

Universal Health Coverage for the Poor in the Coastal Bangladesh through Ethics and Economic Responsibility

Md. Hafiz Iqbal*

Poor people in general get poor quality of health services. The situation is very 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 more costly to reach than in urban hospitals and physician. To ensure good health service for the poor, it is essential to examine the effectiveness of Universal Health Coverage with respect to ethics and economics of responsibility point of view. To fulfill the research objective, this study followed a purposive sampling technique and carried out household interviews through questionnaire survey. This study applied the Probit model to generate empirically supported assessments. Provision of government and private sector intervention through social safety net programs and corporate social responsibility (CSR) for the poor and cost sharing through universal health coverage can help to improve health care service. The findings of this study justify improved, equitable and quality health care system for the poor people of the 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 poverty, Bangladesh

1. Introduction

Poverty and disease go in the same direction and there are complements to each other. 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 sick. Without decent shelter, clean drinking water, proper nutrition and adequate sanitation lead to push poor people 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 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 working as a vicious cycle (WHO 2000).

*Md. Hafiz Iqbal, PhD Researcher, Bangladesh University of Professionals (BUP), Dhaka, Bangladesh
E-mail: vaskoriqbal@gmail.com

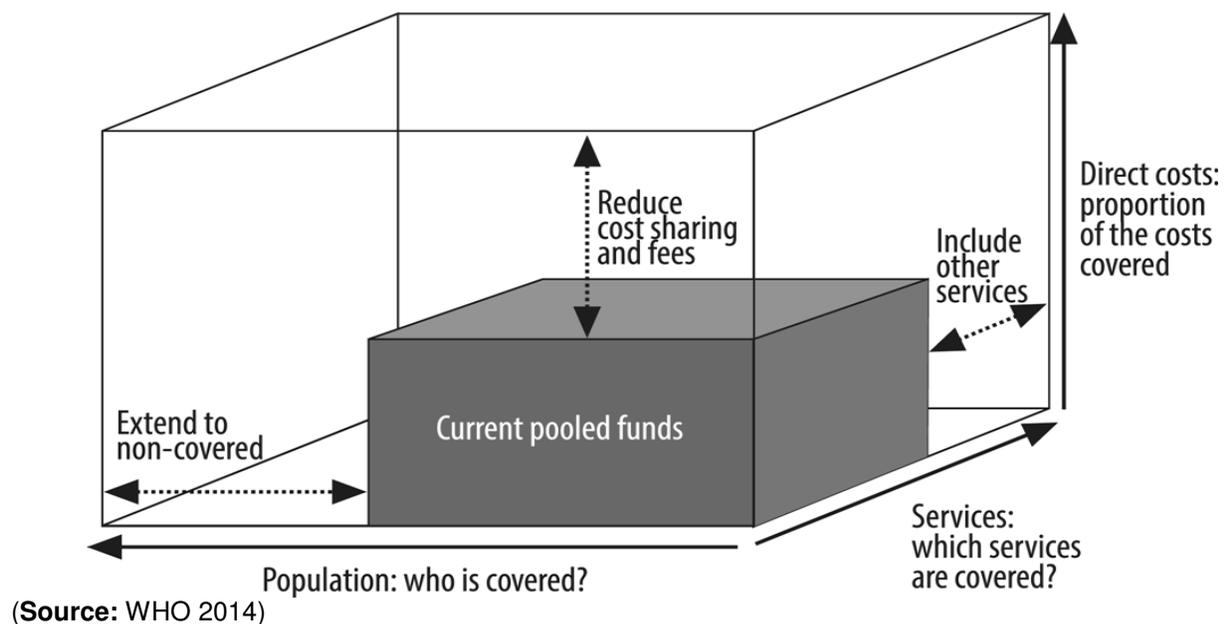
Iqbal

The current large variations in morbidity and mortality are more in underdeveloped countries or regions comparable to those of developed countries and regions due to the differences in living standards, socioeconomic factors (Forsdahl 1977; Marmot 2005; Wilkinson & Pickett 2012; Zaidi 1988). Poor people in the low-income countries live in the remote areas as health care facilities and services are often less complete, farther away and therefore more costly to reach than in urban hospitals and physician (Jensen & Saupé 1987). The lives of the poor are very vulnerable to health risk and their existing high health cost relative to their income. Poor people in the low-income countries are frequently suffering from poverty-related diseases causing higher levels of mortality, which are comparatively less in high income countries (Wogstaff 2002).

Poor people of the coastal region of Bangladesh are frequently suffering from climate induced diseases (Bhattacharjee et al. 2010; Sharma 2012; Khan et al. 2011, Confalonieri et al. 2007; McMichael & Lindgren 2011; Tanser et al. 2003). Public health status along with the health care system (e.g., availability of services, accessibility to services, utilization of 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 the inhabitants are poor and ultra poor. Along with the socioeconomic deprivation, relentless efforts to cope with the numerous coastal hazards have enhanced their vulnerability to health (Parvin 2008).

Assessing the potential health impact of poor people of the coastal region requires an understanding of the vulnerability of populations, their capacity to respond and adapt 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 primary health care (PHC) system in the coastal region of Bangladesh. UHC is surrounded by three dimensions which are shown in Figure 1.

Figure 1: Three dimension of Universal Health Coverage



Iqbal

UHC includes four components: full spectrum of quality health services address quality and efficient financial protection from direct payment for health services; address high out of pocket (OOP) by households, coverage for the entire population; address equity and efficient medical workforce and infrastructure, and address good service.

The first objective is to make the relationship of diseases of the poor people, universal health coverage, corporate social responsibility and social safety net program. The second objective is to identify the major socioeconomic-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 following research questions are addressed in the study: (i) What is the role of universal health coverage along with corporate social responsibility and social safety net program? (ii) Which socioeconomic-demographic factors work as important determinants of universal health coverage? (iii) What are the management strategy to implement universal health coverage for the coastal poor of Bangladesh.

The facts, findings, and policy of the study help to formulate and finalize the future Health Policy of Bangladesh and meet the main goals (e.g., goal 1: poverty and goal 3: good health and well-being) of SDGs. The 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 the study are also helpful for similar coastal regions to construct health policy for the poor. The study generates cutting edge knowledge of universal health coverage for the poor of the southwest coastal region, provide efficient health management technique, answer some unexplored research questions and reduce research gap on the similar studies. So far as we know it may be the first attempts to develop health policy guided by the universal health coverage principle for the coastal people as no previous studies focused in this field.

The author has given an introduction followed by the literature review. Section 3 covers study area and research design. Section 4 includes results and discussion and Section 5 gives conclusion and policy implications of the study.

2. Literature Review

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 the 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

Iqbal

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 point of view, values are derived exclusively from human beings and rights can be defined only with respect to human beings. According to Kant (1780), 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. Kantian philosophy is strongly supported by the libertarian moral philosophy. Libertarian moral philosophy begins from the Kantian imperative of respect for people, 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 the 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 of moral dignity and respect and welfare for the poor.

The presumption that health care cost is the responsibility of individuals is supported by orthodox economics, which treats health care as a consumer good (Cooper & 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 an optional matter of benevolence rather than responsibility (Champlin&Knoedler2008). 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 sector, NGO, development partner, 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 the government with on ethical point of view. They play an important role to make ethical commitment and contribution for enhancing the economic, social and environmental conditions and improving the human welling-being or quality of life of the local community especially for the poor and poor society at a large. They can construct a hospital for the poor, provide health card and provide quality medicine through the rationing system as health care for the poor is treated as a social good and it is fundamentally a matter of collective responsibility (Champlin&Knoedler2008).

Iqbal

Free market individualism and the public interest that will be adequately served by an absence of intentional action an “economic responsibility” (Clark 1936). Health care for the poor is a matter of joint or collective responsibility (Chasse 1994). Thus, it is clear that social responsibility is a construct. It is not concern issue of mainstream economics. Responsibility based health care is able to boost up quality health care for the poor, human well-being and welfare.

Socioeconomic status is the strongest predictor of morbidity, disorder, injury and mortality. For example, impoverished adults live seven to eight years less than those who have incomes four or more times the federal poverty level. In addition, white people with higher education and income, lived 14.2 years longer than black people who have less education and income (Conway 2016). Poor people have to fight against infectious and communicable diseases. On the other hand, rich people suffer frequently from lifestyle diseases. The often co-morbid and ubiquitous malnutrition take their toll on poor people (Singh & Singh 2008). Poverty related diseases cause for higher levels of mortality in low-income than high-income countries. The largest number of infectious diseases and neglected tropical diseases are more commonly found in areas or countries where poverty is high. This list includes widely recognized diseases such as HIV/AIDS, malaria, tuberculosis, dengue, Chikungunya, and foodborne trematode infections. As a consequence, more than one billion poor people worldwide is suffering from such diseases (Rees 2015). Poverty and disease are involved in a vicious downward spiral, each aiding and abetting the other. Poverty is an inveterate consequence and cause of ill health (Klugamn2002).

Approximately 100 million are pushed into poverty every year as a result of OOP payments for health care (MSH 2017). 11 million of Africans fall into poverty due to high OOP payments (WB n.d.). Under the provision of UHC, it is possible to ensure good health and well-being of the poor. Protecting poor people against the impoverishing effect of health payments is the cornerstone of UHC and will help prevent poverty. UHC gets more force when CSR works well. Pharmaceutical companies provide philanthropic activities for the health care of the poor (Smith 2003). Other corporate sectors also play an important role to enhance health facilities for the poor by health related campaign, donation for treatment of the poor and free clinic activities. Access to equitable health care facility is considered as a fundamental human right for all without distinction of race, religion, political belief, economic or social condition. Thus, the distribution of medical resources is usually considered to be equitable when it is based on medical need rather than on the ability to pay (Rice 1987).

The existing papers properly addressed the positive relationship between poverty and diseases in general. But no papers are able to address the relationship between the poverty and diseases of coastal people as coastal people are suffering frequently from climate induced diseases in the conditions of acute presence of poverty. In addition, very few papers show the linkage between ethics and economics of responsibility under the provision of UHC for further protection of financial hardship during the catastrophic period. Suggested policies of the study are derived from its research questions and

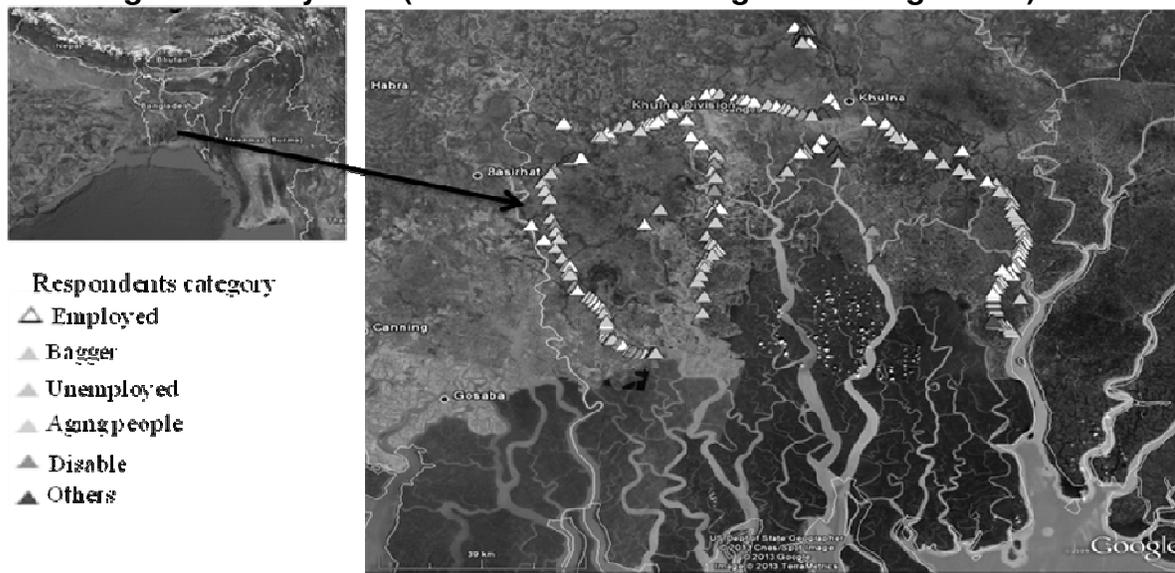
objectives. The study seeks to answer these unexplored research questions which didn't address yet in the recently published credible journal articles.

3. Selection of Study Area and Research Design

3.1 Study Area

Geographical and climatic characteristics have long been a concern issues of human health, mortality, morbidity, the length of life, poverty and human well-being (Pavlovic et al. 2000).Khulna, Satkhira and Bagerhat districts located in the southwest coastal region of Bangladesh are considered the study area because of the prevalence of acute poverty and climate induced diseases.This region is part of an active delta of large Himalayan Rivers and is vulnerable to climate change and natural hazards due to its disadvantaged geographic location and its flat and low-lying topography (Kibria 2011; Iqbal, 2015). The 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 the 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 (see Figure 2 for more details).

Figure 2:Study area (Southwest coastal region of Bangladesh)



Source: Prepared by the author 2017

There is discrimination in health care facility in this region compared to those of other regions of Bangladesh. The index of the 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 the health sector of this

Iqbal

region. The following reasons work as determinants to select the study area of the study: This region is vulnerable to climate change; Water logging is common in the region; Food security is under threat due to salinity, water logging and other climatic factors; Scarcity of pure drinking water is common in the region; People are frequently affected by climate induced diseases; Most of the people are poor and they are unable to bear medical expenses; and Health care facilities are not at standard level.

3.2 Research Design

Social science research frequently seems 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 socioeconomic 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 the overall health status of 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.

3.2.1 Pilot Survey

To observe and understand the current health care facilities and climate induced diseases, three short pilot surveys from (21-24) August, 2016 at Paikgachha Upazilla of Khulna district, Shyamnagar Upazilla of Satkhira district and Rampal Upazilla of Bagerhat District. It helped us to reduce probable non-response and biased response associated with questionnaire survey. Outdoor patients and sometimes accompanied persons of Paikgachha Upazilla Health Complex, Khulna district, Shyamnagar Upazilla Health Complex, Satkhira district and Rampal Upazilla Health Complex, Bagerhat district are the major integrated part of that pilot survey. 30 (10+10+10) respondents from above mentioned Health Complexes were selected for interview.

3.2.2 Sampling Strategy and Questionnaire Survey

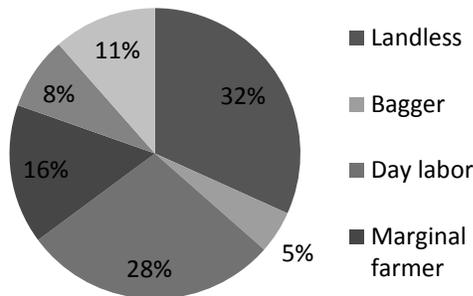
To represent the population as a whole, a comprehensive sample framework is necessary (Iqbal 2015). In the study, the sample frame is a set of poor people from different groups depending on the level of income. The study followed the purposive sampling technique.

The household head represented his/her household members as the respondent in this survey. Personal interviews were conducted with the head of the households, followed by a structured questionnaire to collect information about the perception of CSR and the

Iqbal

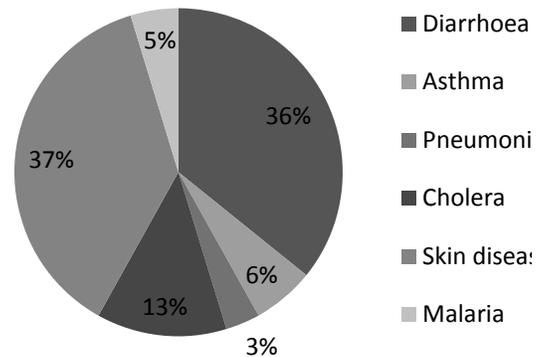
Social Safety Net Program for health care, pattern and frequency of diseases, age, income, family members and educational attainment. The survey using the final version questionnaires was conducted from (23 September-27 December), 2016. The questionnaire was made in English language, but interviews were conducted in the local language, Bangla. Due to the time and budget constraints, the surveys covered 151 respondents of which 142 respondents agreed to participate in the survey and responded to the questionnaire (response rate was 94.04%). Major characteristics of the respondents of the study are depicted in the following figures.

Figure 3:Occupational status



Source: Prepared by the author 2017

Figure 4:Disease patterns



Source:Prepared by the author 2017

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

3.2.3 Model Specification

For empirical assessment, this study used Probit or Normit model. This model is suitable for binary responses. It is also suitable for the cumulative density function that emerges from the normal cumulative function (Iqbal et al. 2014; Munizaga&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:

$$Y_i = \beta_1 + \beta_2 X_i + u_i \tag{1}$$

Where X_i is explanatory variables. Let $Q=1$ if the poverty is related to 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

Iqbal

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 the 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 the outcome variable (P_i) and estimate the parameters of explanatory variables (β_1, β_2), we take the inverse of the equation (2) and obtain

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

Probit model is dummy or binary dependent variable model. It is easy to interpret because unconditional probabilities can be expressed in terms of the standard normal distribution function.

3.2.3.1 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 considers 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

Iqbal

Bureau, n.d.). In most of the cases, the head of the household in 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. The 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 to quantify their impact on diseases of the poor in the study area. Table 1 describes the used variables and attributes in the Probit model with their expected sign.

Table 1: Description of Variables and Attributes with Expected Sign

Outcome/Independent variable and Attributes	Data type	Description	Hypothesized relation
dis: Disease (Outcome variable)	Binary	1: Yes 0: Otherwise	
age: Age (Independent variable)	Continuous	Age of the respondents	(+)
eda: educational attainment (Independent variable)	Binary	1: literate 0: Otherwise	(-)
fam: Family member (Independent variable)	Continuous	No. of family member	(+)
hin: Household income (Independent variable)	Continuous	Household monthly income	(-)
clv: Climatic variability (Independent variable)	Binary	1: Yes for increase diseases 0: Otherwise	(+)
csr: Corporate Social Responsibility (Independent attribute)	Binary	1: Yes for control of diseases 0: Otherwise	(-)
ssnp: Social Safety Net Program (Independent attribute)	Binary	1: Yes for diseases 0: Otherwise	(-)
uhc: Universal health coverage (Independent attributes)	Binary	1: Yes for good health care 0: Otherwise	(-)

(Source: Prepared by the author 2017)

The people of the southwest coastal region are frequently suffering from the climate induced diseases and it is enhanced when there is climatic variability. The situation is worsening for the ageing people, low income household and household with large family members. Government intervention (e.g., Social Safety Net Program and universal health coverage) along with corporate social responsibility can improve the health care facility and reduce the disease threat induced by climate change.

4. Results and Discussion

As shown in Table 2 below, most of the variables and attributes are statistically significant with the expected sign at 0.01 percent, 0.05 percent and 0.10 percent levels respectively.

Table 2: Parameter 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 (reject hypothesis)
eda	-0.21982**	0.54120	0.05109 (accept hypothesis)
fam	0.53122***	0.62096	0.01101 (accept hypothesis)
hin	-0.57090**	0.67091	0.05001 (accept hypothesis)
clv	0.32091**	0.21788	0.03601 (accept hypothesis)
csr	-0.28890E-1***	0.22098	0.00000 (accept hypothesis)
ssnp	-0.86703-1***	0.34987	0.00100 (accept hypothesis)
uhc	-0.54230***	0.45551	0.00000 (accept hypothesis)
constant	1.45904*	0.12101	0.07189 (accept hypothesis)
McFadden (pseudo) R ²	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)

(Source: Prepared by the author 2017)

According to the model, all of the variables are significant except age. The general observation of the field survey identified that the 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. Based on the estimated result, we cannot say anything about the relationship between age and diseases of the southwest coastal region. Thus, we accept the null hypothesis and reject the alternative hypothesis about the relationship between age and disease. 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. Under this circumstance, the concern null hypothesis of these variables is rejected and their alternative hypothesis is accepted. Poor people of the southwest coastal region have a positive perception about 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, lifestyle, disease and nutrition. Poor people have an 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

Iqbal

for the treatment of the poor through the approach of corporate social responsibility. The 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 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 to the diseases of the southwest coastal region, which implies that these variables go in the same direction as diseases. Under this condition, null hypothesis of these variables is rejected and alternative hypothesis is accepted. Poor households are generally consisting of large family members in the southwest coastal region. Large household requires a large amount of the treatment cost. Tidal waves, salinity, cyclones, storm surges, water logging, drought, drinking water scarcity are the most 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. Based on the estimated results, it is said that Null hypothesis is rejected and the alternative hypothesis is accepted at the convenient levels of significance under the scenario of climate induced diseases and all proposed variables and attributes.

The coefficients of the model are range 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&Mekonnen 2011). While pseudo R^2 statistics between 0.2 and 0.4 are said to be adequate (Bennett & Blamey 2001; Birol et al. 2005; Agimass&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 Implication

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 of inequalities in health between the poor and non-poor and on the consequences of impoverishment and income inequality associated with health care expenses. Government and corporate level interventions are highly required for improving the condition. The government can introduce monthly health care allowance for the poor through social safety net programs. Government can

Iqbal

also incorporate compulsory healthcare education at the primary and secondary level and encourage poor people to keep their family size smaller by giving different mode of incentives like monthly financial support and job opportunity. In addition, the government can introduce universal health coverage for the poor in the southwest coastal region with the cost sharing approach. As we have no control over the climatic variabilities, we give more importance on R&D based adaptation 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 for 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. Based on the estimated results of the Probit model, it is strongly suggested that universal health coverage for the poor works well when we consider moral ethics and economics responsibility. When moral ethics and economic responsibility activated properly, UHC works well. In addition, compulsory health education and income play an important role to enhance UHC when there is existence of climatic variability. The findings of this study generate the body of new knowledge in the health sector and protect the poor people from financial hardship during the catastrophic period as the previous studies are failing to address this issue. Ethics and economic responsibility guided variables plays an important role to formulate good health policy and implement universal health coverage for the coastal people that are not addressed properly in the previous study.

Due to the time limitation, budget constraints and other logistic supports, this study is not free from certain lacunas. The southwest coastal region is the study area of this study. It doesnot include the whole coastal region of Bangladesh and large respondents to participate questionnaire survey. Thus, this study recommends for further study to avoid such shortcomings and get better findings to formulate health policy that will cover UHC properly.

References

- Agimass, F & Mekonnen, A 2011, 'Low-income fishermen's willingness-to-pay for fisheries and watershed management: An application of choice experiment to Lake Tana, Ethiopia', *Ecological Economics*, Vol. 71, Pp. 162-170.
- Ahmed, ANMM 1991, 'Women's Participation in Politics: Bangladesh Perspective', *Chittagong University Studies*, Vol. 12, No. 1, Pp. 1-18.
- Bennett, J & Blamey, R 2001, *The choice modeling approach to Environmental valuation: New Horizons in Environmental Economics*, Edward Elgar Publishing, Inc., Massachusetts, USA.
- Bhattacharjee, S, Bhattacharjee, S, Bal, B, Pal, R, Niyogi, SK&Sarker, K 2010, 'Is *Vibrio fluvialis* Emerging As a Pathogen with Epidemic Potential in coastal region of eastern India following cyclone Aila?' *Journal of Health, Population and Nutrition*, Vol. 28, No. 4, Pp. 311-317.
- Birol, E, Karousakis, K & Koundouri, P 2005, *Using a choice experiment to estimate the non-use values of wetlands: the case of Cheimaditida wetland in Greece*,

Iqbal

- Environmental Economy and Policy Research Discussion Paper Series, Department of Land Economy, University of Cambridge.
- Champlin, DP & Knoedler, JT 2008, 'Universal Health Care and the Economics of Responsibility', *Journal of Economic Issues*, Vol. 42, No. 4, Pp. 913-938.
- Chasse, JD 1994, 'The American Association for Labor Legislation and the Institutionalist Tradition in National Health Insurance', *Journal of Economic Issues*, Vol. 28, No. 4, Pp. 1063-1090.
- Clark, JM 1936, 'The Changing Basis of Economic Responsibility', *Journal of Political Economy*, Vol. 24, No. 3, Pp.209-229.
- Confalonieri, U, Menne, B, Akhtar, R, Ebi, KI, Hauengue, M & Kovats, RS 2007, 'Human health', in: MI Parry, OF Canziani, JP Palutikof, PJ Linden & CE Hanson (ed.), *Climate Change 2007: Impacts, Adaptation and Vulnerability*, Contribution of Working Group II to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change, United Kingdom: Cambridge University Press, Pp. 391-431.
- Conway, C 2016, *Poor health: when poverty becomes disease*, University of California, San Francisco, USA, viewed at 29 January 2017, <www.ncsf.edu/news/2016/01/401251/poor-health>.
- Cooper, BS & Vladeck, BC 2000, 'Bringing Competitive Pricing to Medicare: Theory Meets Reality, and Reality Wins', *Health Affairs*, Vol. 19, No. 5, Pp. 49-54.
- Forsdahl, A 1977, 'Are poor living conditions in childhood and adolescence an important risk factor for arteriosclerotic heart disease?', *British Journal of Preventive and Social Medicine*, Vol. 31, Pp. 91-95.
- Hensher, DA, Rose, JM & Green, WH 2005, *Applied Choice Analysis: A Primer*. Cambridge University Press, Cambridge.
- Iqbal, MH, Mahamud, MS, Rahman, MM & Islam, AF 2014, 'Seasonal Food Insecurity in the drought-prone northwestern region of Bangladesh: An econometric analysis', *Journal of International Development and Cooperation*, Vol. 20, No. 2, Pp. 49-59.
- Iqbal, MH 2015, 'Nexus between salinity and ecological sustainability of crop production of southwest coastal region of Bangladesh: Translog Production Function approach', *Bangladesh Journal of Political Economy*, Vol. 31, No. 2, Pp. 491-502.
- Jensen, HH & Saupe, WE 1987, 'Determinants of health insurance coverage for farm family households: A mid western study', *North Central Journal of Agricultural Economics*, Vol. 9, No.1, Pp. 145-155.
- Kant, I 1780, *The Metaphysical Elements of Ethics*, Unabridged Start Publishing LLC.
- Khan, NA 1998 *A Political Economy of Forest Resource Use*, Vermont, Ashgate Publishing Company.
- Khan, AE, Ireson, A, Kovats, S, Mojumder, S.K, Khusru, A, Rahman, A & Vineis, P 2011, 'Drinking water salinity and maternal health in coastal Bangladesh: implications of climate change', *Environmental Health Perspectives*, Vol. 119, No. 9, Pp. 1328-1332.
- Kibria, Z 2011, *Tidal river management (TRM): climate change adaptation and community based river basin management in southwest coastal region of Bangladesh*, Uttaran, Bangladesh: Dhaka

Iqbal

- Klugamn, J 2002, 'Health, nutrition and population', in J Klugamn (ed.), *A sourcebook for poverty reduction strategies*. Washington DC: The World Bank.
- McMichael, AJ & Lindgren, E 2011, 'Climate change: Present and future risks to health and necessary response', *Journal of Internal Medicine*, Vol. 270, No. 5, Pp. 201-413.
- Michigan Sea Grant n.d, *Climate variability and climate change: what is the difference?*, viewed 22 January 2017, <<http://www.miseagrant.umich.edu/downloads/climate/11-703-Climate-Variability-and-Climate-Change.pdf>>.
- MoLJPA 1999. *Bangladesh Constitution, 1972*, Ministry of Law, Justice and Parliament Affairs, The People's Republic of Bangladesh, Bangladesh: Dhaka.
- Mormot, M 2005, 'Social determinants of health inequalities', *Public Health*, Vol. 365, No. 9464, Pp.1099-1104, doi: [http://doi.org/10.1016/S0140-6736\(05\)71146-6](http://doi.org/10.1016/S0140-6736(05)71146-6).
- MSH 2017, *Universal health coverage and non-communicable diseases: a mutually reinforcing agenda*, Management Science for Health, viewed 28 January 2017, <www.msh.org/resources/universal-health-coverage-and-non-communicable-diseases-a-mutually-reinforcing-agenda>.
- Munizaga, MA. & Alvarez-Daziano, R 2001, *Mixed logit vs. nested logit and probit models*, Departamento de Ingenieria Civil, Universidad de Chile, Casilla 228-233, Santiago, Chile.
- Parvin, GA, Takahashi, F & Shaw, R 2008, 'Coastal hazards and community-coping methods in Bangladesh', *Journal of coastal conservation*, Vol. 12, No. 4, Pp. 181-193, doi: 10.1007/s11852-009-0044-0.
- Pavlovic, M, Jazbec, A, Simic, D, Corovic, N, Malinar, M & Mimica, M 2000, 'Variation in Survival in Coastal and Continental Regions of Croatia-Results of a Longitudinal Study', *European Journal of Epidemiology*, Vol. 16, No. 11, Pp. 1061-1068.
- Perman, R, Ma, Y & McGilvray, J 1996, *Natural Resource and Environmental Economics*, London, Longman.
- Rahman, S 1994, 'Agroforestry in Bangladesh: Need for a Collaborative Efforts', *Grassroots*, Vol. 3, No. Xi, Pp. 5-15.
- Rees, A 2015, *Diseases and the link to poverty*, Reset, viewed 16 February 2017, <www.reset.org/knowledge/diseases-and-links-poverty>.
- Rice, T 1987, 'An Economic Assessment of Health Care Coverage for the Elderly', *The Milbank Quarterly*, Vol. 65, No. 4, Pp. 488-520.
- Roy, A 2014, *Transcending Obamacare: A patient-centered plan for near universal coverage and permanent fiscal solvency*, Policy Research of Manhattan Institute, viewed at 17 January 2017, <<https://www.manhattan-institute.org/html/transcending-obamacare-patient-centered-plan-near-universal-coverage-and-permanent-fiscal>>.
- Sharma, R 2012, 'Impacts on human health of climate and land use change in the Hindu Kush-Himalayan region: overview of available information and research agenda', *Mountain Research and Development*, Vol. 32, No. 4, Pp. 480-486.
- Singh, A & Singh, SA 2008, 'Diseases of poverty and lifestyle, well-being and human development' *Mens Sana Monographs*, Vol. 6, No. 1, Pp. 187-225, doi:10.4103/0973-1229.40567.

Iqbal

- Smith, NC 2003, '*Corporate social responsibility: not whether, but now?*' Centre for Marketing Working Paper, no. 03-701, London Business School, UK.
- Stevens, P 2004, *Diseases of poverty and the 10/90 gap*, International Policy Network, London, UK.
- Tanser, F, Sharp, B & le Sueur, D 2003 'Potential effect of climate change on malaria transmission in Africa', *Lancet*, Vol. 362, No. 9398, Pp. 1792-1798.
- UNDP 2012, *APPRC-UNDP research initiative: Social safety nets in Bangladesh*, Review of Issues and Analytical Inventors, Power and Participation Research Centre, vol.1.
- United States Census Bureau n.d, *Educational attainment*, viewed at 22 January 2017, <<http://www.census.gov/hhes/socdemo/education/>>.
- Wagstaff, A 2002, *Poverty and health sector inequalities*. Bulletin of the World Health Organization, doi://dx.doi.org/10.1590/S0042-96862002000200004.
- White, S 1992, *Arguing with the Crocodile: Gender and Class in Bangladesh*, Zed Books Limited, London.
- WB n.d, *Universal health coverage in Africa: a framework for action*, viewed at 27 January 2017, <[http://documents.worldbank.org/curated/en/735071472096342073/pdf/108008-v1-REVISED-PUBLIC-Main-report-TICAD-UHC-Framework-FINAL.pdf](http://documents.worldbank.org/curated/en/735071472096342073/pdf/108008v1-REVISED-PUBLIC-Main-report-TICAD-UHC-Framework-FINAL.pdf)>.
- WHO 2000, *Bulletin of the World Health Organization*, Vol. 78, No.1, doi: <http://dx.doi.org/10.1590/S0042-9686000000100001>.
- WHO 2014, *Health financing for universal coverage*, viewed 22 January 2017, <http://www.who.int/health_financing/en/>.
- World Health Report 2002, *Reducing risks, promoting health life*, Viewed 22 February 2017, <http://www.who.int/whr/2002/en/whr02_en.pdf>.
- Wilkinson, R & Pickett, K 2012, *A critical reading of the spirit level: why equality is better for everyone*. Milos Simic. CERES Department, viewed at 17 January 2017, <[www.environnement.ens.fr/IMG/file/stages/A critical reading of the Spirit Level_MilosSimic-2.pdf](http://www.environnement.ens.fr/IMG/file/stages/A%20critical%20reading%20of%20the%20Spirit%20Level_MilosSimic-2.pdf)>.
- Zaidi, SA 1988, 'Poverty and disease: Need for structural change', *Social Science and Medicine*, Vol. 27, No. 2, Pp. 119-127.