

# **Identifying Non-communicable Disease (NCD) Risk Factors in Bangladesh**

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## EXECUTIVE SUMMARY

### Introduction

Most of the developing countries have substantial burden of non-communicable diseases (NCDs) regardless of the stage of their economic development and epidemiological transition. The increasing burden of NCDs threatens to overwhelm already stretched health services. Prevention through risk factor-focused interventions requires country-specific data so that priorities can be set, targeted programs developed and interventions monitored. This requires a surveillance system of collecting, analyzing and reporting of relevant information in a regular and systematic way.

### Objectives

The objectives of this study were to identify NCD risk factors, compare risk factors data across the demographic groups and incorporate appropriate elements of NCD risk factor module into regular health surveillance system of BRAC.

### Methods

A cross-sectional STEPs approach was adopted using a standardized questionnaire developed by the WHO to collect small amounts of high quality risk factor data. The major behavioral risk factors were smoking, alcohol consumption, diet and physical inactivity whereas the biological risk factors were the physical measurements including blood pressure and obesity. In addition, self reported incidence of non-communicable diseases was also gathered from the randomly selected sample of adults (25 – 64 years).

### Key Findings

#### Behavioral risk factors

The prevalence of smoking was quite high (60%) among men and even higher among the middle-aged persons. Alcohol consumption, on the other hand, was very low (2.9% and men and insignificant among women) in Bangladesh. Dietary habit was heavily dependent on the buying capacity and the availability of food. Thus, the consumption of vegetables (of any kind) was very common and frequent regardless of the socio-economic condition although the fruit consumption was very low and essentially seasonal. Given that a large proportion of the rural population were poor and had to depend on manual labor for their livelihood, physical activities (of any kind or intensity) were very common as nearly 41% were involved in vigorous and about 61% in moderate intensity physical activities.

#### Biological risk factors

Of the biological risk factor measures, overweight was found only 6.7% while only 0.7% was obese among adults. Overweight and obesity were higher among women than men. The prevalence of hypertension was 9.3% with a higher proportion among women (10.6%) than men (7.7%).

### **Self-reported NCDs**

Self-reported stroke incidence was 0.6%. The rate was higher female than male. The prevalence of angina/heart problem was 3.8%. Again, more women than men reported to have such problems. The prevalence of self-reported hypertension was 5.9% compared to measured hypertension of 9.3%. This problem increased with age.

About 1.5% was diagnosed to have diabetes. Approximately 0.4% was taking insulin or any other medications for this problem. The reported cases of cancer were 1%. Nearly all known cancer patients had access to treatment. Surprisingly the reported cases were much higher among the younger than older population. Nearly 2.9% were diagnosed to have chronic lung diseases.

The prevalence of arthritis was 7% among adults while about 4% of the population was diagnosed to be mentally depressed.

### **Concluding Remarks**

The WHO and many other organizations have been advocating policy makers to develop efficient strategies to halt the growth of the non-communicable diseases. The most feasible and cost-effective strategy in the poor countries has been community-based health promotion policy. This strategy requires routine measures of the effects of the program interventions in controlling the risk factors of non-communicable diseases such as smoking, alcohol consumption, level of physical activity, diet pattern, and the prevalence of obesity and blood pressure. This survey provided a large body of information of the status of NCDs and determining priorities for intervention. Most importantly, the study demonstrated that routine monitoring NCD risk factors is possible at reasonable costs if carefully designed and implemented.

# INTRODUCTION

## THE CONTEXT

Most of the developing countries have substantial burden of non-communicable diseases (NCDs) regardless of the stage of their economic development and epidemiological transition. The assessment of public health importance of these diseases has been hampered by the lack of common methods to investigate the overall worldwide burden (Christopher, Murray and Lopez 1997). In 2000, around 60% of all deaths and 43% of the global burden of disease (GBD) was due to coronary heart disease, stroke, cancers, and diabetes mellitus (World Health Organization 2002). Among low and middle income countries, 79% of deaths and 85% of the global burden were due to the major NCDs. Heart disease, stroke, cancer, diabetes, and respiratory diseases are responsible for an increasing proportion of disease burden in many developing countries undergoing an epidemiological transition (Ezzati, Lopez, Vander and Murray 2002). Based on current trends, these diseases are predicted to account for 73% of global deaths and 60% of the GBD by the year 2020 (Murray and Lopez 1996). The emergence of epidemics of NCDs is the result of demographic and epidemiological transitions, along with increases in levels of risk factors resulting from social and economic changes. Over the next 30 years, the burden of disease from NCDs in developing and newly industrialized countries is expected to rise by more than 60% (Murray and Lopez 1996).

## CURRENT SITUATION OF NCDS

Developing countries are currently undergoing an epidemiological transition, what their counterpart countries in developed world have already experienced (Munoz and Nos 1995; Wall 1999). The rise of NCD has been the main concern and alert for the population of developing world. The epidemiological transition has brought double burden of disease for this part of the world. The GBD study had shown that in most part of the world, the NCD epidemic is rising (Murray and Lopez 1997). Rapid changes in the disease pattern have always been marked with an advent of sudden epidemic of infectious diseases. This was true for small pox, tuberculosis, plague and also two most recently emerged infectious diseases-AIDS and Drug resistant tuberculosis. However rapid urbanization in developing world in the last two decades has witnessed a rapid alteration in disease pattern (Soumya 2002). The rising levels of hypertension, diabetes, obesity, tobacco consumption, and blood lipids in Indian population groups have been well documented in recent years. These too portend a major rise in future NCD burden (Srinath 2003). The population-based strategy through the promotion of a healthy life style shows improvements in common risk factors smoking cessation and physical inactivity, prevalence of measurable risk factors has been attempted in some communities (Toh, Chew and Tan 2002).

## NEED TO CONTROL EMERGING NCD EPIDEMIC

Despite epidemiological transition, the focus on the control of infectious and emerging diseases dominates the public health importance in developing countries. Most of the governments need to plan in controlling the emerging NCD epidemics. The increasing burden of NCDs threatens to overwhelm already stretched health services. The economic burden associated with NCDs is increased by expensive modern medical and surgical treatment that is both labor-intensive and technologically sophisticated. Thus, there is an urgent need to prioritize resources for the prevention of NCDs in the first place (Labarthe 1999). Prevention and control programs require specific goals and quantifiable outcomes to be reached within a defined

timeframe. Assessment of progress towards these goals requires surveillance of NCDs and their risk factors.

The factors underlying the major NCDs (heart disease, stroke, diabetes, cancer, and respiratory disease) are well documented. Primary prevention based on comprehensive population-based programs is reported the most cost-effective approach to containing the emerging epidemic of NCDs (Jamison 1993). A vast body of knowledge now exists about the risk factors for NCDs and experience in the prevention of them. Although most of these data come from developed countries, the causal relationships are broadly similar in developing countries. It has also been shown in a number of countries, both developed and developing, that a comprehensive, long term approach has the potential to reduce risk factors in the population and in turn, disease, disability and death (World Health Organization 2000).

Prevention through risk factor focused interventions requires country-specific data on risk factors so that priorities can be appropriately set, targeted programs developed and interventions monitored. For surveillance to inform this process, data must be collected, analyzed and used in a regular and systematic way. Repeated collection of data on risk factors as surrogate measures of disease can be undertaken to monitor trends.

## OBJECTIVES

Overall aim of this study is to identify and strengthen the capacity of Watch DSS of BRAC for continuous NCD risk factor surveillance. The specific objectives of this study are to

- a. Identify NCD risk factors using STEP 1 and STEP 2 approaches of WHO standardized methods,
- b. compare NCD risk factors data across demographic groups and
- c. incorporate appropriate elements of NCD risk factor module into regular surveillance of Watch DSS.

## METHODS

### STUDY DESIGN

A cross-sectional WHO STEPs approach was adopted to conduct this study using a standardized questionnaire developed by the WHO. The STEPs approach was a simple hierarchical risk factor surveillance system developed to collect small amount of good quality data that allows sufficient flexibility and maintains comparability over time and between countries. The surveillance of NCD risk factors, which was less technology and resources demanding, was more feasible in developing countries in comparison to the surveillance of the NCDs themselves (Bonita *et al.* 2002; Bonita, Strongand and de Courten 2001).

The epidemiological results obtained from the STEPS implementation can be used as a powerful tool for advocacy process in public health decision-making, especially for resource allocation for preventing non-communicable disease burden in the future (Armstrong and Bonita 2003). In this approach, the recommended surveillance measures were categorized according to the degree of complexity in obtaining the data. The degree of difficulty equates to whether questionnaires alone were used (Step1), physical measures (Step2) in the field were collected or laboratory measurements (Step3) requiring external expertise were involved. The STEPs approach moves along a sequential three-step process. An outline of the WHO STEPs approach is shown below:



## The WHO STEPS approach for NCD risk factor assessment

Measures	Level		
	Step 1 (Self Report)	Step 2 (Physical)	Step 3 (Biochemical)
Core	Socio-economic and demographic variables, years of education, tobacco and alcohol use, physical inactivity, intake of fruit and vegetable	Measured weight and height, waist circumference, blood pressure	Fasting blood sugar, total cholesterol
Expanded Core	Ethnicity, education, occupation, income. Smokeless tobacco, fat consumption, types of physical activity	Hip circumference, pulse rate, history of blood pressure	History of diabetes, treatment for diabetes, fasting HDL-cholesterol and triglycerides
Optional (examples)	Other health-related behaviors; mental health, disability, injury	Objective measure of physical activity behavior (e.g. timed walk, pedometer), skin fold thickness	Oral glucose tolerance test, urine examination

### SAMPLING TECHNIQUE

The population of Watch DSS of BRAC in Bangladesh served as the sampling frame for this study. Sample was drawn following the WHO STEPs methodology, which included a minimum of 250 individuals in each 10 years age group (25-64 years) for each sex to a total of 1000 males and 1000 females. Individual sampling techniques was followed since the Watch DSS database allowed sample individuals instead of household. The target population was all adults aged 25-64 years. Sample was drawn from the population enumerated by the DSS sites. As sampling frame was available, stratified random sampling technique was used in each sex and age group.

### DATA COLLECTION PROCEDURE

Data were collected during the household visits. The WHO STEP 1 and STEP 2 methods were adapted in this study. The WHO STEP 1 included assessment of NCD risk factor (such as smoking behavior, alcohol consumption, physical activity, fruit and vegetable intake). The instruments included ranges of questions on socio-demographic characteristics, work history, anthropometrics and biological risk factors.

### EQUIPMENTS

The WHO STEP 2 included physical measurements (weight, height, waist circumference) and blood pressure measurements using standardized instruments. Body weight was measured using digital scale. Height was measured using stadiometer. Waist circumference was measured using measuring tape. Blood pressure was measured using digital fully automatic blood pressure measuring apparatus.

The following equipments were used

No.	Equipment	Type
1	Weighing scale	Digital Type
2	Height measuring rod	Manual collapsible rods
3	Girth Meter	Flexible tapes
4	Blood pressure monitor	Fully Automatic digital type

## VALIDITY AND RELIABILITY

Questionnaire was carefully translated jointly into Bangla by both BRAC and two other sites of the ICDDR,B. The translated version was piloted in the field to ensure that respondents understand question in appropriate manner. Interviewers were trained on conducting interview and anthropometry.

## ETHICAL ISSUES

Usual ethical procedure such as written informed consent was taken from every individual respondent before including him/her in the study. A commitment to confidentiality was ensured in the consent forms and training exercise.

## DATA ANALYSIS

The questionnaires were processed after the interviews had taken place to ensure the completeness and appropriateness. Data were analyzed by normal quantitative procedures. The distribution of risk factors by age and sex were compared to understand an ongoing epidemiological transition in Bangladesh. Inferential analysis was conducted to observe the pattern of risk factor across different groups. BMI for study population was also calculated. Results were weighted using the population data on age and sex distribution of the population. The weighting factor was used to ensure appropriate representation of respondents from each sex and age group.

## LIMITATIONS

Although the survey was conducted in ten locations, the sample was not necessarily representative of the rural population of the country. Due to translation of the instrument into Bangla, it was extremely difficult to have similar coding for many variables as used in other countries. Also, there was high absenteeism among male sample population particularly among those working in other places but visit the household once a week. In addition, there were some valid refusal cases due to out-migration, deaths, terminal illness, hearing impairment and mental disorder.

Table 1. Profile of sample population by sociodemographic characteristics

Population characteristics	Sex		All
	Male	Female	
Age (year)			
25 – 34	38.6	43.1	40.9
35 – 44	30.2	28.1	29.1
45 – 54	19.6	16.5	18.1
55 – 64	11.6	12.2	11.9
<i>Mean age</i>	<i>39.4</i>	<i>38.7</i>	<i>39.0</i>
Education			
No school	45.9	59.4	52.7
School	54.1	40.6	47.3
<i>Mean years of school</i>	<i>4.25</i>	<i>2.44</i>	<i>3.33</i>
N	984	1016	2000

## FINDINGS

### HEALTH SEEKING BEHAVIOR

After adjusting with age and sex, the basic characteristics of the sample population are presented in Table 1. A large proportion (40.9%) of the study population was quite young (25 – 34 years). As expected, the proportion had systematically reduced with the increase of age. The mean age was 39 years which was higher among men than women. More than half (52.8%) of the population had no education while the mean schooling was 3.3 years. Education was much better among men than women.

**Table 2. Self reported health status of the sample population**

Health profile	Sex		All
	Male	Female	
<b>Overall health status</b>			
Excellent	1.2	1.7	1.4
Very good	17.0	4.9	10.8
Good	43.3	25.4	34.2
Moderate	24.4	38.6	31.6
Bad	14.1	29.4	21.9
<b>Interference on work ability</b>			
Yes	35.5	30.1	32.7
No	64.5	69.9	67.3

Table 2 shows the self-reported health status of the study population. Only a very small (1.4%) proportion of them rated their health as excellent while about 10.8% rated as very good. More than a third (34.2%) rated their health as good while 31.6% considered to have moderate health. Nearly 21.9% felt that they had very poor health condition at the time of survey. Compared to women, men reported to have better health. About a third (32.7%) reported that health status interfered their work ability. This problem of interference was higher among men than women. Overall, the adult population appeared to be happy with their health condition considering their age.

**Table 3. Health seeking behavior of the sample population**

Felt need for health care	Sex		All
	Male	Female	
< 30 days	43.4	37.3	40.3
1 – <12 months	47.1	45.1	46.1
1 – <2 years	5.3	8.5	6.9
2 – <5 years	2.4	6.1	4.3
5 + years	1.0	2.5	1.7
Never felt	0.8	0.6	0.7

A large proportion (40.3%) of the study population felt the need of health care in the last month while about additional 46.1% needed health services in the remaining 11 months of the last year indicating that the need of health care was very high among the adult population (Table 3). The felt need seemed to be much higher among men than women.

## BEHAVIORAL RISK FACTORS

### Tobacco use

Table 4. Current smoker of any tobacco products by age and sex

Age group	Sex		All
	Male	Female	
All	59.8	2.8	30.8
25 – 34	54.1	0.5	25.2
35 – 44	57.9	3.1	31.0
45 – 54	73.6	4.8	41.6
55 – 64	60.5	7.3	33.1

Table 4 shows that the prevalence of smoking in the rural communities was quite high (30.8%) while nearly 60% of men reported to have been smoking compared to only 2.8% of women during the survey. The prevalence of smoking appeared to have a positive association with age although a declining trend was reported among men after 54 years of age.

Table 5. Smoking behavior among men by age

Smoking behavior	Age group (year)			
	25 – 34	35 – 44	45 – 54	55 – 64
Mean age of start smoking	20.2	20.5	19.9	19.9
Mean number of cigarettes used				
Manufactured cigarettes	8.6	8.9	11.0	9.0
Hand-rolled cigarettes	14.5	15.6	13.7	13.5
Others	-	-	-	7.5

The mean age of start smoking among men was about 20 years and no significant variation in age was reported (Table 5). This indicates that anti-smoking campaign was not effective particularly in the younger generation. Hand-rolled cigarettes (*bidi*) were more popular (with nearly 14 sticks a day) than the manufactured (nearly 9 sticks a day) or other cigarettes regardless of age of the smokers.

### Alcohol consumption

Table 6. Alcohol consumed in last year by age and sex

Age (year)	Sex		All
	Male	Female	
All	2.9	--	1.5
25 – 34	5.3	--	2.4
35 – 44	1.7	--	0.9
45 – 54	2.1	--	1.1
55 – 64	--	--	--
N	29	--	29

Alcohol consumption was found very low (2.9% and men and insignificant proportion among women) in the rural communities in Bangladesh compared to other neighboring countries (Table 6). The prevalence did not show any consistent pattern with age of the consumers although the consumption was found highest among the youngest cohort.

## Diet

**Table 7. Weekly consumption of fruits and vegetables by age and sex**

Factor	Mean days/week	
	Fruit	Vegetable
All	0.47	6.69
Age (year)		
25 – 34	0.57	6.72
35 – 44	0.42	6.67
45 – 54	0.38	6.66
55 – 64	0.35	6.65
Sex		
Male	0.44	6.79
Female	0.49	6.59

Consumption of vegetables among the study population appeared to very high (6.69 days a week) as they consumed vegetables almost everyday (Table 7). Fruit consumption, on the other hand, was reported negligible. The mean intake of fruits was only 0.47 day per week. The consumption of both the fruits and vegetables declined with the increase of age. No significant differences in consumption were reported by sex.

## Physical activity

**Table 8. Prevalence of physical activities by age and sex**

Factor	Physical activity			
	Vigorous	Moderate	Walk or bicycle	Sports, fitness and recreation
All	40.9	61.0	55.7	1.7
Age				
25 – 34	37.6	57.0	51.3	2.8
35 – 44	48.1	63.3	59.5	0.5
45 – 54	43.2	64.4	60.5	0.3
55 – 64	31.1	63.9	54.6	--
Sex				
Male	55.8	48.9	92.8	2.3
Female	26.5	72.7	19.9	0.4
N	818	1219	1115	27

Physical activities (of any kind or intensity) were very common among the rural population in Bangladesh. Table 8 shows that nearly 41% of the adult population went through vigorous intensity physical activities while about 61% had to involve moderate intensity physical activities regardless of age and sex. About 56% of the population generally walked or had to ride bicycle to go to different places everyday. Involvement in sports, fitness or any recreational activities, however, was rare (1.7%) in the rural communities. Physical activities of any kind had no association with age. Gender variation in physical activities was very wide as the involvement of female in these activities was much lower than male in most cases except moderate category of physical activity.

## BIOLOGICAL RISK FACTORS

### Physical measurements

**Table 9. Overweight<sup>a</sup> and obesity<sup>b</sup> by age and sex**

Age (year)	Sex			
	Male		Female	
	Overweight	Obese	Overweight	Obese
All	4.5	0.5	7.3	0.7
25 – 34	4.0	0.8	7.5	0.5
35 – 44	5.1	0.7	9.1	1.1
45 – 54	4.6	--	6.0	1.2
55 – 64	4.4	--	4.1	--
N	44	5	74	7

<sup>a</sup> Overweight if BMI is between 25.0 and 29.9 and <sup>b</sup> obese if BMI is 30.0 or more.

About 6.7% of the adult population was either overweight (6%) or obese (0.7%) in rural Bangladesh. Both the overweight and obesity were much higher among women than men (Table 9). No variation in age was reported.

### Prevalence of hypertension

**Table 10. Prevalence of hypertension by age and sex**

Age (year)	Sex		All
	Male	Female	
All	7.7	10.6	9.3
25 – 34	3.7	4.3	4.0
35 – 44	7.1	12.2	10.1
45 – 54	9.8	14.3	12.7
55 – 64	19.1	20.2	19.3
N	76	103	179

The prevalence of hypertension was 9.3% among the adult population in rural Bangladesh (Table 10). Female (10.6%) were more likely to become hypertensive than male (7.7%) population. As found elsewhere (Boutayeb and Boutayeb 2005), the prevalence appeared to increase with age among both male and female.

## REPORTED NCDS

### Arthritis

Table 11. Self reported diagnosis and treatment of arthritis by age and sex

Factor	Arthritis		
	Diagnosed (%)	Ever treated (%)	Treated in 2 weeks (%)
All	6.9	6.9	2.2
Age			
25 - 34	2.6	2.6	0.9
35 - 44	7.5	7.5	1.9
45 - 54	10.5	10.5	3.6
55 - 64	14.7	14.3	5.5
Sex			
Male	4.8	4.7	1.4
Female	9.0	8.9	2.9
N	138	137	44

Nearly 7% of the adult population was diagnosed to have arthritis (Table 11). All of them were treated at least once while 2.2% were found under treatment at the time of survey. As expected, the prevalence (and treatment) of arthritis appeared to increase with age. The prevalence (and treatment) was significantly higher among female than male population. Use of health services for arthritis in last two weeks, however, was associated with age. No gender variation in treatment was reported.

### Stroke

Table 12. Self reported diagnosis and treatment of stroke by age and sex

Factor	Stroke <sup>a</sup>		
	Diagnosed (%)	Ever treated (%)	Treated in 2 weeks (%)
All	0.6	0.6	0.1
Age			
25 - 34	--	--	--
35 - 44	0.9	0.9	--
45 - 54	0.6	0.6	0.3
55 - 64	2.1	2.1	0.3
Sex			
Male	0.4	0.4	0.1
Female	0.7	0.7	0.1
N	12	12	3

<sup>a</sup> Persons who died of stroke were not included in the estimation.

Self-reported prevalence (and treatment for at least once) of stroke was 0.6% among the survivors (Table 12). About one-sixth of them (or 0.1% of the population) were under treatment during the survey. As expected, the prevalence of stroke was highest in the oldest age group than others. More female than male were reported to have stroke in the study population.

### Angina/Heart problems

Self-reported incidence (and diagnosed by a health professional) of angina or heart problem was 3.8% while 3.5% received treatment at least once and 1.1% was found under treatment during the survey (Table 13). As found elsewhere (Boutayeb and Boutayeb 2005), the

incidence (and, thereby, treatment as well) of heart diseases had significant positive correlation with age. The risk of having heart diseases was much higher among female than male population.

**Table 13. Diagnosis and treatment of angina/heart problem by age and sex**

Factor	Angina		
	Ever diagnosed with angina problem (%)	Ever treated for angina (%)	Received treatment in last 2 weeks (%)
All	3.8	3.5	1.1
Age			
25 – 34	2.4	2.2	0.7
35 – 44	3.8	3.6	1.0
45 – 54	4.7	4.4	1.4
55 – 64	7.1	6.7	2.1
Sex			
Male	3.3	3.0	1.3
Female	4.3	3.9	0.9
N	76	70	22

### Diabetes

**Table 14. Diagnosis and treatment of diabetes as risk factor by age and sex**

Factor	Diabetes		
	Ever diagnosed (%)	Ever been treated (%)	Taking insulin or any drugs (%)
All	1.5	1.3	0.4
Age			
25 – 34	0.4	0.2	--
35 – 44	1.5	1.4	0.3
45 – 54	1.9	1.4	0.3
55 – 64	5.0	4.6	2.1
Sex			
Male	1.6	1.3	0.5
Female	1.5	1.3	0.4
N	31	26	9

About 1.5% of the population was diagnosed to have diabetes while most (1.3%) of them were treated (Table 14). Approximately 0.4% was taking insulin or any other medications for this problem. As found in other studies (Boutayeb and Boutayeb 2005), the chance to become diabetic increases with age of the population. No significant gender variation in diabetes was reported.



## Chronic lung diseases

**Table 15. Diagnosis and treatment of chronic lung diseases by age and sex**

Factor	Diabetes		
	Ever diagnosed (%)	Ever been treated (%)	Taking medicine in two weeks (%)
All	2.9	2.9	0.9
Age			
25 – 34	2.1	2.1	0.4
35 – 44	2.4	2.4	1.0
45 – 54	3.3	3.3	0.8
55 – 64	6.3	6.3	2.1
Sex			
Male	2.5	2.5	0.6
Female	3.2	3.2	1.1
N	58	58	17

Nearly 2.9% of the study population was diagnosed to have chronic lung diseases by any medical professional (Table 15). Each of the diagnosed cases was treated and about 0.9% was under treatment during the survey. The reported incidence was positively associated with age. Female population was more likely to have chronic lung diseases than male population.

**Table 16. Reported symptoms of and testing for chronic lung diseases by age and sex**

Factor	Symptom and Testing			
	Coughing or wheezing (%)	Sputum or phlegm (%)	Blood in phlegm or cough (%)	Examined for tuberculosis (%)
All	3.4	1.4	0.3	1.0
Age				
25 – 34	2.7	1.6	0.2	0.7
35 – 44	2.1	0.7	--	0.9
45 – 54	5.5	1.9	0.8	1.4
55 – 64	6.3	1.7	0.4	1.7
Sex				
Male	3.5	1.4	0.3	1.4
Female	3.4	1.4	0.2	0.6
N	68	28	5	20

Table 16 shows the reported symptoms of and testing for chronic lung diseases by age and sex. Nearly 3.4% had the problems of coughing or wheezing for 10 minutes at a time while about 1.4% had sputum or phlegm with cough. Nearly 0.3% reported that they had blood in phlegm or cough. While asked, about 1% reported that their cough was examined or chest X-ray was taken to diagnose tuberculosis.

## Depression

**Table 17. Diagnosis and treatment of depression by age and sex**

Factor	Depression		
	Ever diagnosed (%)	Ever been treated (%)	Taking medicine or treatment (%)
All	4.0	2.9	0.7
Age			
25 – 34	3.4	2.2	0.5
35 – 44	4.8	3.9	1.0
45 – 54	5.2	3.9	1.4
55 – 64	2.5	1.7	--
Sex			
Male	1.0	0.4	0.2
Female	6.9	5.4	1.3
N	80	59	15

About 4% of the population was diagnosed to be mentally depressed (Table 17). Nearly 2.9% received treatment and 0.7% was under treatment during the time of survey. The problem of depression increased with age up to a point (mid fifties) and then declined. The prevalence of depression was reported significantly higher among female than male population.

## Hypertension

The reported incidence of hypertension, diagnosed by any medical professional, was 5.9% (Table 18). Nearly all (5.6%) of them were treated at least once. About 2.6% were found to take medication to control hypertension. As found elsewhere (Boutayeb and Boutayeb 2005), prevalence of hypertension increased with age. The reported prevalence of hypertension was much higher among female than male population in rural Bangladesh.

**Table 18. Diagnosis and treatment of hypertension by age and sex**

Factor	Hypertension		
	Ever diagnosed (%)	Ever been treated (%)	Taking medicine or treatment (%)
All	5.9	5.6	2.6
Age			
25 – 34	2.9	2.7	0.2
35 – 44	5.8	5.8	3.3
45 – 54	9.1	8.6	4.4
55 – 64	11.3	10.5	6.3
Sex			
Male	3.3	3.2	1.6
Female	8.5	8.0	3.5
N	118	112	52

## Cancer

**Table 19. Diagnosis and treatment of cancer by age and sex**

Factor	Cancer		
	Ever diagnosed (%)	Ever been treated (%)	Taking medicine or treatment (%)
All	1.0	0.9	0.3
Age			
25 – 34	1.2	1.1	0.6
35 – 44	1.0	1.0	--
45 – 54	0.3	0.3	--
55 – 64	0.8	0.8	0.4
Sex			
Male	0.2	0.2	--
Female	1.8	1.6	0.6
N	20	18	6

The reported prevalence of cancer was 1% in the study communities (Table 19). Nearly all (0.9%) known cancer patients had access to treatment. About 0.3% were found under treatment during the survey. Cancer did not show any age preference in Bangladesh and surprisingly the reported cases were much higher among the younger than older population. The prevalence was about nine times higher among female than male population.

## Cervical and breast cancer screening

**Table 20. Cervical and breast cancer screening in women by age**

Age group	Cervical and breast cancer screening		
	Ever had pelvic examination (%)	Ever had PAP smear test (%)	Ever had a mammography (%)
All	1.5	0.7	0.4
25 – 34	1.2	0.9	0.5
35 – 44	2.1	0.7	0.3
45 – 54	0.6	--	0.6
55 – 64	0.8	0.8	--
N	16	7	4

About 1.5% women had pelvic examination and nearly 0.7% had PAP smear test to screen for cervical cancer (Table 20). About 0.4% had a mammography to identify breast cancer. It appears that relatively younger women had better access to screening and tests than older women.

## CONCLUSIONS

The WHO and many other organizations have been advocating policy makers to develop efficient strategies to halt the growth of the non-communicable diseases. The most feasible and cost-effective strategy in the poor countries has been community-based health promotion policy. Designing such program, however, requires information base about the health status of the population, health infrastructure, social and cultural context and intensity of the problems. This strategy also requires routine measures of the adequacy and the effects of the program interventions in controlling the risk factors of non-communicable diseases such as smoking, alcohol consumption, level of physical activity, diet pattern, and the prevalence of obesity and blood pressure. The accurate estimation of the risk factors and their changes are considered prerequisite to monitor the effect of the program and inform policy makers.

It has been reported that the preventive programs for NCDs require information of major risk factors in populations on a regular basis to evaluate the program effects and improve intervention designs. The survey has provided a large body of information for raising public awareness and determining priorities for intervention of this public health problem. This study has demonstrated that routine monitoring NCD risk factors is possible at reasonable costs if carefully designed and implemented.

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