

## Women Health Status and Disease Pattern in Rural Bangladesh: A Study of Bogura District

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### Abstract

*This study attempts to find the women's health status and disease pattern in rural Bangladesh. It finds a pattern of common diseases and social and environmental factors responsible for the diseases of the rural women in the study area. A binary logistic regression model was used to find the determinants of the poor health status of the respondents. The study's findings reveal that among the common diseases, the most common diseases are cold disease, malnutrition and acidity. The percentages of respondents who suffer from the diseases mentioned above are 58.3, 35.0 and 49.2, respectively. The main reason for cold disease and skin allergy may be the use of polluted river water for bathing and washing utilities. It is also found that the age of respondents, household size, family's monthly income, number of diseases and number of visits to the doctor of respondents have a significant impact on the poor health status of rural women in the study area. Age and number of diseases are the major determinants of the poor health status of rural women in the study area. The probability of respondents being in the poor health status category increases with the increase in age and the number of diseases of respondents. A family's monthly income is another major determinant of the poor health status of rural women in the study area. The probability of respondents being in the poor health status category*

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*decreases with the increase in income level of the respondent's family. The study recommends that government reasonable health status efforts, especially for rural women, should focus on appointing more female health workers, making proactive policy in expanding income generating activities for women, strengthening supports for education opportunities, and proper family planning.*

**JEL Classification** O15 · I12 · I15 · I18

**Keywords** Health Status · Rural Women · Diseases Pattern · Logistic Regression · Bangladesh

## 1. Introduction

It is widely recognised that the health and well-being of women and children suffer most in disasters and conflicts (crisis setting) and that their additional needs do not receive due attention from humanitarian and other service providers. These special needs derive from the vulnerability of women to sexual and gender-based violence, reproductive morbidity, sexually transmitted infections including HIV, mental distress, and gender-related inequalities that impact the health and nutrition of women. Gender constructions and discourses shape how rural women and men live their lives, and, consequently, gender is a crucial determinant of health status. So, this study was conducted to analyse the health status and diseases pattern of rural women in Bangladesh.

Health status is a holistic concept determined by more than the presence or absence of any disease. It is often summarised by life expectancy or self-assessed health status and more or broadly includes measures of functioning, physical illness, and mental well-being. Health status is an individual's relative level of wellness and illness, taking into accounts the presence of biological or physiological dysfunction, symptoms, and functional impairment and can be determined by age, household size, family's monthly income, occupation, and by the number of diseases and number of visits to a doctor. Fair or Poor Health Status is defined as respondents who report having fair or poor health from possible response choices of "excellent", "very good", "good", "fair", or "poor". Women's health status has implications for a country's development and quality of life. Women's health is vital in developing countries since their traditional role as a family caregiver makes them chiefly responsible for the health of their children, husband, and other family members in the home. However, the stereotypical view of rural women is that they are stoical, used to adversely and self-reliant. As overseers of the family members who are ill or in need have care, often to the detriment of their health. Rural women's health status is likely to differ depending on where they live.



Though rural women constitute an overwhelming majority of women in developing countries, they suffer from various diseases. Health is an essential requirement to improve the quality of life. The international declaration of Health rights proclaims that "the enjoyment of the highest attainable standard of health is one of the fundamental rights of every human being" (Perry 2000). Women's health involves their emotional, social, spiritual, and physical well-being and is determined by the social, political, and economic context of their lives, as well as biology (Navarro and Shi 2001). Globally, 43% of all women and 56% (on average) of pregnant women suffer from iron-deficiency anaemia (Allen 2000). Every year, about 10 million women endure life-threatening complications during pregnancy and childbirth, sometimes leading to long term disability (WHO 2015). The primary health problems of women are related to malnutrition and environmental factors that are disease-related and mostly preventable (Blair 1980 and Helweg-Larsen and Kruse 2003). In urban areas, only 28% of the population live, but about 75% of health infrastructure, medical workforce and other health resources are concentrated in urban areas, and the rest 72% of people live in rural areas. However, only 25% of medical facilities are concentrated in rural areas (NFHS-3 data). Contagious, infectious and water-borne diseases such as diarrhoea, typhoid, infectious hepatitis, worm infestations, measles, malaria, tuberculosis, whooping cough, respiratory infections, pneumonia and reproductive tract infections dominate the morbidity pattern, especially in rural areas. However, non-communicable diseases such as cancer, blindness, mental illness, hypertension, diabetes, HIV/AIDS, accidents and injuries are also rising.

The susceptibility of women in Bangladesh to these poor health conditions directly results from poverty, inferior socio-cultural status, and limited access to health care services. Poverty contributes to poor health through economic dependence, poor nutrition, substandard housing, and inadequate access to sanitation and safe drinking water (Buor, 2004; Wyss, 2003; Williams, Sobieszczyk, & Perez, 2000; Gijsbers Van Wijk, Van Vliet, & Kolk, 1996; Gellert, 1995). Without income, women cannot obtain nutritious foods and adequate housing that protect and improve their overall health (Buor, 2004). The lack of potable water and proper sanitation facilities also contributes to the rapid spread of infectious diseases. Women's health is intrinsically linked to their status in society, especially those living in rural areas. Research into women's status in society has found that the contributions of women make to families are often overlooked. Instead, they are often regarded as economic burdens, and this view is common in rural areas of the northern belt. There is a strong preference for sons in Bangladesh because they are expected to care for ageing parents. This son preference and high dowry costs for daughters results in the mistreatment of

daughters. Indeed, women have low levels of both education and formal labour-force participation. They typically have little autonomy, living first under the control of their fathers, then their husbands, and finally their sons. These factors have an adverse impact on the health status of Bangladeshi women.

- To achieve this primary objective, this study set some specific objectives, which are as follows:
  - To find the common diseases pattern and the social and environmental factors responsible for the diseases of rural women in the study area.
- To analyse the determinants of the poor health status of rural women of the study area.

The structure of the present study is as follows: after presenting the issue in the introductory section, a brief literature review is provided in Section 2. The materials and methods employed in this study are provided in Section 3. The description of data about to find the common disease's pattern, as well as the social and environmental factors responsible for the diseases of rural women in the study area and discussion of result about the determinant factors of poor health status of rural women in the study area, are presented in Sections 4 and 5 respectively. Finally, the conclusion and policy recommendations are provided in Section 6.

## 2. Literature Review

Women are the most neglected and deprived section of the society in Bangladesh. Women's health and health care are minor or not attended in the traditional society, especially in rural areas. Women's health complexities and problems are among the significant health problems in Bangladesh. Every year, a large number of women endures life-threatening complications during pregnancy and childbirth. The primary health problems of women are related to malnutrition and environmental and disease-related factors. Various studies have been undertaken about diseases and morbidities among rural women in Bangladesh. Some of these studies are given below:

Elahi, Rashid and Sarkar (2016) illustrate that substantial life of women and children are lost every year in Bangladesh through various diseases. Their study area of Gangachara Upazila of Rangpur district is one of the munga-prone areas in Bangladesh. To have performed the analysis on the data sets and derived the findings, applied GIS, as usual, descriptive statistical tools and techniques and collected two types of primary data (socio-economic and geographical) from the field by conducting a questionnaire survey, FGD and GPS device. Their result shows that maximum women families sanitary systems are non-hygienic. Women



and children face different kinds of health problems. They are also affected by several water-borne diseases, and they do not get any doctoral facilities. Paul, Murshed and Akter (2014) illustrate that most women of three char villages of Nilkamal Union of Haimchar Upazila under Chandpur district were found illiterate and not fully conscious about health and health care aspects. The overall health condition of women was found very poor and affected by various diseases from lack of personal attention and adequate health care. They evident that most women aged 26 to 45 in the study area were the most sufferers of a different number of diseases like fever, diarrhoea, skin diseases, asthma, reproductive tract infections (RTI), and various gynaecological diseases. They also identified that water and sanitation-related diseases are very common among the women of the study area, which may result from unsafe water and unhygienic sanitation practices. Joshi and Schultz (2012) analyse the impact of an experimental maternal and child health and family-planning program implemented in Matlab (Dhaka), Bangladesh, in 1977. Village data from 1974, 1982 and 1996 suggest that program villages experienced extra declines in the fertility of about 17%. These program effects are robust to the inclusion of individual, household, and community characteristics. They conclude that the benefits of this reproductive and child health program in rural Bangladesh have many dimensions extending well beyond fertility reduction, which do not appear to dissipate after two decades. Munsur et al. (2010) examined the socio-economic backdrops, living arrangements, health status and abuse of the women aged 60 years and older in the rural Naogaon district of Bangladesh. The result is that an overwhelming majority of the older women aged 60-69 years are widowed, illiterate, have no education and income, are economically dependent, live with married children, are unhealthy, and suffer from arthritis-related illness.

Furthermore, the study shows that nearly 35 per cent of older women are abused, mostly mentally abused, due to poverty. Logistic regression analysis reveals the determinants of living arrangements, health status and abuse of older women. The findings of their study should get due attention to provide secured later life of the elder predominantly female elderly in Bangladesh and developing nation as well. Islam (2006) gauge the general and maternal health status of rural women. They selected two villages Khayerhuda and Monoharpur, of Chuadanga district. They report that 40% of the households were landless, while 44.5% did not have any regular income. About 9% of the women had any income at all to support their families. Only 7% of women had the opportunity to visit nearby satellite clinics or FWCs (Family Welfare Centres) accompanied by untrained TBA (Traditional Birth Attendants) or FWA (Family Welfare Assistants). Self-motivated sterilisation was almost absent among all the women.

Most of the respondents attended quacks or Kabiraj (traditional healers) for general illnesses. Diarrheal was the most common disease experienced by participants. Another study on anaemia among non-pregnant women in rural (Twelve randomly selected villages in Fulbaria Upazila of Mymensingh District) Bangladesh (Ziauddin et. al.2000) found that anaemia was highly prevalent (73%). Most of the women had mild (52%) or moderate (20%) anaemia, but a few of them suffered from severe anaemia (1%). *Ascaris* was common (39%), while hookworm was not (1%). The anaemia prevalence had no statistically significant association with age, parity or *Ascaris* infestation. Women with less than one year of schooling who were landless or reported having an economic deficit in the household had a significantly higher prevalence of anaemia. There was a significantly increasing trend in anaemia prevalence with decreasing socio-economic situation. However, anaemia was common in all social strata.

### **3. Materials and Methods**

#### **3.1 Selection of the Study Area**

In this study, two villages (Baoitona and Joybhoga) were selected randomly from the Naruamala Union of Gabtali Upazila of Bogra district, about 10 kilometres away from the Bogra town. Various categories of socio-economic characteristics inhibit all these two villages. The main characteristic of these villages is that the women are suffering from various diseases. The number of households in Joybhoga village is 555, and the average household size is 3.9. The literacy rate of this village is 51.3%. Where the number of households in Baoitona village is 360, and the average household size is 3.6. The literacy rate of this village is 65.9%. Agriculture and livestock sectors play a vital role in these villages. The villagers produce varieties of crops, namely rice, jute, wheat, potato and other vegetables.

#### **3.2 Research Design**

The research employed a cross-sectional design whereby the data were collected at a single point in time from a sample selected to represent a larger population. The survey consisted of asking questions to a representative sample of rural women in September 2016.

#### **3.3 Sample Size and Sampling Procedure**

The respondents of the study mainly involved women. All categories of women such as single, married, widowed and divorced are included as respondents aged 15 and above. During this time, the women are suffering from various diseases. These respondents are selected following the simple random sampling



procedures, which are interviewed during the data collection period. A total of 120 respondents were selected for interview for the study. Among them, 60 respondents are from the village of Joybhoga (vill-1), and the other 60 respondents are from Baoitona (vill-2).

### **3.4 Techniques of Data Collection**

For the collection of data, the researcher has used a cross-sectional approach, and primary data were collected with face to face interview method using a well-structured questionnaire with both open and closed-ended question items based on the research questions inherent in the research objectives. To test the accuracy of the questionnaire, the researcher made pilot surveys. Then the researcher himself went to the respondents to take interviews. The questionnaire is prepared with great care so that accurate results can be achieved for the study. In this way, a total of 120 respondents have been interviewed.

### **3.5 Data Processing and Analysis**

The collected data were entered into the software SPSS version 15.0 and STATA 11, and they were organised systematically. Data were analysed in three steps. First, the pattern of common diseases and social and environmental factors responsible for the rural women of the study area were analysed using descriptive statistics of SPSS version 15.0 software. Second, to find the determinants of the poor health status of the participant respondents, the binary logistic regression model was used. To estimate the regression equation, the maximum likelihood estimation (MLE) method was applied. It was done using STATA 11 software.

### **3.6 Empirical Model for the study**

The health status of rural women is deplorable. Their age, household size, family's monthly income, occupation, number of diseases, number of doctor visits affect their health status. We can show the effects of their socio-economic characteristics on their health status by an empirical model. In these studies, the regression model estimates the relationship between health status (poor health status) and its determinant factors. The logistic regression model is used to identify the causal effect of determinant factors on the poor health status of rural women. The explanatory variables included in the model are age, household size, family's monthly income, occupation, number of diseases in the previous year, and number of visits to a doctor in the previous year. The logistic regression model is used in this study because the dependent variable (health status of respondents) is binary or dichotomous. It assumes the value 1 when the respondent has poor health and 0 when the respondent has good health.

Let  $\pi_i$  denote the probability of a respondent being in poor health. We assume that  $\pi_i$  is a Bernoulli variable, and its distribution depends on the vector of predictors  $x$  so that

$$\pi_i = \frac{e^{\beta_0 + \beta X}}{1 + e^{\beta_0 + \beta X}}$$

$$\pi_i(x) = e^{(\beta_0 + \beta X)} / (1 + e^{(\beta_0 + \beta X)})$$

Where  $\beta$  is a row vector and  $\beta_0$  is a scalar. The logit function to be estimated is written as

$$\ln \frac{\pi_i}{1 - \pi_i} = \beta_0 + \beta_i X_i$$

The logit variable is the natural log of the odds of the respondent falling into poor health. The logit model is given below, in which several factors are considered as the explanatory variables.

The model is implicitly stated as follows:

$$Y = f(X_1, X_2, X_3, X_4, X_5, X_6) \dots \dots \dots (1)$$

Where,  $Y$  = Health Status (1 = poor health, 0 = good health)

$X_1$  = Age

$X_2$  = Household size

$X_3$  = Family's monthly income (Tk. Per month)

$X_4$  = Occupation (1 = House wife and 0 = otherwise)

$X_5$  = Number of diseases in previous year

$X_6$  = Number of visit to doctor in previous year

Rural women's poor health depends on demographic and socio-economic factors. In the above model, based on the explanatory variables, we show the influence of these factors on poor health.

### 3.7 Specification and estimation of the Model in the Present Study

The above model needs to be appropriately specified for the empirical investigation of the present study. It will help determine the positive and negative impact of the determinants on rural women's health status. We have used primary data to test the impact of the determinant factors of the rural women's poor health status. We have taken a logistic regression model to study the qualitative conclusion.



The model is explicitly stated as follows:

$$Li = \ln \frac{P_i}{1-P_i} = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \beta_6 X_6 + u_i, \dots \dots \dots (2)$$

Where  $Li$  is for the logit for the respondent and  $P_i$  is the probability of the  $i$ th women falling poor health.  $\beta_1$  to  $\beta_6$  are coefficients to be estimated,  $\beta_0$  is the intercept term, and  $u_i$  is the stochastic error term.

The functional relationship between the dependent variable in terms of health status and the considered explanatory variables in terms of socio-economic characteristics such as age, household size, family's monthly income, occupation, the number of diseases, and the number of doctor visits are specified in the earlier section in equation (2) as a logistic regression function. The estimation of equation (2) is performed by using the maximum likelihood estimation procedure.

#### 4. Data Description

For the research, study data has been collected directly from 120 respondents from two sample villages. Data has been collected to get information on the variables and other relevant aspects of the research. It is observed that there have been significant variations in the values of the variables across villages and respondents.

##### 4.2 Common Diseases of the Study Area

The common diseases reported by women from the study area are cold disease, diarrhoea, menstrual and reproductive tract infection (RTI), malnutrition, waist ache, skin allergy, hypertension, hypotension, acidity, eye disease, asthma.

##### 4.3 Pattern of Common Diseases and Social and Environmental Factors Responsible for the Diseases

The lack of safe water supply and basic sanitation facilities coupled with malnutrition, poor and inadequate housing, and other socio-economic factors, particularly poverty, have resulted in high morbidity and mortality within communities in the rural areas of Bangladesh (Aziz et al., 1990, Koenig et al. 2003). The present study attempt to find the pattern of common diseases and social and environmental factors responsible for the diseases

Table 4.2: Number and Percentage of Respondents by the Pattern of Common Diseases

Pattern of Common Diseases	Number of Respondents	(%) of total
Cold Disease	70	58.3
Diarrheal	11	9.2
Menstrual and Reproductive Tract Infection (RTI)	15	12.5
Malnutrition	42	35.0
Waist Ache	30	25.0
Skin Allergy	19	15.83
Acidity	59	49.2
Hypertension	18	15.0
Hypotension	15	12.5
Eye Disease	13	10.83
Asthma	17	14.17

Source: Field Survey, September 2016

The pattern of common diseases as found in the survey shows the following:

**Cold Disease:** Cold Disease is the most common health problem as reported by the study area. From the survey, it is recorded that the highest number of respondents, 58.3%, found suffering from cold disease frequently, and they do not take proper treatment for the disease as the respondent mentioned that they do not treat cold disease as any disease or health problem instead they consider the causing of cold disease as a simple matter. According to the (V.H.W) Pharmacist, bathing in river water is the leading cause of cold diseases of rural women. From the field survey, it is found that 43.3% of rural women use river water for bathing.

**Diarrheal Diseases:** About 9.2% women of in the study area reported that they commonly suffer from diarrhoea. Diarrheal is a water-borne disease, and women are more involved with water use and sanitation than men. In the study area, the majority of the women are illiterate, and they are not aware of their hygiene. The use of unsafe water and inadequate sanitation facilities attribute diarrhoea diseases to the women of rural areas. The survey found that 94.2% of respondents do not wash their hands properly after defecation, and only 5.8 % found to practice hygiene rules. Like other remote rural areas of Bangladesh, there found that only 45.8% has hygienic-sanitary latrines in the study area, and 3.3% has no latrine. The respondent with no toilet facilities in the study area often gets off defecation in the open spaces. The lack of sanitary latrines and hygienic toilet practices are strongly related to diarrhoea diseases. In the study area, 43.3% of respondents use river water for bathing, washing, animal bathing, and other purposes. The field survey shows that anthropogenic causes such as domestic uses, cloth washing, throwing human and animal excreta, and animal bathing purposes are significant factors of water pollution in the river area. At that time,



respondents mainly were affected by water-borne diseases (diarrhoea, cholera) for using the polluted water.

**Menstrual Problem and Reproductive Tract Infection (RTI):** Menstrual problems and RTI of women are less talked about in Bangladesh. However, about 12.5% of surveyed women have mentioned the diseases which they are facing. At the time of menstruation, lower abdominal pain accompanied by heavy bleeding, white discharges accompanied by abdominal cramps, irregularity of menstruation is some common menstrual problems in the rural areas, as mentioned by the respondents. From the study, it was disclosed that almost all the adolescent girls and women in the rural areas use rags for protection during menstruation. These rags are not washed well or never appropriately dried in the sun because of a lack of private places. As a result, they often get mildew or fungus leading to reproductive tract infection. No one of the respondents found in the study area to use sanitary method. These unhygienic practices during menstruation may be the consequences of reproductive tract infection in the study area.

**Malnutrition:** About 35% women of in the study area reported that they commonly suffer from malnutrition. The number is also high regarding the total disease burden of respondents in the study area. In Bangladesh, women get a lesser share in food distribution, especially protein and other health and nutrition-related services, than men. In the study area, the calorie intake of females averaged only 879.41k.cal. The reduced calorie intake for women was also reflected in a higher incidence of malnutrition. The consequences of undernutrition are serious, long-term, intergenerational and mostly irrevocable, resulting in increased morbidity and mortality, increased disease burden, and decreased IQ, physical capacity, and productivity. All of these have adverse effects on the income and economic growth of the country (HSB 2011).

**Waist Ache:** Another typical health problem is waist ache found among the women of the study area. According to the data collected from the study area, 25.0% of respondents found suffering from waist aches. Poor level of nutrition, illiteracy among people, vitamin deficiency, and severe malnutrition is the probable leading causes of waist ache of rural women.

**Skin Allergy:** Lack of physical cleanliness, unhygienic living and personal attention widespread skin allergy found among the different women in the study area. About 15.83% of the respondents women are suffering from skin allergies. According to the (V.H.W) Pharmacist, more than 80% of women suffer from skin diseases. Poor sanitation, lack of cleanliness and proper bathing and clothing practices, living in the crowd and poorly ventilated houses, using unsafe and dirty water for bathing, washing clothes, washing utensils may be the prime causes of widespread women skin allergy in the study area.

**Acidity:** About half, 49.2% women of the study area reported that they commonly suffer from acidity. The number is high regarding the total disease burden of respondents in the study area. In the study area, irregular intake of food and more unhygienic food are the leading causes of acidity of rural women.

**Hypertension:** About 15.0% women of in the study area reported that they commonly suffer from hypertension. Hypertension is a common cardiovascular disease. It is as frequent in developing countries as industrialised and developed ones (Park and Park, 1985, 377). One of the major causes of an overworked heart is high blood pressure. By 'Blood Pressure' we mean, the pressure exerted by the blood on the walls of blood vessels. If this pressure is abnormally high or beyond the normal limits, the condition is referred to as high blood pressure or hypertension (Bhave, Deodhar and Bhave, 1995, 167). Hypertension is an insidious disease and is a significant risk factor for Coronary Heart Disease (C.H.D.) and is essential in the pathogenesis of stroke, congestive heart failure and renal disease. Community studies and clinical observations have suggested that hypertension is associated with several factors such as heredity, weight, salt intake, stress and strain of life and physical inactivity. As weight increases, so does the prevalence of hypertension.

**Hypotension:** It was found that an average of 12.5% of respondents suffering from hypotension in the study area. Hypotension is a physiological ailment. It can be imagined that the history of hypotension may be as long as the human beings. Blood pressure levels below 90 mm Hg. are usually considered as hypotension in adults. However, there could be some persons whose blood pressure persistently remains below 90mm. Hg. (Systolic). Moreover, who are healthy. Hypotension is an essential and early component of shock. Chronic bleeding and side effects of drugs are considered the leading causes of hypotension.

**Eye Disease:** Another common health problem is eye disease found among the women of the study area. According to the data collected from the study area, on average, 10.83% of respondents were suffering from several kinds of eye disorders. The main types of eye complications found were night blindness, glaucoma and cataract. Poor level of nutrition, illiteracy among people, vitamin deficiency, and severe malnutrition may be the leading causes of eye diseases of rural women (Paul, 2014). Again using agricultural residues, biomass fuels for cooking, and their smoke from the hearth may contribute to eye infection of household women in the rural areas. From the survey data, only 1.7% of respondents use gas as cooking fuel and the rest of 98.3% use wood, straws, dung cakes.

**Respiratory Diseases:** It was found that an average of 14.17% of respondents had asthma in the study area. Housing factors can play a significant



role in respiratory health and greatly exacerbate or increase susceptibility to asthma, allergies, and other respiratory illnesses. The study observed that in most houses, 70% are tin sheets that produce many fibre particles in the study area. Thus spending a long time in these types of houses can make respondent's hypersensitive to these particles. Besides, these houses do not protect them from the cold waves during winter and heat waves during summer, which profoundly impacts asthma-related problems.

## 5. Results and Discussion

### 5.1 Determinants of Poor Health Status of Rural Women

Rural women are suffering from poor health status. Some factors impact their health. So it is essential to investigate the factors that determine the poor health status of rural women. In this section, the Logistic regression model is performed to identify the decisive factors determining rural women's poor health status.

Estimation results for the logit model are provided in Table 5.1. For estimation, the logistic regression model for ungrouped data STATA 11 employs the Maximum Likelihood Method, which is generally an effective sample estimation method. As it is mentioned earlier, the whole data set fitted to the regression model. It serves to understand the overall impact of different socio-economic variables on the health status of rural women. To perform the logistic regression, we assume that the dependent variable (Health Status) is measured by the presence or absence of life-threatening disease. As was noted earlier, conventional tests were performed to check the diagnostic exactness of the data and the model.

Table 5.1 shows that most of the explanatory variables turned to be statistically significant such as 'age of respondents' (at 1%), 'household size of respondents' (at 10%), 'family's monthly income of respondents' (at 10%), 'the number of disease of respondents' (at 1%), 'number of visit to doctor (at 5%)'. All these variables exhibited hypothesised signs. On the other hand, variable like 'occupation of respondents' is not significant to explain the poor health status of rural women.

The respondent's age is significant (at a 1% level of significance) determinant of a respondent being in a 'poor health status' category. The sign of coefficient ( $\beta = .09409$ ) is also positive, implying that older women have a higher probability of being in poor health. The odds ratio favouring respondents being poor health status increases by a factor of 1.0986 as the average age of respondents is increased by one year. This finding is consistent with earlier studies done by (Paul A Bourne et al., 2008, Paige Lynn Miller, 2005) and is inconsistent with earlier

Table 5.1: Logistic Regression Estimation Result for Determinants of Poor Health Status of Rural Women

Explanatory Variables	Coefficients	Odds ratio	Std. Err.	z	p>z
Age	.09409***	1.0986	.03063	3.07	0.002
Household Size	.38378*	1.4678	.22154	1.73	0.083
Family's Monthly Income	-.00007*	.9999	.00003	-1.87	0.061
Occupation	-.61584	.5401	.66544	-0.93	0.355
Number of Disease	.83962***	2.3154	.28174	2.98	0.003
Number of visit to doctor	.23890**	1.2698	.11533	2.07	0.038
Constant	-5.200347		1.501515	-3.46	0.001

Number of Obs. = 120; LR chi2 (6) = 63.26; Prob.> chi2 = 0.0000

Pseudo R2 = 0.4180; Log likelihood = -44.038719

Note: \*\*\*, \*\* and \* indicate 1%, 5% and 10% significant level

Source: Author's Estimation, September 2016

studies (Ahmed Mohammad Munsur et al., 2010). One of the possible reasons behind this finding is that with the increase in age, the number of life-threatening diseases also increases.

The household size of the respondent is a significant (at 10% level of significance) determinant of a respondent being in a 'poor health status' category. The sign of coefficient ( $\beta=.38378$ ) is positive, implying that the respondent with a large household size has a higher probability of being poor health status than the small household size. The odds ratio in favour of the respondent being poor health status increases by a factor of 1.4678 as the average household size of the respondent increases by 1 unit. This finding is also consistent with the finding of earlier studies (Paul A, 2008). One of the reasons behind this finding may be that when the household size of respondents increases, they ignore their health.

The family's monthly income of respondents is significant at a 10% level of significance. The sign of coefficient ( $\beta= -.00007$ ) is negative, which implies that the probability of respondents being poor health status decrease with an increase in the family's monthly income level of respondents. The log of odds in favour of respondents being poor health status decreases by .00007 units as the average monthly income increases by 1 unit. For a unit (Tk.1) increase in the level of family's monthly income of respondents, the odds ratio in favour of respondent being poor health status decreases by factor .9999. The reason may be that the families with higher monthly incomes are more conscious about the women of their families. This finding is consistent with the findings of earlier studies (Paul 2008, Munsur et al., 2010).

The number of diseases of the respondent is a significant (at 1% level of significance) determinant of a respondent being in a 'poor health status' category.



The sign of coefficient ( $\beta=.83962$ ) is also positive, implying that the women with a higher number of the disease have a higher probability of being poor health status. The odds ratio in favour of respondents being poor health status increases by factor 2.3154 as the average number of diseases of the respondent is increased by 1 unit. This finding is consistent with earlier studies done by (Paul 2008) and is inconsistent with earlier studies (Ahmed Mohammad Munsur et al., 2010). One of the reasons behind this finding could be that with the increase in number of disease, the number of life-threatening diseases also increases.

The number of visits to the doctor of respondents is significant at a 5% level of significance. The sign of coefficient ( $\beta=.23890$ ) is positive, which implies that the probability of respondents being poor health status increases with an increase in the number of visits to the doctor of respondents. The log of odds in favour of respondents being poor health status increases by .23890 units as the average number of visits to doctor increases by 1 unit. For a unit increase in the number of doctor visits, the odds ratio favouring respondents being poor health status increases by a factor of 1.2698. The reason could be that the number of visits to the doctor of the respondent increases when their health conditions are not so well. This finding is inconsistent with the findings of earlier studies done by (Paul 2008).

The dummy variable 'occupation of respondents' (1=House wife, 0= Others) also influences poor health status negatively. It explains that if a woman is a house wife, the probability of respondents being poor health status decreases. However, it is not significant in explaining the poor health status of rural women of selected villages. This finding is inconsistent with the finding of earlier studies done by (Ahmed Mohammad Munsur et al., 2010), where working respondents are 0.61 times less likely to report unhealthy than those who are not working and have a significant impact on health status.

One possible reason for that their little physical activities helps them to remain well. Indeed, physical activity plays a central role in preventing and managing chronic disease (Cyarto et al., 2004), and physical activity is identified as a leading cause of disability among older adults (Buchner, 1997).

From the maximum likelihood estimates of the model, the Pseudo  $R^2$  is 0.4180, which states that about 42% of the likelihood of a respondent being poor health status is strongly explained by the explanatory variables. To test the overall significance of the model, we have used the Likelihood Ratio (LR) test in place of the F test. In this case, the results also showed that the overall logistic model was significantly based on chi-square ((Prob. > chi2 = 0.0000). The explanatory variables are relevant in analysing the determinants of the poor health status of rural women.

The marginal effects report of logistic regression provides the probability that a respondent will fall in poor health status. Table 5.2 provides the probability estimation for the likelihood of poor health status of respondents given the statistically significant variables: 'age', 'household size', 'family's monthly income', 'number of diseases' and 'number of doctor visits.

*Table 5.2: Marginal Effects of the Explanatory Variables Used to Estimate Logistic Regression*

Explanatory Variables	dy/dx	Std. Err.	z	p>z	x
Age	.01022***	.00324	3.16	0.002	36.3917
Household Size	.04169*	.02464	1.69	0.091	4.14167
Family's Monthly Income	-7.67e-06*	.00000	-1.71	0.088	12672.7
Occupation	-.06055	.05742	-1.05	0.292	.725
Number of Disease	.09122***	.03144	2.90	0.004	3.325
Number of visit to doctor	.02595**	.01239	2.09	0.036	2.89167
Predicted Probability = 0.87596834					
Number of Obs. = 120; LR chi2 (6) = 63.26; Prob.> chi2 = 0.0000					
Pseudo R2 = 0.4180; Log likelihood = -44.038719					

Source: Author's Estimation, September 2016

The marginal effect report of the logistic regression in Table 5.2 indicates that there is a probability of 1% that a respondent will fall in poor health status if her age increases, at mean value, by one year. The marginal effect shows that there is a probability of approximately 4.2% that a respondent will fall in poor health status if her household size increases, at a mean of one additional family member. The marginal effect report of the logistic regression in Table 5.2 also shows that if a respondent family's monthly income increases by one taka, then there are 0.0007% likelihoods that she would not fall in poor health status since the coefficient of this variable is negative.

Further, the marginal effect report of the logistic regression indicates that there is a probability of 9.1% that a respondent will fall in poor health status if her number of diseases increases, at mean value, by one unit. Finally, the marginal effect shows that there is the probability of approximately 2.6% that a respondent will fall in poor health status if her number of visits to the doctor increases at mean value by one unit.

## 6. Conclusions and Recommendations

This study finds the common diseases pattern and the social and environmental factors responsible for the disease-causing of rural women in the study area. It has also estimated the significant determinants of the poor health status of rural women of the study area. The study arrived at several findings for these we can suggest some policy recommendations.



The women living in the rural area of Bogra district are experiencing poor health status and suffering from various diseases. Among the common diseases, the most common diseases are cold disease, malnutrition and acidity. Among the total respondents, the percentages of respondents suffering from these most common diseases are 58.3, 35.0 and 49.2 respectively. The respondents of village-1 are more suffered by cold disease and acidity, and the respondents of village-2 are more malnutrition. Bathing in river water is possibly the leading cause of cold diseases of the women of village-1. Irregular and unhealthy food consumption could be the leading cause of acidity of the women of that village. The reduced calorie intake for women of village-2 may be the leading cause of a higher incidence of malnutrition.

The possible main reason for diarrhoeal diseases and skin allergy is polluted river water for bathing and washing utilities. Poor housing systems and unhygienic sanitary systems may also cause these diseases. Unhygienic practices during menstruation may be the consequence of reproductive tract infection in the study area. Using agricultural residues, biomass fuels for cooking, and smoke from the hearth may contribute to the eye infection of household women in rural areas. The source of fire for cooking and poor housing system may also be the causes of asthma problems. Age of respondents, household size of respondents, family's monthly income of respondents, number of diseases and number of visits to the doctor of respondents are found to have a significant impact on the poor health status of rural women of the study area.

Therefore, the study recommends that safe housing and sanitation programmes for the rural people should be adequately made, and use of gas as a source of cooking fire should be increased instead of wood, straws, and other sources of cooking fire. The study also recommends that government reasonable health status efforts, especially for rural women, should focus on appointing more female health workers, making proactive policy in expanding income generating activities, strengthening supports for education opportunities, and family planning. Further, the study recommends that rural women participate in economic activities and contribute to increasing per capita income, so government should campaign for health awareness with socio-economic development that could change the scenario rapidly. Also, the government should introduce compulsory education for rural girl children and ensure social justice and rights issues, especially for women.

### References

- Allen, L. H. (2000). Anaemia and iron deficiency: effects on pregnancy outcome, *The American Journal of Clinical Nutrition*. 71 (suppl): 1280S–4S.
- Aziz, K. M. A., B. A. Hoque., S. R. A. Huttly., K. M. Minnatullah., Z. Hasan., M. K. Patwary., M. M. Rahaman., & S. Cairncross. (1990). Water Supply, Sanitation and Hygiene Education- Report of a Health Impact Study in Mirzapur, Bangladesh; *Water and Sanitation Report Series-1*, Washington, D.C., U.S.A., pp.1-83.
- Bhave, V. N., et al. (1995). You and Your Health. New Delhi: National Book Trust.
- Blair, P. W. (Ed.) (1980). Health Needs of the World's Poor Women. Equity Policy Center, Washington, D.C. pp.171-173.
- Buchner, D. M. (1997). Physical activity and quality of life in older adults, *J Am Med Assoc*, 277, pp. 64–6.
- Buor, D. (2004). Water needs and women's health in the Kumasi metropolitan area, Ghana. *Health & Place*, 10, 85-103.
- Cyarto, E. V., et al. (2004). Updating the evidence relating to physical activity intervention studies in older people, *J Sci Med Sport*, 7, pp. 30–8.
- Elahi M., Rashid S., & Sarkar P. (2016). An Analysis of Health Situation of Women and Children at the Char of Gangachara Upazila: A GIS-based Case Study. *Global Journal of Human-Social Science: B Geography, Geo-Sciences, Environmental Science & Disaster Management*, Volume 16, Issue 2, Versions 1.0, 2016.
- Ene-Obong, H. N., et al. (December 2001). Determinants of health and nutritional Status of Rural Nigerian women. *Journal of Population and Nutrition* 19(4): 320 – 330.
- Gellert, G. A. (1995). The influences of market economics on primary health care in Vietnam. *Journal of the American Medical Association*, 273(19), 1498-1502.
- Gijsbers Van Wijk, C. M. T., et al. (1996). Gender perspectives and quality of care: Towards appropriate and adequate health care for women. *Social Science & Medicine*, 43(5), 707-720.
- Helweg-Larsen, K., & M. Kruse. (2003). Violence against women and consequent health problems: a register-based study. *The Scandinavian Journal of Public Health*, 31: 51-57.
- Joshi, S., & Schultz T. P. (2012). Family Planning and Women's and Children's Health: Long Term Consequences of an Outreach Program in Matlab, Bangladesh, IZA Discussion Paper No. 6551, May 2012.
- Joulaei, H., et al. (2016). Narrative review of women's health in Iran: challenges and successes. *International Journal for Equity in Health* (2016) 15:25, DOI 10.1186/s12939-016-0316-x.
- Kavishe, F. P., Kalinga, L., Ljugqvist, B. J., & Mangi, N. (1985). The prevalence and the control of underweight in DarEs Salaam, Tanzania. 200pp.



- Koenig, M. A., S. Ahmed, M. B. Hossain., & A.B. M. K. A. Mozumder. (2003). Women's status and domestic violence in rural Bangladesh: Individual- and community-level effects. *Demography*, 40 (2): 269-288.
- M Islam. (2006). General and Maternal Health Status of Rural Women in Bangladesh: A Descriptive Study from Two Remote Villages. *The Internet Journal of Epidemiology*. 2006 Volume 4 Number 2.
- Miller, P. L. (2005). International Development Studies, Barriers Preventing Access to Health Care Services for Women in Rural Samoa (132 pp.)
- Munsur, A. M., et al. (2010). Determinants of Living Arrangements, Health Status and Abuse among Elderly Women: A Study of Rural Naogaon District, Bangladesh. *Journal of International Women's Studies* 11(4), 162-176.
- National Family Health Survey (2007). National Family Health Survey (NFHS-3) 2005-2006. Mumbai. International Institute for Population Sciences.17.
- Navarro, V.,& L. Shi. (2001).The political context of social inequalities and health.*Social Science and Medicine*, 52 (3):481-491.
- Park, J. E.,& Park, K. (1985).Text Book of Preventive and Social Medicine. BanarsidasBhanot Publishers, Jabalpur-482001.
- Paul, A., Murshed, M.M.,& Akter, S. (2014). Women Health and Disease Pattern in the Rural Areas of Bangladesh: A Case Study on Haimchar Upazila Under Chandpur District). *J. Asiat. Soc. Bangladesh*, Sci. 40(1): 27-37, June 2014.
- Perry, B.,& Gesler, W. (2000).Physical access to primary health care in Andean Bolivia. *Social Science & Medicine*, 50(9), 1177-1189.
- Williams, L., Sobieszczyk, T., & Perez, A. (2000).Couples' views about planning fertility in the Philippines. *Rural Sociology*, 65, 484-514.
- Wyss, K. (2003).Access of the urban poor and vulnerable to health care in Africa. Switzerland: Swiss Agency for Development and Cooperation.
- Ziauddin H., et al. (2000).Anaemia among non-pregnant women in rural Bangladesh.*Public Health Nutrition*: 4(1), 79-83.

