic necessities of life including medical care to its citizens (Article 15(a)) and to raise the level of nutrition and to improve public health (Article 18(1)) (Bangladesh Constitution, 1972). The facts, findings, and policy of this study help to formulate and finalize the future Health Policy in Bangladesh and meet the main goals (e.g., goal 1(poverty), and goal 3(good health and well-being)) of SDGs. This study also provides a robust basis for policy makers, planners, researchers, and development partners for further research, project implementation in the health sector, developed specified policies to boost up our sense and notion “Health for All” which is mentioned UN General Assembly Resolution A/RES/67/81, 2012. The findings of this study are also helpful for similar coastal regions to construct health policy for the poor. This study generate cutting edge knowledge on universal health coverage for the poor of the southwest coastal region, provide management techniques, answer some unexplored research questions and reduce research gap on the similar studies.

The specific objectives of this study are set as to make the relationship between diseases of the poor people and universal health coverage, corporate social responsible and social safety net program, identify

the major socio-economic-demographic (SED) factors that work as catalyst of diseases of poor or low income household and develop an approach for the health strategy for the poor.

The rest of the paper is organized as follows: Section 2 represents the study area, Section 3 presents materials and methods which include pilot survey, sampling strategy and questionnaire survey, Probit model, description of variables that are used in the model, Section 4 presents results and Section 5 will present conclusion and policy implications.

## **2. Study Area**

Geographical and climatic characteristics have long been a concern issues to human health, mortality, morbidity, the length of life, poverty and human well-being (Pavlovic at al., 2000). Due to the vulnerability to climate change, natural hazards, poverty and human health, this study considered its study area as Khulna, Satkhira and Bagerhat districts located in the southwest coastal region of Bangladesh. This region is part of an active delta of large Hiamalayan Rivers and is vulnerable to climate change and natural hazards due to its disadvantaged geographic location and its flat and low-lying topography. People of this area frequently fought against the devastating storm surge, cyclone, salinity, water logging and other natural hazards. As a result, poor people suffer a lot and their livelihood standard degrades as well. This area is located between latitude from  $22^{\circ}16'00.3''N$  to  $22^{\circ}58'56.2''N$  and longitude from  $88^{\circ}58'01.1''E$  to  $89^{\circ}56'00.7''E$  of southwest coastal region. This area is bounded by the Ganges River in the North tributaries from the Meghna River in the East, an international boundary in the West and the Bay of Bengal in the South.

The reasons for selection of study area (southwest coastal region) are as follows:

01. This area is vulnerable to climate change.
02. Water logging is common scenario of this region.
03. Food security is under threat due to salinity and other climatic factors.
04. People are frequently affected by climate induced diseases.
05. Most of the people are poor and unable to bear medical expenses.

In addition, there is discrimination in health care facility in this region compared to those of other regions of Bangladesh. The index of treatment facility and education, healthcare facility for infant, child, and poor and eligibility of health care center is now in backward position. Isolation of geographical condition and lack of strong political and corporate commitments are also enhancing further backwardness of health sector of this region.

## **3. Materials and Methods**

Social science research frequently seem to face a “methodological dilemma” that is, how to effectively synthesize formal and informal methods and quantitative and qualitative data (Khan, 1998). This research required, on one hand, quantitative data on different attributes and socio-economic variables

in the context of universal health coverage for the poor of the southwest coastal region of Bangladesh. On the other hand, it needs to address more qualitative issues such as overall health status for the poor. Many researchers share the above concern about how to judiciously balance diverse information and methods and to suit them to the demands of a particular research (White, 1992; Rahman, 1994; Ahmed, 1991).

Accordingly, in line with “methodological pluralism”, this study deployed a combination of interpretive qualitative techniques such as pilot survey and quantitative techniques of sampling, questionnaire survey and Probit model. Both of these techniques were complements to each other in this research.

### **3.1 Pilot Survey**

To reduce probable non-response and biased response associated with questionnaire survey, this study conducted three short pilot surveys from (21-24) August, 2016 at Paikgachha Upazila of Khulna district, Shyamnagar Upazila of Satkhira district and Rampal Upazila of Bagerhat District.

Outdoor patients and sometimes accompanied persons of Paikgachha Upazila Health Complex, Shyamnagar Upazila health Complex and Rampal Upazila Health Complex were the major integrated parts of that pilot survey. 30 (10+10+10) respondents from above mentioned Health Complexes were selected for interview.

### **3.2 Sampling Strategy and Questionnaire Survey**

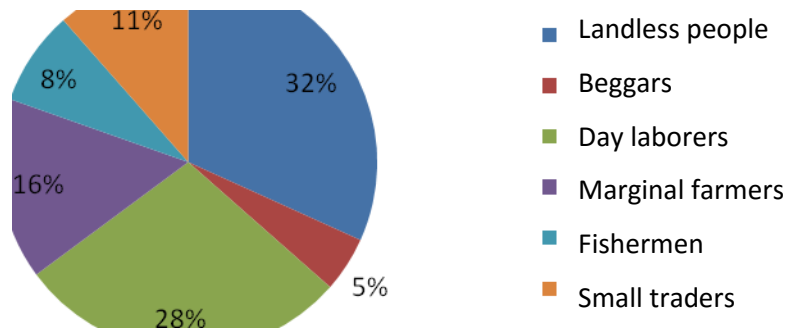
To represent the population as a whole, a comprehensive sample framework is necessary (Iqbal, 2015). In this study, the sample frame is a set of poor people from different groups depending on the level of income. This study followed the purposive sampling technique.

The household head represented his/her household members as the respondent for this survey. Personal interviews were conducted with head of households followed by a structured questionnaire to collect information regarding health care status, donation status (CSR and social safety net programme) for health care, pattern and frequency of diseases, age, income, family members and educational attainment. 142 respondents were selected for the interviews in this study. Major characteristics of the respondents of the study are depicted in the following figures.

### **Figure 2**

Occupational status

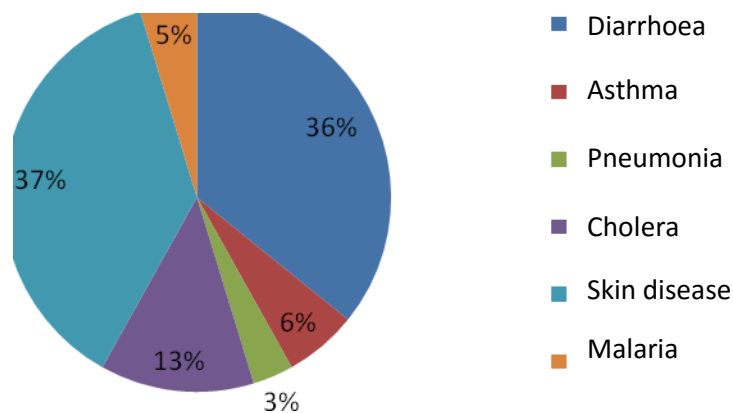




(Source: Prepared by the author based on his collected data)

**Figure 3**

Disease patterns



(Source: Prepared by the author based on his collected data)

Most of the respondents of the study area are landless. The respondents are also including beggars, day laborers, marginal farmer, fishermen and small traders. They frequently suffered diarrhea, asthma, pneumonia, cholera, skin disease and malaria.

### 3.3 Model Specification

For empirical assessment, this study used Probit or Normit model. This model is suitable for binary responses. It is also suitable for cumulative density function that emerges from the normal cumulative function (Iqbal et al., 2014; Munizaga and Alvarez-Daziano, 2001). The estimating model that emerges

from the normal cumulative function is popularly known as the Probit model. The general form of Probit model is as follows:

$$Y_i = \beta_1 + \beta_2 X_i + u_i \quad (1)$$

where  $X_i$  is explanatory variables. Let  $Q = 1$  if the poverty is related with disease and  $Q = 0$  otherwise.

Now it is assumed that for each household there is a threshold level of the disease index, namely  $Y_i^*$ , such that if  $Y_i$  exceeds  $Y_i^*$ , the household will be threatened for disease, otherwise it will not. The threshold  $Y_i^*$ , like  $Y_i$ , is not observable, but we can assume that it is normally distributed with the same mean and variance. Under this circumstance, it is possible not only to estimate the parameters of equation (1) but also to get some information about the unobservable disease index.

Given the assumption of normality, the probability that  $Y_i^*$  is less than or equal to  $Y_i$  can be computed from the standardized normal cumulative density function as

$$\begin{aligned} P_i = P_r(Q = 1) &= \Pr(Y_i^* \leq Y_i) = F(Y) = \frac{1}{\sqrt{2\Pi}} \int_{-\infty}^{T_i} e^{-t^2/2} dt \\ &= \frac{1}{\sqrt{2\Pi}} \int_{-\infty}^{T_i} e^{\beta_1 + \beta_2 X_i} dt \end{aligned} \quad (2)$$

where  $t$  is a standardized normal variable, i.e.,  $t \sim N(0,1)$ .

Since  $P_i$  represents the probability that an event will occur here the probability of falling in disease. It is measured by the area of the standard normal curve from  $-\infty$  to  $P_i$ . If we want to obtain information on outcome variable ( $P_i$ ) and estimate the parameters of explanatory variables ( $\beta_1, \beta_2$ ), we take the inverse of equation (2) and obtain

$$\begin{aligned} Y_i &= F^{-1}(I_i) = F^{-1}(P_i) \\ &= \beta_1 + \beta_2 X_i \end{aligned} \quad (3)$$

### 3.3.1 Description of Variables that are Used in the Probit Model

This study used different variables and attributes in its model. These variables are described as follows:

**Disease (outcome variable):** Disease is an abnormal condition of a part, organ or system of an organism resulting from various causes such as infection, inflammation, environmental factors, social and economic factors, genetic defect characterized by an identifiable group of signs, symptoms or both.

**Household head's individual characteristics:** Household head's individual characteristic consider the age and sex of the head of household (Iqbal et al., 2014). This study considered only the age of the head of household.

**Educational attainment (independent variable):** Educational attainment refers to the highest level of education that an individual has completed (United States Census Bureau, n.d.). In most of the cases, the head of the household of the study area has either primary education [basic education at home] or illiterate [having no literacy].

**Family member (independent variable):** It indicates the no. of family member of the household.

**Household income (independent variable):** Household income is generated from service, business, donation, aid and remittance from abroad. It is an important determinant of poverty.

**Climatic variability (independent variable):** The way climate fluctuates yearly above or below a long-term average value is known as climatic variability (Michigan Sea Grant, n.d.).

**Corporate Social Responsibility (independent attribute):** The definitions of corporate social responsibility vary from place to place, industry to industry and will change over time. It is a concept whereby companies integrate social and environmental concerns in their business operations and in their interaction with their stakeholders on a voluntary basis.

**Social Safety Net Program (independent attribute):** Social safety net program is associated with protecting the poor. Social safety net program is aimed at preventing people from falling below a certain poverty level and to help cope with adverse income fluctuations (UNDP, 2012).

**Universal Health Coverage (independent attribute):** UHC is defined as every person, everywhere, has access to quality health care without suffering financial hardship (WHO, 2014).

The above mentioned variables and attributes are used in the Probit model quantify their impacts on diseases for the poor in the study area. Table 3 describes the used variables and attributes in the Probit model with their expected sign.

**Table 3**

Description of variables and attributes with expected sign

Outcome/Independent variable and Attributes	Data type	Description	Expected sign
<b>dis:</b> Disease (Outcome variable)	Binary	1: Yes 0: Otherwise	
<b>age:</b> Age (Independent variable)	Continuous	Age of the respondents	(+)
<b>eda:</b> educational attainment (Independent variable)	Binary	1: literate 0: Otherwise	(-)
<b>fam:</b> Family member (Independent variable)	Continuous	No. of family member	(+)

<b>hin:</b> Household income (Independent variable)	Continuous	Household monthly income	(-)
<b>clv:</b> Climatic variability (Independent variable)	Binary	1: Yes for increase diseases 0: Otherwise	(+)
<b>csr:</b> Corporate Social Responsibility (Independent attribute)	Binary	1: Yes for control of diseases 0: Otherwise	(-)
<b>ssnp:</b> Social Safety Net Program (Independent attribute)	Binary	1: Yes for diseases 0: Otherwise	(-)
<b>uhc:</b> Universal health coverage (Independent attribute)	Binary	1: Yes for good health care 0: Otherwise	(-)

#### 4. Results and Discussion

As shown in table 4 below, most of the variables and attributes are statistically significant with expected sign at 0.01 percent, 0.05 percent and 0.10 percent levels respectively.

**Table 4**

Parameters estimate of diseases of the southwest coastal region of Bangladesh

Independent variables/Attributes	Coefficient	Standard error	P-value
age	0.30975E-01	0.45091	0.13901
eda	-0.21982**	0.54120	0.05109
fam	0.53122***	0.62096	0.01101
hin	-0.57090**	0.67091	0.05001
clv	0.32091**	0.21788	0.03601
csr	-0.28890E-1***	0.22098	0.00000
ssnp	-0.86703-1***	0.34987	0.00100
uhc	-0.54230***	0.45551	0.00000
constant	1.45904*	0.12101	0.07189
McFadden (pseudo) R <sup>2</sup>		0.37730	
Log-likelihood		-354.0912	
Number of observations (n)		142	

Descriptive statics for continuous data

Age: Mean=41.13, Standard deviation=7.09, Minimum value=20, Maximum Value=71

Family member: Mean=6.42, Standard deviation=1.01, Minimum value=1, Maximum value=7

Income: Mean=4749.52, Standard deviation=713.64, Minimum value=7000, Maximum value=1000

\*\*\*Significant at 1% (0.01), \*\*Significant 5% (0.05), and \*Significant 10% (0.10)

According to the model, all of the variables are significant except age. The general observation of the field survey identified that age of the respondents is inconsistent because most of them are illiterate and less educated and do not know about their exact age. Most of the respondents provide imaginary age information to the data collector. Thus, we cannot say anything about the relationship between age and diseases of the southwest coastal region. Among all statistically significant variables and attributes of the model, educational attainment, household income, social safety net program, corporate social responsibility and universal health coverage are negatively related with diseases which implies the enhancement the educational attainment, household income, corporate social responsibility, social safety net program and universal health coverage results in decrease morbidity and mortality of the poor people as well. Poor people in the southwest coastal region have positive perception on education, income, corporate social responsibility, social safety net program and universal health coverage for reduction of health threat. Educated people are more sincere and cautious about food value and habit, life style, disease and nutrition. Poor people have inconsistent income level of this region. They have less work opportunity due to salinity, water logging and other catastrophic events and hence, their livelihood patterns are under threatened. Income of poor people varies from time to time and location to location. Therefore, poor people do not get access to good health care facilities. Corporate level plays an important role to contribute financial assistance for the treatment of poor through the approach of corporate social responsibility. Social safety net program works toward livelihood security especially for the poor. The universal health coverage is one of the leading and alternative measures rather than the existing and traditional health care system not only in the southwest coastal region of Bangladesh but also in other regions of the world. It enhances human well-being and quality and accessible health care for all. Estimated result of parameters shows that 1 percent increase in education will lead to decrease diseases 21 percent. Furthermore, 1 percent increase in household monthly income, corporate social responsibility, social safety net program and universal health coverage will lead to decrease diseases 57 percent, 2 percent, 8 percent and 54 percent respectively and vice-versa.

On the contrary, the variables, e.g., family members and climatic variability are positively related with the diseases of the southwest coastal region which implies that these variables go to the same direction as diseases. Poor households are generally consisting of large family members in southwest coastal region. Large household requires large amount of treatment cost. Tidal waves, salinity, cyclones, storm surges, water logging, drought, drinking water scarcity are the common natural hazards in this region and these are associated with mortality, morbidity, the length of life, livelihoods and human wellbeing. Due to the widespread poverty and climatic variability, poor people are suffering a lot from climate induced diseases. The estimated result of parameters shows that 1 percent increase in family

member will lead to increase 53 percent disease and it will be 32 percent under the increase climatic variation condition and vice-versa.

The coefficients of the model are ranged from + 0.53122 to -0.57090 (except intercept/constant value). The overall explanatory power of the model estimated could be assessed using McFadden's (pseudo)  $R^2$  (Birol et al., 2005; Hensher et al., 2005; Agimass and Mekonnen, 2011). While pseudo  $R^2$  statistics between 0.2 and 0.4 are said to be adequate (Bennett and Blamey, 2001; Birol et al., 2005; Agimass and Mekonnen, 2011), the corresponding result for the Probit model is higher 0.2 and it is 0.3. Thus, pseudo  $R^2$  suggested that Probit model of this study is well fitted model. It indicates that 37 percent of the variation of the diseases is explained by the associated variables.

## **5. Conclusion and Policy Implications**

Poor people have worse health outcomes than better-off people and this association reflects causality running in both directions: poverty breeds diseases and diseases keep poor people poor (Wagstaff, 2002). The evidence on inequalities in health between the poor and non-poor and on the consequences for impoverishment and income inequality associated with health care expenses. Government and corporate level interventions are highly required for improving the condition. Government can introduce monthly health care allowance for the poor through social safety net program. Government can also incorporate compulsory healthcare education at the primary and secondary level and increase poor people to keep their family size smaller by giving different mode of incentives like monthly financial support and job opportunity. In addition, government can introduce universal health coverage for the poor in the southwest coastal region with cost sharing approach. As we have no control over the climatic variability, we give more importance on R&D based adaptive measures for the poor under the climatic variability condition and it should come from government level and development partners. Corporate sectors should come forward to help the poor for ethical ground. They can provide sponsorship of the health care for the poor and set up temporary health camp or permanent hospital for the poor. Pharmaceutical companies should provide medicine for the poor with reduced price like price flooring approach.

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