HEALTH BEHAVIOR, PERCEPTIONS, PRACTICES, AND DECISION MAKING: SUB-NATIONAL AND SOCIO-DEMOGRAPHIC DIFFERENTIALS IN BANGLADESH, 1995

Abdur Razzaque[1], Shahadat Hossain[2], Hifizur Rahman[2] and Nurul Alam[1]

[1]Public Health Sciences Division, International Centre for Diarrhoeal Diseases Research, Bangladesh, GPO Box-128, Dhaka-1000, Bangladesh; [2]Bangladesh Bureau of Statistics, Statistics Division, Ministry of Planning, Dhaka, Bangladesh

Abstract. The study examines health behavior, perceptions, practices, and decision making using data from the 1995 Health and Demographic Survey conducted by the Bangladesh Bureau of Statistics. Knowledge about causes of diarrhea and food contamination were higher than knowledge about causes of nightblindness and worm infestation but this knowledge is inadequate. The household's economic condition and the respondent's education were found to be positively associated with disease knowledge and food contamination; the same is also true for health behavior and practices. Sub-national variation in disease knowledge and food contamination exists but did not correspond always with the health behavior and practices. Decisions regarding treatment of disease were made by the husband and wife together in two-thirds of the cases, however, it was not uniform across socio-demographic and sub-national categories.

INTRODUCTION

Like many other developing countries, a remarkable decline in mortality was observed in Bangladesh between 1940 and 1960. The decline was largely due to control of communicable diseases like malaria, tuberculosis and cholera. Mortality decline during 1960-80 was rather slow. To accelerate mortality decline, the Alma Ata Declaration asserted that health is human right and that health care should be accessible, affordable and socially relevant (WHO and UNICEF, 1978).

Realizing the intensity of the mortality situation, the government of Bangladesh has established various institutional service facilities since the 1980s. These facilities include Maternal and Child Welfare Center in urban and sub-urban areas, Thana Health Complex at thana level and the Family Welfare Center at union level (DGHS, 1990). The government has also made health service facilities available at Rural Dispensaries and Satellite Clinics. In addition, the government has been promoting oral rehydration therapy for diarrhea management and the immunization program against six major childhood diseases (Huq, 1991).

The level of mortality of a country is influenced by social, nutritional, biological and environmental forces and the socioeconomic factors must operate through the basic proximate determinants that in turn influence the risk of disease and its outcome. In absence of violence or accident, death is always preceded by a shorter or longer illness. In fact, death is rarely an outcome of a single isolated disease episode, rather, it is the consequence of multiple disease process including biosocial interactions. So, adequate knowledge about causes, transmission and prevention of diseases along with hygienic practice is a precondition for achieving low morbidity and mortality in a population (Mosely and Chen, 1984).

Keeping the above theoretical perspective in view, the objective of the study was to examine levels and determinants of knowledge of some infectious diseases, health behavior, practices and decision making regarding treatment of diseases. This study examines whether health knowledge and practices vary by sub-national and socio-demographic characteristics. Such analysis of health issues is important for strengthening the health program to reach all sub-groups of the population as well as for guiding future policy directions.

DATA AND METHODOLOGY

The data source

The data for this analysis are drawn from the

1994-95 Bangladesh Health and Demographic Survey (HDS) conducted by the Bangladesh Bureau of Statistics. The details of the survey are reported elsewhere (BBS, 1994). Part of the HDS is a module, 'health perception, behavior and practices and decision making' and this data set is used in the analysis.

The HDS utilized the Integrated Multi-purpose Sample (IMPS) design. The IMPS is a nationally representative two-stage stratified cluster sampling design created on the basis of the 1991 population census of Bangladesh. The IMPS covers 210 sample *mauzas* (rural 150 and urban 60) out of 372 sample *mauzas* drawn from all over Bangladesh. A total of 53,538 households containing 279,768 population were covered. On an average, an enumeration area consisted of 255 households and 1,333 population as per listing and mapping operation of May, 1994.

All of 372 sample areas (rural 252 and urban 120) of IMPS were covered in this study. Twenty households being even number is the set of 40 households were selected. A survey team of 4 members conducted the interview. The team consisted of two local enumerators (one male and one female) and two enumerators from thana/regional offices. Head of household and his or her spouse were interviewed. The male interviewer enumerated male respondents and the female interviewer enumerated the female respondents using separate forms. The data collection continued for about two weeks in November 1995.

The analysis was restricted to female respondents (7,072 females) because they are the ones responsible for maintaining domestic hygiene, food preparation and caring the sick, so that information collected from the female respondent is expected to be more reliable than that of males.

.

The dependent variables

The dependent variables were grouped into four categories:
• Knowledge of common diseases and food contamination
• Water and sanitation behavior
• Curative and preventive measures and
• Decision regarding treatment of diseases.

Knowledge of diseases: Respondent's knowledge about diseases include diarrhea, nightblindness and worm infection. The causes of diarrhea mentioned by respondents were grouped into six categories: polluted water, contaminated food, uncleaned pots/plates, others, combination of two or more causes, and "did not know". Information about nightblindness was grouped into six categories: deficit of vitamin A, malnutrition, little vegetable intake, others, combination of two or more causes and "did not know". Respondent's knowledge about how worms spread was also assessed and grouped into seven categories: bare foot, defecation in open place, through food/water, through uncleaned latrine, others, combination of two or more causes and "did not know". Respondents were also asked about sources of food contamination and their responses were grouped into six categories: through flies, by dirty hands, by dirty plates, others, combination of two or more causes and "did not know".

Water and sanitation: Information about source of water for washing pots/plates and use of latrine was collected. Source of water for washing pots/plates was grouped into four categories: tap, tubewell, well and others. Types of latrine used were grouped into four categories: sanitary latrine, fixed latrine (Pacca), fixed latrine (Kacca) and others (not fixed/hanging/bush).

The respondents were also asked about the curative measures taken for treating most recent illness of diarrhea. Treatment of diarrhea was grouped into four categories: allopathic, oral packet saline, home made saline and others. Information on use of iodized salt was grouped into either 'yes' or 'no'.

The respondents were asked about who took decision to treat the sick. This information was grouped into five categories: household head, husband, wife, husband-wife together and others.

The independent variables

In this study the set of independent variables included: mother's age, mother's education, possession of radio/and or TV, structure of dwelling, religion, urbanization, division of residence, distance of house from thana headquarters and distance of house from union council.

Mother's age was grouped into four categories (under 20, 20-29, 30-39 and 40 and over). Educa-

tion of mother was ascertained by asking about completed years of schooling and grouped into three categories (no education, 1-5, and 6 and over). Economic condition and exposure to modernity of the household was ascertained by asking about ownership of items such as radio/and or TV: household with none of these items was considered as 'poor' and having any one or both as 'better-off'. Information on structure of dwelling for both wall and roof was collected and dichotomized (tin/cement and others). Respondents were grouped into 'Muslim' or 'Hindu'. Urbanization was categorized either 'rural' or 'urban'. To examine inter divisional variation, households were grouped into four geographic categories: Chittagong, Dhaka, Khulna and Rajshahi. Distance of the house from thana headquarters was grouped into three categories: less than 3, 3-4, and 5 or more km while distance of the house from the union council was dichotomized: less than 3 and 3 or more km.

Method of analysis

To examine the relationship between the dependent and independent variables, logistic regression was used, because of dichotomized dependent variables. The odds ratios are presented; an odds ratio below 1.00 means that an independent variable has a negative effect and an odds ratio above 1.00 means that the independent variable has a positive effect.

RESULTS

Table 1 shows the distribution of respondents by knowledge about diseases and food contamination. About 80% of the respondents reported that 7 or more times loose motion in 24 hours is defined as diarrhea (not shown). However, definition of diarrhea provided by the WHO is 3 or more times loose motion in 24 hours. The most common cause of diarrhea was reported to be food contamination (45%) followed by polluted water (20%). To measure the depth of knowledge about causes of diarrhea, an index was created by adding the number of reported causes; however, only 13% reported two or more causes. Ninety percent of respondents reported at least one cause of diarrhea and they are labeled here as knowledgeable.

The logit analysis revealed that knowledge about cause of diarrhea was similar in rural and urban areas (Table 2). Lower knowledge of diarrhea was found among respondents of Chittagong (0.84 times) and Dhaka (0.84 times) but higher in Khulna (1.31 times) compared to Rajshahi division. Knowledge of diarrhea was higher among Muslims and those who had dwelling structure of tin/cement but lower among illiterate and those who were young compared to their counterparts.

Cause of nightblindness due to vitamin A deficiency was mentioned by 35% while 9% reported it due to malnutrition (Table 1). To measure the depth of knowledge about cause of nightblindness, an index was created by adding the number of reported causes; however, 7% reported two or more causes. Fifty-nine percent of respondents reported at least one cause of nightblindness and they are assumed here as knowledgeable. The logit analysis found that knowledge of nightblindness was lower among rural respondents (0.80 times) compared to urban respondents (Table 2). Knowledge of nightblindness was lower among respondents of Chittagong (0.79 times) and Dhaka (0.74 times) compared to Rajshahi division. Knowledge of nightblindness was greater among those who owned radio/and or TV and those who had dwelling structures of tin/cement but lower among illiterates and those who were young compared to their counterparts.

About 25.0% repondents reported bare foot as a route of worm spread followed by defecation in open place (14%) (Table 1). To measure the depth of knowledge about route of worm spread, an index was created by adding the number of reported routes; however, 7% reported two or more causes. Sixty-two percent respondents reported one or more cause of worm spread and they are labeled here as knowledgeable. The logit analysis identified that knowledge about route of worm spread was lower among rural respondents (0.82 times) compared to urban respondents (Table 2). Knowledge was lower among respondents of Chittagong (0.63 times) and Dhaka (0.86 times) compared to Rajshahi division. Knowledge about worm spread was greater among those who had dwelling structure of tin/cement but lower among illiterate and those who were young compared to their counterparts.

The knowledge of food contamination is essential to prevent diarrhea. Fifty-eight percent respondents reported that food can be contaminated

Table 1

Distribution of respondents (%) by knowledge about diseases and food contamination.

Variables	Percent	No.
Causes of diarrhea (Atleast one 89.9% and did not know 10.1%)[1]		
Polluted water	21.6	1,528
Contaminated food	44.8	3,168
Uncleaned pots	9.6	679
Others	1.4	99
Two or more	12.5	884
Did not know	10.1	714
Causes of nightblindness (Atleast one 59.4% and did not know 40.6%)[1]		
Deficit of vitamin A	35.4	2,503
Due to malnutrition	8.8	622
Little vegetable intake	6.6	467
Others	2.1	149
Two or more	6.5	460
Did not know	40.6	2,871
How worms spread (Atleast one 62% and did not know 38%)[1]		
Bare foot	24.6	1,740
Defecation in open space	14.4	1,018
Food/water hand	9.9	700
Unclean toilet	2.7	191
Others	3.8	269
Two or more	6.6	467
Did not know	38.0	2,687
How food contaminate (Atleast one 92.1% and did not know 7.9%)[1]		
Through flies	58.3	4,123
Dirty hands	6.0	424
Dirty plates and pots	12.5	884
Dirty water	2.6	184
Others	1.5	106
Two or more	11.2	792
Did not know	7.9	559

[1] = These categories were used in the logistic regression. The first category was labeled as '1' in the variable definition.

through flies while only 6% reported that it can be contaminated through dirty hands (Table 1). To measure the depth of knowledge about cause of food contamination, an index was created by adding the number of reported causes; however, 11% reported two or more causes. Ninety-two percent of respondents reported one or more cause of food contamination and they are labeled here as knowledgeable. The logit analysis showed that knowledge about food contamination was similar in rural and urban areas (Table 2). Respondents of Chittagong (0.86 times) and Dhaka (0.92 times) had lower knowledge compared to Rajshahi division. Knowledge about food contamination was lower among those who were illiterate and those who were young compared to their counterparts.

Although over 90% of households were using tap/tubewell/well water for drinking, for washing pots/plates such water use was about 60% (Table 3). To keep foods free from contamination, pots/plates needs to be washed by tap/tuberwell/well water (safe water). The logit analysis showed that use of safe water for washing pots/plates was simi-

Table 2

Logistic regression (odds ratios) of disease knowledge and food contamination.

Covariates	Knowledge of diarrhea (Atleast one = 1)	Knowledge of nightblindness (Atleast one = 1)	Knowledge of worm spread (Atleast one = 1)	Knowledge of food contamination (Atleast one = 1)
Urbanization				
Urban	1.00	1.00	1.00	1.00
Rural	0.95	0.80[a]	0.82[a]	1.01
Division				
Chittagong	0.84[b]	0.79[a]	0.63[a]	0.86[c]
Dhaka	0.84[b]	0.74[a]	0.86[a]	0.92
Khulna	1.31[a]	1.05	1.01	1.08
Rajshahi	1.00	1.00	1.00	1.00
Possession of radio/and or TV				
No	1.00	1.00	1.00	1.00
Yes	1.17	1.50[a]	1.10	1.21
Roof and wall material				
Tin/cement	1.40[a]	1.28[a]	1.17[b]	1.21
Others	1.00	1.00	1.00	1.00
Education of respondent				
Illiterate	0.42[a]	0.53[a]	0.39[a]	0.40[a]
1-5 yr	1.00	1.03	0.94	1.37[b]
6+ yr	1.00	1.00	1.00	1.00
Religion				
Muslim	1.46[a]	1.04	0.97	1.08
Hindu	1.00	1.00	1.00	1.00
Age of respondent (yrs)				
Less than 20	0.55[a]	0.93	0.77[b]	0.72[c]
20-29	1.37[a]	1.02	1.05	1.21[b]
30-39	1.40[a]	1.12[b]	1.25[a]	1.31[a]
40+	1.00	1.00	1.00	1.00
Distance from thana				
Less than 3 km	0.93	1.05	1.06	0.91
3-4 km	1.27[b]	1.02	1.04	1.29[b]
5+ km	1.00	1.00	1.00	1.00
Distance from union				
Less than 3 km	0.78[a]	0.91	0.76[a]	0.93
3+ km	1.00	1.00	1.00	1.00

[a]p < 0.01; [b]p < 0.05 and [c]p < 0.10

lar among respondents of rural and urban areas (Table 4). The use of safe water was lower among respondents of Chittagong (0.21 times) and Khulna (0.57 times) but higher in Dhaka (1.51 times) compared to Rajshahi division. Safe water use was higher among those who owned radio/and or TV, those who had dwelling structure of tin/cement and those who had house less than three km from thana headquarters but lower among illiterate compared to their counterparts.

Defecation in unhygienic conditions is common, about 59% used sanitary/fixed latrines, however, 41% used either hanging latrines or not fixed

Table 3

Distribution of respondent (%) by health behavior, practices and decision regarding treatment.

Variables	Percent	No.
Place of defecation (Sanitary/fixed latrine 52.6% and others 47.4%)[1]		
Sanitary	22.2	1,570
Fixed latrine (Pacca)	11.8	835
Fixed latrine (Kacca)	18.6	1,315
Others (not fixed/hanging/bush)	47.4	3,352
Sources of water for washing pots (Tab/tubewell/well 58.0% and others 42.0%)[1]		
Tap	9.3	655
Tubewell	42.9	3,035
Well	5.8	412
Others (surface)	42.0	2,970
Use of iodized salt (Yes 48.0% and no 52.0%)[1]		
Yes	48.0	3,394
No	52.0	3,678
Use of medicine to treat diarrhea (Oral saline 63.2% and others 36.8%)[1]		
Allopathic	28.8	163
Oral packet saline	45.0	254
Oral home made saline	18.2	103
Others	7.9	45
Decision to treat sick (Husband-wife 40.6% and others 59.4%)[1]		
Household head	16.0	1,131
Husband	30.7	2,171
Wife	8.2	580
Husband and wife	40.6	2,869
Others	4.5	321

[1]= These categories were used in the logistic regression. The first category was labeled as '1' in the variable definition.

or bush as a place for defecation (Table 3). The logit analysis showed that odds of sanitary/fixed latrine use was lower among rural respondents (0.54 times) compared to urban respondents (Table 4). The use of sanitary/fixed latrine was higher among respondents of Chittagong (1.39 times) and Khulna (2.37 times) but lower in Dhaka (0.80 times) compared to Rajshahi division. Use of sanitary/fixed latrine was greater among those who owned radio/ and or TV, those who had dwelling structure of tin/ cement and those who had their house within three km from either thana headquarters or union council but lower among those who were illiterate and those who were young compared to their counterparts.

Those who had suffered from diarrhea in the recent past were asked about the treatment they had: about 65% took oral saline while the rest took either allopathic or other type of medicine (Table

3). The logit analysis found that oral saline use was higher in the Dhaka (1.56 times) but lower in Chittagong (0.75 times) compared to Rajshahi division, however, all the other variables were comparable (Table 4).

Use of iodized salt was not common, about 45% had used it (Table 3). Of those who were using iodized salt, about 60% were using it to prevent goiter, however, about 20% did not know why they were using it. The logit analysis showed that use of iodized salt was lower among rural respondents (0.50 times) compared to urban respondents (Table 4). Respondents of Khulna (1.65 times) and Dhaka (1.18 times) had higher iodized salt use compared to Rajshahi division. Iodized salt use was higher among those who owned radio/and or TV, those who had dwelling structure of tin/cement and those who had house close to either thana headquarters or

Table 4

Logistic regression (odd ratios) of health behavior, practices and decision regarding treatment.

Covariats	Use of water for washing pot/plate (Tap/tubewell/well = 1)	Use of fixed latrine (Yes = 1)	Medicine to treat diarrhea (Oral saline = 1)	Use of iodized salt (Yes = 1)	Decision to treat sick (Husband-wife = 1)
Urbanization					
Urban	1.00	1.00	1.00	1.00	1.00
Rural	1.03	0.54ᵃ	1.16	0.50ᵃ	0.77ᵃ
Division					
Chittagong	0.21ᵃ	1.39ᵃ	0.75ᶜ	0.93	0.70ᵃ
Dhaka	1.51ᵃ	0.80ᵃ	1.56ᵇ	1.18ᵃ	1.15ᵃ
Khulna	0.57ᵃ	2.37ᵃ	0.85	1.65ᵃ	1.31ᵃ
Rajshahi	1.00	1.00	1.00	1.00	1.00
Possession of radio/and or TV					
No	1.00	1.00	1.00	1.00	1.00
Yes	1.31ᵃ	1.42ᵃ	0.86	1.98ᵃ	1.32ᵃ
Roof and wall material					
Tin/cement	1.48ᵃ	2.48ᵃ	0.67	2.10ᵃ	1.13ᶜ
Other	1.00	1.00	1.00	1.00	1.00
Education of respondent					
Illiterate	0.85ᵃ	0.51ᵃ	0.77ᶜ	0.51ᵃ	0.82ᵃ
1-5 yr	0.82ᵃ	0.93	1.08	1.04	1.08ᶜ
6+ yr	1.00	1.00	1.00	1.00	1.00
Religion					
Muslim	1.05	0.93	0.92	0.76ᵃ	0.79ᵃ
Hindu	1.00	1.00	1.00	1.00	1.00
Age of respondent (yrs)					
Less than 20	1.23	0.76ᵇ	0.51	0.92	0.85
20-29	1.00	0.97	1.06	0.95	1.07
30-39	0.93	1.03	1.24	1.16ᵇ	1.17ᵃ
40+	1.00	1.00	1.00	1.00	1.00
Distance from Thana					
Less than 3 km	1.61ᵃ	1.33ᵃ	0.93	1.17ᵃ	1.06
3-4 km	1.46ᵃ	0.98	1.00	1.01	0.88ᵇ
5+ km	1.00	1.00	1.00	1.00	1.00
Distance from Union					
Less than 3 km	1.00	1.00	1.00	1.00	1.00
3+ km	1.35ᵃ	0.77ᵃ	0.77	0.80ᵃ	0.77ᵃ

ᵃp < 0.01; ᵇp < 0.05 and ᶜp < 0.10

union council but lower among illiterate and Muslims compared to their counterparts.

It is often believed that husband or household head takes the decision regarding household matters including health. It was found that in 40% cases the decision was taken by husband-wife together (Table 3). The logit analysis showed that odds of husband-wife's decision regarding health mater was lower among rural respondents (0.77 times) compared to urban respondents (Table 4). Decision about health mater by husband-wife together was higher in Dhaka (1.15 times) and Khulna (1.31 times) but lower in Chittagong (0.70 times) compared to Rajshahi division. Husband-wife's decision regarding health mater was higher among those who owned radio/and or TV but lower among illiterate and Muslims compared to their counterparts.

DISCUSSION

In developing countries like Bangladesh 70-80% children die each year due to infectious diseases. These deaths, in most cases, are preceded by a short or long illness, and such illness can be reduced or avoided by adopting preventive and curative measures. So, knowledge of common diseases as well as their mode of transmission, hygienic practices and timely treatment is important for reducing incidence and case-fatality.

The knowledge about cause of diarrhea and food contamination, although higher than the knowledge about cause of nightblindness and worm infestation, but these knowledges are inadequate: in most cases a single cause was mentioned. For example, diarrheal pathogens transmit from person to person through ingestion of contaminated food and water (Chen 1983; Black 1984); food and water contamination can be reduced by improving personal and domestic hygiene. This is because household environment in the rural area often gets contaminated through hazardous disposal of human and animal feces while in the urban area, such environment is contaminated through defective waste disposal and sewerage system.

Increased knowledge about diseases and food contamination should have a negative impact on disease incidence and case-fatality. In fact, household's economic conditions and respondent's education were found to be positively associated with disease knowledge and food contamination. This is expected because the rich and educated respondents are exposed to media more than the poor and illiterate, and the former can accrue knowledge through reading, listening and personal contact.

Except respondents of the Dhaka division, practices relating to use of water, latrine, oral saline, and iodized salt, did correspond with disease knowledge. The difference in disease knowledge and practice could be due to difference in access to or availability of resources and not necessarily due to disease perception. Bhuiya *et al* (1989) documented that availability of tubewell within *bari* had increased its use but may not reduced incidence of diarrhea if water gets contaminated while collecting and storing (Levine *et al*, 1976).

Apart from the factors discussed above, decision of initiating effective treatment is important because delay in the process may worsen the patient's condition. As initiation of treatment requires money, the mother's involvement in the decision making process is important. However, it is believed that household head or husband alone usually takes such decision. This conviction is not supported by the data. This study documented that in two-thirds cases the decision was taken by the husband-wife together, however, it was not uniform across socio-demographic and sub-national categories.

ACKNOWLEDGEMENTS

REFERENCES

Bangladesh Bureau of Statistics. Summary report of survey on prevalence of morbidity and health status, February 1995, Bangladesh Bureau of Statistics, Dhaka. 1996.

Bhuiya A, Streatfield K, Meyer P. Mother's hygienic awareness, behaviour and knowledge of major childhood diseases in Matlab, Bangladesh. In: Caldwell *et al*, ed. What we know about health transition: The culture, social and behavioural determinants of health. The Australian National University. *Health Transit Ser* 1989; 2 : 462-77.

Black RE. Diarrhoeal diseases and child morbidity and mortality, *Pop Devel Rev* 1984; 10 (suppl) : 141-61.

Chen LC. Interactions of diarrhea and malnutrition: mechanisms and interventions'. In: Chen LC, Serimshaw NS, eds. Diarrhea and Malnutrition. New York and London: Plenum Press. 1983; 3-19.

DGHS (Directorate General of Health Services) Bangladesh Health Services 1989. Government of the People's Republic of Bangladesh. 1990.

Huq M. Near Miracle in Bangladesh. Dhaka University Press, 1991.

Levine RJ, D'Souza S, Khan MA, Nalin DR. Failure of sanitary wells to protect against cholera and other diseases in Bangladesh. *Lancet* 1976; 1 : 86-9.

Mosley WH, Chen LC. An analytical framework for the study of child survival in developing countries. *Pop Devel Rev* 1984; 10 (suppl) : 25-45.

WHO and UNICEF. Alma Ata 1978: Primary Health Care. WHO, Geneva. 1978.