

## Extent and Background Factors of Physical and Mental Disability in Bangladesh

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### Abstract

The extent of disability in Bangladesh in recent time has been examined and the potential background factors causing different types of disability have been identified. The data on disability in Bangladesh was taken from Sample Vital Registration System (SVRS), 2010 collected by Bangladesh Bureau of Statistics. Chi-square test of association showed that type of disability varies significantly with respect to area, sex, division and religion. Age has no significant association with disability. A trichotomous logistic regression model presented the relationship between different background factors and type of disability. The model shows that the disability rate is higher among urban people as compared to rural people. The disability rate in Barisal, Dhaka, Khulna and Rajshahi are significantly higher than Sylhet. The male are more likely to be mentally disabled than female. Both physical and mental disability is higher among non muslims as compared to Muslims.

**Keywords:** Disability, Physical disability, Mental disability, Chi square test of association, Polytomous logistic regression.

### 1. Introduction

In the context of health experience, a disability is any restriction or lack (resulting from an impairment) of ability to perform an activity in the manner or within the range considered normal for a human being<sup>1</sup>. Disability is, to an increasing extent, being addressed as an issue to be included into mainstream development rather than as a matter of separate programs and charity. This follows the recognition that people with disabilities are citizens with equal rights, who, given the opportunity, are able to contribute economically and socially to their households and communities. However, people with disabilities are often discriminated against, socially marginalized and do not have access to basic social services. About 15 percent of the world's population, some 785 million people, has a significant physical or mental disability, including about 5 percent of children, according to a new report prepared jointly by the World Health Organization and the World Bank<sup>2</sup>. In low and middle income countries, 66.5 percent of all years lived with disability are the consequence of 'non-communicable diseases', including mental illness, emphysema and so on. Disability is especially high in people in their 80s, the 'age cohort' growing fastest in the world. A study in 2005 showed that 5.6% people in Bangladesh have disability of one kind or another. Among the persons with disabilities, percentage share of different types of impairments are hearing 18.6%, visual 32.2%, speech 3.9%, physical 27.8%, intellectual 6.7% and multiple 10.7%. Variation was observed in types of disability, their rates and other socio-demographic factors<sup>3</sup>. In 2000 and 2002, the estimated crude disability rates per thousand were 7.4 and 6.62 (for male) and 4.7 and 5.05 (for female) respectively<sup>4</sup>. The global figure for developing countries is 10% of the total population<sup>5</sup>. Considering the global estimate, the number of persons with disabilities in Bangladesh would be about 15 million. Various studies found that the causes of disabilities vary according to different age groups, sex, regions and other background characteristics. A good number of research have been carried out so far on the education, employment, medical treatment and mostly on the rehabilitation of the disabled in Bangladesh<sup>6-12</sup>. However, different census, survey and

SVRS reports state that in spite of concerns of different NGO's and Government of Bangladesh regarding this issue, the rate of disability in Bangladesh shows an increasing trend among both male and female. The disability rate reached its highest level in 2009 and 2010<sup>4, 13-29</sup>.

This paper attempts to explore the background causes of disabilities and to identify the risk factors. It is important to study the background factors to identify the people most vulnerable in order to assist in policy making and management for the disabled in Bangladesh. While the background causes of disabilities would be identified it could be possible to take preventive steps or rehabilitation plan in advance and in that way, this study can contribute in proper health planning, management and policy recommendation for the disabled people in Bangladesh.

The specific objectives of the study are to (i) examine the current scenario of different types of disabilities in Bangladesh (ii) examine differentials of disability and (iii) identify the background factors related to disability and their effects using a polytomous logistic regression model.

### II. Data and Variables

Sample Vital Registration System (SVRS) is a continuous surveillance system that has been in operation since 1980. The data from SVRS 2010 has been used for this study and includes information on 206522 households. The sample design is a stratified cluster design where stratification was done in two ways. First level stratification was done by locality: Rural, Urban and SMA. Second level stratification was done within each stratum. According to the sample design, 1000 PSUs were selected that contain 206, 522 households. 1000 PSUs were allocated to the strata as 640 to Rural, 280 to Urban and 80 to SMAs. There are 10 independent schedules on different topics. Schedule 2 has household related data in Module 1 and population data in Module 2. Schedule 10 has questions to collect data on disability as well as the age, sex, type of disability and reasons behind becoming disabled.

Type of disability, recoded as: Physical disability, Mental disability and no disability, have been considered as the dependent variable in the multivariate analysis. The independent variables were age of respondents (categorized),

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sex (male or female), religion(Muslim and Non-Muslim) and area of residence (Urban, Rural) and division (Dhaka, Khulna, Chittagong, Barisal, Rajshahi and Sylhet).

**III. Methodology**

Chi-square test of association was used to identify the background factors causing disability. The dependant variable ‘Type of disability (Y)’ is categorical and has three categories coded as Y = 0, if not disabled, 1, if physically disabled and 2 if mentally disabled.

A common choice for such cases is a polytomous logistic regression model to see the relationship among the dependent and the independent variables.

Let the dependent variable be Y, with categories 0, 1 and 2 and the independent variables are X<sub>1</sub>, X<sub>2</sub>, ..., X<sub>k</sub>. The objective is to describe the probability that a person will be disabled with independent variable values X<sub>1</sub>, X<sub>2</sub>, ..., X<sub>k</sub>. The probability being modeled is

$$P(Y=i/ X_1, X_2, \dots, X_k) = \frac{1}{1 + e^{-(\alpha + \beta_1 X_1 + \beta_2 X_2 + \dots + \beta_k X_k)}}$$

Where i = 1 or 2 and  $\alpha, \beta_1, \beta_2, \dots, \beta_k$  are the parameters.

Polytomous (Trichotomous) logistic regression model was fitted using the significant background factors as independent variables and type of disability as dependent variable. SPSS 16.0 have been used to analyze the data.

**IV. Results and Discussion**

The reasons for disabilities are diverse: inherent, accident, disease, old age etc. caused different types of disabilities among Bangladeshi individuals. Table 1 presents the reasons and types of disability among Bangladeshi individuals.

**Table 1. No of Respondents by Reasons of disability and Types of disability**

Reasons of disability	Types of disability		Total
	Physical disability	Mental disability	
Inherent	3829(0.3%)	1153(0.1)%	4982(0.5%)
Accidental	1025(0.1%)	182(0.0%)	1207(0.1%)
Disease	2322(0.2%)	610(0.1%)	2932(0.3%)
Old age	948(0.1%)	428(0.0%)	1376(0.1%)
Others	315(0.0%)	151(0.0%)	466(0.0%)
Total	8439(0.8%)	2524(0.2%)	1103326(100%)

Table 1 reports that 10 per thousand in the total population were either physically or mentally disabled. Percentage of physical disability is greater than that of mental disability. Nevertheless, inherent disability is greater for both physical disability and mental disability. The second major reason of physical disability is disease. Accidental reasons also contribute to a noticeable amount to physical disability but not to mental disability. Old age is also another possible cause of physical disability.

The distribution of disabled persons by background characteristics is presented in Table 2.

**Table 2. Types of disability by background characteristics**

Background factor		Types of disability			χ <sup>2</sup>	p-value
		No disability N(%)	Physical disability N(%)	Mental disability N(%)		
Area	Rural	699946(63.4%)	5121(0.5%)	1489(0.1%)	69.843	0.000
	Urban	392417(35.6%)	3318(0.3%)	1035(0.1%)		
Sex	Male	547244(49.6%)	4242(0.4%)	1357(0.1%)	13.629	0.000
	Female	545119 (49.4%)	4197(0.4%)	1167(0.1%)		
Division	Barishal	92066(8.3%)	619(0.1%)	177(0.0%)	0.004	0.000
	Chittagong	220009(19.9%)	1223(0.1%)	389(0.0%)		
	Dhaka	310448(28.1%)	2543(0.2%)	732(0.1%)		
	Khulna	147921(13.4%)	1401(0.1%)	404(0.0%)		
	Rajshahi	256988(23.3%)	2306(0.2%)	762(0.1%)		
	Sylhet	64931(5.9%)	347(0.0%)	60(0.0%)		
Religion	Muslim	960034(87.0%)	7068(0.6%)	2133(0.2%)	0.016	0.000
	Non-muslim	132329(12.0%)	1371(0.1%)	391(0.0%)		
Age of the respondent	Less than 15	350963(31.8%)	2707(0.2%)	776(0.1%)	0.052	0.5490
	15-59	668896(60.6%)	5162(0.5%)	1587(0.1%)		
	60+	72504(6.6%)	570(0.1%)	161(0.0%)		

Area, sex of respondent, division and religion have significant association with type of disability. Age of the respondent, even though identified as a potential risk factor in several studies, was not significantly associated with the dependent variable.

Table 3 shows the estimates of the trichotomous logistic regression model, odds ratios and corresponding p-values for the given data.



**Table 3. Estimates of the Parameters of the Trichotomous Logistic Regression Model**

Background factors		Physical disability			Mental disability		
		Estimated coefficient	p-value	Odds ratio	Estimated coefficient	p-value	Odds ratio
Intercept		-4.843	0.000		-6.709	0.000	
Area	Rural	-0.141	0.000	0.869	-0.212	0.000	0.809
	Urban <sup>(R)</sup>						
Division	Barishal	0.282	0.001	1.258	0.771	0.000	2.161
	Chittagong	0.061	0.518	1.040	0.660	0.000	1.935
	Dhaka	0.471	0.000	1.533	0.963	0.000	2.620
	Khulna	0.609	0.000	1.772	1.106	0.000	3.022
	Rajshahi	0.570	0.000	1.679	1.204	0.000	3.334
	Sylhet <sup>(R)</sup>						
Sex	Male	0.004	0.853	1.004	0.145	0.000	1.156
	Female <sup>(R)</sup>						
Religion	Muslim	-0.386	0.000	0.679	-0.339	0.000	0.713
	Non-muslim <sup>(R)</sup>						

(R is the reference category)

There are some clear differences among the factors causing physical and mental disability. Area, Sex, Religion and Division are significantly associated with different types of disabilities. Rural people are less likely to be physically or mentally disabled as compared to their urban counterparts. Physical disability was significantly higher than Sylhet in all divisions except for Chittagong Division. However, the risk of being mentally disabled is twice as much for people of Barisal and Chittagong as compared to Sylhet and even more in Dhaka, Khulna and Rajshahi. People of Rajshahi and Khulna are more than three times more likely to be mentally disabled as compared to Sylhet. Overall, sex was a significant background factor for mental disability. Male are 15 percent more likely to be mentally disabled as compared to female. However, sex has no significant association with physical disability. Both physical and mental disability are higher among non muslims as compared to muslims. Even though religion is not supposed to be a direct etiologic factor, but it might have some indirect effect on disability. A significant proportion of disabilities worldwide are attributable to childhood malnutrition and to poor water, and sanitation and personal and domestic hygiene<sup>20</sup>, which varies to a great extent for people with different religions. The food habit and social and cultural norms are also different for different religions which might have some impact on this issue.

#### V. Concluding Remarks

The focus of this study was to examine the sources of different types of disabilities and to find out the type of association between the disability type and reasons of disability or disability type and background variables. The alarming fact is that among the 0.8% physically disabled, majority were disabled since they were born. Also among the 0.2% mentally disabled, about half had the same reason. Some small scale studies focused on maternal and/or household characteristics on childhood impairment and disabilities<sup>21</sup>. However, the authors believe that this issue

needs to be addressed with greater concern. The results of bivariate analysis as well as the trichotomous logistic regression details the fact that Area, Sex, Division and Religion of the respondent have significant effects on different types of (physical, mental or none) disability. Why these background factors have effect on the mental and physical disabilities in varying pattern could be mentioned as the further scope of study.

The authors believe that the main focus of the policy makers should be on prevention of disabilities in order to reduce the burden of cost of treatment and rehabilitation of the respective families and/or the Government. The significant background factors identified in this study could be helpful to identify the people at greater risk of different types of disabilities and hence is expected to play role in policy making and management effectively.

#### References

1. WHO, 1980, 1993. International Classification of Impairments, Disability and Handicaps. Geneva.
2. World Report on Disability, 2011. [http://whqlibdoc.who.int/publications/2011/9789240685215\\_eng.pdf](http://whqlibdoc.who.int/publications/2011/9789240685215_eng.pdf)
3. Titumir, R. A. M. and J. Hossain, 2005. Disability in Bangladesh: Prevalence, Knowledge, Attitudes and Practices. *The Innovators*. [http://www.unnayan.org/documents/RightsParticipation/disability\\_prevalence.pdf](http://www.unnayan.org/documents/RightsParticipation/disability_prevalence.pdf)
3. Bangladesh Bureau of Statistics, 2004. Report of Sample Vital Registration System, 2002.
4. WHO, 2002. Towards a Common Language for Functioning, Disability and Health.
5. Danish Bilharziasis Laboratory for the World Bank, People's Republic of Bangladesh, 2004. Disability in Bangladesh: A Situation Analysis.
6. Hosain, G. M.M., and N. Chatterjee, 1998. Health-care utilization by disabled persons: a survey in rural Bangladesh. *Disability & Rehabilitation*, **20(9)**, 337-345.

7. Hosain, G. M.M., D. Atkinson and P. Underwood, 2002. Impact of disability on quality of life of rural disabled people in Bangladesh. *Journal of Health, Population and Nutrition*, **20**(4), 297-305.
8. Ackerman, Paul, et al., 2005. Assessment of educational needs of disabled children in Bangladesh. *Washington, DC: Creative Associates International Inc./USAID*
9. CSID, 2005. Situational Analysis and assessment of education for children with disabilities in Bangladesh, South Asia, East Asia and South Africa. Dhaka, Bangladesh.
10. Alam, K. J. and N. Bari, 2005. Community Based Rehabilitation Practices and Evaluation of Poverty of people with Disabilities in Bangladesh-Bangladesh Country Paper. *The National Forum of Organizations Working With The Disabled, Dhaka*.
11. Malak, M. S. and D. Khanam, 2011. Challenges to Regular Schooling of Female Students with Disabilities in Bangladesh: A Case Study. *Journal of Advanced Social Research*, **1**(2), 147-156.
12. Kabir, N., and N. Rehman, 1996. Four baseline surveys on prevalence of disabilities. *Action Aid Bangladesh, Dhaka*.
13. Bangladesh Bureau of Statistics, 1987. Disabled Population of Bangladesh. Evidences from Demographic Sample Survey, 1982.
14. Bangladesh Bureau of Statistics, 1995. Summary Report of Survey on Prevalence of Disability, May 1994.
15. Bangladesh Bureau of Statistics, 1998. Report of Survey on Prevalence of Disability, June 1996.
16. Bangladesh Bureau of Statistics, 2005. Report on Sample Vital Registration System, 2004.
17. Bangladesh Bureau of Statistics, 2007. Report on Sample Vital Registration System, 2005-2006.
18. Bangladesh Bureau of Statistics, 2008. Report on Sample Vital Registration System, 2007.
19. Murray, J. L. C., and Lopez, A. D., 1997. Global mortality, disability, and the contribution of risk factors: Global Burden of Disease Study, *The Lancet*, **349**(9063), 1436 - 1442
20. Khan, N. Z., S. Ferdous, M. Mahbub, R. Mobarak, M. Parveen, D. Mont, and M. Durkin, 2012. The Impact of Maternal and Household Characteristics on Childhood Impairments and Disabilities in Bangladesh. *Bangladesh Journal of Child Health*, **35**(2), 41-48.