Prevalence of disability in Manikganj district of Bangladesh: results from a large-scale cross-sectional survey

Mohammad Moniruzzaman,1 M Mostafa Zaman,1 Saidur Rahman Mashreky,2 A K M Fazlur Rahman3

To cite: Moniruzzaman M, Zaman MM, Mashreky SR, et al. Prevalence of disability in Manikganj district of Bangladesh: results from a large-scale cross-sectional survey. BMJ Open 2016;6: e010207. doi:10.1136/bmjopen-2015-010207

ABSTRACT

Objective: To conduct a comprehensive survey on disability to determine the prevalence and distribution of cause-specific disability among residents of the Manikganj district in Bangladesh.

Methods: The survey was conducted in Manikganj, a typical district in Bangladesh, in 2009. Data were collected from 37 030 individuals of all ages. Samples were drawn from 8905 households from urban and rural areas proportionate to population size. Three sets of interviewer-administered questionnaires were used separately for age groups 0–1 years, 2–10 years and 11 years and above to collect data. For the age groups 0–1 years and 2–10 years, the parents or the head of the household were interviewed to obtain the responses. Impairments, activity limitations and restriction of participation were considered in defining disability consistent with the International Classification of Functioning, Disability and Health framework.

Results: Overall, age-standardised prevalence of disability per 1000 was 46.5 (95% CI 44.4 to 48.6). Prevalence was significantly higher among respondents living in rural areas (50.2; 95% CI 47.7 to 52.7) than in urban areas (31.0; 95% CI 27.0 to 35.0). Overall, female respondents had more disability (50.0; 95% CI 44.4 to 48.6) than male respondents (46.3; 95% CI 40.9 to 46.3). Educational deprivation was closely linked to higher prevalence of disability. Commonly reported prevalences (per 1000) for underlying causes of disability were 20.2 for illness, followed by 9.4 for congenital causes and 6.8 for injury, and these were consistent in males and females.

Conclusions: Disability is a common problem in this typical district of Bangladesh, which is largely generalisable. Interventions at community level with special attention to the socioeconomically deprived are warranted.

INTRODUCTION

Disability is universal and recognised as a global public health problem. People with disabilities face widespread barriers in accessing healthcare services, education, employment and social services, including housing and transport. They are also likely to experience social stigma, discrimination, inequality and disrespect, among many other hardships in their daily lives. These factors are the major reasons for their poorer health outcomes, lower educational achievement, lower economic participation, and higher rates of poverty than individuals without disabilities.1,2

Globally, more than one billion people (or about 15% of the world’s population) have been estimated to have some form of disability as reported in the first ever World Report on Disability,2 which clearly indicates that the prevalence of disability has risen since the 1970 estimate.3

Despite the high magnitude of disability cases, both awareness of and scientific information on disabilities are lacking in many countries such as Malawi, Mozambique, Zambia, Zimbabwe, India and Nepal.3 The lack of burden data may be due to the difficulty in obtaining this information given the complex nature and multidimensional characteristics. Because of this, many different approaches are used to collect the relevant data.2 Operational measures of disability vary widely across, and even within, countries. These variations occur because of the purpose and application of the data, the
concept of disability, the aspects of disability examined (impairments, activity limitations, participation restrictions, related health conditions, environmental factors), the definitions, question design, reporting sources, data collection methods, and expectations of functioning.2 2

The magnitude of disability among Bangladeshi people is not precisely known. Data on disability burden are either not comprehensive4 and/or suffer from methodological limitations.5 6 Recently, the Sample Vital Registration System (SVRS) and the Household Income and Expenditure Survey (HIES) have started reporting data on disabilities. The SVRS studies7–9 reported the prevalence to be ∼10 per 1000 of the Bangladeshi population. A non-governmental organisation reported a prevalence of five times that of the SVRS studies (56 per 1000).10 The HIES came up with a prevalence of 91 per 1000,11 which is nine times higher than the SVRS data. This study used the shorter version of the Washington Group Disability Questionnaire and did not cover children below 5 years of age. Presumably, the use of a comprehensive longer version of the Washington Group Questionnaire would yield a higher prevalence than that reported.

From the above picture, it is apparent that disability prevalence data for Bangladeshi people are extremely variable. The discrepancy of findings between studies needs to be resolved, and special focus is needed to define disability more comprehensively. Therefore we conducted this survey using a longer version of the Washington Group Questionnaire to describe the prevalence of disability in Bangladeshi people of all ages.

METHODS

A cross-sectional survey was conducted from July to December 2009 in the purposively selected Manikganj district of Bangladesh, which is located about 65 km north-west of the capital city, Dhaka. Manikganj is a typical district of Bangladesh with a central district town, seven moderately urbanised sub-districts with small towns (two of them municipalities), and a vast rural area including 1660 villages.12 It encompasses a population of 1.4 million with a population density of 1007/km², a sex ratio (male/female) of 94.4, 20% of its inhabitants are living in urban areas, an average household (HH) size of 4.3 persons, and a literacy rate of 49.2% (for 7 years or older)—characteristics that closely resemble the demographic profile of the national population.12 13

All non-institutional residents of all ages of the district were considered eligible for this survey. A total of 9450 HHs (2100 urban and 7350 rural proportionate to population size) were targeted to obtain a sample of 40 000 people. Using a prevalence of disability of 1% for Bangladesh (as estimated in the SVRS report) and 0.5% margin of error, we estimated that the minimum sample size required was 1521. This study aimed to estimate data in 10 groups according to gender, urban–rural area of residence and three age groups. Therefore, a minimum of 15 210 respondents were needed. To address the design effect (2.0) and potential response rate (76%), it was further inflated to a final sample size of 40 000.

In urban areas, 20 mahallas (the lowest urban geographic unit having identifiable boundaries) were selected randomly out of 64. From each mahalla, 105 HHs were selected to obtain our targeted number of HHs (2100). All members of the 105 selected HHs from each of the 20 mahallas constituted the urban samples (a total of 8800 individuals). Rural samples were also drawn from 10 randomly selected villages from each of the seven sub-districts (a total of 70 villages). From each village, 105 HHs were selected to obtain the targeted number of HHs (7350). All members of the selected HHs constituted the rural study sample (31 200 individuals). From each mahalla and village, 105 adjacent HHs starting from the randomly selected first HH in the middle of the selected cluster were visited to obtain the target number of HHs and individuals. This number (150 HHs) was calculated on the estimate of having an average HH size (4.2 persons) to obtain the targeted sample size in urban and rural areas. Ultimately, 37 030 (7929 urban and 29 737 rural) individuals from 8905 HHs were recruited. These constitute 94% and 93% response rates for HHs and individuals, respectively.

The field team underwent a 7-day training course before deployment. The team consisted of 20 experienced data collectors, five supervisors and one research manager. All had a masters degree in social sciences and prior experience in health-related research. The training was conducted by the Centre for Injury Prevention and Research, Bangladesh. Assistance from the local health authority was sought to ensure proper identification of sampling unit boundaries and cooperation of the local community. Data were collected by interviewer-administered questionnaires. We used three separate questionnaires for age groups 0–1 years, 2–10 years and 11 years or older. For the age groups 0–1 years and 2–10 years, the parents or the head of the HH were interviewed to obtain the responses. For the first two groups, we used disability questions from the Ten Question (TQ) Screen for Child Disability.14 15 For the respondents aged 11 years or older, we took relevant questions from the first ‘Washington Group set of extended questions’ which was piloted under a project on Health and Disability Statistics by the United Nations Economic and Social Commission for Asia and the Pacific (UNESCAP) and WHO.16 We translated questions into Bangla as appropriate for the Bangladeshi context. Both forward and backward methodologies were applied during translation. In assigning disability, we applied two different approaches in the survey. Age-specific assessment of disability is discussed below.

A. For the children aged 0–1 years and 2–10 years, the responses were ‘yes’ or ‘no’ for disability. In both cases, we used questions taken from the TQ Screen for Child Disability.14 15 However, for children 0–1 years
old, we dropped questions related to understanding and communication, as these questions were not appropriate for children less than 2 years old. For both age groups, the parents or the head of the HH were interviewed to obtain the responses. Variables researched for these age groups are given in boxes 1 and 2.

B. For exploring disability among individuals aged 11 years or older, respondents were interviewed using 23 item questions under the six domains given in box 3.

**Disability measures**

The prevalence of disability was calculated by taking the total number of participants who experience disability as the numerator and the total population screened for disability as the denominator. We used two separate approaches for defining disability. For children aged 0–1 and 2–10 years, the definition was decided on the basis of responses of parents or HH heads to the questions using ‘YES’ or ‘NO’ format (boxes 1 and 2). Any response in favour of physical or psychological limitation by the parent or HH head was identified as a case of disability.

For the respondents aged 11 years or older, we investigated everyone under the six domains with a total of 23 questions (box 3). Responses to these questions were categorised as follows: ‘not at all’ (recorded as 0); ‘just a little’ (recorded as 1); ‘moderate level’ (recorded as 2); ‘a lot of difficulty’ (recorded as 3); ‘unbearable’ (recorded as 4). We used flash cards to show the level of severity of the problem. Different colour flash cards were used for the different levels of severity. A case of disability was identified if all the responses in one domain received a score of ‘2’ or if any of the responses of any domain received a score of ‘3’ or ‘4’.

After identification of disability cases using the above ranking system and criteria, disability prevalence data in the three age groups, 0–14, 15–59 and 60 years or older, were presented. These age groups were selected for the purpose of international comparability, as they are used in the World Report on Disability 2011. We also calculated prevalence of the underlying causes of disability.

Prevalence was calculated per 1000 population with 95% CI. Categorical variables were presented as percentages.

**Box 1 Variables for 0–1 year age group (parents or household heads were interviewed)**

Do you think your child (mention the child’s name) has the following health conditions/problems/difficulties compared with other children of the same age?
1. Delay in sitting, standing and walking.
2. Seeing difficulty either in the day time or at night.
3. Hearing difficulty (uses hearing aid, hears with difficulty, completely deaf).
4. Fits, becomes rigid, or loses consciousness (without fever).
5. Speaking difficulty (whether they can make themselves understood in words; can say any recognisable words).
6. Any abnormal behaviour (different from others/not generally acceptable).

**Box 2 Variables for 2–10 year age group (parents or household heads were interviewed)**

Do you think your child (mention the child’s name) has the following health problems/difficulties compared with other children of the same age?
1. Delay in sitting, standing and walking.
2. Seeing difficulty either in the day time or at night.
3. Hearing difficulty (uses hearing aid, hears with difficulty, completely deaf).
4. Fits, becomes rigid, or loses consciousness (without fever).
5. Difficulty in walking or moving arms or weakness and/or stiffness in arms or legs.
6. Speech is any way different (not clear enough to be understood by people other than the immediate family).
7. Appears in any way mentally backward, dull or slow.
8. Any abnormal behaviour (different from others/not generally acceptable).

Data were analysed by SPSS software V11.0. Prevalences were adjusted to the WHO world population.

**Ethics considerations**

Ethics approval was given by the Bangladesh Medical Research Council. We also obtained permission from the relevant administrative units of the surveyed district. This included the civil surgeon office, Upazila Health Complex and the local government office. Community leaders (elected representatives of the local government offices such as municipality, upazila parishad and union council) orientations were done before starting the survey for their participation in its implementation process. Finally, verbal consent from individual respondents was obtained. Assent in the case of children aged 0–10 years was obtained from their parents.

**RESULTS**

Almost half (49.9%) of the respondents were male, and one-fifth (19.7%) were from urban areas. Overall, nearly two-thirds (62.6%) of the respondents were of working age (15–59 years), and less than one-third (29.8%) were from the youngest age group (0–14 years). Only 7.6% were from the oldest age group (60 years or older). The median age of the respondents was 26 years in both urban and rural areas. About a quarter of the respondents (22.5%) had received no formal education, nearly one-third (31.2%) had received some primary education, and just over a quarter (26.7%) had received some secondary education. Only 7.9% had received education at the higher secondary and above level. Respondents aged 6 and below constituted 11.7% of the sample and were not relevant in this section. The most commonly reported occupations were housewife (33.3%), student (26.0%), agriculture (10.2%), business (8.0%) and employed (7.8%) as shown in Table 1.
Our sex-specific analysis showed that, among the female respondents, the commonly reported occupations were housewife (65.1%), student (25.5%) and employed (2.1%). For the male respondents, the commonly reported occupations were student (26.5%), agriculture (20.0%), business (15.7%), employed (13.5%) and labour (11.2%).

For measuring disability among respondents aged 11 years or older, we used a comprehensive questionnaire consisting of 23 questions grouped under six domains. Responses recorded as ‘just a little’ problem (per 1000 population) ranged from 3.4 to 215.8, ‘moderate level’ from 1.8 to 13.2, ‘a lot of difficulty’ from 0.8 to 3.6, and ‘unbearable’ from 0.3 to 3.5. Commonly reported difficulties were related to body pain/discomfort, sitting to standing, seeing, walking/climbing, standing for at least 30 min, weak/paralysis, or loss of body part (table 2).

After ascertainment of all disability cases from all respondents, we calculated the crude prevalence of disability and then adjusted it to the WHO standard population. The overall age-standardised prevalence of disability among the respondents was 46.5 per 1000 population. In rural areas, it was significantly higher (50.2) than in urban areas (31.0). Overall, the prevalence was higher among female (50.0) than male (43.4) respondents. The oldest age group (≥60 years) had the highest prevalence (164.3) overall, as shown in table 3.

We also calculated the prevalence of the underlying causes of disability. The top underlying cause of disability per 1000 population was illness (20.2) followed by congenital causes (9.4) and injury (6.8). These were more or less consistent across gender in general (table 4).

The proportion of underlying causes of disability was also looked at. The most common cause was illness, which was reported by half of the respondents (49.5%), and was found more commonly in female (52.3%) than male (46.5%) respondents. The second most common cause was congenital, reported by about a quarter (23.0%) of the respondents and evenly distributed.
among male and female respondents. The third most common cause was injury, reported by about one-sixth (16.7%) of the respondents and almost twice as common in male (21.7%) as female (12.0%) respondents (figure 1).

We also investigated the prevalence of disability according to the respondents’ level of education. As shown in figure 2, we found that people with disability had significantly less formal education than the general population. Rates (per 1000 population) were: no formal education, 90.1 (95% CI 84.1 to 96.5); any primary education, 30.8 (27.8 to 34.2); any secondary education 20 (17.4 to 23); higher secondary education and above, 18.5 (14.1 to 24.3).

DISCUSSION
This survey focused on the prevalence of disability. We conducted a dedicated survey using more in-depth questions to generate more comprehensive information on disability. The survey was conducted in a particular district, Manikganj, to provide accurate and disaggregated data on prevalence of disability and the distribution of causes that resulted in permanent disability.

Our prevalence estimate of disability is 46.5 per 1000 population or 4.7%, which is comparable with many countries in the Asia-Pacific Region where disability prevalence ranges from 1.0% to 18.6% with a mean prevalence of 4.6% estimated by UNESCAP in 2012.18 However, it is far below the global prevalence of disability (15.0%) estimated jointly by the WHO and the World Bank.2 We also observed, from the UNESCAP report,18 that sub-regional disability prevalences vary widely. The average disability prevalence ranges from 2.6% in South-East Asia to 17.0% in the Pacific. In the same report, the disability prevalence in Bangladesh is reported to be 0.9%, referring to the SVRS report (9 per 1000 population).7 The disability prevalence determined in the present study is similar to that in our neighbouring country, India (6.3%), which was estimated in a community-based study conducted in a rural area.19 In contrast, it was reported to be as low as 2.0% in India by the National Sample Survey Organization and Census data.20 A review article by Kumar et al.22 stated that disability prevalences vary in India.

The variation in disability prevalences at regional level, among countries, and within a country is also reflected in the World Report on Disability 2011.4 We observed this variation in Bangladesh also. The prevalence we found is lower by half than that (9.1%) reported in HIES 2010 for Bangladesh,11 and that (10.5%) reported in another study carried out to field test the rapid assessment of a disability questionnaire among adults aged ≥18 years old in Bangladesh.23 It also contrasts with the prevalence of 9 per 1000 population or 0.9% reported in the SVRS Survey 2013.9 These variations might be explained by differences in operational measures of disability, designing question, reporting sources, data collection methods, and the purpose and application of the data.

| Variable                                        | Urban (n=7293) | Rural (n=29737) | Total (n=37030) |
|------------------------------------------------|---------------|----------------|----------------|
| Age group (years), %                            |               |                |                |
| 0–14                                           | 29.5          | 29.8           | 29.8           |
| 15–59                                          | 64.1          | 62.2           | 62.6           |
| 60 and above                                   | 6.4           | 8.0            | 7.6            |
| Age (years), median (IQR)                      | 26.9 (12.7–40.8) | 26.0 (12.3–42.0) | 26.1 (12.4–41.8) |
| Sex, %                                         |               |                |                |
| Male                                           | 50.3          | 49.9           | 49.9           |
| Female                                         | 49.7          | 50.1           | 50.1           |
| Educational level, %                           |               |                |                |
| No formal education                            | 18.2          | 23.6           | 22.5           |
| Any primary (1–5 years)                        | 28.8          | 31.7           | 31.2           |
| Any secondary (6–10 years)                     | 28.5          | 26.2           | 26.7           |
| Higher secondary and above (11 years and above) | 13.3          | 6.6            | 7.9            |
| Not applicable (below 6 years)                 | 11.2          | 11.9           | 11.7           |
| Occupation*, %                                 |               |                |                |
| Agriculture                                    | 4.8           | 11.5           | 10.2           |
| Business                                       | 10.5          | 7.4            | 8.0            |
| Student                                        | 26.8          | 25.8           | 26.0           |
| Housewife                                      | 32.3          | 33.1           | 33.0           |
| Employed                                       | 9.9           | 7.3            | 7.8            |
| Unemployed                                     | 3.1           | 4.1            | 3.9            |
| Labourer                                       | 6.5           | 6.1            | 6.2            |
| Retired                                        | 2.4           | 2.3            | 2.3            |
| Other                                          | 3.7           | 2.4            | 2.6            |

*Excluding 4339 aged below 6 years.
Table 2  Distribution of domain-specific problems (per 1000 population) among respondents aged ≥11 years (n=28 818)

| Domain                        | Response                                                                 |
|-------------------------------|--------------------------------------------------------------------------|
|                               | Not at all (score=0) | Just a little (score=1) | Moderate level (score=2) | Lot of difficulty (score=3) | Unbearable (score=4) |
| 1. Activity limitation due to health problems |                             |                           |                           |                           |                     |
| Seeing                        | 874.8                      | 110.2                     | 12.1                      | 2.2                        | 0.7                  |
| Hearing                       | 965.1                      | 28.9                      | 4.5                       | 1.0                        | 0.4                  |
| Walking/climbing              | 880.5                      | 104.0                     | 11.7                      | 2.2                        | 1.6                  |
| Memory/concentration          | 978.5                      | 17.0                      | 3.4                       | 0.8                        | 0.3                  |
| Self-care                     | 983.6                      | 8.2                       | 5.3                       | 1.4                        | 1.5                  |
| Daily activity                | 922.0                      | 62.9                      | 11.0                      | 2.2                        | 2.0                  |
| Weak or loss of body part     | 912.8                      | 69.4                      | 13.2                      | 3.6                        | 1.1                  |
| Communication                 | 988.4                      | 6.3                       | 3.5                       | 1.2                        | 0.6                  |
| 2. Body function (last 30 days) |                             |                           |                           |                           |                     |
| Body pain/discomfort          | 772.4                      | 215.8                     | 10.1                      | 1.4                        | 0.3                  |
| Hand function                 | 990.8                      | 4.3                       | 3.0                       | 0.9                        | 1.0                  |
| 3. Getting around (last 30 days) |                             |                           |                           |                           |                     |
| Standing (at least 30 min)    | 908.6                      | 76.2                      | 10.8                      | 2.2                        | 2.2                  |
| Sitting to standing           | 859.6                      | 128.9                     | 8.2                       | 1.5                        | 1.9                  |
| Moving inside home            | 983.4                      | 9.6                       | 4.2                       | 1.2                        | 1.6                  |
| Security outside home         | 981.7                      | 8.3                       | 6.1                       | 2.1                        | 1.7                  |
| Walking equivalent to 1 km    | 900.3                      | 83.3                      | 9.8                       | 3.1                        | 3.5                  |
| 4. Self-care (last 30 days)   |                             |                           |                           |                           |                     |
| Showering                     | 984.8                      | 7.1                       | 5.0                       | 1.0                        | 2.2                  |
| Dressing                      | 989.7                      | 4.3                       | 3.5                       | 1.0                        | 1.6                  |
| Eating                        | 992.8                      | 3.4                       | 1.8                       | 0.8                        | 1.2                  |
| Independent living            | 979.7                      | 11.6                      | 4.5                       | 1.6                        | 2.6                  |
| 5. Understanding and communicating (last 30 days) |                             |                           |                           |                           |                     |
| Concentration at work for 10 min | 989.5                  | 6.5                       | 2.7                       | 0.9                        | 0.4                  |
| Memory loss for important things | 969.7                  | 25.1                      | 3.6                       | 0.9                        | 0.6                  |
| 6. Getting along with people (last 30 days)  |                             |                           |                           |                           |                     |
| Dealing with unknown person   | 986.0                      | 8.7                       | 3.3                       | 1.4                        | 0.6                  |
| Dealing with close person     | 992.4                      | 4.4                       | 1.9                       | 0.9                        | 0.3                  |

Table 3  Prevalence of disability per 1000 population (95% CI) (n=37 030)

| Sex       | Age* (years) | Urban        | Rural         | Overall        |
|-----------|--------------|--------------|---------------|----------------|
| Male      |              |              |               |                |
| 0–14      | 17.9 (10.1 to 25.7) | 39.9 (34.1 to 45.7) | 35.5 (30.6 to 40.4) |
| 15–59     | 17.8 (12.4 to 23.2) | 31.8 (28.2 to 35.4) | 29.0 (25.9 to 32.1) |
| ≥60       | 102.5 (64.4 to 140.6) | 142.1 (122.4 to 161.8) | 135.5 (117.9 to 153.1) |
| All ages (crude) | 23.5 (18.6 to 28.4) | 43.2 (39.9 to 46.5) | 39.3 (36.5 to 42.1) |
| All ages (standardised)† | 27.9 (22.6 to 33.2) | 47.1 (43.7 to 50.5) | 43.4 (40.5 to 46.3) |
| Female    |              |              |               |                |
| 0–14      | 18.4 (10.2 to 26.6) | 34.0 (28.7 to 39.3) | 31.1 (26.5 to 35.7) |
| 15–59     | 15.2 (10.3 to 20.1) | 33.5 (29.8 to 37.2) | 29.8 (26.7 to 32.9) |
| ≥60       | 166.9 (118.0 to 215.8) | 200.2 (177.1 to 223.2) | 195.6 (174.6 to 216.6) |
| All ages (crude) | 25.4 (20.3 to 30.5) | 46.6 (43.2 to 50.0) | 42.4 (39.5 to 45.3) |
| All ages (standardised)† | 34.2 (28.3 to 40.1) | 53.6 (50.0 to 57.2) | 50.0 (46.9 to 53.1) |
| Both      |              |              |               |                |
| 0–14      | 18.2 (12.5 to 23.9) | 37.0 (33.1 to 40.9) | 33.3 (29.9 to 36.7) |
| 15–59     | 16.5 (12.6 to 20.2) | 32.6 (30.0 to 35.2) | 29.4 (27.2 to 31.6) |
| ≥60       | 133.8 (102.9 to 164.7) | 170.5 (155.3 to 185.7) | 164.3 (150.7 to 177.9) |
| All ages (crude) | 24.4 (20.9 to 27.9) | 44.9 (42.5 to 47.3) | 40.9 (38.9 to 42.9) |
| All ages (standardised)† | 31.0 (27.0 to 35.0) | 50.2 (47.7 to 52.7) | 46.5 (44.4 to 48.6) |

*Age grouping according to the World Disability Report 2011.
†Standardised to the age distribution of the new WHO standard population (2000–2025).
These factors are common in both developed and developing countries. In our study, respondents living in a rural area, women, older people, and people with lower educational achievement are more likely to report having disabilities. These findings are similar to other available data in Bangladesh and in common with those obtained in many other countries.

This study has some limitations. We measured disability on the basis of subjective responses given by either the parents or HH heads for children aged 0–10 years. For those aged 11 years and above, the measurement was made according to the respondents’ own answers. This method of data collection might influence the final estimate because of the possibility of under- or over-estimating. Physical or medical examinations in certain contexts could serve as a more reliable means of verification of certain health-related conditions, hearing and visual problems, presence of any impairment that may lead to disability. We used a visual analogue scale to measure the severity of problems for all respondents aged 11 years or older, which might have led to over- or under-estimation of the severity score. This can be explained by variability in individual understanding, level of education and gender. We collected information on causes of disability under broad headings of illness, congenital and environmental, etc. It would have been better to have detailed information on causes of disability for the purpose of tailored intervention. We had detailed information only for injury.

Given that disability is a complex multidimensional condition, acquiring burden data presents numerous challenges. Therefore, we used context-, age- and domain-specific questionnaires to measure disability. We included people of all ages and used three separate questionnaires that were adapted from widely used valid tools for three selected age groups in order to capture accurate disability measures. We ensured representative sampling from urban and rural settings. The demographic profile of our surveyed district is also highly consistent with the national population. Therefore, it can be claimed that the prevalence estimate from this study represents the national level.

CONCLUSION
Disability is a common problem in this typical district of Bangladesh, which is largely generalisable. Interventions at community level with special attention to the socio-economically deprived are warranted. Interventions targeting commonly reported causes (illness, congenital and injury) will be instrumental in reducing the number of victims and consequences of avoidable disability. However, further study is required to detail the causes of disability.

Acknowledgements This manuscript is based on work performed by the Centre for Injury Prevention and Research, Bangladesh, with technical support from the WHO Country Office for Bangladesh. Administrative and logistical support from Mr Ataur Rahman and Mr Reazvanual Haque Khan, and linguistic support from Ms Andrea Raickovic of the WHO, Bangladesh, are
gratefully acknowledged. We are also grateful to Dr N Paranietharan, the WHO Representative to Bangladesh, for guidance and encouragement to publish this report based on a study carried out several years ago.

Contributors MM: analysed data, interpreted results, and drafted the manuscript. MMZ: designed the study, interpreted results critically, conceptualised the manuscript, guided manuscript writing, and critically reviewed it. SRM: trained the field team, implemented the survey, processed and analysed data, and reviewed the manuscript. AKMFR: designed the study, oversaw the quality control measures, and reviewed the manuscript; he is the guarantor of the survey data. The authors alone are responsible for views expressed in this article and they do not necessarily represent the views, decisions or policies of the institutions with which they are affiliated.

Funding This study was funded by the WHO Country Office for Bangladesh (Allotment No: SE BAN CCB 001 RB 08; SO 03; OSER 01; P05; A02 and AMS code: 6152453).

Competing interests None.

Ethics approval Bangladesh Medical Research Council.

Provenance and peer review Not commissioned; externally peer reviewed.

Data sharing statement No additional data are available.

Open Access This is an Open Access article distributed in accordance with the terms of the Creative Commons Attribution (CC BY 4.0) license, which permits others to distribute, remix, adapt and build upon this work, for the terms of the Creative Commons Attribution (CC BY 4.0) license, which permits others to distribute, remix, adapt and build upon this work, for

REFERENCES

1. World Health Organization. Draft WHO global disability action plan 2014–2021: better health for all people with disability, 2014. http://apps.who.int/gb/ebwha/pdf_files/WHAG77A67_16-en.pdf

2. World Health Organization, World Bank. World Report on Disability. Geneva, 2011. http://www.who.int/disabilities/world_report/2011/report.pdf

3. World Health Organization. Disability prevention and rehabilitation: report of the WHO expert committee on disability prevention and rehabilitation. Technical Report Series 668. Geneva: WHO, 1981. http://whqlibdoc.who.int/trs/WHO_TRS_668.pdf

4. World Health Organization. Situation analysis of Community-based Rehabilitation in the South-East Asia Region. India, 2012. http://www.searo.who.int/entity/disabilities_injury_rehabilitation/documents/situationanalysisofcbrrinsear.pdf

5. The Danish Bilharziasis laboratory for the World Bank and the People’s Republic of Bangladesh. Disabilities in Bangladesh: a situation analysis. Final Report 2004. http://sitesources.worldbank.org/DISABILITY/Resources/Regions/South%20Asia/DisabilityinBangladesh.pdf

6. Handicap International. Mapping report of physical rehabilitation services in Afghanistan, Bangladesh, Odisha (India) and Sri Lanka. India, 2014. http://www.hiproweb.org/uploads/fx_hidrdoc/Mapping_Report_Physical_Rehabilitation_Services_South_Asia_web.pdf

7. Bangladesh Bureau of Statistics. Report on Sample Vital Registration System 2010. Dhaka, 2011. http://www.bbs.gov.bd/WebTestApplication/userfiles/Image/LatestReports/SVRS-10.pdf

8. Bangladesh Bureau of Statistics. Report on Sample Vital Registration System 2012. Dhaka, 2014. http://www.bbs.gov.bd/WebTestApplication/userfiles/Image/LatestReports/MSVSRReport12_21.01.15.pdf

9. Bangladesh Bureau of Statistics. Report on Sample Vital Registration System 2013. Dhaka, 2015. http://www.bbs.gov.bd/WebTestApplication/userfiles/Image/LatestReports/MSVSR_Report_2013.pdf

10. Titumir RAM, Hossain J. Disability in Bangladesh: prevalence, knowledge, attitudes and practices. Dhaka, 2005. http://unyanan.org/reports/Disability%20Prevalence%20and%20Study.pdf

11. Bangladesh Bureau of Statistics. A report of the Household Income and Expenditure Survey 2010. Dhaka, 2011. http://www.bbs.gov.bd/WebTestApplication/userfiles/Image/LatestReports/HIES-10.pdf

12. Bangladesh Bureau of Statistics. District statistics 2011. Manikganj district, Dhaka, 2013. http://www.bbs.gov.bd/WebTestApplication/userfiles/Image/District%20Statistics/Manikganj.pdf

13. Bangladesh Bureau of Statistics. Statistical yearbook of Bangladesh 2012. Dhaka, 2013. http://www.bbs.gov.bd/WebTestApplication/userfiles/Image/SubjectMatterDatabase/index/YB-2012.pdf

14. Durkin M. Measurement of childhood disability in population studies. New York, 2001. http://unstats.un.org/unsd/pdf/pdfs/ac-81-7-1.pdf

15. Zaman SS, Khan NZ, Islam S, et al. Validity of the Ten Questions for screening serious childhood disability: results from urban Bangladesh. Int J Epidemiol 1990;19:613–20. http://ije.oxfordjournals.org/content/19/3/613.abstract or http://www.childinfo.org/files/childdisability_Durkin1990.pdf

16. UNESCAP/WHO Project on Health and Disability Statistics. Disability Question Set Testing, 2005. http://www.cdc.gov/nchs/das/washington_group/meeting6/WG6_ESCAP_WHO_Test_Questionnaire.pdf

17. Ahmed OB, Boschi-Pinto C, Lopez AD, et al. Age standardization of rates: a new WHO standard, GPE Discussion Paper Series: No.31. Geneva, Switzerland: World Health Organization, 2001. http://www.who.int/healthinfo/paper31.pdf

18. The United Nation’s Economic and Social Commission for Asia and the Pacific (ESCAP). Disability at a Glance 2012: Strengthening the evidence base in Asia and the Pacific. http://unescapsdps.org/files/publications/PUB_Disability-Glance-2012.pdf

19. Ganesh KS, Das A, Shashi JS. Epidemiology of disability in a rural community of Karnataka. Indian J Public Health 2008;52:125–9.

20. National Sample Survey Organization. A report on disabled persons in India. New Delhi: Department of Statistics, Government of India, 2003. http://mospi.nic.in/rept%20-%20pubn/485_final.pdf

21. Census of India 2011. Data on disability. Office of the registrar general and census commissioner, India. New Delhi, 2013. http://www.languageinindia.com/jan2014/disabilityinindia2011data.pdf

22. Kumar SG, Roy G, Kar SS. Disability and rehabilitation services in India: issues and challenges. J Fam Med Primary Care 2012;1:69–73. http://www.jfmpc.com/temp/JFamMedPrimaryCare1169-1743895_002903.pdf http://dx.doi.org/10.4103/2249-4863.94458

23. Marella M, Busija L, Islam FM, et al. Field-testing of the rapid assessment of disability questionnaire. BMC Public Health 2014;14:900.

24. Tareque MI, Begum S, Saito Y. Inequality in disability in Bangladesh. PLoS ONE 2014;9:e103681.