গণপ্রজাতন্ত্রী বাংলাদেশ সরকার স্বাস্থ্য ও পরিবার কল্যাণ মন্ত্রনালয় ঢাকা

SURVEY OF AUTISM AND NEURODEVELOPMENTAL DISORDERS IN BANGLADESH

REPORT

August 2013

Community Clinic

NCDC

BMRC

গণপ্রজাতন্ত্রী বাংলাদেশ সরকার স্বাস্থ্য ও পরিবার কল্যাণ মন্ত্রনালয় ঢাকা

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Statement for Home-based Screening for Autism and Neurodevelopmental Disorders in Children aged 0-9 years in 7 Divisions of Bangladesh and Dhaka City

Autism Spectrum Disorders (ASD) is one of the fastest growing non-communicable diseases with a prevalence rate of 1 out of every 88 children (1 in 54 boys) in the United States alone. Every year more children are diagnosed with ASD than they are with pediatric AIDS, diabetes and cancer combined. A unique neurodevelopmental disorder, it is characterized by an inability or loss in language development, impaired social communication, delays in motor development, hypersensitivity to sensory stimulation, stereotypical and/or repetitive mannerisms, and restricted interests. There is no specific cause identified for the disorder other than a genetic predisposition, and it is not limited by any socio-economic, educational, religious, social or cultural boundaries. Despite our lack of knowledge on causation, we do know that early detection and intensive, evidence based-interventions in the first few years of life can significantly mitigate the negative impact of the disorder. Therefore developing multi-faceted, comprehensive and integrated diagnostic and intervention programs within community based health and education systems is urgently required.

I would therefore like to commend and thank the Ministry of Health and Family Welfare of Bangladesh, in particular the Directorate General of Health Services, the Revitalization of Community Health Care Initiatives in Bangladesh (Community Clinic Project), the Bangladesh Medical Research Council and the researchers from the Department of Pediatric Neuroscience, Dhaka Shishu Hospitalfor conducting this door to door survey on disabilities. Although the results seem inconclusive about the actual prevalence of ASD in Bangladesh, the significantly high rate of cognitive disorders indicates the urgent need for an effective national program which includes training of medical, allied health professionals and community workers in early detection strategies, and formulation of effective evidence-based treatment methods that can be easily implemented with parents and caregivers as collaborative partners. In addition, we also need to develop our educational and employment systems so that those with neurodevelopmental disabilities can be given the opportunity to become productive members and be seamlessly included in all aspects of society.

Saima Hossain, S.S.P., NCSP
School Psychologist
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Bangladesh has come a long way in reducing mortality and morbidity of acute childhood illnesses. Among other factors, with better survival of high-risk newborns, lower fertility rates, smaller family sizes and rise in literacy levels among the marginalized, increasing numbers of parents are seeking assistance from health services for a range of neurodevelopmental disorders in children, including Autism, ie, one of the newly emerging concerns. These non-communicable diseases require a baseline of epidemiological information across the country for policy makers and service providers, which will provide a direction for allocation of resources and development of programs where indicated.

Research evidences and clinical experiences indicate that parents want services closer to homes, which are accessible, appropriate and child-friendly. Multi-disciplinary Shishu Bikash Kendras (SBKs) have been established in the outpatients of the paediatrics department of several medical college hospitals where attendances are rising due to the ability of the service to diagnose and provide appropriate management for a wide range of neurodevelopmental problems. However, these services remain inaccessible to the large population living in rural areas or even in urban areas. This survey was directed towards these out of reach children.

For the first time in Bangladesh a brief and simple tool has been applied door-to-door across 7 Upazillas and 1 ward in Dhaka city to screen for a range of neurodevelopmental problems, including autism, by government frontline health workers, ie, Health Assistants (HAs) and Family Welfare Assistants (FWAs) with supervision by Health Inspectors (HIs). The have performed this task with sincerely and credibility. In turn, those found to be at-risk were assessed by team of Community Health Care Providers (CHCPs) in Community Clinics. This section of the survey has been able to transfer a delicate and complex technology to CHCPs, who have performed their task admirably. We can take pride in their quality of work and their potential to strengthen and scale up the program in future. The doctors and psychologists of the SBKs who travelled to the respective survey sites to perform clinical evaluations have also been a key factor towards understanding the underlying pathophysiological, cognitive, mental health and other conditions which emerged from the survey.

The Non Communicable Diseases Directorate has provided comprehensive logistical support towards the completion of the survey; and the findings provide a sound direction for their future programmes. In conclusion, we are hopeful that the findings will assist in establishing country-wide programmes for optimum development of all children in Bangladesh, both abled and those with difficulties.

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Makhduma Nargis

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ASD	Autism Spectrum Disorder
ADHD	Attention Deficit Hyperactive Disorder
ADOS	Autism Diagnostic Observation Schedule
ADL	Activities of daily living
BPF	Bangladesh Protibondhi Foundaation
BSIDII	Bayley Scales for Infant Development
CC	Community Clinic
CHCP	Community Health Care Providers
CHP	Child Health Physicians
CP	Child Psychologists
DS	Demographic Survey
DSQ	Developmental Screening Questionnaire
DGHS	Directorate General of Health Services
DSM IV	Diagnostic and statistical manual
DSH	Dhaka Shishu Hospital
D	Disorder/Disease present
D	Disorder/Disease absent
FWA	Family Welfare Assistant
GDA	General Developmental Assessment
HF	Household Form
HA	Health Assistant
HI	Health Inspector
ICD 10	International Classification of Diseases
IBAS	Independent Behavior Assessment Scale
IMCID	Integrated Management of Childhood Impairments and Disabilities
HSM	Hospital Services Management
MCH	Medical Collage Hospital
MCF	Mother Child Form
MOHFA	Ministry of Health and Family Welfare
MCHAT	Modified Checklist for Autism
NDIs	Neurodevelopmental Impairments
NDDs	Neurodevelopmental Disabilities
NAPC	National Autism Plan for Children
NPV	Negative Predictive Validity
PCL	Participation Checklist
PPV	Positive Predictive Validity
RNDA	Rapid Neurodevelopmental Assessment
RZS	Renell Zinkin Scale
SBK	Shishu Bikash Kendra's
SCQ	Social Communication Questionnaire
SBIS	Stanford Binet Intelligence Scales
Se	Sensitivity
Sp	Specificity
TQP	Ten Questions Plus
UHC	Upazilla Health Complex
UNICEF	United Nations Children's Fund
WPPSI	Wechsler Pre and Primary Scales
WQ	Wealth Quintile
WISC IV	Wechsler Intelligence Scale for Children
WRAT	Wide Range of Achievement Test
WHO	World Health Organization

I. Executive Summary

BACKGROUND

In the past two decades in Bangladesh improved child survival rates has been interposed with a trend towards increasing rates of non-communicable conditions such as childhood disabilities. The present survey was conducted to overcome the paucity of credible information about the extent of these conditions across the country.

DEFINITIONS

Impairment and disability are seen as a continuum of functional deterioration of activities. Based upon conceptual framework, adapted from the International Classification of Function (WHO, 2001), , 'uncertain'or 'mild'grades of impairments, determined in the surveyed children for the following developmental functions: gross motor, fine motor, vision, hearing, expressive language, cognition, behavior and seizures, were considered 'Neurodevelopmental Impairments' (NDIs) (ie, temporary, reversible); while 'moderate' and 'severe'impairments were considered 'Neurodevelopmental Disabilities' (NDDs) (ie, permanent, irreversible). While it is acknowledged that seizures are not a functional domain, they are often a symptom of a neurological dysfunction, hence included.

Adaptations of the International Classification of Diseases (ICD10, WHO, 2004) were followed for diagnosing specific conditions such as autism, cerebral palsies, epilepsies, hearing and visual impairments, etc.

OBJECTIVES

They were (1) to determine the validity of home-based screening tools for use by government frontline health workers to identify children at-risk for NDIs/NDDs (2) To estimate the prevalence of NDIs/NDDs in children when assessed by para-professionals applying validated tools. (3) To estimate the prevalence of underlying medical, psychological, mental health and other conditions, including Autism Spectrum Disorders, in all children identified with NDIs/NDDs (4) to determine the feasibility of a tiered system of developmental surveillance and referral from home to community to tertiary health care services, for early detection and appropriate intervention (5) to identify significant preventable risk factors.

DESIGN

A three-stage survey design was applied. In Stage One, door-to-door screening through maternal recall was conducted by HAs and FWAs. In Stage Two, all screened positive and 10% screened negative were assessed for NDIs/NDDs by CHCPs in the local Community Clinic. In Stage Three all identified with NDI/NDD were provided diagnostic workouts by a professional team comprising of a child health physician and a child psychologist in the respective Upazilla Health Complex.

SITE, SURVEY POPULATION, HUMAN RESOURCE

In Stage One, an estimated 1000 children per upazilla were screened by Health Assistants (HAs) and Family Welfare Assistants (FWAs) in 7 upazillas (Debhata, Wazirpur, Pirganj, Godagari, Pekua, Modhupur, Kulaura) and in the Mirpur ward in Dhaka city. Door-to-door 'blanket' surveys were conducted of all children aged 0-9 years residing around 5 Community Clinics in each Upazilla and in 5 localities within the Mirpur ward in Dhaka city.

In Stage Two, all screened positives and 10% screened negatives were assessed in the Community Clinic by Community Health Care Providers (CHCPs) in rural populations, and within a non-government institution in Dhaka city, ie the Bangladesh Protibondhi Foundation (BPF) for NDIs/NDDs. The assessors were 'blind' to the screening status of the children, to avoid assessment bias.

In Stage Three, all identified with NDIs/NDDs were provided a diagnostic workout by a child health physician and a child psychologist from the nearest Shishu Bikash Kendra in Medical College Hospitals (Shaheed Suhrawardy MCH, Sylhet MCH, Chittagong MCH, Barisal MCH, Rajshahi MCH, Mymensingh MCH, Rangpur MCH, and from Dhaka Shishu Hospital) , at the Upazilla Health Complex.

TOOLS APPLIED

In Stage One the Household Form (HF) and Mother Child Form (MCF) was used to collect sociodemographic information. The Developmental Screening Questionnaire (DSQ; for 0-<2 year olds) and Ten Questions Plus (TQP; for 2-9 year olds) was asked to every mother regarding their child's neurodevelopment.

In Stage Two the Rapid Neurodevelopmental Assessment (RNDA) was administered to all children and the Participation Checklist (PCL) was completed.

In Stage Three the Child Health Physicians conducted a General Developmental Assessment (GDA); completed the Modified Checklist for Autism (MCHAT) or the Social Communication Questionnaire (SCQ); and a checklist was completed based upon the International Classification of Diseases for Autism (ICD) form for any child suspected with autism. The Child Psychologist administered an intelligence test, ie, Bayley Scales for Infant Development (BSIDII), or, Wechsler Pre and Primary Scales of Intelligence (WPPSI), or, the Stanford Binet Intelligence Scales (SBIS), or, Wechsler Intelligence Scale for Children (WISC IV). Every child of school age was administered the Wide Range Achievement Test (WRAT). All 2-9 year olds were administered a test for adaptive behavior, ie, the Independent Behavior Assessment Scale (IBAS). Children with visual impairments were administered the Reynell Zinkin Scales of Intelligence. Each child suspected to have an Autism Spectrum Disorder was administered the Autism Diagnostic Observation Schedule (ADOS).

TRAINING OF FIELD WORKERS, COMMUNITYASSESSORS AND PROFESSIONALS

6 Health Assistants (HAs), 6 Family Welfare Assistants (FWA)s and 5 HIs per site were provided a five-day training in the Upazilla Health Complex by specialist teachers from the Bangladesh Protibondhi Foundaation on demographic survey and home-based screening for NDIs/NDDs. 5 CHCPs per Upazilla were provided a two-week training on administration of the Rapid Neurodevelopmental Assessment (RNDA) at the Dhaka premises of the Bangladesh Protibondhi Foundation. 8 Child Health Physicians and 16 Child Psychologists (ie, one CHP and 2 CPs per Upazilla) were giving a refresher course on diagnosis of neurodevelopmental disorders including autism, following the WHO, ICD norms, in the three-day training in BPF. 7 Statisticians from the Upazillas and 1 from Dhaka city were provided training in data entry and basic softwares (Microsoft Access); and 7 Health Inspectors (His) and 1 FWV were provided training on co-ordination of survey, in BPF in a two-day training. Their data entry was subsequently replaced (see next section).

ANALYSIS

All information were collected in computed data entry forms, couriered to Dhaka city, and entered into the SPSSpc software in the office of the National Co-ordinator, Establishment of Shishu Bikash Kendra, DGHS, in Dhaka Shishu Hospital. Both unweighted and weighted validity and prevalence analysis were calculated, based upon internationally acknowledged epidemiological standards and norms.

TIMELINE

The survey was conducted between January – June 2013.

RESULTS

1. Surveyed population

A total of 7280 children were surveyed in 8 sites. These included Dhaka Division (Modhupur=1001), Sylhet Division (Kulaora=1036), Chittagong Division (Pekua=1021), Khulna Division (Debhata=1000), Rajshahi Division (Godagari=1003), Barisal Division (Wazirpur=1001), Rangpur Division (Pirganj=1015) and Dhaka city (=203). 20% were 0-<2 year olds and 80% were 2-9 year olds.

2. Households surveyed by Wealth Quintiles

Pirganj and Pekua households had the largest numbers in the lower wealth quintiles (WQ 1-2), while Wazirpur, Kulaura and Dhaka city had the largest numbers in the higher wealth quintiles (WQ 3-5).

3. Child At-Risk for NDIs/NDDs: Screen Positivity

Mean screen positivity for combined 8 sites was **6.21%** in 2-9 year olds, and **3.82%** in 0-<2 year olds; and **5.73%** for all the total surveyed population. Highest positivity was in Dhaka city (23%) followed by Pirganj (9.36%). Lowest positivity was in Wazirpur (2.30%).

4. Validity of the Screening Tools

Sensitivity (Se), Specificity (Sp), Positive Predictive Validity (PPV), and Negative Predictive Validity (NPV) of the Developmental Screening Questionnaire (DSQ) and Ten Questions Plus (TQP) combined and unweighted, for all sites combined was 74%, 90%, 82%, and 85%, respectively. Weighted results for Se, Sp, PPV, and NPV were 23%, 88%, 82% and 36%, respectively. Two highest weighted Se were in Dhaka (76%) and Pirganj (74%); and lowest in Godagari (6%) and Kulaora (9%).

5. Prevalence of NDIs/NDDs (ie, Impairment and Disability)

A total of 445 children of the 1201 assessed across all sites had =>1 NDI/NDD. Mean weighted prevalence of any NDI or NDD in the 8 sites combined was **185/1000** (95% CI 161-208). Three highest prevalences were in Godagari (490/1000), Modhupur (301/1000) and Dhaka city (290/1000); and lowest in Debhata (90/1000).

6. Prevalence of specific types of NDIs/NDDs

For each child assessed to have a NDI/NDD had problems in =>2 types of developmental domains. Mean weighted prevalence by specific developmental domains were **36/1000** (gross motor), **45/1000** (fine motor), **12/1000** (vision), **27/1000** (hearing), **56/1000** (expressive language), **158/1000** (cognition), **36/1000** (behavior), and **17/1000** (seizures). 444/1000 children in Godagari and 279/1000 children in Modhupur had cognitive impairments or disabilities. Wazirpur had the lowest prevalence across all developmental domains.

7. Prevalence of NDD (ie. Disability)

Mean weighted prevalence of any NDD in the 8 sites combined was **71/1000** (95% CI: 56-85). Highest prevalence was in Kulaura (162/1000), (/1000) and lowest in Wazirpur (14/1000).

8. Prevalence of Specific Types of NDDs

Mean weighted prevalence by specific developmental domains for all sites combined was **23/1000** (gross motor), **28/1000** (fine motor), **6/1000** (vision), **14/1000** (hearing), **39/1000** (expressive language), **44/1000** (cognition), **20/1000** (behavior), and **6/1000** (seizure). The two highest prevalence by site were for both cognitive disabilities and expressive language

in Dhaka City **(113/1000)**. The second highest prevalence of cognitive disabilities in Modhupur **(105/1000)** and for expressive language in Kulaura **(109/1000)**. Wazirpur had the lowest prevalence across all developmental domains.

9. Prevalence by Diagnostic Groups of Children

Mean prevalence for combined 8 sites were: (1) **4/1000** (Cerebral Palsies); (2) **46/1000** (Cognitive Disorder); (3) **12/1000** (Developmental Motor Disorder); (4) **20/1000** (Expressive Language Disorder); (5) **7/1000** (Seizures/Epilepsies); (6) **7/1000** (Mental Health disorder); (7) **3/1000** (Blindness or VI); (8) **5/1000** (Deafness or HI); (9) **4/1000** (Genetic, Syndromic, Anomaly).

10. Frequency of Autism Spectrum Disorders

In the total assessed population in Stage Three (n=414), 8 children were diagnosed with Autism, plus 1 child with Pervasive Developmental Disorder, Not Otherwise Specified (PDD NOS) and 1 child with Rett Syndrome. Of the 8 with autism, 6 were from Dhaka city, 1 from Kulaora and 1 from Godagari. The PDD NOS child was from Godagari and the Rett Syndrome child from Kulaora.

11. Prevalence of Autism Spectrum Disorder (ASD)

The overall mean prevalence for ASD was **1.55/1000** (**n=7280**). In Dhaka city the prevalence was **30/1000** and **0.68/1000** in rural populations. No child with autism was idenitified in Debhata, Modhupur, Pirganj, Pekua or Wazirpur.

12. Stages One, Two and Three: screening and identifying children with autism

All 8 children with autism were screened positive in the home-based screening in Stage One. In Stage Two they were also identified with NDIs/NDDs in specific developmental domains. In Stage Three the MCHAT/SCQ screened all 8 to be high-risk for autism, out of a total of 25 who screened positive but had other disorders diagnosed by the professionals.

The 1 child with PDD NOS and the other with Rett Syndrome diagnosis were neither identified by the Stage One screen or by the Stage Three screen. However, they were positive for NDIs/NDDs in Stage Two (ie, on the RNDA).

13. Emerging systems of referral

The home-based screening was able to reduce the numbers of children brought for community-based assessments from 100% (n=7280; screened) to 16.49% (n=1201; assessed); and further reduce the numbers evaluated by professionals in the Upazilla Health Complex to 5.6% (n=413; evaluated). By this method best use of scarce expertise was made. Moreover, a significant number of those assessed at the community level had NDIs (or mild difficulties) which are most amenable to home-and-community-based interventions. A system of developmental surveillance and appropriate referral has, thus, emerged; and can be scaled up in a cost-effective manner.

14. Risk factor estimates

Apart from the ability of mother's to read newspapers, which was 'protective', the most significant risk factors were related to perinatal problems.

Poverty had a significant effect on gross motor functions (OR significant) and cognition (OR not significant). Paradoxically, children from the higher wealth quintiles (WQs) were more likely to have the other types of NDIs/NDDs, the most significant being vision (OR 2.27), seizures (OR 1.71) and behavior (OR 1.32) problems. Within the diagnostic categories, Mental Health conditions had the most risk of occurring in the higher WQs (OR 2.8, 95% CI 1.34-6.16).

DISCUSSION
Screen Positivity

In a population of over 150 million a mean positivity rate of 6% implicates a vast number of unidentified children who may be helped to overcome their developmental delays or disorders. Lesser proportions of younger children screened positive, which implies better health care including maternal and perinatal care; or, that younger children were missed by the screening tool.

NDIs/NDDs by developmental domains

Cognitive delay was found to have the highest prevalence. The fact that these children were identified with internationally acknowledged tools by CHCPs in Community Clinics, lends a unique opportunity for the government to utilize this workforce to provide both early identification and early intervention programs. The results provide a huge potential for scaling up this program.

Discerning impairments from disabilities

CHCPs were able to grade children's developmental problems by severity, thus, identifying NDIs (Impairments) which can benefit from home and community based intervention, from NDDs (Disabilities) which need further referral to the Upazilla Hospital or Shishu Bikash Kendra in Medical College Hospitals.

Diagnostic Groups

The diagnoses provided by the professional team who travelled to the Upazilla Hospital from the medical college Shishu Bikash Kendras, was able to provide a clear

understanding for the medical and neuropsychological conditions which are most prevalent.

The 9 diagnostic groups which were categorized have the potential to be made into a short 3-week training curriculum for Upazilla physicians which can potentially be called an "Integrated Management of Childhood Impairments and Disabilities" (IMCID). A piloting of such a project is indicated.

Autism Spectrum Disorders

A high prevalence was noted in Dhaka city, ie 3% of the surveyed population. Prevalences were much lower in rural populations, ie, 0.07%. There is an urgent need to identify children across all metropolitan areas of the country.

Ethical considerations: 'Survey with Services'

Identifying children with neurodevelopmental problems can only make sense to families if they are linked with appropriate interventions. This survey was able to highlight what kinds of interventions can be provided within communities, and within referral services. Many interventions are already evidence-based in Bangladesh, but lacking in some areas. Important among the latter are home and community interventions for Autism and ASDs.

SURVEY LIMITATIONS

Data entry

Quality and work pace of the local data entry was below standards. This system was replaced with entry in a central office in DSH. Further similar projects will need to take this issue into consideration.

Stage One: Field Work

It was difficult to find credible field workers at the PHC levels within the specific ward in Dhaka city. As a high percentage of children were found with NDIs/NDDs in the urban population, further thought needs to be given to programs in metropolitan populations which are under the supervision of city corporations.

Stage One: discrepant validity of survey tools in 8 sites

Quality of screeners, ie, HAs and FWAs, needs to be scrutinized before sending them out for field work. Inter-rater reliability conducted during the training program may be able to discern those with optimum abilities as screeners.

II. Background

Rising rates of childhood impairments and disabilities

Bangladesh has come a long way in reducing under five child mortality rates from 148 per 1000 in 1990 to less than 43 per 1000 in 2012 (UNICEF, 2012). Public health measures such as universal coverage of immunization, prevention of diarrheal diseases, and programs such as the IMCI, have contributed to a decline in communicable diseases. However, with better survival rates an increase in non-communicable diseases such as childhood disabilities has occurred. For example, in a large epidemiological survey of childhood disabilities in 1988 about 8% children in rural and urban populations screened positive (Zaman et al, 1990) compared to 18% in 2005 (UNICEF, 2008). Given the lifelong stress to a child and family and cost of rehabilitation to the country's economy, and the benefits of early detection and intervention (Maulik and Darmstadt, 2009), it is mandatory that children most at risk for disability be identified early and provided appropriate interventions so that such large human and financial costs to the country can be prevented.

Strategies for Detection

A two-stage survey of childhood disabilities has been reported to be the most used methodology in population-based surveys worldwide (UNICEF, 2008). Bangladesh has been one of the countries where these tools have been developed (Zaman et al, 1990; Khan and Durkin, 1995) along with other countries (Belmont, 1984; Durkin, Zaman, et al, 1991; Durkin, Davidson, et al, 1994). The screening tool, called the Ten Questions (TQ) is being used in over 50 countries, and is able to screen those at-risk for disabilities (UNICEF, 2008), and is the most used tool for this purpose worldwide (Maulik and Darmstadt, 2007).

However, the second stage of the survey methodology, which was designed to identify specific types of disabilities by multidisciplinary professionals (doctors, psychologists, etc.) could not be applied in any of these countries in the past three decades due to a lack of professional expertise and standardized tests. To overcome this impediment, within the past decade a team of professionals from Bangladesh have been able to validate an assessment tool (ie, the Rapid Neurodevelopmental Assessment or RNDA; described in the Methods section) for 0-9 year olds for use by generic child care professionals (such as therapists, teachers) to identify a range of neurodevelopmental impairments (NDIs) and neurodevelopmental disabilities (NDDs).

The stress on impairments was based upon the temporal relationship between 'impairments' and 'disabilities' (Figure: 1), where early identification of impairments is able to prevent a majority of children from progressing to a disability; a phenomenon which has been observed in a survey of childhood disability in Bangladesh (Khan, Ferdous, et al, 2011). The tools have received wide acclaim and support, based upon which Bhutan has conducted a two-stage childhood disability survey in 2009-2010 (UNICEF Bhutan, 2012). The demand for the tool, copyrighted by **Bangladesh Protibondhi Foundation** (BPF) (BPF website: http://bangladeshprotibondhifoundation.org/), has resulted in MOUs being signed with the University of California in San Francisco for the application of its Spanish Version in

Fig.1. : A Functional Paradigm for Addressing Neurodevelopmental Functional Limitations as a Continuum. (*Note:* NDI=Neurodevelopmental Impairment; NDD=Neurodevelopmental Disability) (adapted from ICF, WHO, 2001)

Normal

Disease

Impairment (NDI) temporary functional limitation

Reversible

Disability: (NDDs) permanent functional limitation, severe

Irreversible

Handicap: poor social participation

Guatemala ; use in nine countries by Oxford University; and with Mahidol University, Thailand. Training of a wide body of para-professionals for widespread utilization of the tool in Bangladesh is needed.

Government sponsored Shishu Bikash Kendra's

Increasing number of parents are seeking help for children with developmental delay. To address these children's problems the first Shishu Bikash Kendra (SBK) (Child Development Center) was established within Dhaka Shishu Hospital in 1992 (Khan NZ, 1998). A multidisciplinary team (MDT) of professionals evolved over the ensuing decade, with the core team comprising of *Child Health Physicians* (with experience in working with Neurodevelopmental Disorders), *Child Psychologists* (trained in Developmental Psychology) and *Developmental Therapists* (generic therapists trained in the basics of Physio, Occupational and Speech Therapy, within a developmental framework). By 2003 over ten other SBKs had been established in non-government hospitals and health facilities (Khan and Ferdous, 2003).

With increasing numbers of families seeking assistance for their child's developmental problems, the Ministry of Health and Family Welfare (MOHFW) decided to establish similar Shishu Bikash Kendra's (SBK) within all Medical College Hospital (MCHs) (DGHS, 2008). Ten SBKs were established till 2011.

The MOHFW further extended this program to establishment in 25 more hospitals, including district hospitals (Operational Plan: "Establishment of SBKs in Secondary and Tertiary Hospitals", IHM, DGHS, MOHFW, 2011-2016). The success of these SBKs can be judged from the rising numbers of attendances to the various clinics of these SBKs (Website: DGHS, 2011). (http://www.hsmdghs-bd.org/SBK.html).

To benefit the largest population of children a linkage between the SBK services to primary health care needs to be established.

Prevention of disability
Primary Prevention:
A majority of disabilities are preventable through appropriately directed primary prevention measures in health, education and social sectors. In Bangladesh several preventable risk factors have been identified including poor maternal reproductive health, inadequate perinatal care, brain insults during delivery, pre peri and post-natal brain infections, maternal and infant malnutrition, lack of maternal education and poverty (Durkin et al, 2000; Islam et al, 1993). A recent study in the Dacope Upazilla in Khulna has demonstrated the effects of climate disasters such as tsunamis and cyclones on the neurodevelopment of children born to mothers whose children were born as climate refugees (Khan et al, paper submitted to C:CHD). A country-wide ascertainment of risk factors would assist policy-makers in allocating resources to specific preventative programs in specific sites

across the country.

Effectiveness of home-based interventions:

Once high-risk children are identified, appropriate home-based intervention programs (ie, 'Distance Training Packages' or DTP, copyright: Bangladesh Protibondhi Foundation) have been reported, through randomized controlled trials (RCTs), to be as effective as center-based programs for functional improvement of children with multiple and complex disabilities like cerebral palsy (McConachie et al, 2000). These interventions, however, require a comprehensive neurodevelopmental profile of each child, which is yet unavailable within the public health care system.

Services closer to homes:

Distance of services from children's homes, economic factors and cultural taboos have been found to be common barriers to parents seeking services (McConachie et al, 2001). It is, therefore, not surprising that there is an increasing demand for services closer to children's homes. Establishment of systems of detection, intervention and referral at the local levels would allow a large numbers of vulnerable families to avail services.

Maternal Education is 'protective', but they are most at risk of psychiatric morbidity:

In population-based surveys it has been found that maternal education is able to prevent children's neurodevelopmental conditions progressing from impairments to disabilities, probably as she is able to access appropriate services early (Khan, Mont, et al, 2011). However, those mothers who are able to access services become stressed due to their inability to attend appointments regularly, due to family and economic pressure; although, paradoxically, it is these children who demonstrate functional improvement (ie, those children who are brought in 'as intended' by the service-providers (Khan et al, 2007). And these very same mothers, whose numbers of visits are higher to the services, are more at risk of developing psychiatric morbidity, such as psychosomatic disorders and depression (Khan et al, 2008). A country-wide profile of parental education, especially maternal education, will be able to direct resources towards gender empowerment in the most vulnerable sites.

Emerging developmental concerns, including Autism Spectrum Disorders:

Cognition, expressive language, behavioral disorders and diagnosis of autism are rising :

In the past two decades incidence of NDIs/NDDs related to gross and fine motor functions, vision, hearing and seizures, presenting to the Child Development Center, Dhaka Shishu Hospital, have remained constant. However, NDIs/NDDs in the be-

havior, expressive language, and cognitive domains have shown substantial increase (CDC, DSH data, unpublished). Comprehensive diagnostic workouts of these latter group of children, using internationally recognized criterion for diagnosis based upon the DSM IV (American Psychiatric Association, 1994), reveal that Pervasive Developmental Disorders (PDD) including Autism far outweigh other diagnoses (Islam et al, 2011). The internationally acknowledged criterions for diagnosis are rountinely used in clinical practice in Bangladesh Tools (Islam et al, 2011). The extent of these problems across Bangladesh needs to be determined for early recognition, expertise development and specialized interventions.

Behavior problems and psychiatric morbidity in mothers:

Even when there is a complex disability in a child such as cerebral palsy, it is the child's specific behavior problem that is leading to a rise in psychiatric morbidity in mothers (Mobarak, et al, 2000). One reason for high levels of maternal stress is ascribed to the 'burden of caring' that a child with behavior problems poses to the mother, such as in attentiveness and restlessness, poor sleep, help in activities of daily living (ADL; eg. feeding, toileting, bathing) etc. To reduce this 'burden of caring' , and thus maternal stress, any child with a NDI/NDD needs to be assessed for ADL and related functions.

Urban/Rural differences in prevalence of behavior problems and autism:

One study shows that the prevalence of behavior and mental health problems in rural and urban populations of Bangladesh are similar (Mullick and Goodman, 2005). Another population-based survey indicates that behavioral problems in rural children can be ascribed to organic conditions such as malnutrition and anemia (Khan et al, 2009). An unpublished epidemiological data from a survey in Dhaka city in 2008-2009 of children aged 0-9 years suggests a prevalence rate of 3.5 per 1000 for Autism Spectrum Disorders (Khan NZ, unpublished). This assessment needs to be further studies across Bangladesh.

The present survey was conceptualized and designed based upon the above concerns, clinical and epidemiological evidences and growing body of children with neurodevelopmental problems being presented by parents to government health care services.

CONCEPTUAL FRAMEWORK AND DEFINITIONS

Impairment and disability are seen as a continuum of functional deterioration of activities in a range of chidren's neurodevelopmental domains.

Based upon this conceptual framework, 'uncertain'or 'mild'grades of neurodevelopmental impairments, determined in the surveyed children for the following developmental functions: gross motor, fine motor, vision, hearing, expressive language, cognition, behavior and seizures, were considered 'Neurodevelopmental Impairments' (NDIs) (ie, temporary and reversible conditions, which would be amenable to home-based and community-based interventions); while 'moderate' and 'severe' neurodevelopmental impairments were considered 'Neurodevelopmental Disabilities' (NDDs) (ie, permanent and irreversible conditions which would require rehabilitation and specialist referrals). While it is acknowledged that seizures are not a functional domain, they are often a symptom of a neurological dysfunction, hence included in the assessment.

The focus of the entire survey was on both NDIs and NDDs, considered together. A small sub-section in the results chapter focuses on NDDs only. This entire assessment was conducted by mid-level health care para-professionals.

Criterions from the International Classification of Diseases (ICD 10, WHO) were adhered to for diagnosing specific conditions by multidisciplinary teams of professionals. These conditions included autism, cerebral palsies, epilepsies, hearing and visual impairments, genetic syndromes etc., ie, the entire array of neurological and developmental disorders in children.

OBJECTIVES

1. To determine the **validity** of home-based screening to identify children at-risk for Neurdevelopmental Impairments (NDIs)/Neurodevelopmental Disabilities (NDDs), for use by government frontline health workers.

2. To estimate the **prevalence** of NDIs/NDDs in children when assessed by para-professionals applying validated tools.

3. To estimate the prevalence of underlying medical, psychological, mental health and other **disorders, including Autism**, in all children identified with NDIs/NDDs.

4. To determine the feasibility of a tiered **system of referral** from primary to secondary to tertiary health care services for children with NDIs/NDDs, including Autism, to facilitate early detection and appropriate intervention.

5. To ascertainment preventable **risk factors** for NDIs/NDDs.

VISION
To ensure optimum development of all children in Bangladesh.

III. Methods and Materials

Survey design

A Three Stage survey design was developed (figure: 2).

In *Stage One*, a door-to-door demographic survey of households who have children aged 0-9 years was conducted. In all these homes Health Assistants (HAs) and Family Welfare Assistants (FWAs) conducted interviews of mothers , or any other primary care-provider of the children, to screen for NDIs/NDDs (Home Screening). At the end of the screening, every child was either 'screen positive' or 'screen negative'.

In *Stage Two*, within a maximum of two weeks of the home-based screening, all 'screen positives' and 10% of systematically selected 'screen negatives' were brought to the nearest Community Clinic, where the Community Health Care Provider (CHCP), blinded to the screen results of the child, assessed the child in a range of neurodevelopmental functional domains , including gross motor, fine motor, vision, hearing, expressive language, cognition, and behavior and for seizures (Community Assessment). All impairments were graded by severity to determine if the child had a NDI or NDD (see Definitions below). The assessors where blind to the screening status of children they assessed.

In *Stage Three*, within a maximum of two weeks of the stage two assessment, all children identified with NDIs/NDDs were provided a diagnostic workout by a professional team consisting of a Child Health Physician and a Child Psychologist in the Upazilla Hospital (UH) (Hospital Assessment). Efforts were made to provide a diagnosis compatible with international standards, eg, the International Classification of Diseases (International Classification of Diseases, WHO, 2004) and Diagnostic and Statistical Manual (American Psychiatric Association, DSM IV, 1994).

Sample Size and Site

The survey was designed to screen 1000 children In each of the 7 Upazillas in the 7 Divisions of Bangladesh, and in one ward within Dhaka city. The specific Upazillas (Debhata, Pirganj, Godagari, Wazirpur, Modhupur, Pekua, Kulaora; and Mirpur ward in Dhaka city) were chosen by the NCD Line Directorate, DGHS, Dhaka. Consideration was given to the accessibility of the sites to the nearest Shishu Bikash Kendra (SBK) within government Medical College Hospitals. Fig. 2.2. indicates areas of survey and the SBK closest to it (Figure: 3).

In each of the survey sites (total=8), five clusters were identified around 5 Community Clinics, where door-to-door 'blanket' household demographic surveys (DS) was conducted to identify all children aged

Figure 2: The Three Stage Survey Design

3-stage survey design
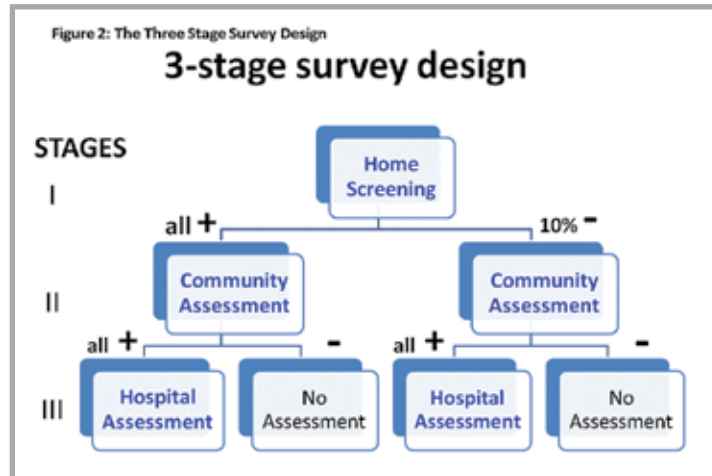
0-9 years of age and their mothers. 200 children were to be screened per cluster, which would yield a total of 1000 children from 5 sites.

In Dhaka city, due to unavoidable reasons, the initial survey was replaced by the second field survey. The numbers of children screened was reduced to around 40 per locality, which yielded a total of 200 children from 5 localities.

Tools and Procedures (figure: 4)

A. *Stage One: Home-Based Screening*

Demographic Survey (DS): In a 'blanket survey' at each study site starting from the north-west corner of the area, a team of surveyors, comprising of HAs or FWAs (or Community Workers in Dhaka city), provided an ID number to all households with children aged 0-9 years, for all mothers and for each specific child. For this stage of the survey, The DS was supervised by Health Inspectors (HIs).

Household Form **(HF)** (Adapted from: Zaman et al, 1992)**:** The Head of the Household (eg. father or mother or grandparent) was interviewed.

Mother-Child Form **(MCF)** (Adapted from: Zaman et al, 1992) Every mother in the identified household with a child aged 0-9 years was interviewed.

Developmental Screening Questionnaire **(DSQ)** (Khan, Muslima et al, 2012) (Annex 2)**:** The mother, or any other primary care-provider of the child, was administered the DSQ for all children aged 0 - < 2 years.

Ten Questions Plus Questionnaire **(TQP)** (Wu et al, 2010) (Annex 3)**:** The mother, or any other primary care-provider of the child, was administered the TQP for all children aged 2-9 years.

B. *Stage Two: Community Based Assessment*

In Stage Two all Screen Positives and 10% Screen Negatives (identified by supervisors) were brought to the nearest Community Clinic (CC) for Neurodevelopmental Assessment by Community Health Care Providers (CHCP), within a maximum of two weeks

Figure 3: MAP of Survey Sites

Rangpur Division: Pirganj Upazilla= **1015**

Rajshahi Division: Godagari Upazilla = **1003**

Khulna Division: Debahatta Upazilla = **1001**

TOTAL CHILDREN = 7280

Dhaka Division: Modhupur Upazilla = **1001**

Sylhet Division: Kulaora Upazilla= **1036**

Dhaka City= **203**

Barisal Division: Wazirpur Upazilla= **1008**

Chittagong Division: Pakua Upazilla= **1021**
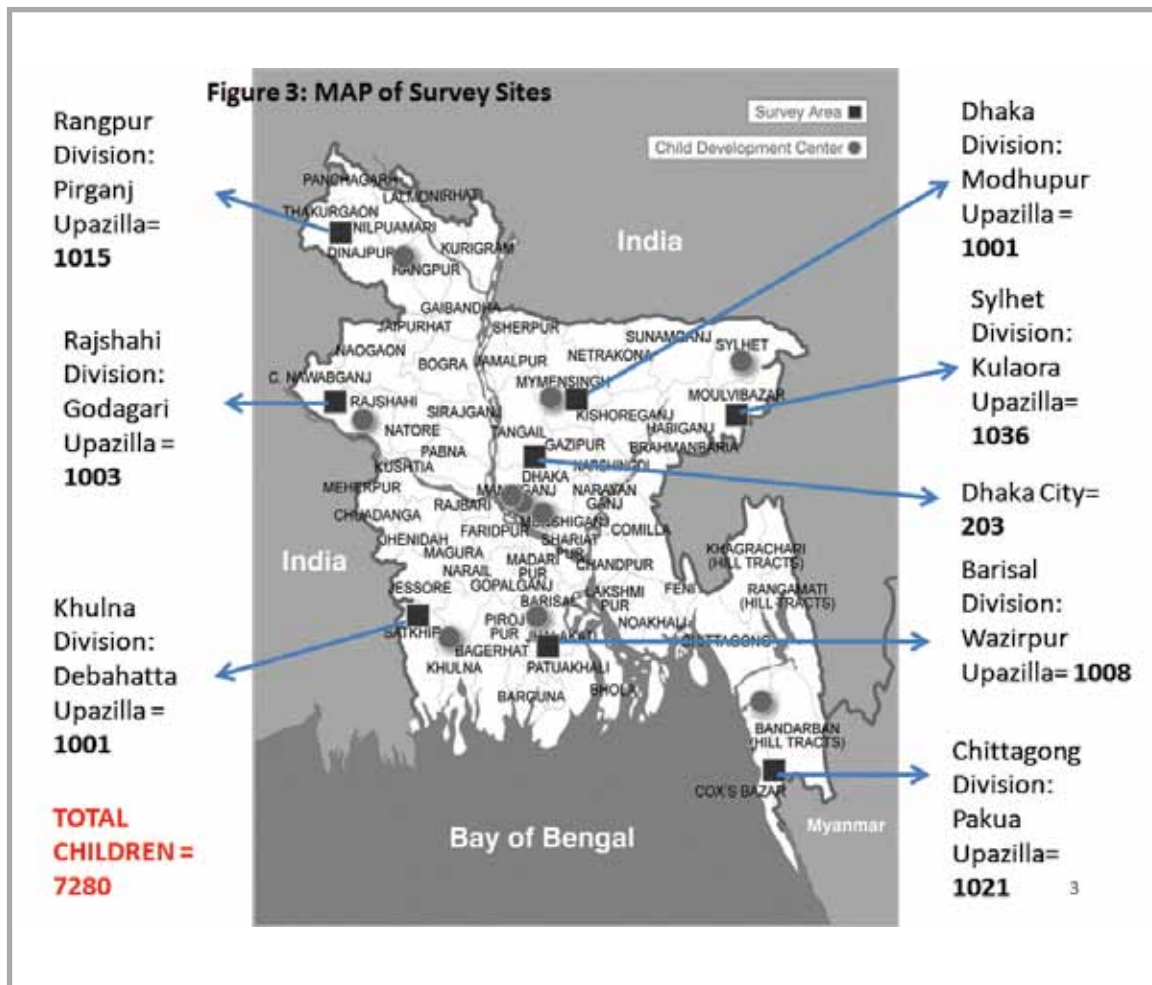
of the home- based screening. Assessments were done by administering the Rapid Neurodevelopmental Assessment (RNDA). The **Rapid Neurodevelopmental Assessment (RNDA)** is a unique tool which has been developed over several years by a team of committed researchers, including child health physicians, developmental pediatricians, child neurologists, neuro-epidemiologists, child psychologists, special education teachers, and developmental therapists whose aim was to simplify the multiprofessional neurodevelopmental assessment (ie, by a team comprising of a child health physician, a child psychologist, and a therapist), so that single childcare professionals (eg, trained college graduates, teachers) are able to administer it. The tool has been validated against psychometric tests and tests of adaptive behavior which were either developed or adapted for Bangladesh. RNDA for 0-2 year olds has been published (Khan, Muslima, et al, 2010; Appendix 6); RNDA for 2-5 year olds is also due for publication in *Pediatrics* in Feb 2013 (Khan. Muslima, et al, 2013); , and RNDA for >5-9 year olds are has been submitted to a peer-reviewed international journal (Khan, Muslima, et al, submitted). RNDA for 10-16 year olds has also been validated and paper for publication is in process.

A **Participation Checklist (PCL)** (Annex 4) was designed for this study for all children, sections divided into 5 age groups, which recorded the child's participation within family, social, community and school activities and for any economic or monetary gains. It was aimed at identifying levels of handicap.

Every assessor was provided a 10-point **Positive Parenting Advice Checklist** (Sutton, Carole et. al.) (Annex 5), which they were trained to convey to all parents who came with their children for assessment.

C. Stage Three: Hospital based diagnostic workout

Stage Three diagnostic workout was conducted by professionals comprising of a Child Health Physician and a Child Psychologist, who travelled from the Shishu Bikash Kendra of the closest Medical College Hospital. The Child Health Physician conducted a General Developmental Assessment (GDA), a screening for autism and a checklist for autism; and the Child Psychologists did a Psychological Assessment (PA) comprising of IQ tests (for every child), tests for adaptive behavior (for 2-9 year olds) and achievement (for >6 year olds); and a diagnostic test for autism when indicated. A Summary Sheet

Fig 4: Survey tools

STAGE 1:
Household Form (**HF**), Mother Child Form (**MCF**), Developmental Screening Questionnaire (**DSQ**), Ten Questions Plus (**TQP**)

Blind to Screening Results

STAGE 2:
Rapid Neurodevelopmental Assessment (**RNDA**), Participation Checklist (**PCL**)

STAGE 3: Physicians
General Developmental Assessment (**GDA**), **MCHAT**, **SCQ**, **ICD** for ASD

STAGE 3: Psychologists
IQ tests: BSID II, Stanford Binet, WPPSI, Reynell Zinkin, WISC IV, Independent Behavior Assessment Scale (**IBAS**), **WRAT**, **ADOS**

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was completed, by consensus of both professionals, where diagnosis of the underlying condition adhered to definitions and classifications adapted from the International Classification of Diseases (ICD 10) (Annex 6). Each child could have a maximum of six types of diagnosis in combination and priority -listed according to need for further referral.

Assessment by Child Health Physicians:

General Developmental Assessment (GDA) is the standard of assessment by physicians, which has been standardized in Bangladesh (Zaman et al, 1990; Khan and Durkin, 1995; Khan NZ, GOB report 2011-2016) and other countries (Durkin et al,). The components of the assessments include detailed history, observation, clinical examination and diagnosis based upon international standards (International Classification of Diseases, adapted; Annex 6) including specific parameters which are recognized by the National Autism Plan for Children (NAPC) in the UK (Dover and Le Couter, 2007).

Checklists for Autism if child fulfilled the age criterion for its administration. These were:

Ages:

a. Modified Checklist for Autism in Toddlers (MCHAT) – for children aged 18 months – 4 years (Annex 7)

b. Social Communication Questionnaire (SCQ) – for children aged 4 years and above (Annex 8)

Assessment by Child Psychologists:

Psychometric Tests administered according to child's *chronological age*: All tests have been adapted for Bangladesh, or developed for the country.

1-3 years: Bayley Scales of Infant Development (**BSID II**)(Parveen, PhD Thesis, 2012). The test has been adapted for Bangladesh by Dr. Parveen (paper submitted to Dhaka University Psychology Journal in Dec 2012).

1-9 years: Stanford Binet Intelligence Scale (**SBIS**). The non-verbal sections of the SBIS have been adapted for use in Bangladesh rural and urban children (Huq S, 1996)

1-7 years: Wechsler Preschool and Primary Scales for Intelligence (**WPPSI**), which has been adapted in Bangla by the Child Development Unit, ICCDDRB (Shiraji et al, 2008)

6-16 years: Wechsler Intelligence Scale for Children (**WISC IV**), which has been adapted in Bangladesh towards the fulfillment of an MPhil Degree in Psychology at the Dhaka University by Fatema Begum (2012).

5+ years: Wide Range Achievement Test (WRAT): To test for academic achievements related to reading, numerical understanding, writing, spelling, etc.

Reynell-Zinkin Scales of Intelligence (RZS): for visually impaired children 0-5 years of age.

Test for assessing Adaptive Behavior:

2-9 years: **Independent Behavior Assessment Scale** (**IBAS**): The IBAS was developed in Bangladesh for assessment of adaptive behavior of children aged 2-9 years (Munir et al, 1999). Test items were modified from western adaptive behavior scales and were made more contextually relevant based on ecological inventories of real-life functional situations of urban and rural Bangladeshi children, who may not have access to formal learning facilities. Through maternal recall and direct testing, children were evaluated on the following four subscales: motor, socialization, communication and activities of daily living. Norms are presented as means and standard deviations and as percentile ranks for each of the sub-scales in each age group. A full-scale score and percentile rank is also calculated.

Conclusive diagnosis for Autism:

a. **Autism Diagnostic Observation Schedule (ADOS)** (Version 1)

b. **Summary Sheet by Child Health Physicians and Child Psychologists**:

Consensual Diagnosis was completed by the professional team, the child psychologists' test results specially applicable for cognition, expressive language, behavior, mental health disorders; and Autism.

Summary Report for Parents:

Every parent was provided a short report which included: (a) Child's Neurodevelopment Summary (b) Diagnosis (c) Treatment advice where needed; advice on appropriate interventions (d) Referral for further investigations, or management, where indicated.

Human Resource Development (figure 5)

6 HAs and 6 FWAs per site (total=96), plus 5 Health Inspector (HI) per site (total=40) were provided a five-day training in the Upazilla Health Complex by specialist teachers from the Bangladesh Protibondhi Foundaation (BPF) on demographic survey and home-based screening for NDIs/NDDs (Table III.1)

5 CHCPs per Upazilla (total=35 from 7 Upazillas), plus one Health Inspectors (HAs) per upazilla (n=6), were provided a two-week training on administration of the Rapid Neurodevelopmental Assessment (RNDA) at the Dhaka premises of the Bangladesh Protibondhi Foundation (Table III.1).

8 Child Health Physicians (CHPs) and 16 Child Psychologists (CPs) (ie, one CHP and 2 CPs per Upazilla) were giving a refresher course on diagnosis of neurodevelopmental disorders including autism, following international criterions, in a three-day training in BPF (Table III.1).

Data Management

All forms at the three stages of the survey were computer coded. 7 Statisticians from the 7 Upazillas and 1 from Dhaka city were provided training in data entry and basic softwares (Microsoft Access) in BPF in a two-day training. Their data entry was subsequently replaced due to unavoidable reasons. All hard copies were couriered to the the National Coordinator and Principle Investigators office in Dhaka Shishu Hospital where all data were entered into the SPSSpc software program and analyzed.

7 Health Inspectors (HI) from 7 Upazillas and 1 Family Welfare Visitor (FWV) from Dhaka City were provided a 2-day training on survey co-ordination of the survey at Stages One, Two and Three (Table III.1).

Analysis:

Wealth Quintiles:

A composite score for wealth of households was computed with variable from the Household Form (HF), ranging from the least wealthy households (Quintile 1) to the most affluent households (Quintile 5). The variables included in the composite score were: (1) Household income (2) Living in own or rented house (3) Land ownership (4) Materials used for house construction (5) Electricity (6) Possessions (7) Source of drinking water (8) Salinity in drinking water (9) arsenic in water (10) Type of latrine.

Unweighted and Weighted Analysis of Sensitivity, Specificity, Predictive Validities and Prevalence (figure 6)

Two-phase (or double sampling) survey designs are employed to estimate Sensitivity (Se), Specificity (Sp), Positive Predictive Validity (PPV), Negative Predictive Validity (NPV) of epidemiological tools; and Prevalence of a particular condition/disease when identification/

Fig 5: Human Resource

STAGES

I — Primary Health Care HA, FWA

II — Community Clinic CHCP / Community Clinic CHCP

III — Upazilla Hospital Physician, Psychologist / Upazilla Hospital Physician, Psychologist
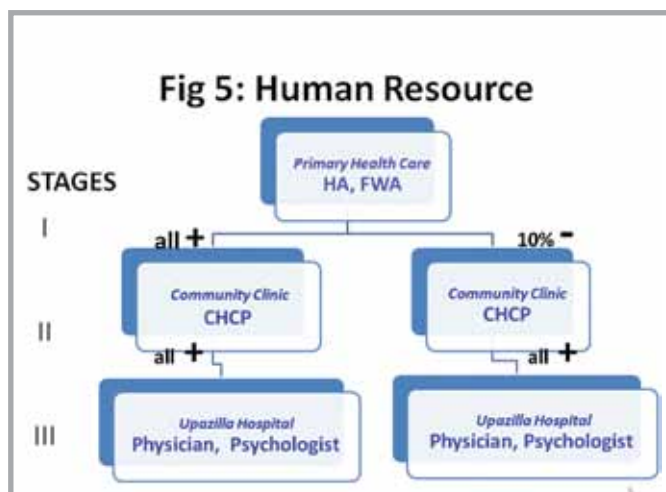
Figure 6: Weighted Validity Analysis of Data from 2-Phase Surveys

unweighted

		Disease (Phase 2 result)			
		+	-	Not assessed	Total
Screen (Phase 1 result)	+	a	b	e	a+b+e
	-	c	d	f	c+d+f
	Total	a+c	b+d	e+f	a+b+c+d+e+f

weighted

		Disease (Phase 2 result)		
		+	-	Total
Screen (Phase 1 result)	+	a(w)	(a+b+e)-a(w)	a+b+e
	-	c(ŵ)	(c+d+f)-c(ŵ)	c+d+f
	Total			a+b+c+d+e+f

If 100% of those screening positive are assessed, weight = 1 for each child screened positive and assessed; if 10% of those screening negative are assessed, weight=10 for each child screened negative and assessed. In weighted analysis, even one 'false negative' can have a large impact on sensitivity; specificity gains from weighted analysis.

Shrout and Newman, *Biometrics*, 1989

diagnosis is difficult or expensive. In the first phase, a relatively simple and inexpensive 'screening' test can be administered to a large sample size from the population of interest; resulting in patients who screen positive (S) and those who screen negative (Š). In the second phase of the survey a subset of patients from both S and Š groups are assigned an ultimate diagnosis; for example, disorder/disease present (D), or absent (Ď). The results of such a survey design can be reported by converting a 2x2 table (unweighted) to a 2x3 table (weighted) (table III. 4) (Shrout and Newman, 1989).

Weighting refers to extrapolation of the true-positive rate among the population evaluated in phase two to the entire population surveyed in phase one. If 100% of those screening positive are assessed, weight = 1 for each child screened positive and assessed; if 10% of those screening negative are assessed, weight=10 for each child screened negative and assessed. **In weighted analysis, even one 'false negative' can have a large impact on sensitivity**; specificity gains from weighted analysis.

Stage Three: Diagnostic Groups

Any diagnosis made by the team of professionals who clinically evaluated the children in Stage III followed an adapted version of the International Classification of Diseases (ICD 10). Based on the natural histories of each kind of diagnosis, underlying pathophysiologies, commonality of risk factors etc. all the diagnoses which were ultimately made, were classified under 9 Diagnostic Groups (Annex 6).

There were 58 types of diagnoses made by the professional team comprising of the physician and psychologist, based upon clinical examination and battery of psychological tests. These were grouped into 9 categories, ie, (1) Cerebral Palsies (spastic quadriplegia, diplegia, hemiplegia, dyskinesias, hypotonias, akinetic) (2) Cognitive Disorder (cognitive delay/intellectual disability, learning difficulties) (3) Developmental Motor Disorder (developmental motor delay, psychomotor delay, global delay, developmental delay) (4) Expressive Language Disorder (speech delay, aphasia) (5) Seizures Disorders (generalized epilepsy, tonic clonic epilepsy, secondarily generalized epilepsy, partial epilepsy, atypical febrile seizures, febrile seizures, etc) (6) Mental Health Disorders (ASD, ADHD, PDD NOS, attention deficits, conduct disorders, school refusal, school phobia and Rett Syndrome) (7) Blindness or Visual Impairment (including squint/strabismus) (8) Deafness or Hearing Impairment (9) Genetic, Syndromic, Anomalies (Down's, cleft palate, club foot, hydrocephalus, developmental regression, etc).

Prevalence estimated by diagnostic groups, including autism, was the frequencies of the conditions diagnosed in the 7 rural sites, expressed per 1000. This was based upon the presumption that all children with these conditions had been identified from the screened population of around 1000 children in each site. The exception was Dhaka city, where the number of children screened was one-fifth of the other sites, and therefore, each type of diagnostic condition was re-calculated for 1000 children.

Timeline: Training, Field Work, Data Computation, Analysis

The entire survey was conducted between January to June 2013. A timeline for specific activities is provided in Table III.1.

ETHICAL CONSIDERATIONS

Verbal consent was taken from all families who were visited in their homes, regarding the aims, scope and objectives of the study and it's lack of any direct biological sample collection, unauthorized interventions etc. It was submitted as a research to the Ethical Review Committee of Dhaka Shishu Hospital and the Bangladesh Medical Research Council.

Training Schedule: Table III.1

Stage	Date	Time	Place of training	No.of trainer	No. of Trainee	Content
1	9.2.2013 To 13.2.2013	9.00am To 4.00 pm	Madhupur Dhaka Division Pekua Chittagong Diviion Pirganj Rangpur Division Wazirpur Barisal Division	8 (main-4, assistant -4)	17 FWA-6 HA-6 HI-5	Demographic survey DSQ TQP HF MCF
1	16.2.2013 To 20.2.2013	9.00am To 4.00 pm	Kulaura Sylhet Division Mirpur Dhaka City Godagari Rajshahi Division Debhata Khulna Division	8 (main-4, assistant -4)	DO	DO
2	24.2.2013 To 11.3.2013	9.00am To 4.00 pm	BPF, Dhaka	8 (main-4, assistant -4)	48 CHCP-40, HA-8	RNDA. Participation check list
3	18.3.2013 To 20.3.2013	9.00am To 2.00 pm	BPF, Dhaka	3	Child Health Physicians-8 (SBK) Psychologists -16 (SBK)	GDA Diagnostic code ICD-10 criteria for Autism. M-CHAT. SCQ. PA (IQ) PA (adaptive behaviour) ADOS WRAT
Statisticians and Local coordinator	10.2.1013 and 11.2.2013	9.00am To 4.00 pm	BPF, Dhaka	3	Local coordinators-8, Statisticians-8	Coordination of survey Data management

Timeline: Field Work, Date Computaions, Analysis: Table III.1			
Stage	Date	Responsible person per Upzzila	Content
1	24.2.2013 To 11.3.2013	HI-5 HA-6 FWA-6	Demographic survey DSQ TQP HF MCF
2	16.3.2013 To 2.4.2013	CHCP-5	RNDA PCL
3	30.3.2013 To 18.4.2013	CHP-1 PHYCHOLOGIST-2	GDA Diagnostic code ICD-10 criteria for Autism. M-CHAT. SCQ. PA (IQ) PA (adaptive behaviour) ADOS WRAT
Date Computation	24.4.2013 To 14.7.2013	**Technical team** Department of Pediatric Neuroscience, Bangladesh Institute of Child Health, Dhaka Shishu Hospital	--
Analysis	15.7.1013 To 5.8.2013	DO	--

IV. Results

I. DESCRIPTION OF TOTAL SURVEYED POPULATION

1. TOTAL NUMBER SCREENED, ASSESSED AND DIAGNOSED BY AGE GROUP AND SURVEY SITES

Total numbers of children enrolled in Stages I, II and III in 8 survey sites (Table IV. I. 1a.)

A total of 7280 children were enrolled in Stage One door-to-door home-based screening of the survey. In each of the 7 rural sites over 1000 children were screened, with a maximum of 1036 in Kulaura and a minimum of 1000 in Debhata. In Dhaka city, due to unavoidable reasons, the numbers of children screened was reduced to around 40 per locality, which yielded a total of 203 children from 5 localities.

In Stage Two, a total of 1201 children were assessed in the Community Clinic by CHCPs. Due to the paucity of children screened in Stage One in Dhaka city, all children irrespective of screen status, were assessed (n=203). The second highest numbers assessed was in Pirganj (n=183).

In Stage Three, all assessed to have a NDI/NDD were brought to the Upazilla Health Complex and assessed by a visiting team of professionals comprising of a Child Health Physician and 2 Child Psychologists per site. A total of 413 children were assessed. Maximum numbers of were from Pirganj (n=87) and minimum in Wazirpur (n=21).

Total enrolled population by age group, mean ages, and screening outcomes (Table IV.I.1b) (figure 7)

Of the 7280 total children screened in the 8 survey sites, 1465 (20.12%) were 0-<2 years of age; and 5815 (79.88%) were 2-9 years of age. Highest numbers of children who screened positive in both DSQ and TQP were from Dhaka city (17.02% and 25.64%, respectively). The second highest numbers of screen positivity for DSQ and TQP was in Pirganj (7.58% and 9.83%, respectively). A total of 417 children of the total 7280 enrolled, screened positive, or 5.73%.

Figure 7: % of total children (n=7280) screened positive by DSQ (0–<2 years) or TQP (2-9 years) by 8 survey sites and all sites combined
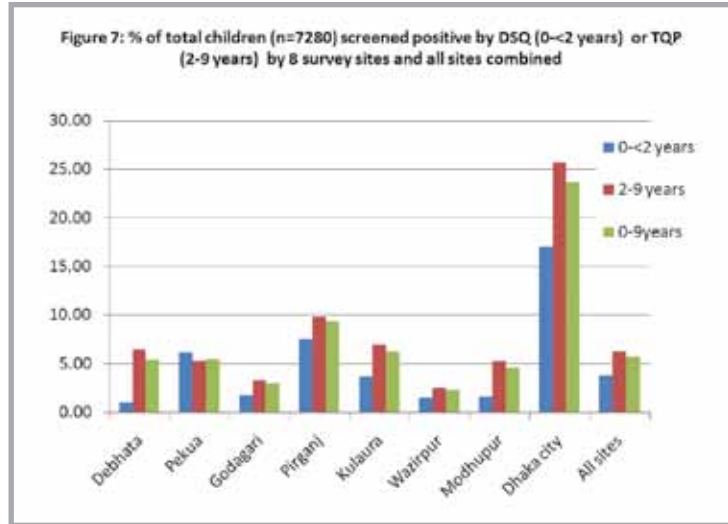
Mean age of the 1465 younger children screened was 11.56 months (SD 6.65; minimum 0.20, maximum 23.96). Mean age of the 5815 older children screened was 5.21 year (SD 2.07; minimum 2, maximum 9).

Total enrolled population in Stage One, Two and Three (figure: 8).

Of the 413 children seen in Stage Three, 308

Fig. 8. : Total children enrolled in the three stages of the survey
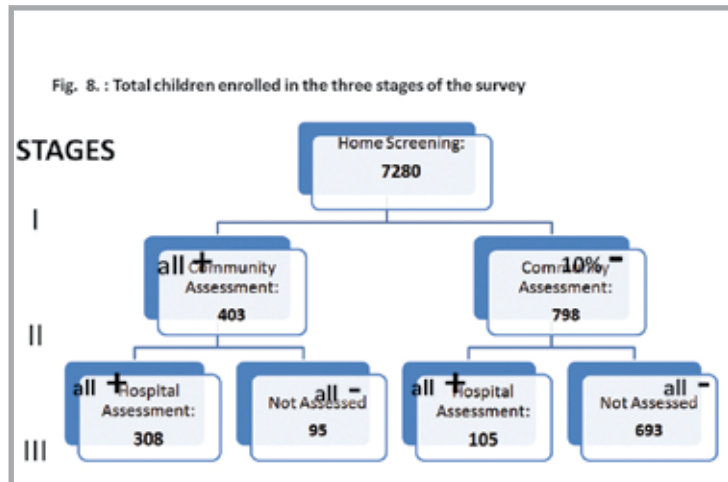
screened positive in Stage One, and assessed in Stage Two to have =>1 NDI/NDD. In addition 105 children who screened negative in Stage One and assessed to have => 1 NDI/NDD in Stage Two were also seen in Stage Three.

Table IV. I.1a: Total numbers of children enrolled in Stages I, II and III, by age groups and survey sties

Name of Sites	STAGE I					STAGE II				STAGE III	
	Total 0-2 years	% of screened total	Total 2-9 years	% of screened total	Total 0-9 years (100%)	Total 0-2 years	Total 2-9 years	Total 0-9 years	% of screened total	Total 0-9 years	% of screened total
Devhata	191	19.1	809	80.9	1000	29	119	148	14.8	45	4.5
Pekua	194	19	827	81	1021	31	109	140	13.71	43	4.21
Godagari	224	22.33	779	77.67	1003	24	104	128	12.76	69	6.87
Pirganj	211	20.79	804	79.21	1015	34	149	183	18.02	87	8.66
Kulaura	216	20.85	820	79.15	1036	19	127	146	14.09	32	3.08
Wazirpur	196	19.58	805	80.42	1001	30	88	118	9.79	21	2.09
Modhupur	186	18.58	815	81.42	1001	24	111	135	13.48	67	6.69
Dhaka city	47	23.15	156	76.85	203	46	157	203	100	49	24.13
All sites Combined	1465	20.12	5815	79.88	7280	237	964	1201	16.22	413	5.68

Table IVI.1b: Total childen (n=7280) screened by DSQ or TQP , by Positive (+) or Negative (-) screen status by 8 survey sites and combined.

Site	DSQ (0-<2 years)					TQP (2-9 years)					All (0-9 years)		
	DSQ (+)	DSQ (-)	Total DSQ	% of Total Screened	% DSQ positive	TQP(+)	TQP (-)	Total TQP	% of Total Screened	% TQP positive	DSQ or TQP positive	% of Total screened positive	Total children
Debhata	2	189	191	19.10	1.05	52	757	809	80.90	6.43	54	5.4	1000
Pekua	12	182	194	19.00	6.19	44	783	827	81.00	5.32	56	5.48	1021
Godagari	4	220	224	22.33	1.79	26	753	779	77.67	3.34	30	2.99	1003
Pirganj	16	195	211	20.79	7.58	79	725	804	79.21	9.83	95	9.36	1015
Kulaura	8	208	216	20.85	3.70	57	763	820	79.15	6.95	65	6.27	1036
Wazirpur	3	193	196	19.58	1.53	20	785	805	80.42	2.48	23	2.3	1001
Modhupur	3	183	186	18.58	1.61	43	772	815	81.42	5.28	46	4.6	1001
Dhaka city	8	39	47	23.15	17.02	40	116	156	76.85	25.64	48	23.65	203
All sites	56	1409	1465	20.12	3.82	361	5454	5815	79.88	6.21	417	5.73	7280

2. DESCRIPTION OF THE HOUSEHOLDS

Household Characteristics of the total surveyed population of children and by 8 survey sites (Table IV. I. 2a: Annex 1)

Most households were male-headed. Highest female headed household was in Dhaka city (3.54%), second highest in Debhata (3.22%).

Occupation for the majority, for all sites combined, was farming (40.98%) (highest in Kulaura, ie 57.94%; and lowest in Debhata, ie, 11.53% and none in Dhaka city), business (20.84%) (highest in Godagari, ie, 34.03%; and lowest in Modhupur, ie 11%), and unskilled labor (18.01%) (highest in Debhata, ie, 35.52%; and lowest in Godagari, ie, 1.55%) . 25.53% were service holders in Dhaka city.

A mean of 34.83% households had taken loans, with a maximum (54.12%) in Modhupur and a minimum of 17.73% in Dhaka city.

86.50% were Muslims, 11.82% Hindus, 1.55% Christians, 0.12% Buddhist or Tribal. 39.28% in Dehbata, and 25.87% in Wazirpur were Hindus. Christians comprised 9.55% of population in Modhupur.

52.21% of households had a monthly income of =<Taka 5000, with the lowest in Debhata (77.51%) and second lowest in Pirganj (75.72%). The least number of lowest income households was from Dhaka city (3.53%) (see Methods).

30.49% of household heads had never received education. Of them, highest numbers were in Modhupur (52.97%) and lowest in Wazirpur (8.14%). Father's education followed a similar, if not identical, pattern.

Numbers of surveyed households in Three Survey Stages and their % distribution by Wealth Quintiles in 8 Survey Sites (Table IV.I.2b)

There were differences in the distribution of surveyed households by wealth quintiles. The lowest quintile constituted the largest group in Pekua (37.4%), Pirganj (35.7%) and Debhata (26.3%); while in Modhupur the largest group belonged to the second lowest quintile (25%). In Godagari the largest group were in the 3rd wealth quintile (31.3%). In Kulaura and Dhaka city the largest group were in the highest wealth quintile, ie, 34.2% and 52.2%, respectively.

II. VALIDITY OF THE SCREENING TOOLS

1. VALIDITY OF THE DSQ (0-<2 YEARS) FOR ANY NDI/NDD AND FOR SPECIFIC NDI/NDD, UNWEIGHTED AND WEIGHTED, ALL SITES COMBINED AND BY SPECIFIC SITES

DSQ (0-<2 year olds) Validity by Any and Specific NDIs/NDDs_all sites combined_unweighted (N=1465) (Table IV.II.1a)

Sensitivity (Se), Specificity (Sp), Positive and Negative Predictive Validity (PPV, NPV) for 'any NDI/NDD' was good to excellent. For NDI/NDD in individual domains PPV was low in the following domains: gross motor, fine motor, vision, hearing, behavior and seizures.

DSQ Validity by Any and Specific NDIs/NDDs_all sites combined_weighted (N=1465) (Table IV.II.1b)

In the weighted analysis Se dropped to 22%, with Sp and PPV improving, and NPV remaining high. Highest Se was for vision and expressive language, and least for cognition. For the other domains, almost half the children had been screened positive.

DSQ Valiidty by Specific NDIs/NDDs_by 8 sites_unweighted (N=1465) (Table IV.II.1c)

Dhaka city: Validity was excellent. There were no children screened or assessed to have seizures.

Modhupur: Validity was excellent except for fine motor problems (50%). No children with vision or hearing problems were screened.

Kulaura: Se ranged from 67% (gross motor) to 100% (fine motor, vision, hearing, expressive language, cognition, behavior). No child with seizures was screened.

Debhata: 100% Se for fine motor and vision problems; 67% for expressive language and cognitive problems; 50% for gross motor, hearing and behavior problems. No child with seizures was screened.

Godagari: 100% Se for gross and fine motor, expressive language and behavior problems; 30% for vision problems; 38% for cognitive problems. No child with vision problems was screened.

Pirganj: Se was high to excellent across all the specific domains.

Pekua: Se was high to excellent across all the specific domains, except for vision problems (56%).

Wazirpur: No child with hearing or expressive language problems or seizures was identified. For all other domains Se was high except for gross motor problems (50%).

DSQ Validity by Specific NDIs/NDDs_by 8 sites_weighted (N=1465) (Table IV.II.1d)

Dhaka city: Validity (Se and Sp) remained high. There were no children assessed to have seizures.

Modhupur: Se fell for gross motor, fine motor, cognitive and behavior problems.

Kulaura: Validity remained high across all specific domains.

Debhata: Se fell for gross motor, hearing, expressive language, cognition and behavior.

Godagari: Se fell for hearing and cognitive problems; and remained high for problems in other domains.

Pirganj: Se remained high across all the specific domains, but fell for cognitive problems (24%).

Pekua: Se remained high or rose across all specific domains.

Wazirpur: Se lowered further for gross motor (11%), remained high for all the other domains which were identified for problems in the Stage Two assessed children.

Table IV.I.2b: Numbers of households surveyed in the Three Stages by % Wealth Quintiles in 8 Survey Sites (Total row %=100%)[1,2]

	Survey Stage	Numbers of Children	Quintile 1	Quintile 2	Quintile 3	Quintile 4	Quintile 5
Debhata	Stage I	994	**26.3**	17	16.3	21.7	18.7
	Stage II	147	23.8	19.7	14.3	19.7	22.4
	Stage III	45	22.2	24.4	26.7	11.1	15.6
Godagari	Stage I	943	12.2	15.7	**31.3**	20.9	19.9
	Stage II	109	11,0	13.8	32.1	22	21.1
	Stage III	59	8.5	15.3	39	18.6	18.6
Kulaora	Stage I	1035	8.3	19.1	22.9	15.5	**34.2**
	Stage II	146	7.5	23.3	16.4	15.8	37
	Stage III	32	3.1	25	12.5	12.5	46.9
Modhupur	Stage I	973	19.2	**25**	18.7	21.6	15.5
	Stage II	130	14.6	26.2	17.7	24.6	16.9
	Stage III	63	17.5	23.8	19	25.4	14.3
Pirganj	Stage I	1000	**35.7**	**24.4**	16	11.7	12.2
	Stage II	183	35.5	25.1	16.4	15.8	7.1
	Stage III	87	33.3	27.6	16.1	20.7	2.3
Pekua	Stage I	1006	**37.4**	**24.8**	21	10.2	6.7
	Stage II	140	44.3	16.4	18.6	9.3	11.4
	Stage III	43	34.9	23.3	16.3	16.3	9.3
Wazirpur	Stage I	975	6.8	18.2	19.2	**29**	**26.9**
	Stage II	100	9	12	22	34	23
	Stage III	16	12.5	0	18,8	31.3	37.5
Dhaka City	Stage I	178	0	0	1.7	**46.1**	**52.2**
	Stage II	178	0	0	1.7	46.1	**52.2**
	Stage III	42	0	0	2.4	45.2	52.4

[1]Mean WQ for 7 rural sites: WQ 1=21%; WQ 2=20%; WQ 3=21%; WQ 4=19%; WQ 5=19%
[2]National statistical mean (BDHS 2011): WQ 1=19%; WQ 2=20%; WQ 3=19%; WQ 4=21%; WQ 5=21%

Table IV. II. 1a. DSQ (0-<2 year olds) Validty by Any and Specific NDIs/NDDs_all sites combined_unweighted (N=1465)

SITE	Se	95% CI-lower	95% CI-upper	Sp	95% CI-lower	95% CI-upper	PPV	95% CI-lower	95% CI-upper	NPV	95% CI-lower	95% CI-upper
Any	68%	57%	80%	94%	90%	97%	80%	69%	90%	89%	85%	94%
Gross motor	86%	73%	99%	86%	81%	90%	44%	31%	58%	98%	96%	100%
Fine motor	91%	79%	103%	84%	79%	89%	37%	24%	50%	99%	97%	100%
vision	100%	100%	100%	81%	76%	86%	20%	10%	31%	100%	100%	100%
Hearing	82%	64%	100%	82%	77%	87%	26%	14%	38%	98%	97%	100%
Expressive language	92%	83%	101%	90%	85%	94%	61%	48%	74%	98%	97%	100%
Cognition	70%	57%	84%	88%	84%	93%	57%	44%	71%	93%	89%	97%
Behavior	85%	65%	104%	81%	76%	86%	20%	10%	31%	99%	97%	100%
Seizur	86%	60%	112%	79%	74%	84%	11%	3%	19%	99%	98%	101%

IV. II. 1b. DSQ Validty by Any and Specific NDIs/NDDs_all sites combined_weighted (N=1465)

SITE	Se	95% CI-lower	95% CI-upper	Sp	95% CI-lower	95% CI-upper	PPV	95% CI-lower	95% CI-upper	NPV	95% CI-lower	95% CI-upper
Any	22%	17%	28%	98%	97%	99%	80%	69%	90%	78%	75%	81%
Gross motor	45%	32%	58%	95%	93%	97%	44%	31%	57%	95%	93%	97%
Fine motor	57%	41%	74%	94%	92%	96%	37%	24%	50%	97%	96%	99%
vision	100%	100%	100%	93%	90%	95%	20%	10%	31%	100%	100%	100%
Hearing	39%	23%	54%	93%	91%	95%	26%	14%	37%	96%	94%	98%
Expressive language	60%	47%	72%	96%	95%	98%	61%	48%	74%	96%	94%	98%
Cognition	24%	17%	32%	96%	94%	98%	57%	44%	70%	85%	82%	87%
Behavior	43%	24%	61%	93%	90%	95%	20%	10%	31%	97%	96%	99%
Seizur	45%	19%	71%	92%	90%	94%	11%	3%	19%	99%	98%	100%

Table IV. II. 1c: DSQ Valiidty by Specific NDIs/NDDs_by 8 sites_unweighted (N=1465)

SITE	Gross motor		Fine motor		vision		Hearing		expr language		Cognition		Behavior		Seizures	
	(Se)	(Sp)	(Se)	(Sp)	(Se)	(Sp)	(Se)	(Sp)	(Se)	(Sp)	(Se)	(Sp)	(Se)	(Sp)	(Se)	(Sp)
Dhaka city	67%	86%	100%	89%	100%	85%	80%	90%	89%	100%	75%	95%	100%	85%	0%	83%
Modhupur	67%	95%	50%	95%	0%	88%	0%	88%	100%	100%	60%	100%	67%	95%	100%	91%
Kulaura	100%	61%	100%	61%	100%	61%	100%	65%	100%	65%	100%	61%	100%	61%	0%	58%
Debhata	50%	96%	100%	96%	100%	96%	50%	96%	67%	100%	67%	100%	50%	96%	0%	93%
Godagari	100%	95%	100%	95%	0%	83%	50%	86%	100%	91%	38%	94%	100%	87%	100%	87%
Pirganj	100%	69%	100%	62%	100%	56%	100%	58%	92%	77%	77%	71%	100%	55%	100%	56%
Pekua	100%	84%	100%	78%	56%	78%	100%	75%	100%	81%	100%	81%	100%	75%	100%	72%
Wazirpur	50%	93%	100%	96%	100%	96%	0%	90%	0%	90%	100%	93%	100%	96%	0%	90%

Table IV. II. 1d: DSQ Valiidty by Specific NDIs/NDDs_by 8 sites_weighted (N=1465)

SITE	Gross motor		Fine motor		vision		Hearing		expr language		Cognition		Behavior		Seizures	
	(Se)	(Sp)	(Se)	(Sp)	(Se)	(Sp)	(Se)	(Sp)	(Se)	(Sp)	(Se)	(Sp)	(Se)	(Sp)	(Se)	(Sp)
Dhaka city	67%	99%	100%	99%	100%	99%	80%	99%	89%	100%	75%	100%	100%	99%	0%	99%
Modhupur	19%	100%	10%	100%	100%	100%		99%	100%	100%	15%	100%	19%	100%	100%	100%
Kulaura	100%	99%	100%	99%	100%	99%	100%	99%	100%	99%	100%	99%	100%	99%		99%
Debhata	12%	100%	100%	100%	100%	100%	12%	100%	22%	100%	22%	100%	12%	100%	100%	100%
Godagari	100%	100%	100%	100%		99%	8%	99%	100%	100%	5%	100%	100%	99%	100%	99%
Pirganj	100%	99%	100%	98%	100%	98%	100%	98%	50%	99%	24%	99%	100%	97%	100%	98%
Pekua	100%	99%	100%	99%	100%	99%	100%	99%	100%	99%	100%	99%	100%	99%	100%	98%
Wazirpur	12%	100%	100%	100%	100%	100%		99%		99%	100%	100%	100%	100%		99%

2. VALIDITY OF THE TQP (2-9 YEARS) FOR ANY NDI/NDD AND FOR SPECIFIC NDI/ NDD, UNWEIGHTED AND WEIGHTED, AND WEIGHTED, ALL SITES COMBINED, AND BY SPECIFIC SITES

TQP Validity by Any and Specific NDI/NDD_all sites combined_unweighted (N=5185) (Table IV.II.2a).

Se, Sp, PPV and NPV for any NDI/NDD were good to high for any NDI/NDD. PPV was low for specific domains including vision, hearing, seizures, behavior gross motor and fine motor problems.

TQP Validity by Any and Specific NDI/NDD_all sites combined_weighted (N=5185) (Table IV.II.2b)

Se declined for any and across all specific NDIs/ NDDs. For any NDI/NDD the Sp and PPV remained high but the NPV declined to 39%. For specific domains the PPV remained low for most domains, but the Sp and NPV remained high.

TQP Valiidty for Specific NDIs/NDDs_by 8 sites_ unweighted (Table IV.II.2c)

Dhaka city: Validity was uniformly high across all specific NDIs/NDDs.

Modhupur: Se was low for vision, hearing, behavior and seizure related problems.

Kulaura: Se was low for gross motor problems (20%), about 50% for fine motor, vision, hearing, expressive language, cognition and behavior problems, and high for seizures (88%)

Debhata: Validity was uniformly high across all specific NDIs/NDDs.

Godagari: Tool picked up about one-third children with cognitive problems (Se=33%). Se was fair (for fine motor, vision and hearing problems) to high (expressive language, behavior, seizures) for the other domains.

Pirganj: Validity was uniformly high across all specific NDIs/NDDs.

Pekua: Validity was uniformly high across all specific NDIs/NDDs.

Wazirpur: Se was low for gross motor, fine motor and vision problems, and high for other specific NDIs/ NDDs.

TQP Valiidty for Specific NDIs/NDDs by 8 sites_ weighted (Table IV.II.2d)

Dhaka city: Validity remained high for all specific NDIs/NDDs.

Modhupur: Se for all the eight specific domains for NDIs/NDDs fell to very low levels.

Kulaura: Se for all the eight specific domains for NDIs/NDDs fell to very low levels, except for seizres (46%).

Debhata: Validity remained high for all specific NDIs/ NDDs.

Godagari: Se fell for fine motor (15%), vision (18%) and hearing (13%) problems; and further for cognitive (5%) problems.

Pirganj: Validity remained high for all specific NDIs/ NDDs.

Pekua: Validity remained high for all specific NDIs/ NDDs.

Wazirpur: Validity remained high for all specific NDIs/ NDDs.

3. VALIDITY OF THE DSQ/TQP (0-9 YEARS) FOR ANY NDI/NDD AND FOR SPECIFIC NDI/ NDD , UNWEIGHTED AND WEIGHTED, ALL SITES COMBINED, AND BY SPECIFIC SITES

Validity of the Screening Tools (DSQ/TQP) for Any NDI/NDD_all and 8 sites combined_unweighted (N=7280) (Table IV.II.3a) (figure 9 and figure 10)

Se, Sp, PPV, and NPV for the entire surveyed population to screen for any problem, unweighted, was high, ie, 74%, 90%, 82% and 85%, respectively. They were lowest for Kulaura (Se=53% , Sp=60% , PPV=29%) and Godagari (Se=38%, NPV=53%).

Validity of the Screening Tools (DSQ/TQP) for Any NDI/NDD_all and 8 sites combined_weighted (N=7280) (Table IV.II.3b) (figure 9 and figure 10)

Se and NPV fell to 25% and 36%, respectively for the entire population. Validity remained high for Dhaka city and Pirganj; while Se fell for Debhata and Pekua, ie from 89% to 42% for Debhata; and from 90% to 49% for Pekua.

Table IV. II. 2a. TQP (2-9 years) Validity by Any and Specific NDI/NDD_all sites combined_unweighted (N=5185)

SITE	Se	95% CI-lower	95% CI-upper	Sp	95% CI-lower	95% CI-upper	PPV	95% CI-lower	95% CI-upper	NPV	95% CI-lower	95% CI-upper
Any	75%	70%	79%	89%	87%	92%	82%	78%	86%	84%	81%	87%
Gross motor	78%	69%	87%	67%	64%	71%	17%	13%	21%	97%	96%	99%
Fine motor	78%	70%	86%	69%	66%	72%	24%	20%	29%	96%	95%	98%
vision	68%	49%	88%	65%	61%	68%	4%	2%	6%	99%	98%	100%
Hearing	79%	69%	89%	67%	64%	70%	14%	10%	18%	98%	97%	99%
Expr language	83%	77%	89%	72%	69%	75%	36%	31%	41%	96%	94%	97%
Cognition	75%	71%	80%	86%	83%	88%	75%	70%	79%	86%	83%	89%
Behavior	79%	70%	87%	68%	65%	71%	20%	16%	24%	97%	96%	98%
Seizures	85%	75%	94%	67%	63%	70%	13%	9%	16%	99%	98%	100%

Table IV. II. 2b. TQP Valiidty (2-9 years) by Any and Specific NDI/NDD_all sites combined_weighted (N=5185)

SITE	Se	95% CI-lower	95% CI-upper	Sp	95% CI-lower	95% CI-upper	PPV	95% CI-lower	95% CI-upper	NPV	95% CI-lower	95% CI-upper
Any	26%	23%	28%	89%	87%	92%	82%	78%	86%	39%	37%	42%
Gross motor	29%	23%	35%	65%	62%	68%	17%	13%	21%	79%	76%	82%
Fine motor	29%	24%	34%	67%	64%	70%	24%	20%	28%	72%	69%	75%
vision	20%	11%	29%	62%	58%	65%	4%	2%	6%	90%	88%	92%
Hearing	31%	24%	38%	64%	61%	67%	14%	10%	18%	83%	80%	86%
Expr language	36%	31%	41%	70%	67%	74%	36%	31%	40%	71%	67%	74%
Cognition	26%	23%	29%	86%	83%	88%	75%	70%	79%	42%	39%	45%
Behavior	30%	24%	36%	66%	63%	69%	20%	16%	24%	77%	74%	80%
Seizures	39%	30%	48%	64%	61%	67%	13%	9%	16%	89%	86%	91%

Table IV. II. 2c: TQP Valiidty for Specific NDI/NDD_by 8 sites_unweighted

SITE	Gross motor		Fine motor		vision		Hearing		exp language		Cognition		Behavior		Seizures	
	(Se)	(Sp)	(Se)	(Sp)	(Se)	(Sp)	(Se)	(Sp)	(Se)	(Sp)	(Se)	(Sp)	(Se)	(Sp)	(Se)	(Sp)
Dhaka city	78%	78%	100%	77%	100%	77%	60%	76%	90%	84%	76%	95%	88%	81%	89%	78%
Modhupur	29%	61%	40%	61%	40%	61%	33%	61%	45%	62%	67%	96%	33%	61%	33%	61%
kulawra	20%	55%	50%	57%	50%	57%	56%	58%	48%	58%	54%	59%	53%	58%	88%	60%
Devhata	100%	63%	100%	59%	100%	59%	100%	63%	94%	66%	97%	82%	94%	66%	100%	63%
Godagari	92%	86%	67%	77%	67%	77%	57%	78%	78%	87%	33%	87%	75%	78%	71%	79%
Pirganj	100%	51%	6%	48%	100%	48%	100%	51%	100%	59%	100%	93%	100%	50%	100%	50%
Pekua	92%	73%	100%	66%	100%	66%	100%	69%	100%	78%	89%	92%	100%	73%	100%	68%
wazirpur	33%	83%	33%	79%	33%	79%	100%	87%	100%	90%	100%	86%	100%	84%	84%	78%

Table IV. II. 2d: TQP Validity for Specific NDI/NDD_by 8 sites_weighted

SITE	Gross motor		Fine motor		vision		Hearing		exp language		Cognition		Behavior		Seizures	
	(Se)	(Sp)	(Se)	(Sp)	(Se)	(Sp)	(Se)	(Sp)	(Se)	(Sp)	(Se)	(Sp)	(Se)	(Sp)	(Se)	(Sp)
Dhaka city	78%	94%	88%	96%	100%	94%	60%	94%	90%	96%	76%	99%	88%	96%	89%	95%
Modhupur	3%	93%	4%	93%	6%	93%	4%	93%	7%	94%	15%	100%	4%	93%	4%	93%
kulawra	2%	91%	4%	91%	9%	91%	11%	91%	9%	93%	10%	93%	10%	92%	41%	92%
Devhata	100%	93%	49%	93%	100%	92%	100%	93%	59%	94%	77%	97%	59%	94%	100%	93%
Godagari	57%	98%	15%	97%	18%	96%	13%	96%	28%	98%	5%	99%	25%	96%	21%	96%
Pirganj	100%	89%	100%	90%	100%	88%	100%	89%	100%	92%	100%	99%	100%	89%	100%	89%
Pekua	56%	95%	65%	96%	100%	93%	100%	94%	100%	96%	46%	99%	100%	95%	100%	94%
wazirpur	100%	97%	100%	98%	4%	97%	100%	98%	100%	99%	100%	99%	100%	98%	100%	94%

Fig 9: Sensitivity (Se) of the Screening Tools (DSQ / TQP) for Any NDI or NDD in 8 sites and combined unweighted and weighted (N=7280)
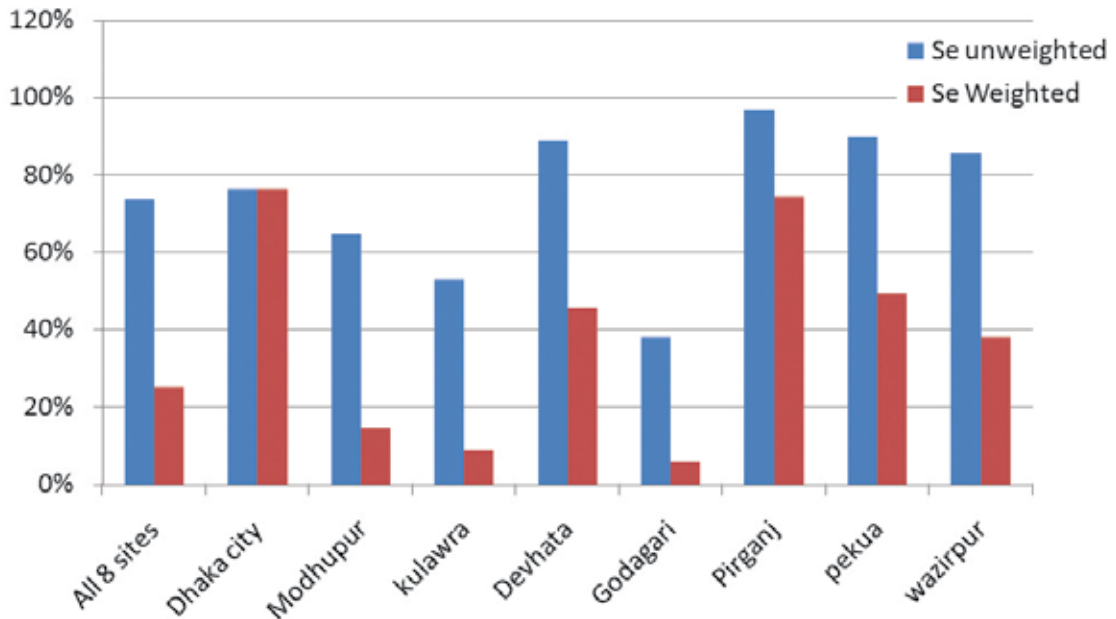
Figure 10: Specificity (Sp) of the Screening Tools (DSQ / TQP) for Any NDI or NDD in 8 sites and combined unweighted and weighted (N=7280)
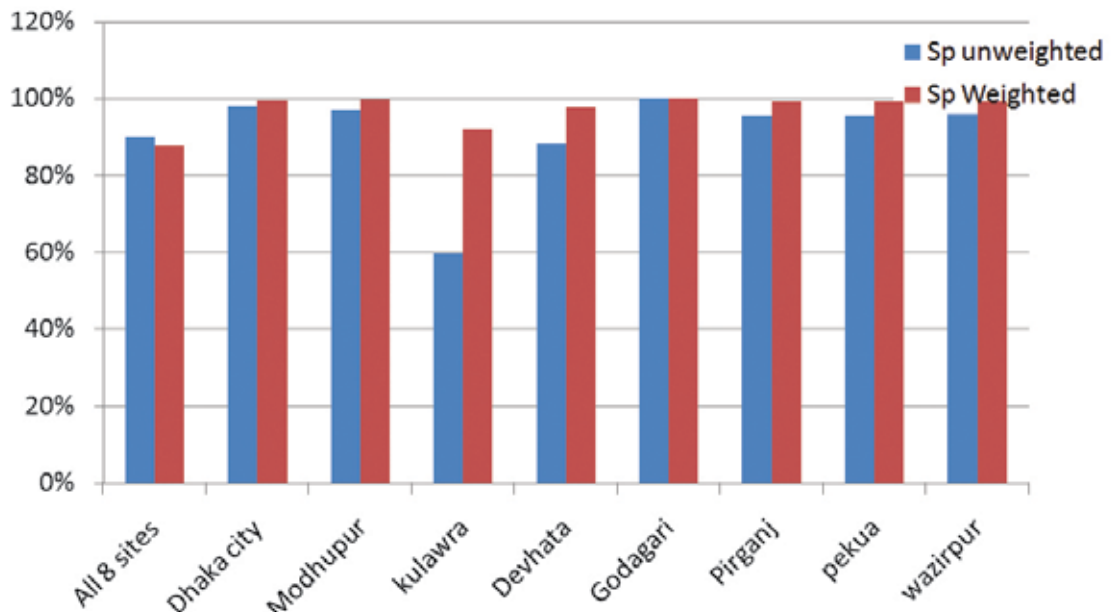
Table IV. II. 3a. Validity of the Screening Tools (DSQ/TQP) for Any NDI/NDD_all and 8 sites combined_unweighted (N=7280)

SITE	Se	95% CI-lower	95% CI-upper	Sp	95% CI-lower	95% CI-upper	PPV	95% CI-lower	95% CI-upper	NPV	95% CI-lower	95% CI-upper
All 8 sites	74%	70%	78%	90%	88%	92%	82%	78%	85%	85%	83%	88%
Dhaka city	76%	65%	87%	98%	96%	100%	94%	87%	101%	91%	86%	95%
Modhupur	65%	53%	76%	97%	93%	101%	96%	90%	102%	73%	64%	82%
kulawra	53%	36%	70%	60%	51%	69%	29%	17%	40%	81%	72%	89%
Devhata	89%	80%	98%	88%	82%	95%	77%	65%	88%	95%	90%	99%
Godagari	38%	27%	49%	100%	100%	100%	100%	100%	100%	53%	43%	62%
Pirganj	97%	93%	100%	96%	91%	100%	96%	92%	100%	97%	93%	100%
pekua	90%	81%	98%	96%	91%	100%	92%	84%	99%	95%	90%	99%
wazirpur	86%	71%	101%	96%	92%	100%	82%	66%	98%	97%	93%	100%

Table IV. II. 3b. Validity of the Screening Tools (DSQ/TQP) for Any NDI/NDD_all and 8 sites combined_weighted (N=7280)

SITE	Se	95% CI-lower	95% CI-upper	Sp	95% CI-lower	95% CI-upper	PPV	95% CI-lower	95% CI-upper	NPV	95% CI-lower	95% CI-upper
All 8 sites	25%	23%	28%	88%	85%	90%	82%	78%	85%	36%	33%	38%
Dhaka city	76%	65%	87%	99%	99%	100%	94%	87%	101%	98%	96%	99%
Modhupur	15%	11%	19%	100%	99%	100%	96%	90%	102%	68%	65%	71%
kulawra	9%	5%	13%	92%	90%	94%	29%	18%	40%	75%	72%	78%
Devhata	46%	36%	56%	98%	97%	99%	77%	66%	88%	92%	90%	94%
Godagari	6%	4%	8%	100%	100%	100%	100%	100%	100%	55%	51%	58%
Pirganj	74%	67%	82%	99%	99%	100%	96%	92%	100%	95%	93%	96%
Pekua	49%	40%	59%	99%	98%	100%	92%	84%	99%	91%	89%	94%
Wazirpur	38%	25%	52%	99%	99%	100%	82%	66%	98%	95%	93%	97%

Validity of the Screening Tools (DSQ/TQP) for Specific NDI/NDD_all sites combined_unweighted (N=7280) (Table IV.II.3c)

Se, Sp, and NPV for specific NDIs/NDDs was high. PPV was low, except for cognitive problems (72%)

Validity of the Screening Tools (DSQ/TQP) for Specific NDI/NDD_all sites combined_weighted (N=7280) (Table IV.II.3d)

Se fell for all domains, and was highest for seizures (40%) and lowest for cognitive problems (26%). Sp remained above 60% for most domains (highest for cognition, ie, 83%) and except for vision problems (59%). PPV was lowest for vision problems (6%) and highest for cognition (72%). NPV was high for most domains (range 66% - 85%) except cognition (39%).

Validity of the Screening Tools (DSQ/TQP) for Specific NDIs/NDDs_by 8 sites_unweighted (N=7280) (Table IV.II.3e)

Se and Sp for specific NDIs/NDDs were high across almost all survey sites, but relatively lower in Modhupur (Se ranging from 33-40% for fine and gross motor, vision, hearing, behavior and seizure problems) and Kulaura (Se for gross motor problems 27%, and fine motor problems 36%).

Validity of the Screening Tools (DSQ/TQP) for Specific NDIs/NDDs_by 8 sites_weighted (N=7280) (Table IV.II.3f)

Dhaka city: Second highest Se and Sp across all domains. Se ranging from 70% (hearing) to 100% (vision)

Modhupur: Lowest Se across all domains ranging from 4% (hearing) to 16% (cognition).

Kulaura: Second lowest Se across all domains ranging from 3% (gross motor) to 38% (seizures).

Debhata: 4th best validity outcomes of the 8 survey sites, with Se ranging from 46% (behavior) to 100% (vision and seizures).

Godagari: 3rd lowest validity with Se ranging from 5% (cognition) to 61% (gross motor).

Pirganj: Highest validity across all specific domains, Se mostly 100%, except for cognition (73%).

Pekua: 3rd highest validity scores across specific domains. Se ranging from 51% (cognition) to 100% (vision, hearing, expressive language, behavior and seizure related problems).

Wazirpur: 5th best validity outcomes with Se ranging from 13% (vision) to 100% (fine motor, expressive language, cognition and behavior problems).

Table IV. II. 3c. Validity of the Screening Tools (DSQ/TQP) for Specific NDI/NDD_all sites combined_unweighted (N=7280)

SITE	Se	95% CI-lower	95% CI-upper	Sp	95% CI-lower	95% CI-upper	PPV	95% CI-lower	95% CI-upper	NPV	95% CI-lower	95% CI-upper
Gross motor	80%	72%	88%	71%	68%	74%	21%	17%	25%	97%	96%	98%
Fine motor	80%	73%	87%	72%	69%	75%	26%	22%	30%	97%	96%	98%
vision	79%	65%	93%	68%	65%	70%	6%	4%	9%	99%	98%	100%
Hearing	80%	71%	89%	70%	67%	72%	16%	12%	19%	98%	97%	99%
Expressive language	84%	79%	90%	76%	73%	78%	39%	34%	44%	96%	95%	98%
Cognition	75%	70%	79%	86%	84%	89%	72%	68%	77%	88%	85%	90%
Behavior	79%	72%	87%	71%	68%	73%	20%	16%	24%	97%	96%	98%
Seizur	85%	76%	94%	69%	66%	72%	12%	9%	16%	99%	98%	100%

Table IV. II. 3d. Validity of the Screening Tools (DSQ/TQP) for Specific NDI/NDD_all sites combined_weighted (N=7280)

SITE	Se	95% CI-lower	95% CI-upper	Sp	95% CI-lower	95% CI-upper	PPV	95% CI-lower	95% CI-upper	NPV	95% CI-lower	95% CI-upper
Gross motor	32%	27%	38%	63%	60%	66%	21%	17%	25%	75%	72%	79%
Fine motor	32%	27%	38%	64%	61%	67%	26%	22%	30%	71%	68%	74%
vision	31%	21%	41%	59%	56%	62%	6%	4%	9%	90%	88%	93%
Hearing	32%	26%	39%	61%	58%	64%	16%	12%	19%	80%	77%	83%
Expressive language	39%	35%	44%	69%	65%	72%	39%	34%	44%	69%	66%	72%
Cognition	26%	24%	29%	83%	80%	86%	72%	68%	77%	39%	37%	42%
Behavior	32%	26%	37%	62%	59%	66%	20%	16%	24%	75%	72%	79%
Seizur	40%	32%	49%	60%	57%	63%	12%	9%	16%	88%	85%	90%

Table IV. II. 3e. Validity of the Screening Tools (DSQ/TQP) for Specific NDI/NDD_by 8 sites_unweighted (N=7280)

SITE	Gross motor		Fine motor		vision		Hearing		exp language		Cognition		Behavior		Seizures	
	(Se)	(Sp)	(Se)	(Sp)	(Se)	(Sp)	(Se)	(Sp)	(Se)	(Sp)	(Se)	(Sp)	(Se)	(Sp)	(Se)	(Sp)
Dhaka city	75%	80%	89%	83%	100%	79%	70%	79%	90%	88%	75%	95%	88%	82%	80%	79%
Modhupur	40%	66%	36%	66%	40%	66%	33%	66%	57%	69%	67%	97%	40%	67%	43%	66%
Kulawra	27%	56%	36%	56%	67%	57%	64%	59%	52%	59%	56%	60%	56%	58%	88%	59%
Devhata	91%	69%	92%	70%	100%	66%	90%	69%	89%	73%	95%	86%	89%	72%	100%	69%
Godagari	94%	88%	68%	85%	67%	78%	56%	80%	80%	88%	34%	89%	80%	80%	75%	81%
Pirganj	100%	54%	100%	55%	100%	49%	100%	52%	98%	62%	97%	89%	100%	51%	100%	51%
Pekua	95%	75%	96%	78%	100%	68%	100%	70%	100%	79%	90%	89%	100%	74%	100%	69%
Wazirpur	86%	86%	100%	87%	60%	83%	100%	88%	100%	90%	100%	91%	100%	86%		81%

Table IV. II. 3f. Validity of the Screening Tools (DSQ/TQP) for Specific NDI/NDD_by 8 sites_weighted (N=7280)

SITE	Gross motor		Fine motor		vision		Hearing		expr language		Cognition		Behavior		Seizures	
	(Se)	(Sp)	(Se)	(Sp)	(Se)	(Sp)	(Se)	(Sp)	(Se)	(Sp)	(Se)	(Sp)	(Se)	(Sp)	(Se)	(Sp)
Dhaka city	75%	93%	89%	95%	100%	93%	70%	93%	90%	96%	75%	99%	88%	94%	80%	93%
Modhupur	6%	93%	5%	93%	6%	93%	4%	93%	11%	94%	16%	100%	6%	93%	7%	93%
Kulawra	3%	90%	5%	90%	15%	90%	13%	91%	9%	92%	10%	92%	10%	91%	38%	91%
Devhata	51%	93%	54%	93%	100%	91%	49%	93%	47%	94%	66%	97%	46%	94%	100%	93%
Godagari	61%	97%	19%	97%	17%	95%	12%	96%	30%	98%	5%	99%	30%	96%	24%	96%
Pirganj	100%	88%	100%	89%	100%	86%	100%	87%	80%	91%	73%	98%	100%	87%	100%	87%
Pekua	67%	94%	71%	95%	100%	92%	100%	92%	100%	95%	51%	98%	100%	94%	100%	92%
Wazirpur	38%	97%	100%	97%	13%	97%	100%	98%	100%	98%	100%	98%	100%	97%		96%

III. PREVALENCE OF NEURODEVEL-OPMENTAL IMPAIRMENTS (NDI)/ NEU-RODEVELOPMENTAL DISABILITIES (NDD) COMBINED

### 1. PREVALENCE IN ALL AGE GROUPS (0-9 YEAR OLDS)

Prevalence of any NDI/NDD for children aged 0-9 years_for combined and 8 Study Sites, unweighted (n=1201) and weighted (N=7280) (Table IV.III.1a) (figure 11)

The weighted prevalence of any NDI/NDD when all children, both assessed and not assessed were considered, was 185/1000 (95% CI 161/1000-208/1000) or 18.5%. Estimates of prevalence was highest in Godagari (490/1000) and lowest for Wazirpur (49/1000).
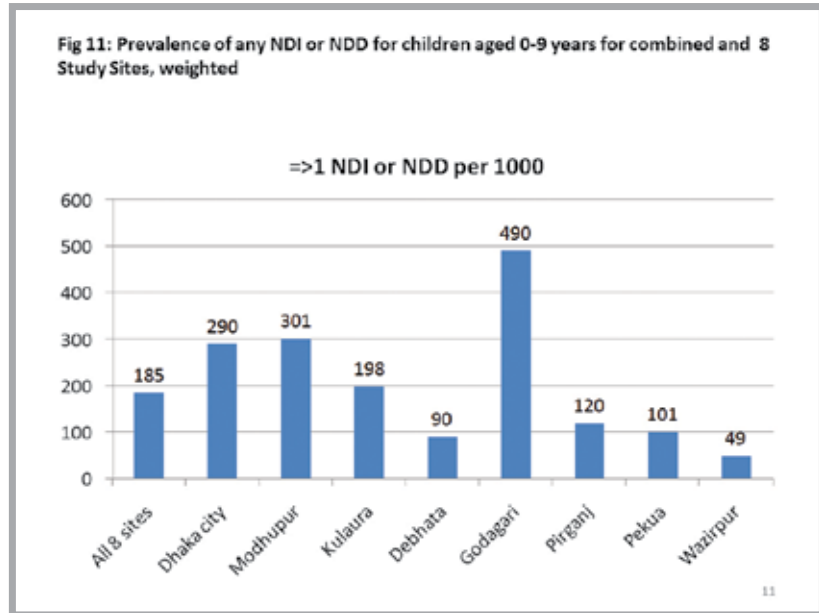
Fig 11: Prevalence of any NDI or NDD for children aged 0-9 years for combined and 8 Study Sites, weighted

=>1 NDI or NDD per 1000

Prevalence of Specific NDIs/NDD for total assessed children_by 8 Study Sites, unweighted (n=1201) (Table IV.III.1b)

Highest unweighted prevalence of NDIs/NDDs in gross motor was in Pekua (135/1000); for fine motor in Pekua (164/1000); for vision in Wazirpur (42/1000); for hearing in Pirganj (82/1000); for expressive language in Godagari (156/1000); for cognition in Godagari (507/1000); for behavior in Debhata (121/1000); and for seizures in Godagari (62/1000).

Prevalence of Specific NDIs/NDD for total assessed children_by 8 Study Sites, weighted (N=7280) (Table IV.III.1c) (figure 12a, 12b, 12c, 12d, 12e, 12f, 12g, 12h)

Highest weighted prevalence of NDIs/NDDs for gross motor was in Kulaura (93/1000); for fine motor in Modhupur (101/1000); for vision in Modhupur (34/1000); for hearing in Kulaura (52/1000); for expressive language in Kulaura (160/1000); for cognition in Godagari (444/1000); for behavior in Modhupur(102/1000); and for seizures in Dhaka city (49/1000).

2. PREVALENCE IN YOUNGER AGE GROUP (0-<2 YEAR OLDS)

Prevalence of any NDIs/NDDs in children aged 0-<2 years_all sites combined and by 8 Sites, unweighted and weighted (Table IV.III.2a) (figure 12a, 12b, 12c, 12d, 12e, 12f, 12g,12h)

Unweighted prevalence for all sites combined was 265/1000; with highest prevalence in Pirganj (500/1000) and lowest in Kulaura (66/1000). Weighed prevalence for all sites combined was 135/1000, with highest in Godagari (312/1000) and lowest in Kulaura (9/1000).

Prevalence of Specific NDIs/NDDs in children aged 0-<2 years_by 8 Study Sites, unweighted (Table IV.III.2b)

Highest unweighted prevalence for NDIs/NDDs in gross motor was 235/1000 in Pirganj; for fine motor in Modhupur (166/1000); for vision in Pekua (129/1000); for hearing in Dhaka city (106/1000); for expressive language in Pirganj (352/1000); for cognition in Godagari (333/1000); for behavior in Modhupur (125/1000); and for seizures in Pekua and Pirganj (58/1000).

Prevalence of Specific NDIs/NDD in children aged 0-<2 years_by all sites combined and by 8 Study Sites, weighted (Table IV.III.2c)

Highest weighted prevalence for a specific NDI/NDD, all sites combined, was in cognition (90/1000) and lowest for vision (7/1000).

Site wise, highest weighted prevalence for NDIs/NDDs in gross motor was 63/1000 in Dhaka city; for fine motor in Modhupur (104/1000); for vision in Pekua (24/1000); for hearing in Dhaka city (106/1000); for expressive language in Dhaka city (191/1000); for cognition in Godagari (258/1000); for behavior in Modhupur (57/1000); and for seizures in Dhaka city (21Z/1000).

Fig 12 a : Prevalence of Gross Motor impairment or disability for total assessed children by 8 study sites and combined, weighted (N=7280)

Gross Motor impairment or disability per 1000
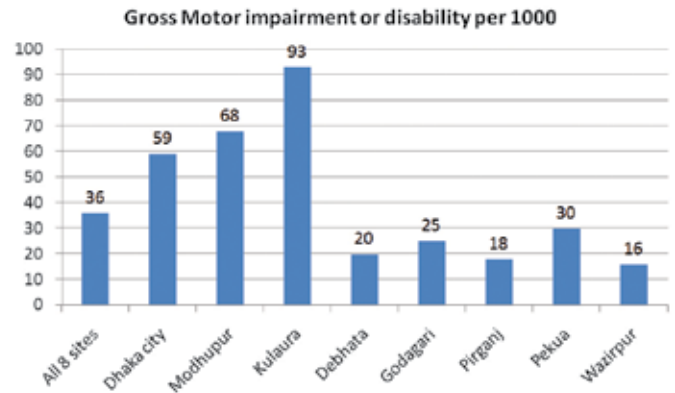
Fig 12 b: Prevalence of Fine Motor impairment or disability for total assessed children by 8 study sites and combined, weighted (N=7280)

Fine Motor impairment or disability per 1000
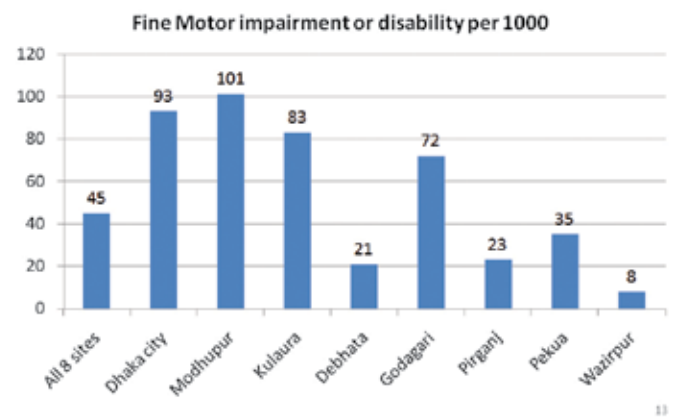
Fig 12c : Prevalence of Vision impairment or disability for total assessed children by 8 study sites and combined, weighted (N=7280)

Vision impairment or disability per 1000
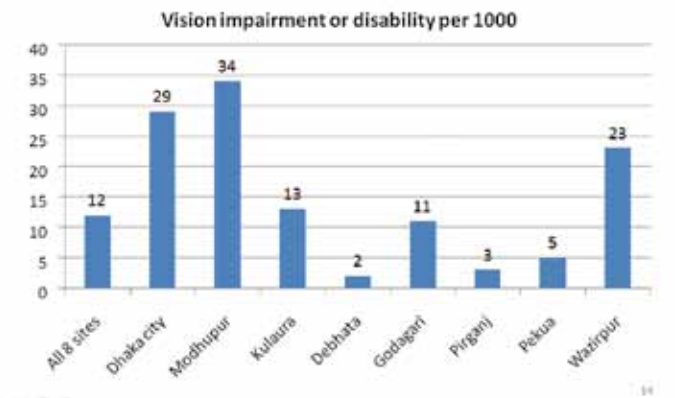
Fig 12d: Prevalence of Hearing impairment or disability for total assessed children by 8 study sites and combined, weighted (N=7280)

Hearing impairment or disability per 1000

Site	Value
All 8 sites	27
Dhaka city	49
Modhupur	44
Kulaura	52
Debhata	19
Godagari	44
Pirganj	14
Pekua	10
Wazirpur	9

Fig 12e: Prevalence of Expressive Language impairment or disability for total assessed children by 8 study sites and combined, weighted (N=7280)

Expressive Language impairment or disability per 1000

Site	Value
All 8 sites	56
Dhaka city	147
Modhupur	72
Kulaura	160
Debhata	37
Godagari	55
Pirganj	50
Pekua	26
Wazirpur	11
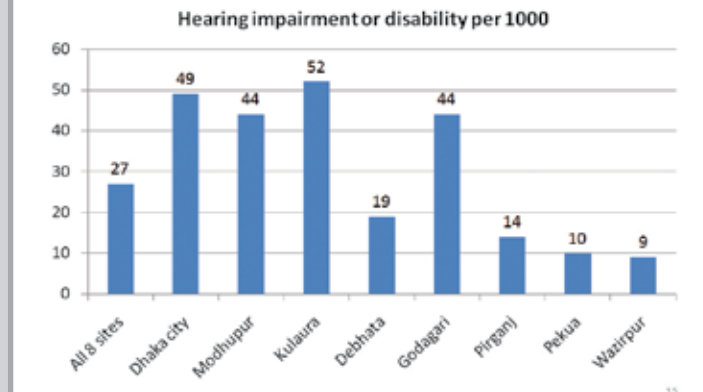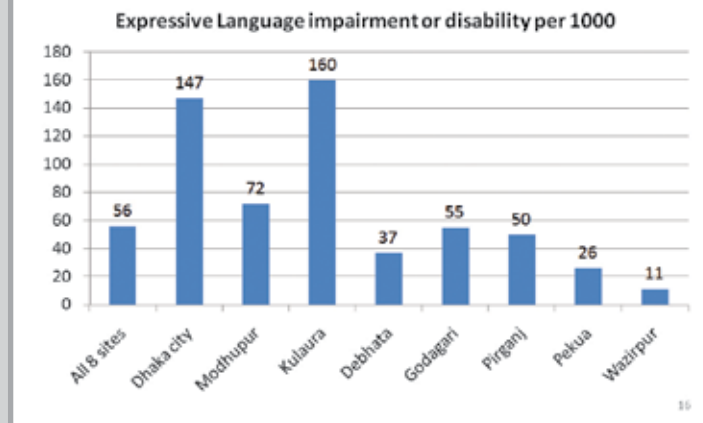
Fig 12f: Prevalence of Cognitive impairment or disability for total assessed children by 8 study sites and combined, weighted (N=7280)

Cognitive impairment or disability per 1000

Site	Value
All 8 sites	158
Dhaka city	261
Modhupur	279
Kulaura	150
Debhata	58
Godagari	444
Pirganj	113
Pekua	83
Wazirpur	12
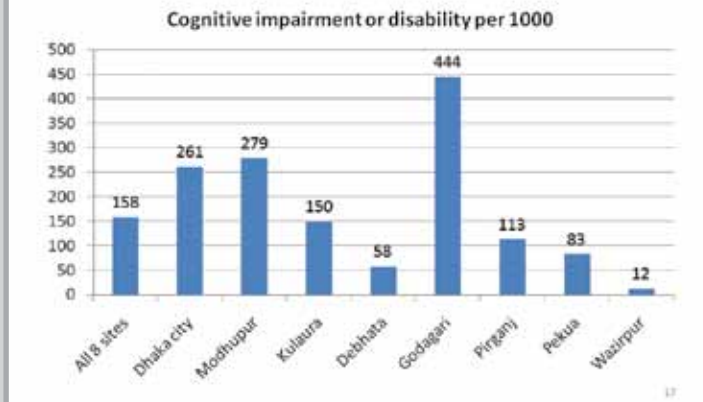
Fig 12g: Prevalence of Behavior impairment or disability for total assessed children by 8 study sites and combined, weighted (N=7280)

Behavior impairment or disability per 1000

Site	Value
All 8 sites	36
Dhaka city	83
Modhupur	102
Kulaura	88
Debhata	36
Godagari	13
Pirganj	8
Pekua	17
Wazirpur	7
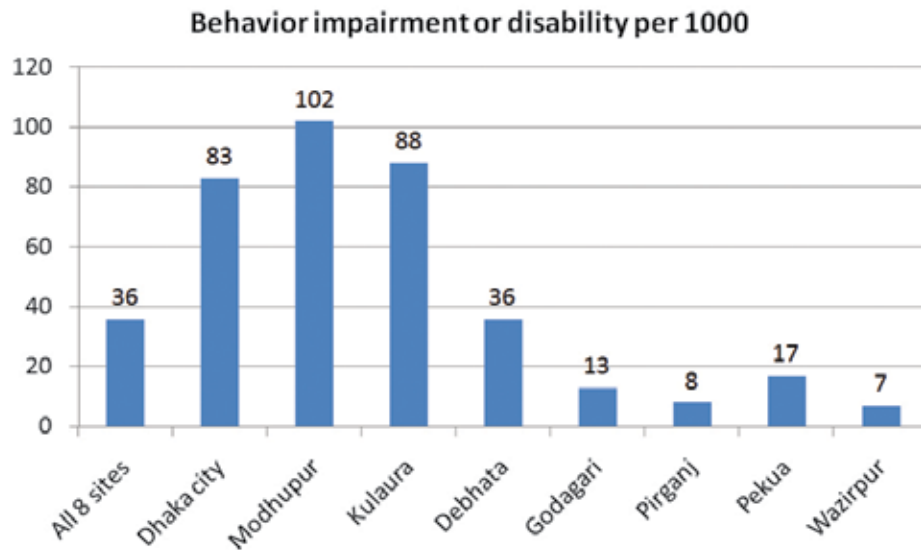
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Fig 12h: Prevalence of Seizure impairment or disability for total assessed children by 8 study sites and combined, weighted (N=7280)

Seizure impairment or disability per 1000

Site	Value
All 8 sites	17
Dhaka city	49
Modhupur	45
Kulaura	18
Debhata	9
Godagari	25
Pirganj	9
Pekua	8
Wazirpur	0
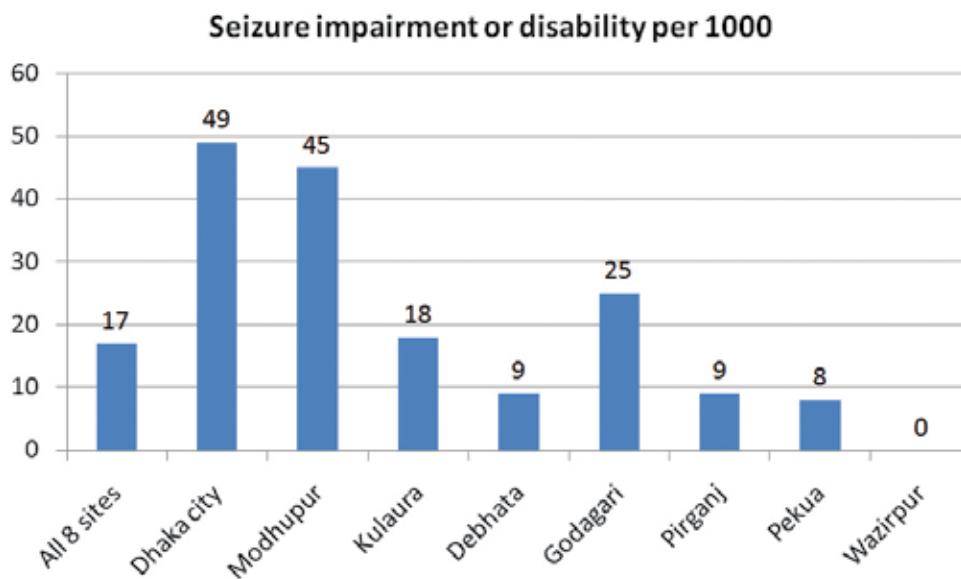
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Table IV.III.1a: Prevalence of any NDI/NDD for children aged 0-9 years_for combined and 8 Study Sites, unweighted and weighted

SITE	UNWEIGHTED			WEIGHTED		
	Prevalence per 1000	95% CI-lower	95% CI-upper	Prevalence per 1000	95% CI-lower	95% CI-upper
All 8 sites	371	304	438	**185**	161	208
Dhaka city	290	228	353	290	287	526
Modhupur	503	434	572	301	212	389
Kulaura	232	174	291	198	118	278
Debhata	304	240	367	90	47	134
Godagari	593	526	661	**490**	394	586
Pirganj	513	444	582	120	82	158
Pekua	350	284	415	101	56	147
Wazirpur	178	125	230	**49**	14	84

Table IV.III.1b: Prevalence of Specific NDI/NDD for total assessed children_ by 8 Study Sites, unweighted (n=1201)

SITE	Prevalence per 1000							
	Gross motor	Fine motor	Vision	Hearing	Exp Language	Cognition	Behavior	**Seizures**
All Sites	87	**108**	27	65	**154**	**324**	84	49
Dhaka city	59	93	29	49	147	0.261	83	49
Modhupur	74	103	37	44	103	488	111	51
Kulawra	75	75	20	75	184	184	109	54
Debhata	74	81	13	67	128	263	**121**	60
Godagari	125	148	23	70	**156**	**507**	39	**62**
Pirganj	103	131	21	**82**	229	475	49	54
Pekua	**135**	**164**	35	64	164	292	107	50
Wazirpur	59	67	**42**	64	93	101	59	0

Table IV.III.1c: Prevalence of Specific NDI/NDD for total assessed children_ by 8 Study Sites, weighted (N=7280)

Prevalence per 1000

SITE	Gross motor	Fine motor	Vision	Hearing	Exp Language	Cognition	Behavior	Seizures
All Sites	36	45	12	27	56	**158**	36	17
Dhaka city	59	93	29	49	147	261	83	**49**
Modhupur	68	**101**	**34**	44	72	279	**102**	45
Kulaura	**93**	83	13	**52**	**160**	150	88	18
Devhata	20	21	2	19	37	58	36	9
Godagari	25	72	11	44	55	**444**	13	25
Pirganj	18	23	3	14	50	113	8	9
Pekua	30	35	5	10	26	83	17	8
Wazirpur	16	8	23	9	11	12	7	0

Table IV.III.2a: Prevalence of any NDI/NDD in children aged 0-<2 years_by 8 Study Sites, unweighted (n=237) and weighted (n=1465)

SITE	UNWEIGHTED			WEIGHTED		
	Prevalence per 1000	95% CI-lower	95% CI-upper	Prevalence per 1000	95% CI-lower	95% CI-upper
All 8 sites	**265**	205	326	**135**	91	179
Dhaka city	234	175	292	234	113	355
Modhupur	250	190	309	156	8	304
Kulawra	**66**	32	101	**9**	3	21
Devhata	214	157	270	162	24	300
Godagari	416	348	484	**312**	114	510
Pirganj	**500**	431	568	220	58	381
Pekua	258	197	318	49	18	80
Wazirpur	100	58	141	46	24	118

Table IV. III.2b: Prevalence of Specific NDI/NDD in children aged 0-<2 years_by 8 Study Sites, unweighted (n=237)

Prevalence per 1000

SITE	Gross motor	Fine motor	Vision	Hearing	Expr language	Cognition	Behavior	Seizures
All 8 sites_ Combined	118	92	46	71	151	**185**	54	29
Dhaka city	63	63	21	**106**	191	170	21	21
Modhupur	125	**166**	0	0	125	208	**125**	41
Kulaura	52	52	52	105	105	52	52	0
Debhata	71	35	35	71	107	107	71	0
Godagari	125	125	0	83	83	**333**	41	41
Pirganj	**235**	147	58	88	**352**	382	29	**58**
Pekua	193	129	**129**	96	161	161	96	**58**
Wazirpur	66	66	66	0	0	33	66	0

Table IV.III.2c: Prevalence of Specific NDI/NDD in children aged 0-<2 years_by 8 Study Sites, weighted (n=1465)

Prevalence per 1000

SITE	Gross motor	Fine motor	vision	Hearing	expressive language	Cognition	Behavior	**Seizures**
All Sites Combined	38	24	7	25	39	90	18	9
Dhaka city	**63**	63	21	**106**	**191**	170	21	**21**
Modhupur	57	**104**	16	0	16	109	**57**	5
Kulawra	4	4	4	9	9	4	4	0
Devhata	43	5	5	43	48	48	43	0
Godagari	13	13	0	53	8	**258**	4	4
Pirganj	37	23	9	14	103	201	4	9
Pekua	37	24	**24**	18	30	30	18	12
Wazirpur	41	5	10	**0**	**0**	**5**	**5**	**0**

3. PREVALENCE IN OLDER AGE GROUPS (2-9 YEAR OLDS)

Prevalence of any NDI/NDD in children aged 2-9 years by all sites combined and by 8 Sites, unweighted (n=964) and weighted (n= 5815) (Table IV.III.3a)

Prevalence for all sites combined, unweighted, was 397/1000; and weighted prevalence was 198/1000. The highest weighted prevalence was in Godagari (535/1000). Lowest weighted prevalence was in Wazirpur (49/1000), followed by Debhata (62/1000) and Pirganj (95/1000).

Prevalence of Specific NDI/NDD in children aged 2-9 years_by 8 Sites, unweighted (n=964) (Table IV.III.3b)

Highest unweighted prevalence for a specific NDI/NDD, all sites combined, was in cognition (358/1000) and lowest for vision (22/1000).

Site wise, highest unweighted prevalence for NDIs/NDDs in gross motor was 153/1000 in Wazirpur; for

all sites combined, was in cognition (177/1000) and lowest for vision (13/1000).

Site wise, highest weighted prevalence for NDIs/NDDs in gross motor was 105/1000 in Kulaura ; for fine motor in Dhaka city (102/1000); for vision in Modhupur (44/1000); for hearing in Modhupur and Kulaura (58/1000); for expressive language in Kulaura (162/1000); for cognition in Godagari (490/1000); for behavior in Modhupur (116/1000); and for seizures in Modhupur (58/1000).

IV. PREVALENCE OF ANY NEURODEVELOPMENTAL DISABILITY (NDD)
1. PREVALENCE OF ANY NDD IN 0-9 YEAR OLDS

Prevalence of any neurodevelopmental disability (NDD) in 0-9 years old in all site combined and 8 sites, unweighted and weighted (Table IV.IV.1a.) (figure 13)

Unweighted prevalence for all sites combined of any disability (NDD) was 180/1000 (95%CI: 127-233).

Weighted prevalence for all sites combined of any disability (NDD) was 71/1000 (95%CI: 56-85). Site wise the prevalence was highest in Kulaura (162/1000) and lowest in Wazirpur (14/1000).

Fig 13: Prevalence of Any disability (NDD) in 0-9 years old all site combined and 8 sites, weighted

=>1 disability per 1000
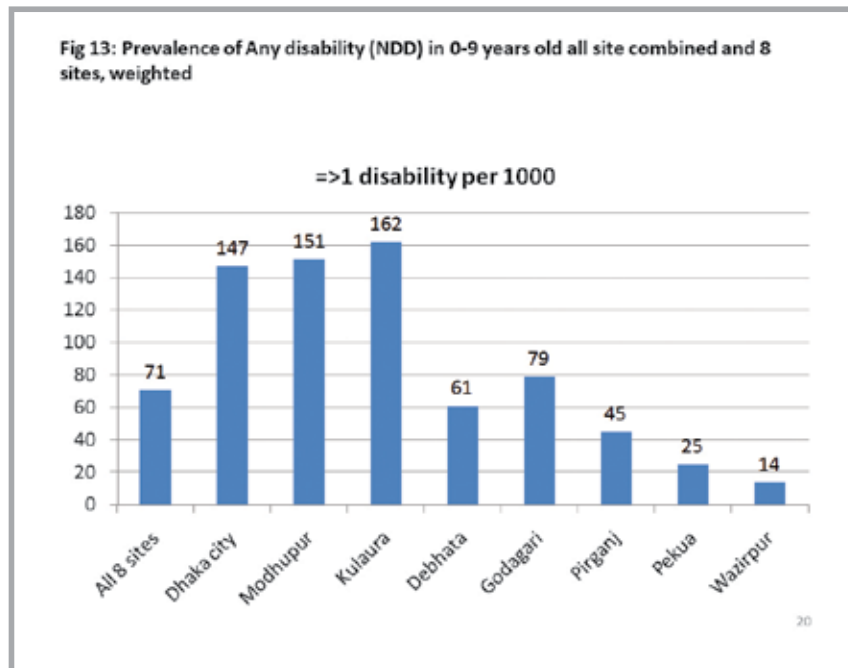
2. PREVALENCE OF SPECIFIC NDDS IN 0-9 YEAR OLDS

Prevalence of specific disabilities (NDDs) in 0-9 year olds in all sites combined and in 8 sites, weighted (Table IV.IV.2a) (fig 14a, 14b, 14c, 14d, 14e, 14f, 14g, 14h)

Mean weighted prevalence of specific disabilities for all sites combined was 23/1000 (gross motor), 28/1000 (fine motor), 6/1000 (vision), 14/1000 (hearing), 39/1000 (expressive language), 44/1000 (cognition), 20/1000 (behavior), and 6/1000 (seizure). The two highest prevalence by site were for both cognitive disabilities and expressive language in Dhaka City (113/1000). The second highest prevalence of cognitive disabilities in Modhupur (105/1000) and for expressive language in Kulaura (109/1000). Wazirpur had the lowest prevalence across all developmental domains.

fine motor in Pirganj (178/1000); for vision in Modhupur (45/1000); for hearing in Wazirpur (102/1000); for expressive language in Pirganj (201/1000); for cognition in Modhupur (549/1000); for behavior in Debhata (133/1000); and for seizures in Debhata (75/1000).

Prevalence of Specific NDIs in children aged 2-9 years_by all sites combined and by 8 Sites, weighted (Table IV.III.3c)

Highest weighted prevalence for a specific NDI/NDD,

Table IV.III.3a: Prevalence of any NDI/NDD in children aged 2-9 years_by 8 Study Sites, unweighted (n=964) and weighted (n= 5815)

SITE	UNWEIGHTED			WEIGHTED		
	Prevalence per 1000	95% CI-lower	95% CI-upper	Prevalence per 1000	95% CI-lower	95% CI-upper
All 8 Sites	397	330	464	**198**	171	226
Dhaka city	3077	244	371	307	236	379
Modhupur	558	490	626	342	238	447
Kulaura	252	192	311	227	137	316
Debhata	325	260	389	**62**	32	92
Godagari	634	568	700	**535**	428	641
Pirganj	516	448	585	**95**	75	116
Pekua	376	309	442	**117**	59	175
Wazirpur	204	149	260	**49**	9	89

Table IV.III.3b: Prevalence of Specific NDI/NDD in children aged 2-9 years_ by 8 Study Sites, unweighted (n=964)

SITE	Prevalence per 1000							
	Gross motor	Fine motor	vision	Hearing	expressive language	Cognition	Behavior	**Seizures**
All Sites Combined	79	112	22	64	155	**358**	92	53
Dhaka city	57	32	32	32	134	288	102	57
Modhupur	63	45	**45**	54	99	**549**	108	54
Kulaura	78	157	15	70	196	204	118	63
Debhata	75	8	8	66	133	300	**133**	**75**
Godagari	125	28	28	67	173	548	38	67
Pirganj	73	**178**	13	80	**201**	496	53	53
Pekua	119	9	9	55	165	330	110	45
Wazirpur	**153**	34	34	**102**	125	90	68	0

Table IV.III.3c: Prevalence of Specific NDI/NDD in children aged 2-9 years_ by 8 Study Sites, weighted

Prevalence per 1000

SITE	Gross motor	Fine motor	vision	Hearing	expressive language	Cognition	Behavior	Seizures
All Sites Combined	36	51	13	28	61	**177**	41	20
Dhaka city	57	**102**	32	32	134	288	102	57
Modhupur	72	101	**44**	**58**	89	328	**116**	**58**
Kulaura	**105**	94	14	**58**	**162**	172	100	21
Debhata	11	26	1	10	32	58	32	11
Godagari	28	86	14	42	67	**490**	16	31
Pirganj	13	23	2	14	37	92	10	10
Pekua	30	38	1	8	25	98	16	7
Wazirpur	6	9	29	11	14	14	7	0

Table IV.IV.1a: Prevalence of Any disability (NDD) in 0-9 years old allsite combined and 8 sites, unweighted_weighted

	UNWEIGHTED			WEIGHTED		
SITE	Prevalence per 1000	95% CI-lower	95% CI-upper	Prevalence per 1000	95% CI-lower	95% CI-upper
All sites combined	**180**	127	233	**71**	56	85
Dhaka city	147	99	196	147	101	193
Modhupur	185	131	238	151	81	221
Kulaura	198	143	253	**162**	89	236
Debhata	168	117	220	61	22	100
Godagari	203	147	258	79	33	125
Pirganj	251	191	311	45	32	57
Pekua	157	107	207	25	15	35
Wazirpur	118	74	163	**14**	7	22

Table IV.IV.2a: Prevalence of specific NDD (disabilities) in 0-9 years olds in 8sites, weighted

SITE	Prevalence per 1000							
	Gross motor	Fine motor	vision	Hearing	expressive language	Cognition	Behavior	Seizures
All site combined	23	28	6	14	39	44	20	6
Dhaka city	34	64	19	14	113	113	39	24
Modhupur	44	45	12	34	58	105	56	10
Kulaura	58	35	13	5	109	76	50	4
Debhata	16	5	1	17	31	25	17	1
Godagari	20	28	10	23	39	52	3	11
Pirganj	15	9	1	9	21	33	6	5
Pekua	10	9	4	3	14	19	9	3
Wazirpur	5	7	3	0	11	9	6	0

Fig14a : Prevalence of Gross Motor disability in 0-9 years olds in 8sites and combined, weighted

Gross Motor disability per 1000

Bar chart values:
- All 8 sites: 23
- Dhaka city: 34
- Modhupur: 44
- Kulaura: 58
- Debhata: 16
- Godagari: 20
- Pirganj: 15
- Pekua: 10
- Wazirpur: 5
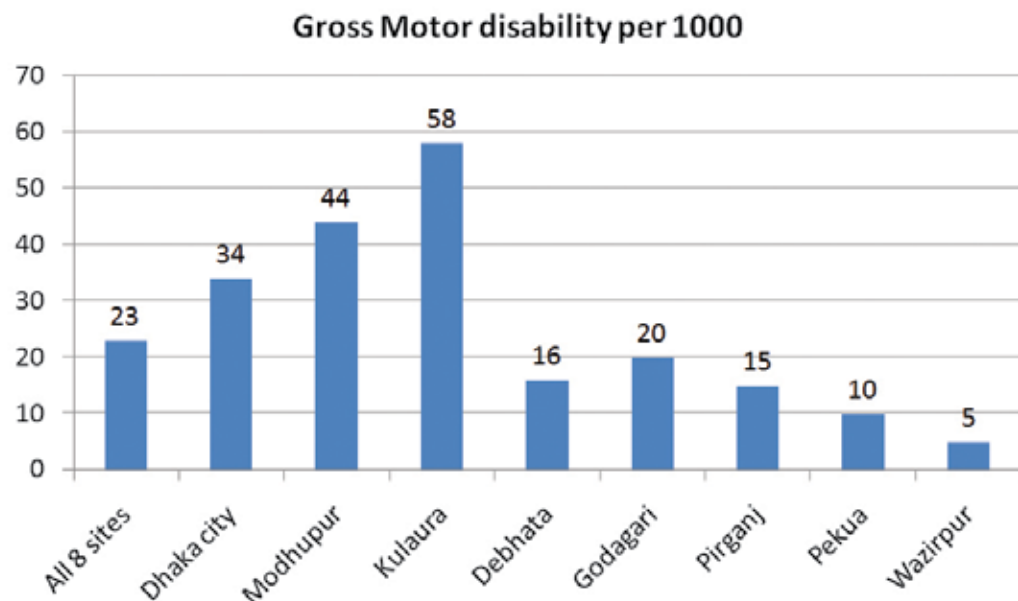
21

Fig 14b: Prevalence of Fine Motor disability in 0-9 years olds in 8sites and combined, weighted

Fine Motor disability per 1000

Bar chart values:
- All 8 sites: 28
- Dhaka city: 64
- Modhupur: 45
- Kulaura: 35
- Debhata: 5
- Godagari: 28
- Pirganj: 9
- Pekua: 9
- Wazirpur: 7
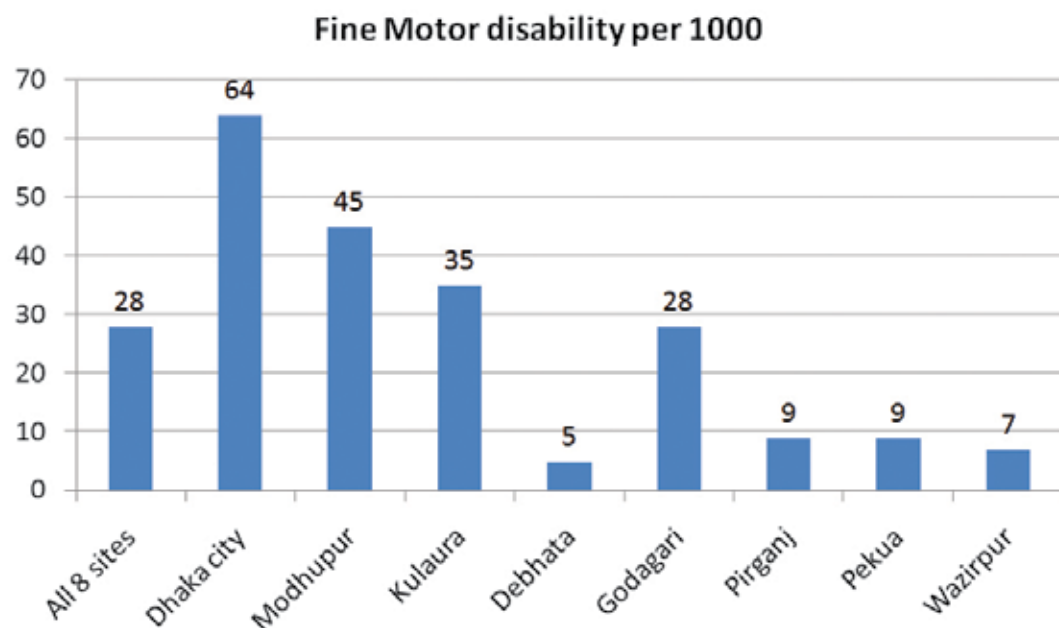
22

Fig 14c:Prevalence of Vision disability in 0-9 years olds in 8sites and combined, weighted

Vision disability per 1000
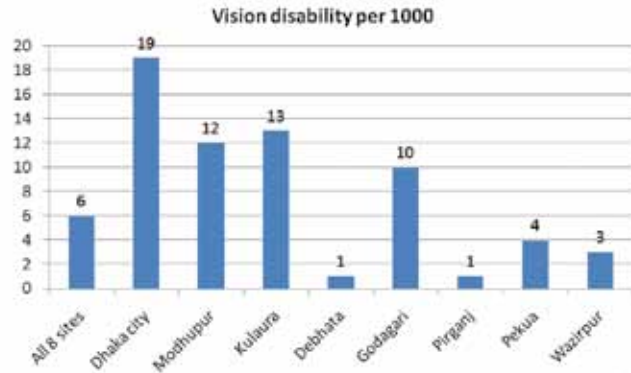
Fig 14d: Prevalence of Hearing disability in 0-9 years olds in 8sites and combined, weighted

Hearing disability per 1000
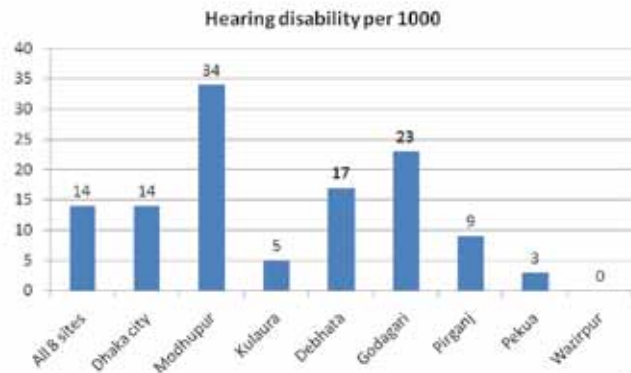
Fig 14e: Prevalence of Expressive Language disability in 0-9 years olds in 8sites and combined, weighted
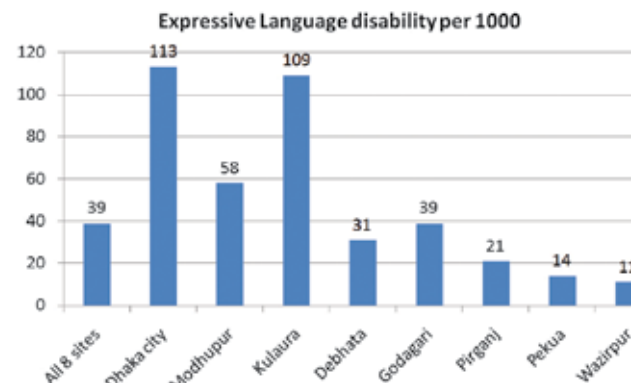
Expressive Language disability per 1000

Fig 14f: Prevalence of Cognitive disability in 0-9 years olds in 8 sites and combined, weighted

Cognitive disability per 1000
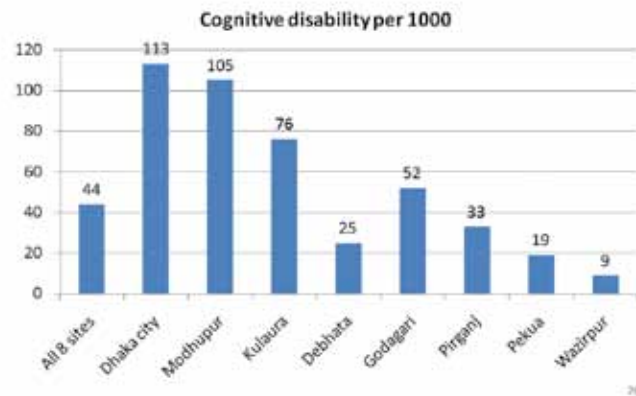
Fig 14g: Prevalence of Behavior disability in 0-9 years olds in 8 sites and combined, weighted

Behavior disability per 1000
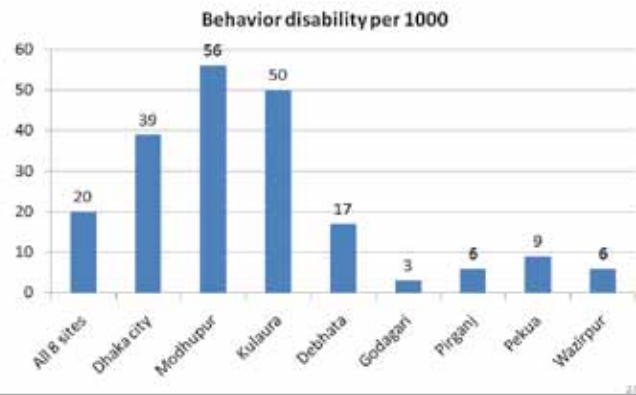
Fig 14h: Prevalence of Seizure disability in 0-9 years olds in 8 sites and combined, weighted

Seizure disability per 1000
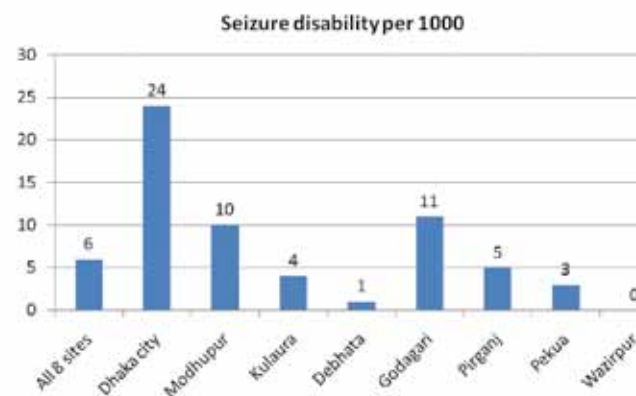
V. PREVALENCE BY DIAGNOSTIC GROUPS: FROM STAGE III

Prevalence by Diagnostic Groups in combined and in 8 survey sites (Table IV.V.1a) (Figure 15)

When all sites were combined, prevalence was highest in the 'Cognitive Delay' group (46/1000) followed by 'Expressive Language Delay/Disorders' (20/1000) group. Site wise, the highest prevalence of the 'Cerebral Palsies' was in Dhaka city (30/1000), for 'Cognitive Delay/Disorders' in Dhaka city (148/1000), for 'Developmental Motor Delay' in Dhaka city (79/1000), for 'Expressive Language Delay/Disorders' in Dhaka city (99/1000), for 'Seizures/Epilepsies' in Dhaka city (30/1000), for 'Mental Health Disorders' in Dhaka city (59/1000), for 'Blindness/Visual Impairments' in Dhaka city (10/1000), for 'Deafness/Hearing Impairment' in Debhata (11/1000), for 'Genetic/Syndromic/Anomalies/Regressions' in Kulaura (12/1000). Second highest prevalence for 'Cognitive Delay/Disorder' was in Pirganj (79/1000) and for 'Expressive Language Delay/Disorders' in Godagari (20/1000). All prevalences were highest for Dhaka city and lowest for Wazirpur.

Percentages of diagnosis of children by Diagnostic Groups all sites combined and by 8 survey sites on Stage III multiprofessional evaluation (Table IV.V.1b.)

For all sites combined 77% were diagnosed in the 'Cognitive Delay/Disorder' group, 25% in the 'Language Delay/Disorder' group, 14% in the 'Developmental Motor Delay' group; 10% in the 'Mental Health disorders' group; 8% in the 'Genetic/Syndromic/Anomalies/Regression' group; 7% in the 'Cerebral Palsies' group; and 5% each in the 'Deafness or Hearing Impairment' and 'Blindness or Visual Impairment' group.

There were differences by site. Although all sites had 61%-90% diagnosed with 'Cognitive Delay/Disorder' in Wazirpur it was 26%. For 'Expressive Language Delay/Disorders' the highest numbers were diagnosed in Kulaura (78%). 39% in Debhata, 29% in Wazirpur and 19% in Kulaura had a diagnosis of 'Genetic/Syndromic/Anomaly/Regressions etc'. Most numbers of children were diagnosed with 'Mental Health Disorders' in Wazirpur (50%) and Debhata (39%). Highest numbers with 'Cerebral Palsies' were diagnosed in Kulaura (26%).

Figure 15. Mean Prevalence per 1000 by Diagnostic Groups in all sites combined

SITE	Cerebral Palsies Prevalence per 1000	Cognitive Delay/ Disorders Prevalence per 1000	Developmental Motor Delay Prevalence per 1000	Expressive Language Delay/ Disorders Prevalence per 1000	Seizures/ Epilepsies Prevalence per 1000	Mental Health Disorders Prevalence per 1000	Blindness/ Visual impairment Prevalence per 1000	Deafness/ Hearing Impairment Prevalence per 1000	Genetic/ Syndromic/ Anomalies/ Regressions Prevalence per 1000
All sites combined	4	46	12	20	7	7	3	5	4
Dhaka city	30	148	79	99	30	59	10	2	-
Modhupur	4	56	2	5	5	3	2	2	2
Kulaura	6	22	-	20	6	9	2	3	4
Debhata	5	42	9	23	10	9	4	11	12
Godagari	2	63	20	17	7	6	5	6	2
Pirganj	1	79	15	34	6	-	2	8	3
Pekua	3	30	14	10	8	3	4	3	3
Wazirpur	4	16	11	13	1	8	2	3	5

Table IV.V.1b: Percentages of Diagnoses by Diagnostic Groups on Stage III multiprofessional evaluation

SITE	Cerebral Palsies	Cognitive Delay/ Disorders	Developmental Motor Delay	Expressive Language Delay/ Disorders	Seizures/ Epilepsies	Mental Health Disorders*	Blindness/ Visual impairment	Deafness/ Hearing Impairment	Genetic/ Syndromic/ Anomalies/ Regressions
All 8 sites (n=413)	7%	77%	14%	25%	5%	10%	4%	5%	8%
Dhaka city (n=49)	11%	53%	45%	33%	4%	14%	1%	1%	0%
Modhupur (n=67)	9%	83%	4%	5%	9%	0%	4%	4%	4%
Kulaura (n=32)	26%	61%	0%	78%	8%	9%	7%	1%	19%
Debhata (n=45)	1%	62%	20%	22%	1%	39%	1%	20%	39%
Godagari (n=69)	0%	90%	16%	16%	5%	10%	5%	8%	3%
Pirganj (n=87)	0%	69%	32%	34%	1%	0%	0%	1%	0%
Pekua (n=43)	0%	69%	2%	1%	1%	0%	1%	0%	0%
Wazirpur (n=21)	1%	26%	1%	26%	0%	50%	0%	0%	25%

*Frequency of ASDs was 12% in Dhaka city and 1% in rural populations

VI. AUTISM SPECTRUM DISORDERS

In home-based screening (ie, TQP), all the 8 children diagnosed with core autism, screened positive. In the center-based assessment CHCP administering the RNDA were able to identify an additional 2 children for behavior impairments, who, in the hospital-based evaluations were diagnosed with Pervasive Developmental Disorder, Not Otherwise Specified (PDD-NOS) and Rett Syndrome. The MCHAT and SCQ, administered to all children in Stage III, was able to screen for core autism, but missed the other disorders.

Frequency of diagnosis of Autism Spectrum Disorder in Stage Three diagnosis by professionals in 8 survey sites (Table IV.VI.1a.)

A total of 8 children with Autism (6 Dhaka city; 1 Kulaura; 1 Godagari) were diagnosed in the 8 study sites. In addition, 1 child with Pervasive Developmental Disorders, Not Otherwise Specified (PDD NOS) (Kulaura) and 1 child with Rett Syndrome (Godagari) were diagnosed.

Prevalance of Autism Spectrum Disorders combined for all sites and in rural (7 Upazillas) pop-ulations in a subpopulation of referred children (Table IV.VI.1b.) (figure 16)

The overall prevalence rate for Autism Spectrum Disorders was 1.55/1000; and in rural populations it was 0.68/1000 and in Dhaka city 30/1000.

Of the 6 children diagnosed with autism out of about 203 screened in the community door to door survey in Dhaka city, 3 children (7.3 year old boy; 9 year old girl; 5.2 year old boy) who were diagnosed prior to the present survey had 'migrated' to the area because of the availability of special schools for autistic children. The 3 other children (8.6 year old girl; 5.7 year old boy; 4.4 year old girl), first diagnosed in the present survey, had been residents in the area prior to their diagnosis. Only the oldest was attending a mainstream school.

The girl diagnosed in Godagari (7.3 year old) was attending a mainstream school. The boy identified in Kulaora (6.1 year old) was not attending school.

A boy aged 2.57 years was diagnosed PDD NOS in Godagari was not attending school and a girl aged 5.67 years in Kulaura was also out of school.

Figure 16: Mean Prevalance per 1000 of Autism Spectrum Disorders in Dhaka city, in rural populations (7 Upazillas), and combined

Autism Spectrum Disorder per 1000
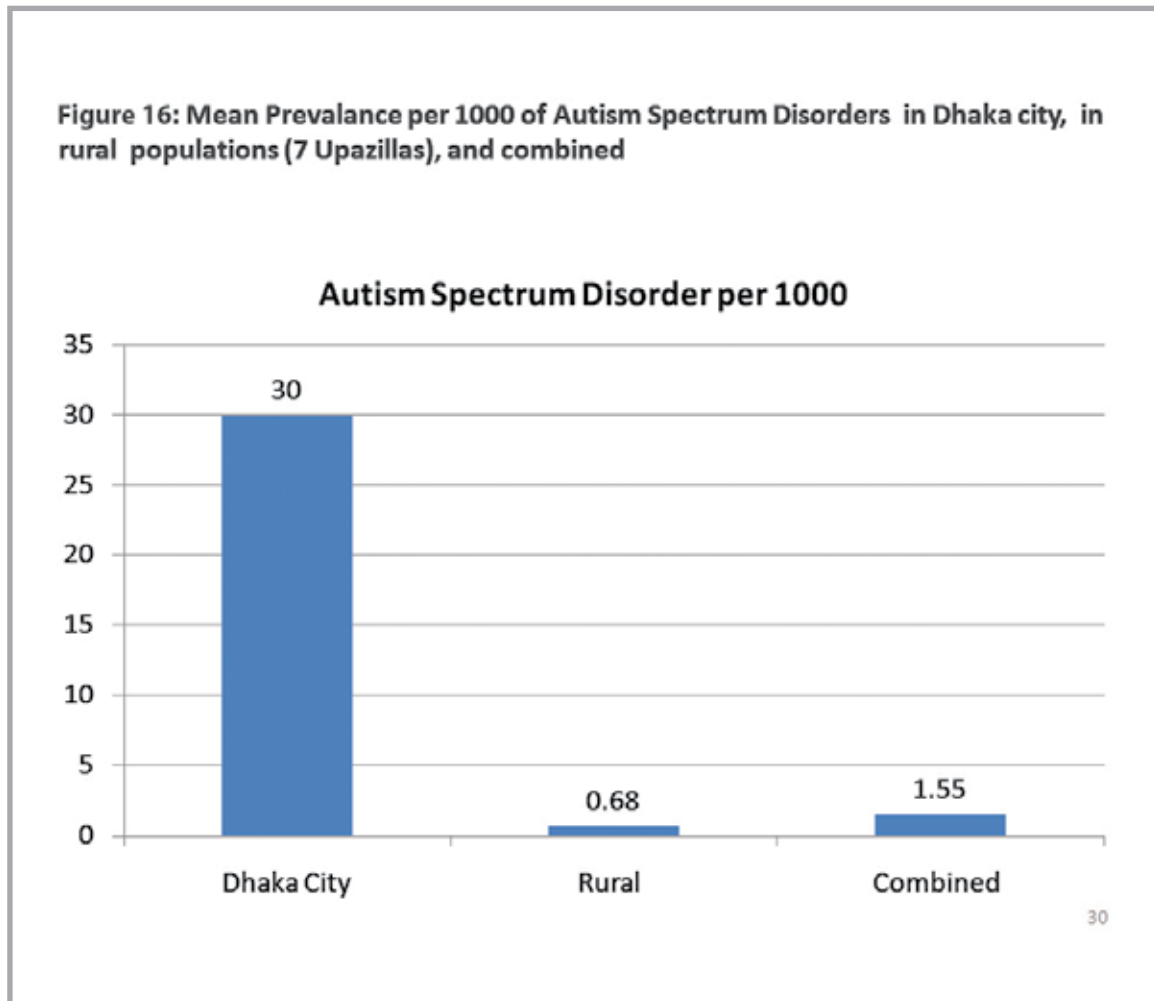
Table IV.VI.1a: Frequency of diagnosis of Autism Spectrum Disorders in Stage Three diagnosis by professionals in 8 survey sites

	Autism		Rett Syndrome		PDD NOS		Total children evaluated
SITE	Number	%	Number	%	Number	%	
All 8 sites	8	1.9	1	0.2	1	0.2	414
Dhaka city	6	12.2	0	0	0	0	49
Modhupur	0	0	0	0	0	0	67
Kulawra	1	3.1	1	3.1	0	0	32
Devhata	0	0	0	0	0	0	45
Godagari	1	1.4	0	0	1	1.4	69
Pirganj	0	0	0	0	0	0	88
Pekua	0	0	0	0	0	0	43
Wazirpur	0	0	0	0	0	0	21

Table IV.VI.1b: Prevalance of ASD combined for all sites, and in urban (Dhaka city) and rural (7 Upazillas) populations

SITE	PREVALENCE PER 1000
ALL SITES COMBINED	1.55
DHAKA CITY	30
RURAL	0.68

VII. EMERGING SYSTEMS OF REFERRAL

Grades of severity of functional limitations in Stage Two assessments; and their relationship with Stage Three diagnostic workouts was explored.

Ratio (in %) of NDIs and NDDs among children assessed to have specific NDIs/NDDs by CHCPs in Stage Two assessment on RNDA (Table IV.VII.1a) (figure 17)

In every neurodevelopmental domain assessed by CHCP within community clinics, there were significant proportions of children with milder conditions (NDIs). For example, among the proportion assessed with cognitive difficulties (32.5%), 20% had NDIs compared to 12% with NDDs.

Percentage of impairments (NDIs) and disabilities (NDDs) assessed in Stage Two, by Diagnostic Groups (% of total, n=413) evaluated in Stage Three (figure 18)

Figure 17: % of Impairments and Disabilities on RNDA by Developmental Domain, *n=1201 (100%)*

Figure 18: Ratio in % of NDIs and NDDs assessed in Stage Two in each Diagnostic Groups (% of total, n=413) evaluated in Stage Three
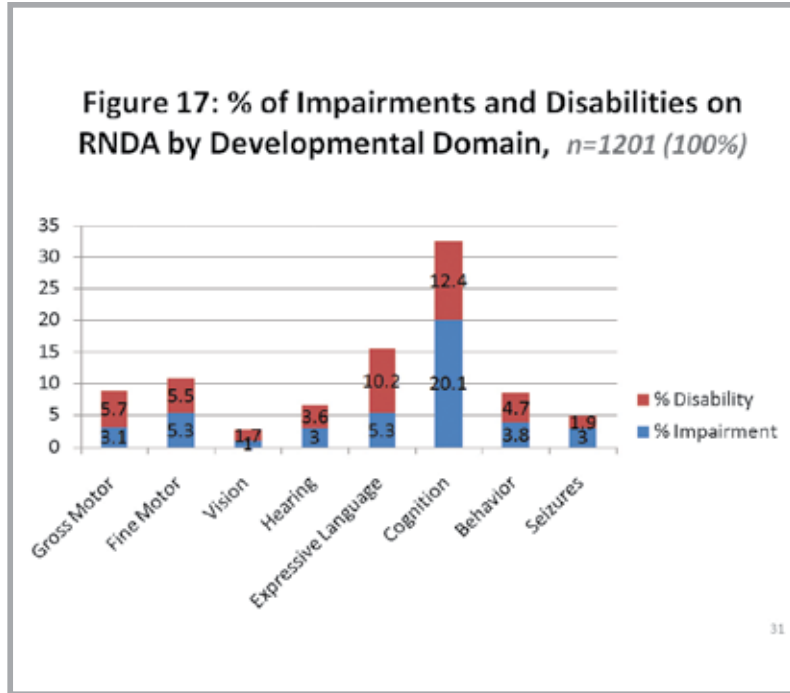
52.8% of children with a diagnosis of 'Cognitive Delay or Disorder' had impairments (or mild functional limitations) when assessed by CHCPs on the RNDA. This group of children comprised 47.2% of the evaluated population in Stage Three. The second commonest diagnostic group was 'Language Delay or Disorders' (34.6%) where 19.6% children had impairments on the RNDA; and the rest had more serious grades of functional limitations or disability. The third largest diagnostic group was 'Motor Delay' (21.1%) where 20.7% were identified with impairments. No child in the 'Cerebral Palsies' diagnostic group was assessed for impairment, ie, all had serious functional limitations or disabilities. 38%, 30.6%, and 25.8% children with a 'Mental Health condition', or 'Seizures/ Epilepsies' or 'Genetic/Syndromic/ Congenital Anomaly/etc' diagnosis had impairments on RNDA assessment, respectively. 23.7% and 8.7% of children with diagnosis of 'Deafness or Hearing Impairment' and 'Blindness or Visual Impairment' had impairments assessed by CHCPs.
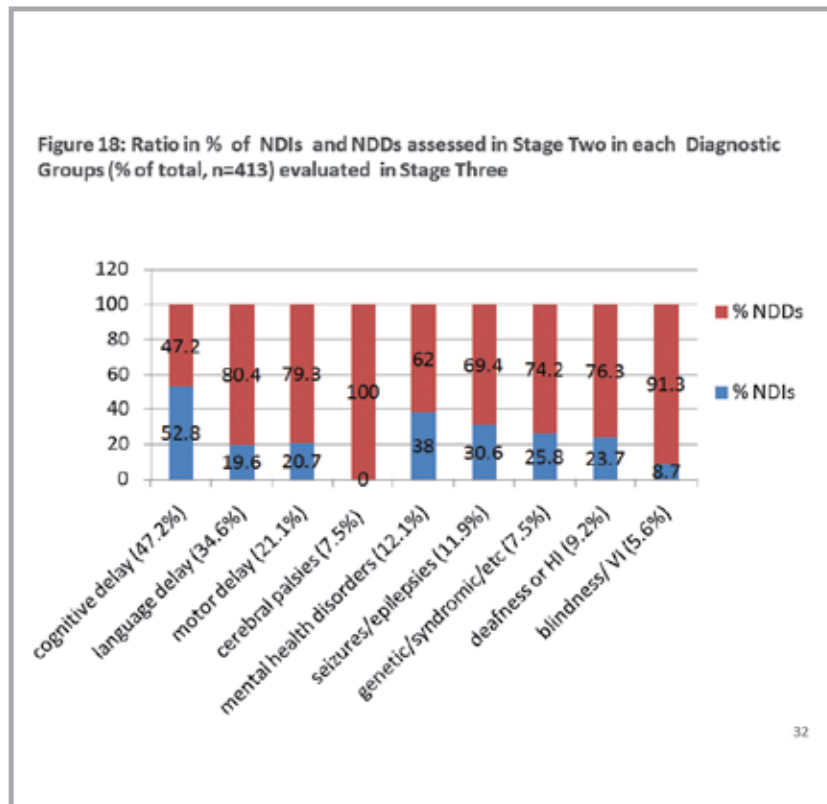
Table IV.VII.1a: Ratio of NDIs and NDDs assessed in Stage Two by Diagnostic Groups (% of total, n=413) from Stage Three		
Diagnostic Group	**Impairments (NDI)**	**Disability (NDD)**
Cognitive Delay (47.2%)	52.8	47.2
Language Delay (34.6%)	19.6	80.4
Motor Delay (21.1%)	20.7	79.3
Cerebral Palsies (7.5%)	0	100
Mental Health conditions (12.1%)	38	62
Seizures/Epilepsies (11.9%)	30.6	69.4
Genetic/Syndromic/etc (7.5%)	25.8	74.2
Deafness or Hearing Impairment (9.2%)	23.7	76.3
Blindness/ Visual Impairment (5.6%)	8.7	91.3

VIII. ESTIMATES OF RISK FACTORS

Risk of any and specific NDIs/NDDs by socio-demographic factors (Table IV.VIII.1a.)

Mother's inability to read a newspaper was the most significant risk factor to affect screen positivity (p value 0.0001; OR 1.496, 95% CI: 1.173-1.908).

Other variables which had significant correlations with child's screen positivity, but not yielding significant ORs, were: religion (p value 0.035), fathers with less than primary school education (p value 0.024), mothers with less than primary school education (p value 0.0001), and consanguinity (p value 0.0001).

Risk of screen positivity by perinatal factors (0-<2 year olds) (Table IV.VIII.1b.)

65.40% were home delivered. 57.36% were delivered by a skilled person (SBA, nurse or doctor).

There was a high risk of screen positivity related to perinatal factors. Preterm delivery (OR 3.734), delayed cry (OR 5.354), change of color (OR 6.909), neonatal jaundice (15.292) were the most significant. Home delivery and neonatal seizures were significantly correlated (p values; 0.048 and 0.0001, respectively), although ORs were not significant.

Risk of screen positivity by perinatal factors (2-9 year olds) (Table IV.VIII.1c)

83.43% were home delivered. 45.94% were delivered by a skilled person (SBA, nurse or doctor).

There was a high risk of screen positivity related to perinatal factors. Neonatal Jaundice (OR 24.958), delayed cry (OR 5.111), change of color (OR 4/493), were the most significant. Delivery by unskilled person and neonatal seizures were also significantly correlated (p values; 0.027 and 0.0001, respectively), although ORs did not reach significance.

Risk of screen positivity by nutritional status in Stage Two assessed children (Table IV.VIII.1d.)

Stunted children were at higher risk of being screened positive for a NDI/NDD (OR 1.601, 95% CI: 1.39 − 2.069). Wasting was not significantly correlated to screen positivity.

Any and Specific NDI/NDD (information from Stage II) by dichotomous Wealth Quintiles (Lowest WQs=WQ 1 and 2; Highest WQs= WQ 3, 4 or 5), all sites combined. (Table IV.VIII.1e)

Percentage of children assessed with any NDI/NDD in was slightly higher (39.5%) in the lowest quintile than in the higher quintiles (38%), which did not reach statistical significance. Amongst the specific functional impairments, lowest quintiles had the highest proportion of children with cognitive problems (lowest quintiles 35.5% vs. highest quintiles 30.9%), and gross motor impairments (lowest quintiles 8.9% vs. highest quintiles 8.5%), the differences not reaching statistical significance. All other specific impairments had more proportion of children from the highest wealth quintiles (WQs), ie, expressive language impairments (lower WQs 14% vs. higher WQ 16%; p value 0.22; OR=1.162, 95% CI: 0.825-1.639), vision impairments (lower WQs 1.5% vs. higher WQ 3.3%; p value 0.046; OR=2.27, 95% CI: 0.923-5.615), seizure disorders (lower WQs 3.4% vs. higher WQ 5.8%; p value 0.053; OR=1.71, 95% CI: 0.926-3.183), behavior problems (lower WQs 7.1% vs. higher WQ 9.2%; p value 0.137, OR=1.32, 95% CI: 0.838-2.077), with weak significance; and, fine motor impairments (lower WQs 9.9% vs. higher WQ 11%), , the last group not reaching statistical significance.

Diagnostic groups (information from Stage III) by dichotomous Wealth Quintiles (Lowest WQs=WQ 1 and 2; Highest WQs= WQ 3, 4 or 5), all sites combined. (Table IV.VIII.1f.)

A large majority of children were diagnosed under the Cognitive Delay/Disorders group by professionals, ie, 92% versus 77.3% from the lowest and highest WQs, respectively (p value 0.0001; OR=0.296). The only other group of disorders where the lowest WQs had larger proportions of children were for 'Deafness or Hearing Impairment' (lowest WQ=11.3%; highest WQ=8%), not reaching statistical significance.

In all other groups of disorders there were more children from the highest WQs, the highest proportion being 'Mental Health Disorders' (lowest WQ=6%; highest WQ=15.5%; p value 0.003, OR=2.884, 95% CI: 1.349-6.164) and 'Developmental Motor Delay' (lowest WQ=17.3%; highest WQ=22.3%; not statistically significant).

Table IV.VIII.1a: Risk of screen positivity by sociodemographic factors

Variables	Dichotomous Values	# of families/ chidlren	% of screened positives of total within group	chisquare	df	p value	OR	95% CI Lower	95% CI Upper
Religion									
	Muslim	2838	7.3	3.431	1	0.035	0.674	0.443	1.026
	Non Muslim	498	5						
Father's Education									
	<Primary	2822	7.6	4.059	1	**0.024**	0.77	0.597	0.994
	Primary and above	1514	5.9						
Iodized Salt									
	No or sometimes	1569	7.1	0.061	1	0.425	1.031	0.81	1.313
	Always	2767	6.9						
Mother's Education									
	<Primary	2632	8.2	16.25	1	**0.0001**	0.604	0.472	0.774
	Primary and above	1893	5.1						
Mother Can Read Newspaper									
	No or with difficulty	2241	9.2	10.644	1	**0.001**	**1.496**	**1.173**	**1.908**
	Yes	1664	6.4						
Consanguinity									
	Blood Relation	278	12.6	14.804	1	**0.0001**	0.486	0.334	0.707
	No or other	4247	6.5						
Wealth Quintile									
	Lowest two quintiles	2876	5.5	0.267	1	0.322	1.056	0.86	1.296
	Highest two quintiles	4228	5.8						

Table IV.VIII.1b: Risk of screen positivity by perinatal factors (0-<2 year olds)

Variables	Dichotomous labels	# of children	% of positives within group	chisquare	df	p value	OR	95% CI Lower	95% CI Upper
Born at Term	No	38	13.2	7.896	1	**0.018**	**3.734**	**1.396**	**9.988**
	Yes	1231	3.9						
Place of Delivery	Home	830	4.3	0.155	1	**0.048**	0.888	0.493	1.601
	Institution	430	3.9						
Delivered by	Unskilled Person	541	3.7	0.542	1	0,278	0.808	0.459	1.425
	Skilled Person	728	4.5						
Immediate Cry	Delayed	98	14.9	31.931	1	**0.0001**	**5.354**	**2.807**	**10.21**
	Immediate	1358	3.9						
Change of Color at Birth	Unusual	36	19.4	24.975	1	**0.0001**	**6.909**	**2.883**	**16.56**
	Normal	1422	3.4						
Neonatal Jaundice	No	14	14.2	18.364	1	**0.013**	**15.292**	**2.933**	**79.714**
	Yes	742	1.1						
Neonatal Seizures	Yes	11	81.8	104.506	1	**0.0001**	0.012	0.003	0.06
	No	698	5.3						
Informant	Mother	1353	3.8	0.166	1	0.414	1.216	0.475	3.111
	Other	110	4.5						
Caretaker of the Child	Mother	1437	3.8	1.341	1	0.234	2.328	0.534	10.155
	Others	24	8.3						

Table IV.VIII.1c: Risk of screen positivity by perinatal factors (2-9 year olds)

Variables (2-9 year olds)	Dichotomous labels	# of children	% of positives within group	chisquare	df	p value	OR	95% CI Lower	95% CI Upper
Place of Delivery	Home	4852	6.1	0.221	1	0.341	1.07	0.808	1.417
	Institution	963	6.5						
Delivered by	Unskilled Person	3142	5.6	3.919	1	**0.027**	0.807	0.652	0.998
	Skilled Person	2671	6.9						
Born at Term	Yes	5669	6.3	1.059	1	0.218	0.548	0.173	1.748
	No	84	3.6						
Immediate Cry	Delayed	251	22.3	121.672	1	**0.0001**	**5.111**	3.713	7.036
	Immediate	5489	5.3						
Change of Color at Birth	Unusual	115	21.7	49.553	1	**0.0001**	**4.493**	2.845	7.096
	Normal	5651	5.8						
Neonatal Jaundice	No	3630	1	213.391	1	**0.0001**	**24.958**	13.363	46.613
	Yes	85	20						
Neonatal Seizures	Yes	43	69.8	106.492	1	**0.0001**	0.068	0.035	0.131
	No	2057	13.5						

Table IV.VIII.1d: Risk of screen positivity by nutritional status in Stage Two assessed children; some children whose height and weight could not be measures are excluded

Variables (0-9 year olds)	Dichotomous labels	# of children	% of positives within group	chisquare	df	p value	OR	95% CI Lower	95% CI Upper
Stunting: from Stage Two									
	No	468	30.1	13.027	1	**0.0001**	**1.601**	**1.239**	**2.069**
	Yes	595	40.8						
Wasting: from Stage Two									
	No	312	24	1.897	1	0.101	1.32	0.889	1.962
	Yes	207	29.5						

Table IV.VIII.1e: Any and specific NDIs/NDDs (information from Stage II) and by diagnostic groups (information from Stage III) by dichotomous Wealth Quintiles (Lowest WQs=WQ 1 and 2; Highest WQs=WQ 3, 4 or 5), all sites combined

Variables (all children)	Dichotomous labels	# of families with children assessed for NDIs/NDDs	% of positives within group	chisquare	df	p value	OR	95% CI Lower	95% CI Upper
Any NDI/NDD	Lowest WQs	406	**39.2**	1.089	1	0.164	0.875	0.681	1.124
	Highest WQs	707	38						
Specific NDI/ NDD: Gross Motor	Lowest WQs	406	**8.9**	0.038	1	0.463	0.958	0.623	1.473
	Highest WQs	727	8.5						
Specific NDI/ NDD: Fine Motor	Lowest WQs	406	**9.9**	0.365	1	0.309	1.131	0.758	1.689
	Highest WQs	727	**11**						
Specific NDI/ NDD: Vision	Lowest WQs	406	**1.5**	3.36	1	**0.046**	**2.276**	0.923	**5.615**
	Highest WQs	727	**3.3**						
Specific NDI/ NDD: Hearing	Lowest WQs	406	**6.4**	0.017	1	0.502	1.033	0.631	1.692
	Highest WQs	727	6.6						
Specific NDI/ NDD: Expressive Language	Lowest WQs	406	14	0.74	1	0.22	1.162	0.825	1.639
	Highest WQs	727	16						
Specific NDI/ NDD: Cognition	Lowest WQs	406	**35.5**	2.422	1	0.068	0.815	0.631	1.054
	Highest WQs	727	30.9						
Specific NDI/ NDD: Behavior	Lowest WQs	406	**7.1**	1.444	1	0.137	**1.32**	0.838	**2.077**
	Highest WQs	727	**9.2**						
Specific NDI/ NDD: Seizures	Lowest WQs	406	**3.4**	3.007	1	**0.053**	**1.717**	0.926	**3.183**
	Highest WQs	727	**5.8**						

Table IV.VIII.1f: Diagnostic groups (information from Stage III) by dichotomous Wealth Quintiles (Lowest WQs=WQ 1 and 2; Highest WQs= WQ 3, 4 or 5), all sites combined

Variables (all children)	Dichotomous labels	# of families with children evaluated by professionals	% of positives within group	chisquare	df	p value	OR	95% CI Lower	95% CI Upper
Cognitive Delay/ Disorders	Lowest WQs	150	**92**	14.063	1	**0.0001**	0.296	0.153	0.575
	Highest WQs	238	77.3						
Language Delay/Disorders	Lowest WQs	150	**30.7**	1.416	1	0.14	1.303	0.842	2.014
	Highest WQs	238	**36.6**						
Developmental Motor Delay/ Disorders	Lowest WQs	150	**17.3**	1.382	1	0.148	1.366	0.811	2.302
	Highest WQs	238	**22.3**						
Cerebral Palsies	Lowest WQs	150	**4**	3.306	1	**0.05**	**2.323**	**0.915**	**5.895**
	Highest WQs	238	**8.8**						
Mental Health Conditions	Lowest WQs	150	**6**	8.024	1	**0.003**	**2.884**	**1.349**	**6.164**
	Highest WQs	238	**15.5**						
Seizures/ Epilepsies	Lowest WQs	150	**10**	0.806	1	0.232	1.348	0.701	2.591
	Highest WQs	238	**13**						
Deafness/ Hearing Impairments	Lowest WQs	150	**11.3**	1.227	1	0.176	0.679	0.341	1.352
	Highest WQs	238	8						
Blindness/ Visual Impairments	Lowest WQs	150	**4.7**	0.46	1	0.33	1.374	0.547	3.453
	Highest WQs	238	**6.3**						
Genetic/ Syndromic/ Congenital Anomalies/etc	Lowest WQs	150	**5.3**	1.621	1	0.141	1.718	0.741	3.984
	Highest WQs	238	**8.8**						

IX. ASSESSMENT OF PARTICIPATION

Participation among 0-<2 year old children (table IV.IX.1a)

Among the 0-<2 year olds only a few children with NDIs/NDDs were excluded from participating in family activities. In a significant proportion of all children (no NDI/NDDs 10.7%; NDIs/NDDs 13%) there was an absence of joint learning activities. No children were sources of income for the families.

Participation among 2-5 year old children (table IV.IX.1b)

Among the 2-5 year olds there a significant proportion with NDIs/NDDs were not given a choice for play, outdoor activities etc. 22.9% were also not encouraged to do domestic chores compared to 6.4% of appropriately developing children. A significant proportion (12.9%) were also excluded from peer play; 10% were excluded from participating in family programs; and 11% had no family member telling them or sharing stories. A significant proportion of appropriately developing children were a source of family income (7.8%) compared to those with NDIs/NDDs (2.4%).

Participation among 6-9 year old children (table IV.IX.1c)

Among the 6-9 year olds significant proportion of both appropriately developing children (15.7%) and an even larger proportion of those with NDIs/NDDs (32.5%) were discouraged from asking questions during mealtimes. 17.9% of those with NDIs/NDDs were not going to school compared to 2.1% of their appropriately developing peers. A significantly larger proportion appropriately developing children were a source of family income (8.5%) compared to those with NDIs/NDDs (2.1%).

Table IV.IX.1a: Correlation between those with and without NDIs/NDDs who answered in the negative (or positive, depending upon the mode of questioning) to child's participation (questions from Participation Checklist or PCL) in age group 0-<2 years

Questions		Number of children: No NDI/ NDD=178 (100%); NDI/NDD=69 (100%)	chi square	df	p value
I. FAMILY					
1. Do family play with this child?	Answer 'no' amongst 'no imp' group	7 (3.9)	0.022	1	0.563
	Answer 'no' amongst 'imp' group	3 (4.3)			
2. Is child's preference considered during play?	Answer 'no' amongst 'no imp' group	1 (0.6)	7.201	2	0.027
	Answer 'no' amongst 'imp' group	4 (5.8)			
3. Is the child's preference considered when going out?	Answer 'no' amongst 'no imp' group	3 (1.7)	9.338	2	0.009
	Answer 'no' amongst 'imp' group	6 (8.7)			
4. Is the child's preference considered in selection of dress?	Answer 'no' amongst 'no imp' group	6 (3.4)	7.059	2	0.029
	Answer 'no' amongst 'imp' group	7 (10.1)			
II. PEER GROUP					
1. Do the peer group consider the child's preferences during play?	Answer 'no' amongst 'no imp' group	13 (7.3)	1.695	2	0.428
	Answer 'no' amongst 'imp' group	5 (7.2)			
2. Is the child's preference in making friends honored or respected?	Answer 'no' amongst 'no imp' group	1 (0.6)	8.323	2	0.016
	Answer 'no' amongst 'imp' group	4 (5.8)			
III. CULTURAL					
1. Is there any scope for the child to play during family programs?	Answer 'no' amongst 'no imp' group	11 (6.2)	2.611	2	0.271
	Answer 'no' amongst 'imp' group	8 (11.6)			
IV. EDUCATION					
1. Do family members take part during child's learning time, reciting poems or showing pictures?	Answer 'no' amongst 'no imp' group	19 (10.7)	0.278	1	0.372
	Answer 'no' amongst 'imp' group	9 (13.0)			
2. Is the child's preference considered when selecting poem, pictures or stories?	Answer 'no' amongst 'no imp' group	9 (5.1)	0.871	2	0.647
	Answer 'no' amongst 'imp' group	4 (5.8)			
V. ECONOMIC					
1. Is the child involved in family source of income in any way?	Answer 'no' amongst 'no imp' group	0			
	Answer 'no' amongst 'imp' group	0			

Table IV.IX.1b: orrelation between those with and without NDIs/NDDs who answered in the negative (or positive, depending upon the mode of questioning) to child's participation (questions from Participation Checklist or PCL) in age group 2-5 years				
Questions	**Number of children: No Imp=283 (100%); Imp=170 (100%)**	**chi square**	**df**	**p value**
I. FAMILY				
1. Do family members/ care givers play with this child?	Answer 'no' amongst 'no imp' group	5 (1.8)	2.276	1	0.115
	Answer 'no' amongst 'imp' group	7 (4.1)			
2. Is child's preference considered during play?	Answer 'no' amongst 'no imp' group	3 (1.1)	12.954	2	0.002
	Answer 'no' amongst 'imp' group	11 (6.5)			
3. Is the child's preference considered when going outdoors?	Answer 'no' amongst 'no imp' group	13 (4.6)	5. 987	1	0.013
	Answer 'no' amongst 'imp' group	18 (10.6)			
4. Is the child's preference considered in selection of dress?	Answer 'no' amongst 'no imp' group	11 (3.9)	5.784	1	0.015
	Answer 'no' amongst 'imp' group	16 (9.4)			
5. Is the child encouraged to take part in family domestic work?	Answer 'no' amongst 'no imp' group	18 (6.4)	26.544	1	0.0001
	Answer 'no' amongst 'imp' group	39 (22.9)			
6. Are the child's preferences considered during domestic work?	Answer 'no' amongst 'no imp' group	3 (1.1)	37.423	2	0.0001
	Answer 'no' amongst 'imp' group	9 (5.3)			
II. PEER GROUP				
1. Do the peer group involve the child in group play?	Answer 'no' amongst 'no imp' group	1 (0.4)	34.917	1	0.0001
	Answer 'no' amongst 'imp' group	22 (12.9)			
2. Do the peer groups consider the child's preferences during play?	Answer 'no' amongst 'no imp' group	8 (2.8)	35.163	2	0.0001
	Answer 'no' amongst 'imp' group	3 (1.8)			
3. Is the child's preference in making friends honored or respected?	Answer 'no' amongst 'no imp' group	2 (0.7)	12.767	2	0.002
	Answer 'no' amongst 'imp' group	10 (5.9)			

III. CULTURAL

1. Is there any scope for the child to play during family programs?	Answer 'no' amongst 'no imp' group	16 (5.7)	2.97	1	0.064
	Answer 'no' amongst 'imp' group	17 (10.0)			
2. Are the child's preferences in dress selection honored when joining in a family cultural program?	Answer 'no' amongst 'no imp' group	12 (4.2)	6.921	1	0.008
	Answer 'no' amongst 'imp' group	18 (10.6)			

IV. EDUCATION

1. Do family members take part in story telling or sharing stories with the child?	Answer 'no' amongst 'no imp' group	11 (3.9)	10.339	1	0.001
	Answer 'no' amongst 'imp' group	20 (11.8)			
2. Is the child's preference considered during story telling?	Answer 'no' amongst 'no imp' group	8 (2.8)	13.367	2	0.001
	Answer 'no' amongst 'imp' group	11 (6.5)			

V. ECONOMIC

1. Is the child involved in family source of income in any way?	Answer 'yes' amongst 'no imp' group	22 (7.8)	5.769	1	0.011
	Answer 'yes' amongst 'imp' group	4 (2.4)			

Table IV.IX.1c: Correlation between those with and without NDIs/NDDs who answered in the negative (or positive, depending upon the mode of questioning) to child's participation (questions from Participation Checklist or PCL) in age group 6-9 years

Questions		Number of children: No Imp= 284 (100%); Imp= 195 (100%)	chi square	df	p value
I. FAMILY					
1. Is the child encouraged to take part in the family mealtime?	Answer 'no' amongst 'no imp' group	1 (0.4)	5.961	1	0.02
	Answer 'no' amongst 'imp' group	6 (3.1)			
2. Is the child encouraged to ask questions to the adults during family meal time?	Answer 'no' amongst 'no imp' group	44 (15.7)	26.013	2	0.0001
	Answer 'no' amongst 'imp' group	63 (32.5)			
3. Is the child's preference encouraged during cooking family meals?	Answer 'no' amongst 'no imp' group	5 (1.8)	5.337	1	0.021
	Answer 'no' amongst 'imp' group	11 (5.7)			
4. Is the child encouraged to take part in family domestic work?	Answer 'no' amongst 'no imp' group	8 (2.8)	17.894	1	0.0001
	Answer 'no' amongst 'imp' group	25 (12.9)			
5. Are the child's preferences considered during domestic work?	Answer 'no' amongst 'no imp' group	2 (0.7)	22.116	2	0.0001
	Answer 'no' amongst 'imp' group	12 (6.2)			
6. Is the child allowed to interact with family guests?	Answer 'no' amongst 'no imp' group	0	11.786	1	0.001
	Answer 'no' amongst 'imp' group	8 (4.1)			
7. Is the child's preferences considered during going outdoors?	Answer 'no' amongst 'no imp' group	3 (1.1)	9.83	1	0.002
	Answer 'no' amongst 'imp' group	12 (6.2)			
8. Is the child's preferences respected during selection or makng dresses?	Answer 'no' amongst 'no imp' group	8 (2.8)	15.268	1	0.0001
	Answer 'no' amongst 'imp' group	23 (11.9)			
9. Is the child's preferences respected during selection of dress?	Answer 'no' amongst 'no imp' group	6 (2.1)	8.507	1	0.004
	Answer 'no' amongst 'imp' group	15 (7.7)			
II. PEER GROUP					

1. Do the peer group involve the child in group activity in school?	Answer 'no' amongst 'no imp' group	1 (0.4)	63.216	2	0.0001
	Answer 'no' amongst 'imp' group	16 (8.2)			
2. Do the peer group involve the child in group play in school?	Answer 'no' amongst 'no imp' group	2 (0.7)	51.244	2	0.0001
	Answer 'no' amongst 'imp' group	11 (5.7)			
3. Do the peer group consider the child's preferences during play?	Answer 'no' amongst 'no imp' group	2 (0.7)	66.759	2	0.0001
	Answer 'no' amongst 'imp' group	19 (9.8)			
III. CULTURAL					
1. Is there any scope for the child to take part in cultural activities?	Answer 'no' amongst 'no imp' group	2 (0.7)	74.066	2	0.0001
	Answer 'no' amongst 'imp' group	24 (12.4)			
IV. EDUCATION					
1. Does the child go to school?	Answer 'no' amongst 'no imp' group	6 (2.1)	37.676	1	0.0001
	Answer 'no' amongst 'imp' group	35 (17.9)			
V. ECONOMIC					
1. Is the child involved in family source of income in any way?	Answer 'yes' amongst 'no imp' group	24 (8.5)	8.582	1	0.002
	Answer 'yes' amongst 'imp' group	4 (2.1)			

V. Discussion

Representativeness of the surveyed population

There were similarities between the poverty characteristics of the surveyed population compared to recently published reports, which identified the Western regions of Bangladesh to be lagging behind in poverty alleviation (The World Bank, 2013). The highest levels of poverty were found in Pirganj (North West); and in Pekua (South East); followed by Debhata (West) and Godagari (West). The comparatively more affluent were Wazirpur (South West) and Kulaura (East). The door-to-door blanket survey conducted in Dhaka city, due to unavoidable reasons, was replaced by a second survey where low -middle income and middle income localities were targeted and door-to-door screening re-conducted; (see methods). This is reflected in majority being from the higher wealth quintiles.

As the mean rural WQ status of the 7 rural upazillas surveyed was almost identical to the national statistics (BDHS, 2011) (see Table IV.I.2b), it strengthens the point that any national estimate of NDIs/NDDs is unlikely to be different from the findings of this survey. 'No education' in mothers was less than the national statistics for women of reproductive age (28%, BDHS, 2011; compared to a mean of 24% in the present survey), a fact which might be 'protective' for children (see below) and evidence of improving literacy rates. Wealth status of the urban children was much higher than national statistics and all information arising for this population has to be considered accordingly.

Home-Based Screening: Rates of Screen Positivity

Screen positivity rates, reported to be 7% two decades earlier (in 2-9 year olds) (Zaman et al, 1990); and 18% (in 2-9 year olds) in 2005 (UNICEF, 2008) showed a marginal reduction to 6.21% (in 2-9 year olds); and 5.73% for all ages (0-9 years) . Positivity rates varied by site, the highest found in Pirganj (9.36%) and the lowest in Wazirpur (2.3%), which seems to follow a poverty-related trend, as a majority of the households in Pirganj belonged to the lowest wealth quintile; while a majority of households from Wazirpur belonged to the highest wealth quintiles.

Screen Positivity in Younger versus Older Children

Higher rates of screen positivity than younger versus older children was found in the 2-9 years age group, with a mean positivity rate of 6.21%. The highest rate was in Pirganj and Pekua and lowest in Wazirpur. In the 0->2 years age group the positivity rate declined to less than half of the older children, ie, 3.82%; the highest rates of screen positivity was in Pirganj and Pekua; and third highest in Kulaura.

The reasons for a declining trend needs consideration. Improving perinatal conditions could be one reason, as home deliveries were reduced to 65% in the 0-<2 year olds compared to 83% in the 2-9 year olds. In addition, 57% of younger children compared to 46% of older children were delivered by a skilled attendant. The other consideration is that younger and first-time mother were not able to identify delays in their children on home-based screening.

Differences in unweighted and weighted validity of the screening tools: implications for improvement of field workers' screening skills

There were major difference between unweighted and weighed results in the validity analysis, reflecting a substantial proportion of children remained unidentified (false negatives) during the home-based survey. A systematic sampling of proportion of screened negatives was able to identify the gap.

There were some sites, eg. Dhaka city and Pirganj (and Debhata and Pekua for specific NDIs/NDDs), where the field workers performed better, and Se of the screening tools remained high even on weighted analysis. This provides a direction for improving the competency of field workers during the training workshops. Inter-rater reliability estimations between trainers and trainees, and elimination of those least reliable may be an important quantitive and objective strategy. A recent disability survey in Bhutan (Bhutan UNICEF, 2010) was able to identify the most efficient primary school teachers later employed for assessing children at the community levels, using a similar strategy.

High Prevalence of overall and specific NDIs and NDDs across Bangladesh: Implications for policy development

Weighted prevalence for NDIs/NDDs overall was 185/1000. It was 198/1000 in older children and 135/1000 in younger children. These figures implicate almost one-fifth of all children across Bangladesh to have some developmental problem, which poses a huge challenge to the country, if optimum development is to be achieved universally. However, as the majority of these children had NDIs, or mild difficulties, they would benefit most from early and appropriate home-based and community-based interventions.

Randomized controlled trials (RCTs) of home-based interventions have shown comparable results with center-based interventions in Bangladesh, provided the parent-trainer partnership is healthy, interactive, and participatory, ie, 'well intentioned' (McConachie et al, 2000). Providing the field screeners and community assessors with appropriate training and technology, directed towards overcoming specific developmental limitations, is evidence-based and doable.

When only NDD (ie, disability) was considered, overall prevalence dropped to 71/1000. These are the children who add to the 'burden of caring' and social and economic stress on families and mothers (Mobarak et al, 2001; McConachie et al, 2001), and re-

quire both social safety nets and facilities for tertiary evaluations and rehabilitation. The establishment of Shishu Bikash Kendras (SBKs) in major government medical college hospital across Bangladesh (website: http://www.hsmdghs-bd.org/SBK.html) provides a technical know-how and an infrastructure for similar development in district hospitals and Upazilla Health Complexes.

Differences in prevalence of overall and specific NDIs/NDDs across survey sites: ie, sites which need most vigorous scaling-up of programs identified

The highest rate of NDIs/NDDs for total surveyed children was found in Godagari (535/1000), followed by Modhupur (342/1000) and Dhaka city (307/1000); and the lowest in Wazirpur (35/1000), followed by Debhata (62/1000). The former sites implicate over one-third to half the children in their areas with a neurodevelopmental problem. Specific areas of difficulties in these children are mainly related to cognition (eg. Godagari 444/1000). Again, as discussed in the previous section, when the Godagari data for NDIs is compared to those children who have NDD (or serious functional limitations), then levels of cognitive difficulties came down to 53/1000. This indicates that most of these children's difficulties are of a mild nature which can be reversed with appropriate home-based and community-based interventions.

Emerging systems of referral

The possibility of a system of home-based screening by appropriately trained HAs/FWAs, linked with community based assessment by CHCPs in the closest community clinics, has emerged from the present survey; ie, 'impairments' provided home-based and community-based interventions and 'disabilities' referred for further evaluations. This would empower families, children and the community at large; and reduce the numbers of children to be further referred.

Diagnostic Workouts by Multidisciplinary Professionals: Prevalence and Clinical Load

Those children identified by CHCPs within Community Clincics with serious difficulties (ie, NDDs) would best benefit from referral to the Upazilla Health Complex, to be seen either by a team of visiting professionals from the closest SBKs (eg. to conducte Shishu Bikash Camps, quarterly), or provided treatment and appropriate management by local physicians who can be trained to diagnose through a specifically developed training for an 'Integrate management of childhood NDIs and NDDs'.

The clinical load on an SBK-type of services within Upazilla hospitals can be appreciated from the ratio of diagnosis made by the multiprofessional team. An array of diagnoses was made. The highest frequencies were for those related to cognition and language disorders, which would most benefit from a multi-professional evaluation, ie, a physician-psychologist team.

Prevalences of the various types of diagnosis showed a disproportionate number within the 'Cognitive Delay' and 'Language Disorders' group. This scenario justified and introduction of child psychologists and developmental therapists within clinical services, as an integral part of the Shishu Bikash Kendra multiprofessional team, ie, within public health care services, who would be able to identify specific types of delays and disorders and provide appropriate interventions.

A manual (eg. Guide to Diagnosis of Common Neurodevelopmental Disorders in Children) which includes the commonest 9 groups of diseases and disorders diagnosed by the professional team of child health physicians and psychologists in the present survey, could be developed. This would include a comprehensive workout for Autism Spectrum Disorders within those children referred for 'behavior' or 'cognitive' or 'expressive language' problems. A smaller proportion of these children would benefit from further referral to SBKs within medical college hospitals and other specialized hospitals.

The future of child psychologists, educational psychologists, and early child development (ECD) professionals in nurturing children's cognitive and language development cannot be needs special consideration. All SBKs within medical college hospitals are already being run by a multi disciplinary team which included child psychologists and developmental therapists (essential professionals for hands-on interventions) as the core team, along with child health physicians. This team can be further expanded to cover district and Upazilla hospitals.

Autism Spectrum Disorders: Implications for Home- based Screening, Community -based Assessment and Hospital- based Diagnosis

In the Home-based screening all children with core autism screened positive, implying that the process can be employed in two/three stage surveys. In the second stage the RNDA was sensitive in identifying not only core autism, but also the children within the larger spectrum of disorders. A further analysis of individual items or 'Red Flags' within the RNDA may be able to assist the CHCPs in further referring all children who fail the items. For example, an earlier diagnosis has been suggested with early repetitive behaviors (McConachie et al, 2005); or prelinguistic predictors of language, including the use of eye gaze, gestures and sounds to communicate and the ability to understand words and to play with objects, which provide important clues about the development of language (Wetherby et al, 2004). A majority of these items are included in the RNDA. Factor such as being male; or those with low IQ or reports of developmental regression (Shattuck et al, 2009) are also early indicators. A comprehensive list of indicators and 'red flags' for use by frontline community workers needs further evaluation.

Apart from diagnosed children, there was a sub-population with age-appropriate cognition but delayed expressive language development (n=22). All those who were more than 5 years of age within this group (n=14) need follow up in their social/communication skills to see if high functioning autism was 'missed'.

There was a significant difference in prevalence of autism between Dhaka city (ie, 30/1000) and rural populations (0.68/1000), and the underlying reasons for this difference needs further exploration. 3 out of 6 children's families had 'migrated' to the area for reasons of special schools being present after they had been diagnosed with autism, this could be one cause of the very high prevalence found in urban populations, as has been found in studies in western countries (Gillberg et al, 2006). In fact, on further search a total of 17 'autism-friendly' schools were reported around an estimated 5 mile radius of the study area. A mapping of such schools across Dhaka city and other metropolitan areas is warranted, as is a search for other risk factors which might be rendering urban children more vulnerable.

Children diagnosed with ASD were from the highest WQs. Considering these two findings, surveys across all metropolitan areas of the country and across all income divides may provide a more comprehensive estimate of prevalence of ASDs, as many children are presently slipping through the gap.

Through the scales, procedures and methods used, this survey has been able to provide a community based system-wide perspective on the prevalence of autism and ASD across urban and rural populations of Bangladesh, through a process that has been advocated across continents by researchers and practitioners in the field (Khan et al, 2012). A further step forwards would be the development of evidence-based and affordable care-packages delivered by the very health care workers who were able to identify the children.

Risk estimates: Household, Maternal. Perinatal and Nutritional Factors

Mother's inability to read a newspaper was the most significant risk factor for a child to be positive on home-based screening. This is an indication of the importance of functional application of education towards receiving information. Wealth Quintiles *per se* was not a significant risk for screen positivity. However, there were other effects shown (please see section below).

An array of perinatal factors were significant as well, including preterm delivery, delayed cry, change of color and neonatal jaundice. Place of delivery seemed to affect older children negatively (more % of screen positives among hospital delivered children), implying that these mothers were taken to hospital as high-risk pregnancies and not as a routine delivery; and positively in younger children (less % screen positives among hospital delivered chil-

dren), meaning that the trend towards deliveries in birthing centers is rising.

Stunted children had a high risk of screen positivity, implicating the effects of longstanding malnutrition.

Family, peer group, cultural, educational, and economic participation among children with NDIs/NDDs

Among the 0-<2 year olds with NDIs/NDDs there was a lack in significant proportions of the families involvement in learning activities. This void can be filled by providing strategies to parents, such as adaptations of the Care for Child Development Package (UNICEF, 2012) in some LAMICs (Yousufzai A, 2013) which can be incorporated either as a universal program for all children of similar age in any subsequent scaled up program; or for all who are positive on home-based screening.

Among the 2-5 year olds significant proportions with NDIs/NDDs were excluded from participating in family, peer group, cultural, and learning activities; and, similar to the situation in younger children, their families need to be encouraged to be increase the child's participation. Paradoxically, a significant proportion were not involved in domestic chores and may be indicative of caring families who prevent children with NDIs/NDDs from activities which are seen to be unsafe. They were also prevented from taking part in activities to generate family income, another indicator perhaps of a degree of caring in families where any source of income is welcome, which was not the case for their appropriately developing peers.

Among the 6-9 year olds the most significant exclusion was from schooling for children with NDIs/NDDs, which is an area where formal institutional support for inclusive classrooms and mobility to go to school can be facilitated. Discouragement in asking questions may be another cultural phenomenon, as it included a quarter of appropriately developing children and one-thirds of children with NDIs/NDDs. The Positive Parenting Advice provided to parents through a short counseling session is expected to encourage parent-child bonding including a more interactive relationship.

In this report individual items from the Participation Checklist (PCL) were cross-tabulated with any NDI/NDD variable for the three age groups in which all information were gathered. Evaluation of the validity of a composite score would perhaps make a better indicator to address the needs of a large proportion of children most excluded from participating within their communities and who may require facilitation by a care practitioner. Finally, the child's perspective was not included, which is acknowledged and advocated as an important measurement of participation (McConachie et al, 2006), and might have added another dimension from the children themselves, including issues relating to emotions and self-esteem.

Emerging Concerns: NDI/NDDs and Diagnostic Groups by Wealth Quintiles (WQs)

Cognitive and Gross Motor NDIs/NDDs had the most significant risk of occurring in children from the lowest two WQs. Larger proportion of Expressive Language, Vision, Hearing, Behavior, Seizures and Fine Motor Impairments were identified in children from the highest WQs. When definitive diagnostic categories were considered, there was one outstanding relationship, ie, between cognitive impairments and children from the lowest WQs. This is an acknowledged relationship (Grantham McGregor et al, 2007) and it is expected that any program which alleviates poverty will benefit this large population. Another correlation with poverty was deafness or hearing impairments, and children need regular monitoring for appropriate interventions.

However, there were emerging concerns. Most diagnostic groups, with Mental Health conditions being the most significant, had an inverse relationship with poverty, ie, occurring in the majority in children from the highest WQs. These families, as more affluent, may be 'opting out' of the public health care system; and efforts need to be made to bring them within a larger developmental surveillance or safety net. Late identification or diagnosis may be hampering the lives of thousands.

Moreover, as Bangladesh improves its standing as a LAMI country, increasing numbers of these conditions, eg. Mental Health Disorders, will be emerging. With the evidence-base that the present survey provides, it will prepare the health care services to not only address these emergning concerns, but also prevent them.

Human Resource Development

For the first time within Bangladesh's primary health care system a core team of frontline workers and paraprofessionals have been trained to apply valid tools to screen and assess children for a range of neurodevelopmental problems. With short training on a very complicated and new subject, this core team has performed with credibly. Their training and field experiences provides the government with an opportunity to further scale up the program in the respective administrative divisions of the country.

VI. Recommendations

The following set of recommendations are provided with the objective of scaling up early screening, identification, intervention, diagnosis and management of children with a range of NDIs/NDDs across all areas of Bangladesh; and with the ultimate aim of optimizing development of all children in the country.

Home-Based Programs

1. Introduce universal screening of all children for neurodevelopmental problems from 0-9 years of age using the tools and procedures validated through the present survey.

2. Investigate biological, environmental and social risk factor which may be adding to the huge proportion of the children with a range of difficulties, with specific focus on cognitive difficulties, especially in certain sites identified by the survey.

3. Further research and development to validate a screening methodology of pre-primary and primary school aged children in metropolitan areas of the country, i.e. all major cities, should be validated for a more comprehensive ascertainment of autism and autism spectrum disorders.

4. Strengthen urban neurodevelopmental screening programs through organizations, both government and non-government, working with respective city corporations.

5. Introduce Positive Parenting Advice (PPA) and strategies for increasing children's participation within families, social event, and schools; including increased learning opportunities for children with NDIs/NDDs.

6. In training frontline workers during scaling-up programs, ascertain inter-rater reliability, so that quality of screening can be improved.

7. Adapt and introduce UNICEF's Care for Child Development Program for all toddlers, pre-primary and primary school aged children.

8. Develop a system of record-keeping and monitoring of all children's development by frontline health workers, with special focus on newborns and 0-2 year olds.

Community Based Programs

1. Link screen positivity with comprehensive neurodevelopmental assessment at the community level, ie, at the nearest Community Clinic in rural populations, using the RNDA.

2. In urban populations train para-professionals, eg, community health care providers, NGO workers, teachers' assistants etc, in government orgranisations and NGOs, to administer the RNDA.

3. Scale up simple home- based screening fol-

lowed by community based assessments with evidence-based interventions through CHCPs in rural populations and their counterparts in urban populations.

4. Develop a tiered system of development surveillance with clear strategies for interventions, monitoring and further referrals.

Hospital Based Programs

1. Strengthen clinical skills of physicians within primary and secondary health care centers and hospitals, including District Hopitals, Upazilla Health Care Centers (UZHCCs), and Union Parishad Health Care Centers.

2. Direct resources towards innovative human resource development, eg. employment of child psychologist at the Upazilla level, to address the large numbers of children with cognitive difficulties.

3. As an alternative to the above mentioned approach, provide comprehensive neurodevelopmental assessment by allowing CHCPs (trained in applying the RNDA and in establishing a child and family -friendly functional approach) to work with respective children from their communities at the UZHCCs with trained physicians.

4. Establish a Shishu Bikash Camp every three months, so that the traveling multidisciplinary team from the government medical college hospital Shishu Bikash Kendra may assess children referred from the community.

Further analysis of survey data

1. Data from the three stages of the survey must be further analyzed to ascertain the following: Sociodemographic, environmental, nutritional, perinatal and other biological risk factors for each site survey and for providing a national guideline for the prevention of NDIs/NDDs across the 8 survey sites; and across Bangladesh.

2. Item-wise analysis of the RNDA to identify signs, ie, 'red flags', which could assist in identifying specific diagnostic conditions, such as autism, cognitive and learning difficulties, speech and language disorders, cerebral palsy, epilepsy, etc.

3. Analyzing the array of psychometric tests which were administered for identifying specific types of cognitive delays and disorders, including sub-populations with difficulties in executive functioning, short term and long term memory, verbal and performance scores, expressive and receptive language problems, etc.

4. Correlating psychometric test results with levels of difficulties, severity grading on the RNDA; and diagnoses.

Besides the abovementioned possibilities for analysis, there remains a mine of information within the survey which should be made available to epidemiologists, public health specialists, child health physicians, child psychologists and other disciplines in the health sector.

Recommendations for Policy makers

1. Dissemination of the survey report should be made to all levels of policy makers within the MOHFW, as well as other ministries, including inter-ministerial national workshop where the major findings can be highlighted.

2. Scaling up of the program for "Surveillance of Neurodevelopmental Disorders including Autism across Bangladesh" should be planned, where the scales, tools, procedures and methodologies of the present survey can be adapted.

3. The potential skills of CHCPs through the Community Clinics should be utilized in any scaled up program, with the presently trained CHCPs used as Trainers.

4. A transdisciplinary national and international workshop should be convened where strategies emerging from the present survey can be combined with other evidence-based home-based and community-based intervention programs and incorporated to strengthen any future scaling up of services.

5. City-based programs are urgently needed to address autism spectrum disorders.

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VIII. Photo Gallery

Training on 3rd stage

Training of coordinator (HI)

Training of statistician

IX. Annexure

Table IV.I.2a: Household Characteristics of the total surveyed population of children and by 8 survey sites

Household Form (HF) Variables	Dhaka City		Modhupur		Kulaura		Godagari		Pirganj		Debhata		Pekua		Wazirpur		All_sites combined	
	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%
GENDER OF H. HEAD																		
Male	136	96.45	670	96.96	749	100	706	99.72	747	97.01	722	96.78	523	98.31	683	99.27	4935	98.23
Female	5	3.54	21	3.04	0	0	2	0.28	23	2.99	24	3.22	9	1.69	5	0.73	89	1.77
Total	141	100.00	691	100	749	100	708	100.00	770	100.00	746	100.00	532	100.00	688	100.00	5024	100.00
OCCUPATION OF THE HOUSE HOLD																		
service	36	25.53	45	6.51	45	6.01	21	2.97	47	6.10	40	5.36	76	14.29	84	12.21	394	7.84
skilled professional	1	0.71	3	0.43	12	1.60	0	0.00	3	0.39	5	0.67	3	0.56	2	0.29	29	0.58
housewife	3	2.13	12	1.74	0	0	2	0.28	15	1.95	15	2.01	9	1.69	1	0.15	57	1.13
housewife but earns	0	0.00	0	0.00	0	0	0	0.00	0	0.00	0	0.00	1	0.19	2	0.29	3	0.06
domestic help	0	0.00	0	0.00	10	1.34	1	0.14	4	0.52	5	0.67	6	1.13	1	0.15	27	0.54
landlord	1	0.71	0	0.00	0	0.00	0	0.00	1	0.13	4	0.54	3	0.56	1	0.15	10	0.20
business	39	27.66	76	11.00	115	15.35	241	34.04	136	17.66	211	28.28	80	15.04	149	21.66	1047	**20.84**
driver	21	14.89	6	0.87	15	2.00	7	0.99	8	1.04	22	2.95	15	2.82	8	1.16	102	2.03
unskilled labourer	36	**25.53**	165	23.88	115	15.35	11	1.55	167	21.69	265	35.52	48	9.02	98	14.24	905	**18.01**
handicraft maker	0	0.00	3	0.43	0	0.00	0	0.00	4	0.52	18	2.41	6	1.13	3	0.44	34	0.68
farmer	0	0.00	362	**52.39**	434	**57.94**	335	**47.32**	361	**46.88**	86	**11.53**	216	40.60	266	**38.66**	2059	**40.98**
beggar	0	0.00	2	0.29	0	0.00	0	0.00	1	0.13	0	0.00	0	0.00	1	0.15	4	0.08
fisherman	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	62	8.31	2	0.38	44	6.40	108	2.15
unskilled birth attendent	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	2	0.27	0	0.00	0	0.00	2	0.04
skilled birth attendent	0	0.00	0	0.00	0	0.00	1	0.14	0	0.00	62	8.31	0	0.00	0	0.00	1	0.02
others	3	2.13	14	2.03	0	0.00	89	12.57	23	2.99	11	1.47	63	11.84	28	4.07	231	4.60
no information	1	0.71	3	0.43	3	0.40	0	0.00	0	0.00	0	0.00	4	0.75	0	0.00	11	0.22
Total	141	100.00	691	100	749	100.00	708	100.00	770	100.00	746	100	532	100.00	688	100.00	5024	100.00

Household Form Variables (contd.)	Dhaka City		Modhupur		Kulaura		Godagari		Pirgonj		Debhata		Pekua		Wazirpur		All sites combined	
	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%
LOAN																		
No	116	82.26	317	45.88	518	69.16	539	76.13	447	58.05	452	60.59	427	80.26	459	66.72	3274	65.17
Yes	25	**17.73**	374	**54.12**	231	30.84	169	23.87	323	41.95	452	39.41	105	19.74	229	33.28	1750	**34.83**
Total	141	100.00	691	100.00	749	100.00	708	100.00	770	100.00	746	100.00	532	100.00	688	100.00	5024	100.00
RELIGION																		
Islam	140	99.29	602	87.12	707	94.39	657	92.80	767	99.61	453	60.72	513	96.43	508	73.84	4346	**86.50**
Hindu	1	0.7	19	2.75	42	5.61	39	5.51	3	0.39	293	**39.28**	19	3.57	178	**25.87**	594	11.82
Christian	0	0.00	66	**9.55**	0	0	11	1.55	0	0.00	0	0.00	0	0.00	1	0.15	78	1.55
Bhudhist	0	0.00	0	0.00	0	0	0	0.00	0	0.00	0	0.00	0	0.00	1	0.15	1	0.02
Tribal	0	0.00	4	0.58	0	0	1	0.14	0	0.00	0	0.00	0	0.00	0	0.00	5	0.10
Total	141	100.00	691	100.00	749	100.00	708	100.00	770	100.00	746	100.00	532	100.00	688	100.00	5024	100.00
INCOME																		
3,000	1	0.7	143	20.69	152	20.29	68	9.60	261	**33.90**	159	**21.31**	36	6.77	18	2.62	842	**16.76**
3,001 - 5,000	4	2.83	249	36.03	190	25.37	213	30.08	322	**41.82**	423	**56.70**	212	39.85	168	24.42	1781	**35.45**
5,001 - 10,000	57	40.42	233	33.72	146	19.49	331	46.75	133	17.27	127	17.02	168	31.58	381	55.38	1572	31.29
10,001 - 15,000	43	30.49	39	5.64	80	10.68	75	10.59	48	6.23	30	4.02	50	9.40	89	12.94	453	9.02
15,001 - 20,000	20	14.18	22	3.18	67	8.95	12	1.69	3	0.39	6	0.80	29	5.45	17	2.47	176	3.50
20,001 - 30,000	11	7.8	2	0.29	98	13.08	7	0.99	2	0.26	1	0.13	28	5.26	7	1.02	156	3.11
30,001 -	5	3.54	3	0.43	16	2.14	2	0.28	1	0.13	0	0.00	9	1.69	8	1.16	44	0.88
Total	141	100.00	691	100.00	749	100.00	708	100.00	770	100.00	746	100.00	532	100.00	688	100.00	5024	100.00
EDUCATION HOUSE HOLD HEAD																		
Never	29	**20.57**	366	**52.97**	152	**20.29**	251	**35.45**	326	**42.34**	116	**15.55**	236	**44.36**	56	**8.14**	1532	**30.49**
Primary	47	33.33	179	25.90	383	51.13	213	30.08	222	28.83	272	36.46	158	29.70	362	52.62	1835	**36.52**

Household Form Variables (contd.)	Dhaka City		Modhupur		Kulaura		Godagari		Pirgonj		Debhata		Pekua		Wazirpur		All sites combined	
	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%
Class VIII	27	19.15	52	7.53	58	7.74	122	17.23	76	9.87	202	27.08	53	9.96	112	16.28	702	13.97
Class X	3	2.13	30	4.34	55	7.34	72	10.17	40	5.19	57	7.64	12	2.26	35	5.09	304	6.05
SSC	14	9.93	23	3.33	44	5.87	34	4.80	37	4.81	41	5.50	25	4.70	67	9.74	285	5.67
HSC	12	8.51	24	3.47	25	3.34	12	1.69	38	4.94	27	3.62	20	3.76	31	4.51	189	3.76
Graduate (BA)	5	3.55	9	1.30	11	1.47	4	0.56	24	3.12	24	3.22	17	3.20	16	2.33	110	2.19
Postgraduat (MA)	4	2.84	8	1.16	21	2.80	0	0.00	7	0.91	7	0.94	11	2.07	9	1.31	67	1.33
Total	141	100.00	691	100.00	749	100.00	708	100.00	770	100.00	746	100.00	532	100.00	688	100.00	5024	100.00
EDUCATION FATHER																		
Never	36	25.532	333	48.19	178	23.77	243	34.32	314	40.78	107	14.34	227	42.67	53	7.70	1491	29.68
Primary	35	24.823	187	27.06	343	45.79	192	27.12	225	29.22	242	32.44	161	30.26	347	50.44	1731	34.45
Class VIII	29	20.567	67	9.70	88	11.75	121	17.09	76	9.87	201	26.94	56	10.53	124	18.02	762	15.17
Class X	4	2.837	30	4.34	52	6.94	86	12.15	43	5.58	68	9.12	12	2.26	38	5.52	333	6.63
SSC	15	10.638	31	4.49	33	4.41	43	6.07	42	5.45	64	8.58	31	5.83	69	10.03	328	6.53
HSC	12	8.511	24	3.47	20	2.67	18	2.54	38	4.94	33	4.42	20	3.76	30	4.36	195	3.88
Graduate (BA)	6	4.255	12	1.74	21	2.80	5	0.71	23	2.99	22	2.95	15	2.82	17	2.47	121	2.41
Postgraduat (MA)	4	2.837	7	1.01	14	1.87	0	0.00	9	1.17	9	1.21	10	1.88	10	1.45	63	1.25
Total	141	100.00	691	100.00	749	100.00	708	100.00	770	100.00	746	100.00	532	100.00	688	100.00	5024	100.00
OWERSHIP OF RESIDENCE																		
Own House	32	22.70	665	96.24	708	94.53	689	97.32	728	94.55	717	96.11	495	93.05	663	96.37	4696	93.47
Rent	109	77.30	17	2.46	22	2.94	11	1.55	15	1.95	20	2.68	32	6.02	13	1.89	239	4.76
In other house	0	0.00	9	1.30	19	2.54	8	1.13	27	3.51	9	1.21	5	0.94	12	1.74	89	1.77
Total	141	100.00	691	100.00	749	100.00	708	100.00	770	100.00	746	100.00	532	100.00	688	100.00	5024	100.00

Household Form Variables (contd.)	Dhaka City		Modhupur		Kulaura		Godagari		Pirgonj		Debhata		Pekua		Wazirpur		All sites combined	
	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%
LAND OWNERSHIP																		
Landless	28	19.86	80	11.58	87	11.62	224	**31.64**	83	10.78	21	2.82	113	21.24	50	7.27	686	**13.65**
0 - 5 decimal	63	44.68	144	20.84	279	37.25	176	24.86	314	40.78	350	46.92	203	38.16	71	10.32	1600	31.85
10 decimal	25	17.73	69	9.99	77	10.28	147	20.76	96	12.47	103	13.81	79	14.85	138	20.06	733	14.59
20 decimal	17	12.06	56	8.10	64	8.54	30	4.24	48	6.23	54	7.24	42	7.89	181	26.31	492	9.79
30 decimal above	8	5.67	342	49.49	242	32.31	131	18.50	229	29.74	218	29.22	95	17.86	248	36.05	1513	30.12
Total	141	100.00	691	100.00	749	100.00	708	100.00	770	100.00	746	100.00	532	100.00	688	100.00	5024	100.00
TYPE OF HOUSE LIVING IN																		
Mud	1	0.71	39	5.64	45	6.01	66	9.32	125	16.23	310	41.55	116	21.80	7	1.02	709	14.11
Wall Mud + Roof Tin	2	1.42	327	47.32	119	15.89	230	32.49	233	30.26	47	6.30	122	22.93	19	2.76	1099	21.88
Wall Bamboo + Roof Tin	3	2.13	20	2.89	185	24.70	57	8.05	65	8.44	23	3.08	160	30.08	81	11.77	593	11.80
Wall Tin + Roof Tin	12	8.51	273	39.51	44	5.87	145	20.48	111	14.42	23	3.08	12	2.26	535	77.76	1155	22.99
Wall Brick + Roof Tin	92	65.25	32	4.63	245	32.71	162	22.88	228	29.61	171	22.92	27	5.08	38	5.52	995	19.80
Brick House	26	18.44	0	0.00	111	14.82	47	6.64	4	0.52	166	22.25	48	9.02	8	1.16	410	8.16
Flat in Building	4	2.84	0	0.00	0	0.00	0	0.00	1	0.13	5	0.67	0	0.00	0	0.00	10	0.20
Others	1	0.71	0	0.00	0	0.00	1	0.14	3	0.39	1	0.13	47	8.83	0	0.00	53	1.05
Total	141	100.00	691	100.00	749	100.00	708	100.00	770	100.00	746	100.00	532	100.00	688	100.00	5024	100.00
ELECTRICITY																		
No	0	**0.00**	324	**46.89**	158	**21.09**	199	**28.11**	502	**65.19**	282	**37.80**	311	**58.46**	246	**35.76**	2022	**40.25**
Yes	141	100.00	367	53.11	591	78.91	509	71.89	268	34.81	464	62.20	221	41.54	442	64.24	3002	59.75
Total	141	100.00	691	100.00	749	100.00	708	100.00	770	100.00	746	100.00	532	100.00	688	100.00	5024	100.00

Household Form Variables (contd.)	Dhaka City		Modhupur		Kulaura		Godagari		Pirgonj		Debhata		Pekua		Wazirpur		All_sites combined	
	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%
ELECTRIC BULB																		
No	0	0.00	324	46.89	158	21.09	294	41.53	508	65.974	292	39.14	340	63.91	252	36.63	2168	43.15
Yes	141	100.00	367	53.11	591	78.91	414	58.47	262	34.026	454	60.86	192	36.09	436	63.37	2856	56.85
Total	141	100.00	691	100	749	100	708	100.00	770	100.000	746	100.00	532	100.00	688	100.00	5024	100.00
FAN																		
No	0	0.00	419	60.64	288	38.45	337	47.60	539	70	387	51.88	420	78.95	393	57.12	2679	53.32
Yes	141	100.00	272	39.36	461	61.55	371	52.40	231	30	359	48.12	112	21.05	295	42.88	2345	46.68
Total	141	100.00	691	100	749	100.00	708	100.00	770	100	746	100.00	532	100.00	688	100.00	5024	100.00
RADIO																		
No	139	98.58	661	95.66	708	94.53	618	87.29	751	97.53	691	92.63	508	95.49	641	93.17	4716	93.87
Yes	2	1.42	30	4.34	41	5.47	90	12.71	19	2.47	55	7.37	24	4.51	47	6.83	308	6.13
Total	141	100	691	100.00	749	100.00	708	100.00	770	100.00	746	100.00	532	100.00	688	100.00	5024	100.00
TELEVISION																		
No	27	19.15	504	72.94	376	50.20	462	65.25	589	76.49	445	59.65	502	94.36	393	57.12	3297	65.63
Yes	114	80.85	187	27.06	373	49.80	246	34.75	181	23.51	301	40.35	30	5.64	295	42.88	1727	34.38
Total	141	100	691	100.00	749	100.00	708	100.00	770	100.00	746	100.00	532	100.00	688	100.00	5024	100.00
FRIDGE																		
No	92	65.25	674	97.54	608	81.17	627	88.56	746	96.88	696	93.30	508	95.49	645	93.75	4595	91.46
Yes	49	34.75	17	2.46	141	18.83	81	11.44	24	3.12	50	6.70	24	4.51	43	6.25	429	8.54
Total	141	100.00	691	100	749	100	708	100.00	770	100.00	746	100.00	532	100.00	688	100.00	5024	100.00

Household Form Variables (contd.)	Dhaka City		Modhupur		Kulaura		Godagari		Pirgonj		Debhata		Pekua		Wazirpur		All_sites combined	
	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%
VCR/DVD																		
No	136	96.45	646	93.49	667	89.05	692	97.74	760	98.70	725	97.18	522	98.12	665	96.66	4812	95.78
Yes	5	3.55	45	6.51	82	10.95	16	2.26	10	1.30	21	2.82	10	1.88	23	3.34	212	4.22
Total	141	100.00	691	100.00	749	100	708	100.00	770	100.00	746	100.00	532	100.00	688	100.00	5024	100.00
PHONE																		
No	11	7.80	683	98.84	0	0	233	32.91	292	37.92	300	40.21	207	38.91	207	30.09	1618	32.21
Yes	130	92.20	8	1.16	749	100	475	67.09	478	62.08	446	59.79	325	61.09	481	69.91	3406	67.79
Total	141	100	691	100.00	749	100	708	100.00	770	100.00	746	100.00	532	100.00	688	100.00	5024	100.00
COMPUTER																		
No	136	96.45	678	98.12	728	97.20	692	97.74	763	99.09	737	98.79	525	98.68	681	98.98	4939	98.31
Yes	5	3.55	13	1.88	21	2.80	16	2.26	7	0.91	9	1.21	7	1.32	7	1.02	85	1.69
Total	141	100.00	691	100	749	100	708	100.00	770	100.00	746	100.00	532	100.00	688	100.00	5024	100.00
BICYCLE																		
No	140	99.29	476	68.89	627	83.71	461	65.11	533	69.22	419	56.17	520	97.74	640	93.02	3815	75.94
Yes	1	0.71	215	31.11	122	16.29	247	34.89	237	30.78	327	43.83	12	2.26	48	6.98	1209	24.06
Total	141	100	691	100.00	749	100	708	100.00	770	100.00	746	100.00	532	100.00	688	100.00	5024	100.00
RICHSHAW/ CNG																		
No	136	96.45	611	88.42	733	97.86	621	87.71	689	89.48	735	98.53	518	97.37	676	98.26	4718	93.91
Yes	5	3.55	80	11.58	16	2.14	87	12.29	81	10.52	11	1.47	14	2.63	12	1.74	306	6.09
Total	141	100.00	691	100	749	100	708	100.00	770	100.00	746	100.00	532	100.00	688	100.00	5024	100.00

Household Form Variables (contd.)	Dhaka City N	Dhaka City %	Modhupur N	Modhupur %	Kulaura N	Kulaura %	Godagari N	Godagari %	Pirgonj N	Pirgonj %	Debhata N	Debhata %	Pekua N	Pekua %	Wazirpur N	Wazirpur %	All_sites combined N	All_sites combined %
BUS/TRUCK																		
No	141	100.00	688	99.57	740	98.80	623	87.99	766	99.48	737	98.79	528	99.25	685	99.50	4907	97.67
Yes	0	0	3	0.43	9	1.20	85	12.01	4	0.52	9	1.21	4	0.75	3	0.40	117	2.33
Total	141	100.00	691	100	749	100	708	100.00	770	100.00	746	100.00	532	100.00	688	100.00	5024	100.00
MOTOR CYCLE																		
No	138	97.87	642	92.91	693	92.52	595	84.04	695	90.26	656	87.94	523	98.31	679	98.69	4620	91.96
Yes	3	2.13	49	7.09	56	7.48	113	15.96	75	9.74	90	12.06	9	1.69	9	1.31	404	8.04
Total	141	100.00	691	100	749	100	708	100.00	770	100.00	746	100.00	532	100.00	688	100.00	5024	100.00
PRIVETCAR/ TAXI CAB																		
No	141	100.00	691	100	734	98.00	706	99.72	766	99.48	744	99.73	532	100.00	688	100.00	5001	99.54
Yes	0	0	0	0.00	15	2.00	2	0.28	4	0.52	2	0.27	0	0.00	0	0.00	23	0.46
Total	141	100.00	691	100	749	100.00	708	100.00	770	100.00	746	100.00	532	100.00	688	100.00	5024	100.00
BOAT																		
No	141	100.00	683	98.84	741	98.93	652	92.09	762	98.96	738	98.93	531	99.81	613	89.10	4860	96.74
Yes	0	0.00	8	1.16	8	1.07	56	7.91	8	1.04	8	1.07	1	0.19	75	10.90	164	3.26
Total	141	100.00	691	100.00	749	100.00	708	100.00	770	100.00	746	100.00	532	100.00	688	100.00	5024	100.00
COW																		
No	141	100.00	475	68.74	632	84.38	455	64.27	374	48.57	545	73.06	414	77.82	546	79.36	3581	71.28
Yes	0	0.00	216	31.26	117	15.62	253	35.73	396	51.43	201	26.94	118	22.18	142	20.64	1443	28.72
Total	141	100.00	691	100.00	749	100.00	708	100.00	770	100.00	746	100.00	532	100.00	688	100.00	5024	100.00

Household Form Variables (contd.)	Dhaka City		Modhupur		Kulaura		Godagari		Pirgonj		Debhata		Pekua		Wazirpur		All_sites combined	
	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%
SHALLOW TUBEWEL																		
No	141	100.00	631	91.32	710	94.79	681	96.19	652	84.68	697	93.43	458	86.09	639	92.88	4609	91.74
Yes	0	0.00	60	8.68	39	5.21	27	3.81	118	15.32	49	6.57	74	13.91	49	7.12	415	8.26
Total	141	100.00	691	100	749	100	708	100.00	770	100.00	746	100.00	532	100.00	688	100.00	5024	100.00
RIVER													532	100.00				
No	141	100.00	691	100	742	99.07	657	92.80	763	99.09	741	99.33	0	0.00	671	97.53	4937	98.27
Yes	0	0.00	0	0	7	0.93	51	7.20	7	0.91	5	0.67	532	100.00	17	2.47	87	1.73
Total	141	100.00	691	100	749	100	708	100.00	770	100.00	746	100.00			688	100.00	5024	100.00
FOUNTAIN/RAIN WATER																		
No	141	100.00	691	100	749	100	641	90.54	770	100.00	746	100.00	532	100.00	671	97.53	4940	98.33
Yes	0	0.00	0	0	0	0	67	9.46	0	0.00	0	0.00	0	0.00	17	2.47	84	1.67
Total	141	100.00	691	100	749	100	708	100.00	770	100.00	746	100.00	532	100.00	688	100.00	5024	100.00
Pond																		
No	141	100.00	690	99.86	610	81.44	638	90.11	768	99.74	745	99.87	532	100.00	557	80.96	4680	93.15
Yes	0	0.00	1	0.14	139	18.56	70	9.89	2	0.26	1	0.13	0	0.00	131	19.04	344	6.85
Total	141	100.00	691	100	749	100	708	100.00	770	100.00	746	100.00	532	100.00	688	100.00	5024	100.00
PURCHASE WATER																		
No	141	100.00	691	100	749	100	708	100	768	99.74	746	100.00	532	100.00	688	100.00	5022	99.96
Yes	0	0.00	0	0	0	0	0	0	2	0.26	0	0.00	0	0.00	0	0.00	2	0.04
Total	141	100.00	691	100	749	100	708	100	770	100.00	746	100.00	532	100.00	688	100.00	5024	100.00

Household Form Variables (contd.)	Dhaka City		Modhupur		Kulaura		Godagari		Pirgonj		Debhata		Pekua		Wazirpur		All_sites combined	
	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%
DUCK/HEN																		
No	141	100.00	173	25.04	325	43.39	314	44.35	289	37.53	200	26.81	165	31.02	132	19.19	1739	34.61
Yes	0	0.00	518	74.96	424	56.61	394	55.65	481	62.47	546	73.19	367	68.98	556	80.81	3285	65.39
Total	141	100.00	691	100.00	749	100.00	708	100.00	770	100.00	746	100.00	532	100.00	688	100.00	5024	100.00
COW/GOAT																		
No	141	100.00	343	49.64	533	71.16	366	51.69	277	35.97	470	63.00	348	65.41	485	70.49	2962	58.96
Yes	0	0.00	348	50.36	216	28.84	342	48.31	493	64.03	276	37.00	184	34.59	203	29.51	2062	41.04
Total	141	100.00	691	100.00	749	100.00	708	100.00	770	100.00	746	100.00	532	100.00	688	100.00	5024	100.00
FARM																		
No	141	100.00	665	96.24	711	94.93	606	85.59	713	92.60	735	98.53	523	98.31	676	98.26	4769	94.92
Yes	0	0.00	26	3.76	38	5.07	102	14.41	57	7.40	11	1.47	9	1.69	12	1.74	255	5.08
Total	141	100.00	691	100.00	749	100.00	708	100.00	770	100.00	746	100.00	532	100.00	688	100.00	5024	100.00
TAP IN THE HOUSE																		
No	105	74.47	688	99.57	676	90.25	686	96.89	765	99.35	746	100.00	520	97.74	685	99.56	4870	96.93
Yes	36	25.53	3	0.43	73	9.75	22	3.11	5	0.65	0	0.00	12	2.26	3	0.44	154	3.07
Total	141	100	691	100.00	749	100.00	708	100.00	770	100.00	746	100.00	532	100.00	688	100.00	5024	100.00
TAP IN THE FIELD																		
No	80	56.74	684	98.99	660	88.12	669	94.49	765	99.35	685	91.82	495	93.05	574	83.43	4724	94.03
Yes	61	43.26	7	1.01	89	11.88	39	5.51	5	0.65	61	8.18	37	6.95	114	16.57	300	5.97
Total	141	100	691	100.00	749	100.00	708	100.00	770	100.00	746	100.00	532	100.00	688	100.00	5024	100.00

Household Form Variables (contd.)	Dhaka City		Modhupur		Kulaura		Godagari		Pirgonj		Debhata		Pekua		Wazirpur		All_sites combined	
	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%
GOVT. TUBEWELL/TAP																		
No	41	29.08	688	99.57	705	94.13	540	76.27	767	99.61	308	41.29	213	40.04	424	61.63	3686	73.37
Yes	100	70.92	3	0.43	44	5.87	168	23.73	3	0.39	438	58.71	319	59.96	264	38.37	1338	26.63
Total	141	100	691	100.00	749	100.00	708	100.00	770	100.00	746	100.00	532	100.00	688	100.00	5024	100.00
WELL																		
No	139	98.58	680	98.41	712	95.06	678	95.76	759	98.57	743	99.60	530	99.62	574	83.43	4814	95.82
Yes	2	1.42	11	1.59	37	4.94	30	4.24	11	1.43	3	0.40	2	0.38	114	16.57	210	4.18
Total	141	100	691	100.00	749	100.00	708	100.00	770	100.00	746	100.00	532	100.00	688	100.00	5024	100.00
TUBEWELL																		
No	141	100.00	88	12.74	361	48.20	311	43.93	68	8.83	448	60.05	361	67.86	402	58.43	2170	43.19
Yes	0	0.00	603	87.26	388	51.80	397	56.07	702	91.17	298	39.95	171	32.14	286	41.57	2854	56.81
Total	141	100.00	691	100.00	749	100.00	708	100.00	770	100.00	746	100.00	532	100.00	688	100.00	5024	100.00
SALT WATER																		
No	141	100.00	691	100.00	749	100.00	683	96.47	767	99.61	740	99.20	532	100.00	688	100.00	4990	99.32
Yes	0	0.00	0	0.00	0	0	25	3.53	3	0.39	6	0.80	0	0.00	0	0.00	34	0.68
Total	141	100.00	691	100.00	749	100.00	708	100.00	770	100.00	746	100.00	532	100.00	688	100.00	5024	100.00
ARSENIC IN WATER																		
No	141	100.00	691	100.00	739	98.66	700	98.87	770	100.00	740	99.20	532	100.00	686	99.71	4998	99.48
Yes	0	0.00	0	0.00	10	1.34	8	1.13	0	0.00	6	0.80	0	0.00	2	0.29	26	0.52
Total	141	100.00	691	100.00	749	100.00	708	100.00	770	100.00	746	100.00	532	100.00	688	100.00	5024	100.00

Household Form Variables (contd.)	Dhaka City		Modhupur		Kulaura		Godagari		Pirgonj		Debhata		Pekua		Wazirpur		All_sites combined	
	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%
TYPE OF TOILET																		
Flush	137	97.16	356	51.52	526	70.23	320	45.20	214	27.79	280	37.53	208	39.10	440	63.95	2481	49.38
Bucket	1	0.71	146	21.13	110	14.69	296	41.81	308	40.00	458	61.39	258	48.50	245	35.61	1821	36.25
Pit	3	2.13	171	24.75	111	14.82	41	5.79	32	4.16	3	0.40	8	1.50	1	0.15	370	7.36
open toilet	0	0	11	1.59	1	0.13	50	7.06	116	15.06	2	0.27	56	10.53	0	0.00	236	4.70
others	0	0	7	1.01	1	0.13	1	0.14	100	12.99	3	0.40	2	0.38	2	0.29	116	2.31
Total	141	100	691	100.00	749	100.00	708	100.00	770	100.00	746	100.00	532	100.00	688	100.00	5024	100.00
USE IODIZED SALT																		
no, never	135	95.74	347	50.22	739	98.66	401	56.64	349	45.32	722	96.78	74	13.91	686	99.71	3453	68.73
sometimes	2	1.42	230	33.29	8	1.07	129	18.22	101	13.12	2	0.27	272	51.13	1	0.15	744	14.81
yes, usually	4	2.84	112	16.21	1	0.13	143	20.20	307	39.87	22	2.95	185	34.77	1	0.15	775	15.43
uncertain	0	0.00	2	0.29	1	0.13	35	4.94	13	1.69	0	0.00	1	0.19	0	0.00	52	1.04
Total	141	100	691	100.00	749	100.00	708	100.00	770	100.00	746	100.00	532	100.00	688	100.00	5024	100.00
Information about individual mothers and their children: from Mother Child Form (MCF)																		
MOTHER EDUCATION																		
Never	43	29.05	253	35.38	181	23.15	149	19.68	250	31.85	106	13.78	223	39.12	44	6.04	1249	23.77
Primary	46	31.08	270	37.76	210	26.85	220	29.06	283	36.05	258	33.55	141	24.74	363	49.79	1790	34.07
Class VIII	28	18.92	103	14.41	166	21.23	226	29.85	143	18.22	283	36.80	98	17.19	182	24.97	1229	23.39
Class X	17	11.49	75	10.49	179	22.89	102	13.47	70	8.92	95	12.35	78	13.68	102	13.99	718	13.67
SSC	8	5.41	9	1.26	32	4.09	47	6.21	26	3.31	22	2.86	23	4.04	28	3.84	195	3.71
HSC	4	2.70	4	0.56	11	1.41	8	1.06	9	1.15	4	0.52	6	1.05	9	1.23	55	1.05
Graduate (BA)	2	1.35	1	0.14	3	0.38	5	0.66	4	0.51	1	0.13	1	0.18	0	0.00	17	0.32

Household Form Variables (contd.)	Dhaka City		Modhupur		Kulaura		Godagari		Pirgonj		Debhata		Pekua		Wazirpur		All_sites combined	
	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%
Postgraduat (MA)	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	1	0.14	1	0.02
Total	148	100	715	100.00	782	100.00	757	100.00	785	100.00	769	100.00	570	100.00	729	100.00	5254	100.00
CAN READ PAPER																		
Can not Read	43	29.05	302	42.24	181	23.15	359	47.42	524	66.75	197	25.62	273	47.89	307	42.11	2186	41.61
Difficulty	46	31.08	210	29.37	210	26.85	31	4.10	72	9.17	151	19.64	80	14.04	165	22.63	964	18.35
Can read Easily	59	39.86	203	28.39	391	50.00	367	48.48	189	24.08	421	54.75	217	38.07	257	35.25	2104	40.05
Total	148	100.00	715	100.00	782	100.00	757	100.00	785	100.00	769	100.00	570	100.00	729	100.00	5254	100.00
OTHER WORKS (mother)																		
No	126	85.14	677	94.69	764	97.70	733	96.83	716	91.21	695	90.38	562	98.60	704	96.57	4976	94.71
Yes	22	14.86	38	5.31	18	2.30	24	3.17	69	8.79	74	9.62	8	1.40	25	3.43	278	5.29
Total	148	100.00	715	100.00	782	100.00	757	100.00	785	100.00	769	100.00	570	100.00	729	100.00	5254	100.00
REMUNERATION FOR WORK																		
No	122	82.43	673	94.13	763	97.57	733	96.83	716	91.21	695	90.38	562	98.60	704	96.57	4967	94.54
Yes	26	17.57	42	5.87	19	2.43	24	3.17	69	8.79	74	9.62	8	1.40	25	3.43	287	5.46
Total	148	100.00	715	100.00	782	100.00	757	100.00	785	100.00	769	100.00	570	100.00	729	100.00	5254	100.00
MICROCREDIT																		
No	137	92.57	518	72.45	659	84.27	602	79.52	600	76.43	673	87.52	428	75.09	589	80.80	4205	80.03
Yes	11	7.43	197	27.55	123	15.73	155	20.48	185	23.57	96	12.48	142	24.91	140	19.20	1049	19.97
Total	148	100.00	715	100.00	782	100.00	757	100.00	785	100.00	769	100.00	570	100.00	729	100.00	5254	100.00

Mother Child Form (MCF) variables	Dhaka City N	%	Modhupur N	%	Kulaura N	%	Godagari N	%	Pirgonj N	%	Debhata N	%	Pekua N	%	Wazirpur N	%	All_sites combined N	%
CONSANGUINITY																		
No	134	90.54	667	93.29	722	92.33	699	92.34	728	92.74	741	96.36	516	90.53	678	93.00	4884	92.96
Yes, first cousin	14	9.46	44	6.15	43	5.50	58	7.66	53	6.75	25	3.25	41	7.19	13	1.78	291	5.54
Yes	0	0.00	2	0.28	1	0.13	0	0.00	1	0.13	1	0.13	3	0.53	4	0.55	12	0.23
Yes, Other	0	0.00	1	0.14	14	1.79	0	0.00	3	0.38	2	0.26	8	1.40	8	1.10	36	0.69
not specific relative	0	0.00	1	0.14	2	0.26	0	0.00	0	0.00	0	0.00	2	0.35	26	3.57	31.00	0.59
Total	148	100.00	715	100.00	782	100.00	757	100.00	785	100.00	769	100.00	570	100.00	729	100.00	5254	100.00
DEAD CHILDREN																		
No	129	87.16	646	90.35	726	92.84	711	93.92	718	91.46	738	95.97	513	90.00	694	95.20	4874	92.77
Yes	19	12.84	69	9.65	56	7.16	46	6.08	67	8.54	31	4.03	57	10.00	35	4.80	380	7.23
Total	148	100.00	715	100.00	782	100.00	757	100.00	785	100.00	769	100.00	570	100.00	729	100.00	5254	100.00
Information about individual children 0-<2 years age: from the Developmental Screening Questionnaire (DSQ)																		
BORN AT 9 MONTHS																		
Yes	45	95.74	176	94.62	211	97.69	220	98.21	199	94.31	188	98.43	192	98.97	195	99.49	1426	97.34
Before 8.5 months	2	4.26	10	5.38	4	1.85	4	1.79	7	3.32	3	1.57	2	1.03	0	0.00	32	2.18
Unknown	0	0.00	0	0	1	0.46	0	0.00	5	2.37	0	0	0	0.00	1	0.51	7	0.48
Total	47	100.00	186	100.00	216	100.00	224	100.00	211	100.00	191	100.00	194	100.00	196	100.00	1465	100.00
DELIVERY PLACE																		
Home	24	51.06	161	86.56	118	54.63	124	55.36	125	59.24	112	58.64	166	85.57	145	73.98	975	**66.55**
Maternity Centre	0	0.00	1	0.54	2	0.93	4	1.79	2	0.95	2	1.05	2	1.03	1	0.51	14	0.96

Mother Child Form (MCF) variables	Dhaka City		Modhupur		Kulaura		Godagari		Pirgonj		Debhata		Pekua		Wazirpur		All_sites combined	
	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%
Clinic	10	21.28	10	5.38	83	38.43	41	18.30	24	11.37	47	24.61	4	2.06	16	8.16	235	16.04
Hospital	10	21.28	13	6.99	12	5.56	54	24.11	60	28.44	30	15.71	22	11.34	34	17.35	235	16.04
Others	3	6.38	1	0.54	1	0.46	1	0.45	0	0.00	0	0.00	0	0.00	0	0.00	6	0.41
Total	47	100.00	186	100.00	216	100.00	224	100.00	211	100.00	191	100.00	194	100.00	196	100.00	1465	100.00
DELIVERY BY WHOM																		
Physician	15	31.91	42	22.58	101	46.76	58	25.89	36	17.06	78	40.84	38	19.59	37	18.88	405	**27.65**
Nurses	10	21.28	6	3.23	26	12.04	56	25.00	59	27.96	20	10.47	10	5.15	31	15.82	218	**14.88**
Skilled birth attendant	9	19.15	36	19.35	24	11.11	22	9.82	49	23.22	30	15.71	3	1.55	71	36.22	244	**16.66**
Unskilled birth attendant	11	23.40	69	37.10	61	28.24	14	6.25	41	19.43	61	31.94	143	73.71	51	26.02	451	**30.78**
Any family member	2	4.26	32	17.20	4	1.85	74	33.04	26	12.32	2	1.05	0	0.00	6	3.06	146	9.97
Unknown	0	0.00	1	0.54	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	1	0.07
Total	47	100.00	186	100.00	216	100.00	224	100.00	211	100.00	191	100.00	194	100.00	196	100.00	1465	100.00
CHILD CRY IMMEDIATELY																		
Yes	38	80.85	185	99.46	205	94.91	208	92.86	188	89.10	184	96.34	183	94.33	167	85.20	1358	92.70
No within 5 minetes	6	12.77	1	0.54	2	0.93	6	2.68	7	3.32	1	0.52	5	2.58	24	12.24	52	3.55
After 5 minutes	2	4.26	0	0	7	3.24	9	4.02	16	7.58	5	2.62	4	2.06	3	1.53	46	3.14
Unknown	1	2.13	0	0	2	0.93	1	0.45	0	0.00	1	0.52	2	1.03	2	1.02	9	0.61
Total	47	100.00	186	100.00	216	100.00	224	100.00	211	100.00	191	100.00	194	100.00	196	100.00	1465	100.00
CHANGE COLOR AT BIRTH																		
Normal	43	91.49	186	100.00	212	98.15	218	97.32	198	93.84	187	97.91	185	95.36	193	98.47	1422	97.06
Blue	3	6.38	0	0	4	1.85	2	0.89	6	2.84	3	1.57	4	2.06	3	1.53	25	1.71
Pale	1	2.13	0	0	0	0.00	2	0.89	7	3.32	1	0.52	1	0.52	0.00	0.00	11	0.75

Mother Child Form (MCF) variables	Dhaka City		Modhupur		Kulaura		Godagari		Pirgonj		Debhata		Pekua		Wazirpur		All_sites combined	
	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%
Unknown	0	0.00	0	0	0	0.00	2	0.89	0	0.00	0	0.00	4	2.06	0.00	0.00	7	0.48
Total	47	100.00	186	100.00	216	100.00	224	100.00	211	100.00	191	100.00	194	100.00	196	100.00	1465	100.00
HOW ALERT AT BIRTH																		
Alert	44	93.62	184	98.92	209	96.76	220	98.21	194	91.94	186	97.38	192	98.97	194	98.98	1423	97.13
Lethargic	3	6.38	2	1.08	7	3.24	4	1.79	17	8.06	5	2.62	2	1.03	2	1.02	42	2.87
Total	47	100.00	186	100.00	216	100.00	224	100.00	211	100.00	191	100.00	194	100.00	196	100.00	1465	100.00
HOW WITHIN 7 DAYS OF BIRTH																		
Mild Jaundice	18	38.30	185	99.46	18	8.33	201	89.73	12	5.69	81	42.41	64	32.99	163	83.16	742	50.65
Severe Jaundice	2	4.26	0	0.00	3	1.39	2	0.89	3	1.42	1	0.52	3	1.55	0	0.00	14	0.96
Seizures	1	2.13	1	0.54	0	0	1	0.45	4	1.90	2	1.05	2	1.03	0	0.00	11	0.75
N/A	26	55.32	0	0.00	195	90.28	20	8.93	192	91.00	107	56.02	125	64.43	33	16.84	698	47.65
Total	47	100.00	186	100.00	216	100.00	224	100.00	211	100.00	191	100.00	194	100.00	196	100.00	1465	100.00
PAST 1 YEAR SZ WITHOUT FEVER																		
No	47	100.00	185	99.46	216	100	223	99.55	209	99.05	189	98.95	191	98.45	192	97.96	1452	99.11
yes	0	0.00	1	0.54	0	0	1	0.45	2	0.95	2	1.05	3	1.55	4	2.04	13	0.89
Total	47	100.00	186	100.00	216	100	224	100.00	211	100.00	191	100.00	194	100.00	196	100.00	1465	100.00
CHILD SEX (DSQ)																		
Male	27	57.45	96	51.61	121	56.02	130	58.04	109	51.66	94	49.21	101	52.06	110	56.12	788	53.79
Female	20	42.55	90	48.39	95	43.98	94	41.96	102	48.34	97	50.79	93	47.94	86	43.88	677	46.21
Total	47	100.00	186	100.00	216	100.00	224	100.00	211	100.00	191	100.00	194	100.00	196	100.00	1465	100.00

Information about individual children 2-9 years age: from the Ten Questions Plus (TQP)

Child variables (TQP)	Dhaka City		Modhupur		Kulaura		Godagari		Pirgonj		Debhata		Pekua		Wazirpur		All_sites combined	
	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%
CHILD SEX (TQP)																		
Male	75	48.08	414	50.80	464	56.59	417	53.53	428	53.23	390	48.21	437	52.84	412	51.18	3037	52.23
Female	81	51.92	401	49.20	356	43.41	362	46.47	376	46.77	419	51.79	390	47.16	412	48.82	2778	47.77
Total	156	100.00	815	100	820	100.00	779	100.00	804	100.00	809	100.00	827	100.00	805	100.00	5815	100.00
BORN AT 9 MONTHS																		
Yes	152	97.44	804	98.65	809	98.66	762	97.82	752	93.53	799	98.76	818	98.91	773	96.02	5669	97.49
Before 8.5 Months	4	2.56	7	0.86	9	1.10	17	2.18	18	2.24	10	1.24	7	0.85	12	1.49	84	1.44
Unknown	0	0	4	0.49	2	0.24	0	0.00	34	4.23	0	0.00	2	0.24	20	2.48	62	1.07
Total	156	100.00	815	100.00	820	100.00	779	100.00	804	100.00	809	100.00	827	100.00	805	100.00	5815	100.00
DELIVERY PLACE																		
Home	111	71.15	757	92.88	647	78.90	564	72.401	623	77.49	638	78.86	794	96.01	718	89.19	4852	83.44
Maternity Centre	2	1.28	4	0.49	4	0.49	6	0.770	2	0.25	10	1.24	1	0.12	2	0.25	31	0.53
Clinic	9	5.77	24	2.94	150	18.29	60	7.702	41	5.10	89	11.00	4	0.48	39	4.84	416	7.15
Hospital	31	19.87	30	3.68	17	2.07	145	18.614	138	17.16	71	8.78	28	3.39	45	5.59	505	8.68
Others	3	1.92	0	0.00	2	0.24	4	0.513	0	0.00	1	0.12	0	0.00	1	0.12	11	0.19
Total	156	100.00	815	100.00	820	100.00	779	100.000	804	100.00	809	100.00	827	100.00	805	100.00	5815	100.00
DELIVERY BY WHOM																		
Physician	37	23.72	131	16.07	299	36.46	160	20.54	134	16.67	71	8.78	63	7.62	111	13.79	1006	17.30
Nurses	16	10.26	25	3.07	57	6.95	145	18.61	167	20.77	81	10.01	18	2.18	62	7.70	571	9.82
Trained birth attendant	18	11.54	191	23.44	125	15.24	74	9.50	168	20.90	173	21.38	4	0.48	341	42.36	1094	18.81
Untrained birth attendant	82	52.56	361	44.29	328	40.00	54	6.93	149	18.53	418	51.67	739	89.36	250	31.06	2381	40.95

Child variables (TQP)	Dhaka City		Modhupur		Kulaura		Godagari		Pirgonj		Debhata		Pekua		Wazirpur		All_sites combined	
	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%
Family member	3	1.92	106	13.01	11	1.34	346	44.42	186	23.13	66	8.16	3	0.36	41	5.09	762	13.10
Unknown	0	0.00	1	0.12	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	1	0.02
Total	156	100.00	815	100.00	820	100.00	779	100.00	804	100.00	809	100.00	827	100.00	805	100.00	5815	100.00

CRY IMMEDIATELY

Child variables (TQP)	Dhaka City		Modhupur		Kulaura		Godagari		Pirgonj		Debhata		Pekua		Wazirpur		All_sites combined	
Yes	130	83.33	792	97.18	761	92.80	739	94.87	758	94.28	789	97.53	797	96.37	723	89.81	5489	94.39
No within 5 minetes	10	6.41	6	0.74	13	1.59	27	3.47	20	2.49	11	1.36	14	1.69	45	5.59	146	2.51
After 5 mineetes	11	7.05	11	1.35	34	4.15	10	1.28	20	2.49	4	0.49	5	0.60	10	1.24	105	1.81
Unknown	5	3.21	6	0.74	12	1.46	3	0.39	6	0.75	5	0.62	11	1.33	27	3.35	75	1.29
Total	156	100.00	815	100.00	820	100.00	779	100.00	804	100.00	809	100.00	827	100.00	805	100.00	5815	100.00

CHANGE OF COLOR AT BIRTH

Child variables (TQP)	Dhaka City		Modhupur		Kulaura		Godagari		Pirgonj		Debhata		Pekua		Wazirpur		All_sites combined	
Normal	133	85.26	806	98.90	796	97.07	731	93.84	776	96.52	802	99.13	819	99.03	788	97.89	5651	97.18
Blue	12	7.69	6	0.74	17	2.07	5	0.64	9	1.12	6	0.74	4	0.48	5	0.62	64	1.10
Pale	6	3.85	2	0.25	5	0.61	8	1.03	18	2.24	1	0.12	1	0.12	10	1.24	51	0.88
Unknown	5	3.21	1	0.12	2	0.24	35	4.49	1	0.12	0	0.00	3	0.36	2	0.25	49	0.84
Total	156	100.00	815	100.00	820	100.00	779	100.00	804	100.00	809	100.00	827	100.00	805	100.00	5815	100.00

HOW ALERT CHILD AT BIRTH

Child variables (TQP)	Dhaka City		Modhupur		Kulaura		Godagari		Pirgonj		Debhata		Pekua		Wazirpur		All_sites combined	
Alert	137	87.82	808	99.14	784	95.61	773	99.23	770	95.77	799	98.76	822	99.40	802	99.63	5695	97.94
Lethergic	19	12.18	7	0.86	36	4.39	6	0.77	34	4.23	10	1.24	5	0.60	3	0.37	120	2.06
Total	156	100.00	815	100.00	820	100.00	779	100.00	804	100.00	809	100.00	827	100.00	805	100.00	5815	100.00

HOW WITHIN 7 DAYS OF BIRTH

Child variables (TQP)	Dhaka City		Modhupur		Kulaura		Godagari		Pirgonj		Debhata		Pekua		Wazirpur		All_sites combined	
Mild Jaundice	11	7.05	712	87.36	660	80.49	524	67.27	381	47.39	157	19.41	524	63.36	661	82.11	3630	62.42
Severe Jaundice	9	5.77	15	1.84	18	2.20	11	1.41	12	1.49	3	0.37	15	1.81	2	0.25	85	1.46
Seizure	10	6.41	4	0.49	2	0.24	8	1.03	12	1.49	2	0.25	2	0.24	3	0.37	43	0.74

Child variables (TQP)	Dhaka City		Modhupur		Kulaura		Godagari		Pirgonj		Debhata		Pekua		Wazirpur		All_sites combined	
	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%
N/A	126	80.77	84	10.31	140	17.07	236	30.30	399	49.63	647	79.98	286	34.58	139	17.27	2057	35.37
Total	156	100.00	815	100	820	100.00	779	100	804	100.00	809	100.00	827	100.00	805	100.00	5815	100.00
REGULAR SCHOOL																		
Never	93	59.62	343	42.09	513	62.56	410	52.63	441	54.85	273	33.75	364	44.01	365	45.34	2802	48.19
No, Dropout	2	1.28	10	1.23	1	0.12	6	0.77	3	0.37	9	1.11	4	0.48	3	0.37	38	0.65
Yes, Irregular	5	3.21	37	4.54	35	4.27	32	4.11	49	6.09	57	7.05	41	4.96	80	9.94	336	5.78
Yes, Regular	56	35.90	425	52.15	271	33.05	331	42.49	311	38.68	470	58.10	418	50.54	357	44.35	2639	45.38
Total	156	100.00	815	100.00	820	100.00	779	100.00	804	100.00	809	100.00	827	100.00	805	100.00	5815	100.00
CARETAKER OF THE CHILD																		
Mother	146	93.59	782	95.95	808	98.54	765	98.20	776	96.52	737	91.10	820	99.15	794	98.63	5685	97.76
Father	2	1.28	4	0.49	8	0.98	6	0.77	4	0.50	18	2.22	3	0.36	1	0.12	32	0.55
Grand Mother	4	2.56	22	2.70	2	0.24	3	0.39	20	2.49	30	3.71	3	0.36	10	1.24	73	1.26
Brother/Sister	3	1.92	3	0.37	0	0.00	1	0.13	1	0.12	4	0.49	0	0.00	0	0.00	9	0.15
Other Reletive	1	0.64	1	0.12	2	0.24	1	0.13	1	0.12	5	0.62	0	0.00	0	0.00	5	0.09
Others	0	0.00	3	0.37	0	0.00	3	0.39	2	0.25	15	1.85	1	0.12	0	0.00	11	0.19
Total	156	100.00	815	100.00	820	100.00	779	100.00	804	100.00	809	100.00	827	100.00	805	100.00	5815	100.00

Developmental Screening Questionnaire (DSQ)
(০-২৩ মাস)

Age	Domain	Questions	Item no.
০ মাস	শারীরিক বিকাশ (Gross motor)	চিৎ হয়ে শোওয়া অবস্থায় বা উপুড় অবস্থায় মাথা নাড়ায়	DSQ-1
	হাতের কর্ম (Fine motor)	হাতের মুঠি মাঝে মাঝে খোলে	DSQ-2
	দৃষ্টি শক্তি (Vision)	আলোতে প্রতিক্রিয়া করে	DSQ-3
	শ্রবণ শক্তি (Hearing)	কানে ভনাতে পায় (চমকে ওঠে, চোখ বড় করে, চোখ পিট পিট করে, মুখেরভাব পরিবর্তন হয়, শব্দের দিকে চোখ ঘুরায়)	DSQ-4
	বোধ শক্তি (Cognition)	সংেতন হয় (কথা বলানে/স্পর্শে/ মুখ দেখানে)	DSQ-5
	সামাজিকতা (Socialization)	সান্ত্বনা ও স্নেহ অনুভব করে (মােয়ের গলার স্বর শুনলে, দেখলে বা কোলে নিলে কান্না থামিয়ে দেয়)	DSQ-6
	আচরণ (Behavior)	অতিরিক্ত কান্নাকাটি বা ঘ্যান ঘ্যান করে না এবং স্বাভাবিক ঘুম হয়	DSQ-7
	মুখের আওয়াজ/কথা (Speech)	শব্দ করে কান্না করে	DSQ-8
১ মাস	শারীরিক বিকাশ (Gross motor)	চিৎ হয়ে শোওয়া অবস্থায় বা উপুড় অবস্থায় মাথা নাড়ায়	DSQ_9
	হাতের কর্ম (Fine motor)	হাতের মুঠি মাঝে মাঝে খোলে	DSQ-10
	দৃষ্টি শক্তি (Vision)	মুখের দিকে তাকায়	DSQ-11
	শ্রবণ শক্তি (Hearing)	কানে ভনাতে পায় (চমকে ওঠে, চোখ বড় করে, চোখ পিট পিট করে, মুখেরভাব পরিবর্তন হয়, শব্দের দিকে চোখ ঘুরায়)	DSQ-12
	বোধ শক্তি (Cognition)	খাওয়ানোর সময় মুখের দিকে তাকায়/কোলে নিলে বা কথা বললে কান্না থামায় দেয়	DSQ-13
	সামাজিকতা (Socialization)	সান্ত্বনা ও স্নেহ অনুভব করে (মােয়ের গলার স্বর শুনলে, দেখলে বা কোলে নিলে কান্না থামিয়ে দেয়)	DSQ-14
	আচরণ (Behavior)	অতিরিক্ত কান্নাকাটি বা ঘ্যান ঘ্যান করে না এবং স্বাভাবিক ঘুম হয়	DSQ-15
	মুখের আওয়াজ/কথা (Speech)	শব্দ করে কান্না করে	DSQ-16

মাস	বিষয়	বর্ণনা	DSQ
২ মাস	শারীরিক বিকাশ (Gross motor)	বসা অবস্থায় মাথা মাঝে মাঝে উপরের তোলে	DSQ-17.
	হাতের কর্ম (Fine motor)	হাতের মুঠি মাঝে মাঝে খোলে	DSQ-18
	দৃষ্টি শক্তি (Vision)	বড় জিনিস দেখে (১২ সেঃ মিঃ সাইজের জিনিস)	DSQ-19
	শ্রবণ শক্তি (Hearing)	কানে ভালো শুনতে পায় (চমকে ওঠে, চোখ বড় করে, চোখ পিট পিট করে, শ্বেবহাব পরিবর্তন হয়, শব্দের দিকে চোখ ঘুরায়)	DSQ-20
	বোধ শক্তি (Cognition)	চোখে চোখে তাকায়/চোখের সামনান চলমান খেলনা বা কোন জিনিস দৃষ্টি দিয়ে অনুসরণ করে	DSQ-21
	সামাজিকতা (Socialization)	সান্ত্রিধ্য ও স্নেহ অনুভব করে (মায়ের গলার স্বর শুনলে, দেখলে বা কোলে নিলে কান্না থামিয়ে দেয়)	DSQ-22
	আচরণ (Behavior)	অতিরিক্ত কান্নাকাটি বা ঋান্ন ফ্যান করে না এবং স্বাভাবিক ঘুম হয়	DSQ-23
	মুখের আওয়াজ/কথা (Speech)	কান্না ছাড়া অন্য কোন আওয়াজ করে	DSQ-24
৭ মাস	শারীরিক বিকাশ (Gross motor)	বসা অবস্থায় মাথা সোজা করে বেশ কিছুক্ষন ধরে রাখে	DSQ_25
	হাতের কর্ম (Fine motor)	বেশীরভাগ সময় হাতের মুঠি খোলা থাকে	DSQ-26
	দৃষ্টি শক্তি (Vision)	ছোট জিনিস দেখে (যেমন: চারের পেয়ালা)	DSQ-27
	শ্রবণ শক্তি (Hearing)	কানে ভালো শুনতে পায় (চমকে ওঠে, চোখ বড় করে, চোখ পিট পিট করে, শ্বেবহাব পরিবর্তন হয়, শব্দের দিকে চোখ ঘুরায়)	DSQ-28
	বোধ শক্তি (Cognition)	কথার এছুত্তরে হাসে বা আওয়াজ করে	DSQ-29
	সামাজিকতা (Socialization)	সান্ত্রিধ্য ও স্নেহ অনুভব করে (মায়ের গলার স্বর শুনলে, দেখলে বা কোলে নিলে কান্না থামিয়ে দেয়)	DSQ-30
	আচরণ (Behavior)	অতিরিক্ত কান্নাকাটি বা ঋান্ন ফ্যান করে না এবং স্বাভাবিক ঘুম হয়	DSQ-31
	মুখের আওয়াজ/কথা (Speech)	কান্না ছাড়া অন্য কোন আওয়াজ করে	DSQ-32
৮ মাস	শারীরিক বিকাশ (Gross motor)	বসা অবস্থায় মাথা সোজা করে বেশ কিছুক্ষন ধরে রাখে	DSQ-33
	হাতের কর্ম (Fine motor)	হাতের মুঠি খোলা থাকে এবং হাতে কিছু ধরিয়ে দিলে কিছু সময় হাতে রাখতে পারে	DSQ-34
	দৃষ্টি শক্তি (Vision)	ছোট জিনিস দেখে (যেমন: চারের পেয়ালা)	DSQ-35
	শ্রবণ শক্তি (Hearing)	কানে ভালো শুনতে পায় (চমকে ওঠে, চোখ বড় করে, চোখ পিট পিট করে, শ্বেবহাব পরিবর্তন হয়, শব্দের দিকে চোখ ঘুরায় বা মাথা ঘুরায়)	DSQ-36
	বোধ শক্তি (Cognition)	হাতে ধরা খেলনার দিকে তাকায়	DSQ-37
	সামাজিকতা (Socialization)	সান্ত্রিধ্য ও স্নেহ অনুভব করে (মায়ের গলার স্বর শুনলে, দেখলে বা কোলে নিলে কান্না থামিয়ে দেয়)	DSQ-38
	আচরণ (Behavior)	অতিরিক্ত কান্নাকাটি বা ঋান্ন ফ্যান করে না এবং স্বাভাবিক ঘুম হয়	DSQ-39
	মুখের আওয়াজ/কথা (Speech)	অ, আ, উ, ই ইত্যাদি স্বরবর্ণের মত আওয়াজ করে	DSQ-40

মাস	বিভাগ	বিবরণ	DSQ
৫ মাস	শারীরিক বিকাশ (Gross motor)	পুরোপুরি ঘাড় শক্ত হয়েছে	DSQ-41
	হাতের কাজ (Fine motor)	সামনের জিনিস হাত বাড়িয়ে ধরতে পারে	DSQ-42
	দৃষ্টি শক্তি (Vision)	ছোট জিনিস দেখে (যেমন: চারোল শেয়ালা)	DSQ-43
	শ্রবণ শক্তি (Hearing)	কানে শুনতে পায় (চমকে ওঠে, চোখ বড় করে, চোখ পিট পিট করে, মুখেরভাব পরিবর্তন হয়, শব্দের দিকে চোখ বা মাথা ঘুরায়)	DSQ-44
	বোধ শক্তি (Cognition)	সামনের খেলনা হাত বাড়িয়ে ধরে এবং নাড়ায়	DSQ-45
	সামাজিকতা (Socialization)	সারিৎখ ও স্নেহ অনুভব করে (মায়ের গলার স্বর শুনলে, দেখলে বা কোলে নিলে কান্না থামিয়ে দেয়)	DSQ-46
	আচরণ (Behavior)	অতিরিক্ত কান্নাকাটি বা ম্যান ম্যান করে না এবং স্বাভাবিক ঘুম হয়	DSQ-47
	মুখের আওয়াজ/কথা (Speech)	অ, আ, উ, ইত্যাদি স্বরবর্ণের মত আওয়াজ করে	DSQ-48
৬ মাস	শারীরিক বিকাশ (Gross motor)	পুরোপুরি ঘাড় শক্ত হয়েছে	DSQ-49
	হাতের কাজ (Fine motor)	সামনের রাখা ছোট জিনিস মুঠি করে ধরতে পারে (১ ” সাইজের জিনিস)	DSQ_50
	দৃষ্টি শক্তি (Vision)	ছোট জিনিস দেখে (যেমন: স্মাটি)	DSQ-51
	শ্রবণ শক্তি (Hearing)	কানে শুনতে পায় (চমকে ওঠে, চোখ বড় করে, চোখ পিট পিট করে, মুখেরভাব পরিবর্তন হয়, শব্দের দিকে মাথা ঘুরায়)	DSQ-52
	বোধ শক্তি (Cognition)	পরিচিত ব্যক্তিকে চেনে (মা, বাবা)	DSQ-53
	সামাজিকতা (Socialization)	সারিৎখ ও স্নেহ অনুভব করে (মায়ের গলার স্বর শুনলে, দেখলে বা কোলে নিলে কান্না থামিয়ে দেয়)	DSQ-54
	আচরণ (Behavior)	চারপাশ লক্ষ্য করে এবং স্বাভাবিক ঘুম হয়	DSQ-55
	মুখের আওয়াজ/কথা (Speech)	ব্যঞ্জনবর্ণে স্বরবর্ণ উচ্চারিত ধ্বনি (মা, বা, দা, ইত্যাদি) একবার করে বলে	DSQ-56
৭ মাস	শারীরিক বিকাশ (Gross motor)	পুরোপুরি ঘাড় শক্ত হয়েছে এবং উপুড় হতে পারে	DSQ-57
	হাতের কাজ (Fine motor)	সামনের রাখা ছোট জিনিস মুঠি করে ধরতে পারে (১ ” সাইজের জিনিস) এবং এক হাতের জিনিস অন্য হাতে নিতে পারে	DSQ-58
	দৃষ্টি শক্তি (Vision)	ছোট জিনিস দেখে (যেমন: স্মাটি)	DSQ-59
	শ্রবণ শক্তি (Hearing)	কানে শুনতে পায় (চমকে ওঠে, চোখ বড় করে, চোখ পিট পিট করে, মুখেরভাব পরিবর্তন হয়, শব্দের দিকে মাথা ঘুরায়)	DSQ-60
	বোধ শক্তি (Cognition)	পরিচিত ব্যক্তিকে চেনে (মা, বাবা)	DSQ-61
	সামাজিকতা (Socialization)	সারিৎখ ও স্নেহ অনুভব করে (মায়ের গলার স্বর শুনলে, দেখলে বা কোলে নিলে কান্না থামিয়ে দেয়)	DSQ-62
	আচরণ (Behavior)	চারপাশ লক্ষ্য করে এবং স্বাভাবিক ঘুম হয়	DSQ-63
	মুখের আওয়াজ/কথা (Speech)	ব্যঞ্জনবর্ণে স্বরবর্ণ উচ্চারিত ধ্বনি (মা, বা, দা, ইত্যাদি) একবার করে বলে	DSQ-64

বয়স	বিষয়	বিবরণ	কোড
৮ মাস	শারীরিক বিকাশ (Gross motor)	পুরোপুরি মাথা শক্ত হয়েছে এবং উপুড় হতে পারে এবং একটু সময় একা বসে থাকতে পারে (কমপক্ষে ২ মিনিট)	DSQ-65
	হাতের কাজ (Fine motor)	সামনের রাখা ছোট জিনিস মুঠি করে ধরতে পারে (১" সাইজের জিনিস) এবং এক হাতের জিনিস অন্য হাতে নিতে পারে	DSQ-66
	দৃষ্টি শক্তি (Vision)	ছোট জিনিস দেখে (যেমন: স্মার্টি)	DSQ-67
	শ্রবণ শক্তি (Hearing)	কানে শুনতে পায় (চমকে ওঠে, চোখ পিট পিট করে, ভুরুভাবার পরিবর্তন হয়, শব্দের দিকে মাথা ঘুরায়)	DSQ-68
	বোধ শক্তি (Cognition)	পরিচিত ব্যক্তিকে চেনে (মা, বাবা)	DSQ-69
	সামাজিকতা (Socialization)	সান্ত্বনা ও স্নেহ অনুভব করে (মায়ের গলার স্বর শুনলে, দেখলে বা কোলে নিলে কান্না থামিয়ে দেয়)	DSQ-70
	আচরণ (Behavior)	চারপাশ লক্ষ্য করে এবং স্বাভাবিক ঘুম হয়	DSQ-71
	কথার আওয়াজ/কথা (Speech)	ব্যঞ্জনবর্ণযুক্ত স্বরবর্ণ উচ্চারিত ধ্বনি (মা, বা, দা, হ্যাগিি) একবার করে বলে	DSQ-72
৯ মাস	শারীরিক বিকাশ (Gross motor)	পুরোপুরি মাথা শক্ত হয়েছে এবং কিছু সময় একা বসে থাকতে পারে (কমপক্ষে ৫-১০ মিনিট)	DSQ-73
	হাতের কাজ (Fine motor)	ছোট জিনিস আঙ্গুল দিয়ে ধরতে পারে (যেমন: বিস্কুট/মুড়ি)	DSQ-74
	দৃষ্টি শক্তি (Vision)	ছোট জিনিস দেখে (যেমন: স্মার্টি)	DSQ-75
	শ্রবণ শক্তি (Hearing)	কানে শুনতে পায় (শব্দের দিকে মাথা ঘুরায়, দূরের বাহিরে থেকে ডাকলে সাড়া দেয়)	DSQ-76
	বোধ শক্তি (Cognition)	পরিচিত ও অপরিচিত ব্যক্তি চিনতে শুরু করেছে	DSQ-77
	সামাজিকতা (Socialization)	সান্ত্বনা ও স্নেহ অনুভব করে (মায়ের গলার স্বর শুনলে, দেখলে বা কোলে নিলে কান্না থামিয়ে দেয়)	DSQ-78
	আচরণ (Behavior)	চারপাশ লক্ষ্য করে এবং স্বাভাবিক ঘুম হয়	DSQ-79
	কথার আওয়াজ/কথা (Speech)	ব্যঞ্জনবর্ণযুক্ত স্বরবর্ণ উচ্চারিত ধ্বনি (মা, বা, দা, হ্যাগিি) দুইবার করে বলে (যেমন- বা বা, মা মা, দা দা)	DSQ-80

মাস	ধরন	বিবরণ	DSQ
১০ মাস	শারীরিক বিকাশ (Gross motor)	তুলনাবে একা বসতে পারে	DSQ-81
	হাতের কাজ (Fine motor)	ছোট জিনিস আঙুল দিয়ে ধরতে পারে (যেমন: বিস্কুট/মুড়ি)	DSQ-82
	দৃষ্টি শক্তি (Vision)	ছোট জিনিস দেখে (যেমন: স্মার্ট)	DSQ-83
	শ্রবণ শক্তি (Hearing)	কানে শুনতে পায় (শব্দের দিকে মাথা ঘুরায়, দৃষ্টি বাহিরে থেকে ডাকলে সাড়া দেয়)	DSQ-84
	বোধ শক্তি (Cognition)	পরিচিত ও অপরিচিত ব্যক্তি আলাদাভাবে বুঝতে পারে	DSQ-85
	সামাজিকতা (Socialization)	সাহ্রিং ও স্নেহ অনুভব করে (মায়ের গলার স্বর শুনলে, দেখলে বা কোলে নিলে কান্না থামিয়ে দেয়)	DSQ-86
	আচরণ (Behavior)	চারপাশ লক্ষ্য করে এবং স্বাভাবিক ঘুম হয়	DSQ-87
	মুখের আওয়াজ/কথা (Speech)	ব্যঞ্জনবর্ণসহ স্বরবর্ণ উচ্চারিত ধ্বনি (মা, বা, দা ইত্যাদি) চারবার করে বলে (যেমন- বা বা বা, মা মা মা)	DSQ-88
১১ মাস	শারীরিক বিকাশ (Gross motor)	শোয়া থেকে উঠে বসতে পারে এবং হামাগুড়ি দেয় বা বসে বসে আগাতে পারে	DSQ-89
	হাতের কাজ (Fine motor)	ছোট জিনিস আঙুল দিয়ে ধরতে পারে (যেমন: বিস্কুট/মুড়ি)	DSQ-90
	দৃষ্টি শক্তি (Vision)	ছোট জিনিস দেখে (যেমন: স্মার্ট)	DSQ-91
	শ্রবণ শক্তি (Hearing)	কানে শুনতে পায় (শব্দের দিকে মাথা ঘুরায়, দৃষ্টি বাহিরে থেকে ডাকলে সাড়া দেয়)	DSQ-92
	বোধ শক্তি (Cognition)	বড়দের অনুকরণ করে হাততালি বা টা টা (দেয়/শব্দ হয় দুবে ঘুন্টুনি বাজার	DSQ-93
	সামাজিকতা (Socialization)	সাহ্রিং ও স্নেহ অনুভব করে (মায়ের গলার স্বর শুনলে, দেখলে বা কোলে নিলে কান্না থামিয়ে দেয়)	DSQ-94
	আচরণ (Behavior)	চারপাশ লক্ষ্য করে এবং স্বাভাবিক ঘুম হয়	DSQ-95
	মুখের আওয়াজ/কথা (Speech)	ব্যঞ্জনবর্ণসহ স্বরবর্ণ উচ্চারিত ধ্বনি (মা, বা, দা ইত্যাদি) চারবার করে বলে (যেমন- বা বা বা, মা মা মা)	DSQ-96
১২ মাস	শারীরিক বিকাশ (Gross motor)	বসা অবস্থা থেকে কিছু ধরে দাঁড়াতে পারে এবং আসবাবপত্র ধরে হাঁটতে পারে	DSQ-97
	হাতের কাজ (Fine motor)	ছোট জিনিস দুই আঙুল দিয়ে ধরতে পারে (যেমন: মুড়ি)	DSQ-98
	দৃষ্টি শক্তি (Vision)	ছোট জিনিস দেখে (যেমনঃ মসুরের ডাল বা সরিষার একটি দানা, একটি পিঁপড়া)	DSQ-99
	শ্রবণ শক্তি (Hearing)	কানে শুনতে পায় (শব্দের দিকে মাথা ঘুরায়, দৃষ্টি বাহিরে থেকে ডাকলে সাড়া দেয়)	DSQ-100
	বোধ শক্তি (Cognition)	আদর বললে আদর করে/ হাততালি বা টা টা দিতে বললে দেয়	DSQ-101
	সামাজিকতা (Socialization)	কথার অনুত্তরে সাড়া দেয়	DSQ-102
	আচরণ (Behavior)	চারপাশ লক্ষ্য করে এবং স্বাভাবিক ঘুম হয়	DSQ-103
	মুখের আওয়াজ/কথা (Speech)	কোন শব্দ অর্থহীনভাবে বা অনুকরণ করে বলে (যেমন: মা, বাবা)	DSQ-104

বয়স	বিকাশের ক্ষেত্র	বিবরণ	কোড
১৩ মাস	শারীরিক বিকাশ (Gross motor)	বসা অবস্থা থেকে কিছু ধরে দাঁড়াতে পারে এবং আসবাবপত্র ধরে হাঁটতে পারে	DSQ-105
	হাতের কাজ (Fine motor)	ছোট জিনিস দুই আঙ্গুল দিয়ে ধরতে পারে (যেমন: মুঠি)	DSQ-106
	দৃষ্টি শক্তি (Vision)	ছোট জিনিস দেখে (যেমনঃ মসুরের ডাল বা সরিষার একটি দানা, একটি পিঁপড়া)	DSQ-107
	শ্রবণ শক্তি (Hearing)	কানে শুনতে পায় (শব্দের দিকে মাথা ঘুরায়, দূরের বাহিরে থেকে ডাকলে সাড়া দেয়)	DSQ-108
	বোধ শক্তি (Cognition)	আদর করে বললে আদর করে/ হাততালি বা টা টা দিতে বললে দেয়	DSQ-109
	সামাজিকতা (Socialization)	কথার প্রত্যুত্তরে সাড়া দেয়	DSQ-110
	আচরণ (Behavior)	চারপাশ লক্ষ্য করে এবং স্বাভাবিক ঘুম হয়	DSQ-111
	মুখের আওয়াজ/কথা (Speech)	কোন শব্দ অর্থহীনভাবে বা অনুকরণ করে বলে (যেমন: মা, বাবা)	DSQ-112
১৪ মাস	শারীরিক বিকাশ (Gross motor)	বসা অবস্থা থেকে কিছু ধরে দাঁড়াতে পারে এবং আসবাবপত্র ধরে হাঁটতে পারে	DSQ-113
	হাতের কাজ (Fine motor)	ছোট জিনিস দুই আঙ্গুল দিয়ে ধরতে পারে (যেমন: মুঠি)	DSQ-114
	দৃষ্টি শক্তি (Vision)	ছোট জিনিস দেখে (যেমনঃ মসুরের ডাল বা সরিষার একটি দানা, একটি পিঁপড়া)	DSQ_115
	শ্রবণ শক্তি (Hearing)	কানে শুনতে পায় (শব্দের দিকে মাথা ঘুরায়, দূরের বাহিরে থেকে ডাকলে সাড়া দেয়)	DSQ-116
	বোধ শক্তি (Cognition)	আদর করে বললে আদর করে/ হাততালি বা টা টা দিতে বললে দেয়	DSQ-117
	সামাজিকতা (Socialization)	কথার প্রত্যুত্তরে সাড়া দেয়	DSQ-118
	আচরণ (Behavior)	চারপাশ লক্ষ্য করে এবং স্বাভাবিক ঘুম হয়	DSQ-119
	মুখের আওয়াজ/কথা (Speech)	কোন শব্দ অর্থহীনভাবে বা অনুকরণ করে বলে (যেমন: মা, বাবা)	DSQ-120
১৫ মাস	শারীরিক বিকাশ (Gross motor)	কিছু না ধরে বসা অবস্থা থেকে দাঁড়াতে পারে	DSQ-121
	হাতের কাজ (Fine motor)	ছোট জিনিস দুই আঙ্গুল দিয়ে ধরতে পারে (যেমন: মুঠি)	DSQ-122
	দৃষ্টি শক্তি (Vision)	ছোট জিনিস দেখে (যেমনঃ মসুরের ডাল বা সরিষার একটি দানা, একটি পিঁপড়া)	DSQ-123
	শ্রবণ শক্তি (Hearing)	কানে শুনতে পায় (শব্দের দিকে মাথা ঘুরায়, দূরের বাহিরে থেকে ডাকলে সাড়া দেয়)	DSQ-124
	বোধ শক্তি (Cognition)	পরিচিত ব্যক্তিকে দেখাতে বললে তার দিকে তাকায় বা নির্দেশ করে/ সহজ নির্দেশনা বোঝে (যেমন – ধরো না, খেতে আস)	DSQ-125
	সামাজিকতা (Socialization)	কথার প্রত্যুত্তরে সাড়া দেয়	DSQ-126
	আচরণ (Behavior)	পরিস্থিতির প্রতি মনোযোগী (খাওয়া, খেলা, অভ্যর্থনা, বিদায় ইত্যাদি)	DSQ-127
	মুখের আওয়াজ/কথা (Speech)	অন্তত একটি অর্থবহ শব্দ বলে (যেমন- বাবা, মা, মাম (পানি), ভাও (ভাত), দে, না, আর ইত্যাদি)	DSQ-128

মাস		বিবরণ	কোড
১৫ মাস	শারীরিক বিকাশ (Gross motor)	কিছু না ধরে বসা অবস্থা থেকে দাঁড়াতে পারে	DSQ-129
	হাতের কার্য (Fine motor)	ছোট জিনিস দু আঙ্গুল দিয়ে ধরতে পারে (যেমন: মুড়ি)	DSQ-130
	দৃষ্টি শক্তি (Vision)	ছোট জিনিস দেখে (যেমনঃ মসুরের ডাল বা সরিষার একটি দানা, একটি পিঁপড়া)	DSQ_131
	শ্রবণ শক্তি (Hearing)	কানে শুনতে পায় (শব্দের দিকে মাথা ঘুরায়, দৃষ্টি বাহিরে থেকে ডাকলে সাড়া দেয়)	DSQ-132
	বোধ শক্তি (Cognition)	পরিচিত ব্যক্তিকে দেখাতে বলনে তার দিকে তাকায় বা নির্দেশ কবে/ সহজ নির্দেশনা বোঝে (যেমন – ধরো না, খেতে আস)	DSQ-133
	সামাজিকতা (Socialization)	কথার অনুরূপ সাড়া দেয়	DSQ-134
	আচরণ (Behavior)	পরিস্থিতির প্রতি মেলাখোলী (খাওয়া, খেলা, অভ্যর্থনা, বিদায় ইত্যাদি)	DSQ-135
	মুখের আওয়াজ/কথা (Speech)	দুটি অর্থবহ শব্দ বলে	DSQ-136
১৭ মাস	শারীরিক বিকাশ (Gross motor)	কিছু না ধরে বসা অবস্থা থেকে দাঁড়াতে পারে	DSQ-137
	হাতের কার্য (Fine motor)	ছোট জিনিস দুই আঙ্গুল দিয়ে ধরতে পারে (যেমন: মুড়ি)	DSQ-138
	দৃষ্টি শক্তি (Vision)	ছোট জিনিস দেখে (যেমনঃ মসুরের ডাল বা সরিষার একটি দানা, একটি পিঁপড়া)	DSQ-139
	শ্রবণ শক্তি (Hearing)	কানে শুনতে পায় (শব্দের দিকে মাথা ঘুরায়, দৃষ্টি বাহিরে থেকে ডাকলে সাড়া দেয়)	DSQ-140
	বোধ শক্তি (Cognition)	পরিচিত ব্যক্তিকে দেখাতে বলনে তার দিকে তাকায় বা নির্দেশ কবে/ সহজ নির্দেশনা বোঝে (যেমন – ধরো না, খেতে আস)	DSQ-141
	সামাজিকতা (Socialization)	কথার অনুরূপ সাড়া দেয়	DSQ-142
	আচরণ (Behavior)	পরিস্থিতির প্রতি মেলাখোলী (খাওয়া, খেলা, অভ্যর্থনা, বিদায় ইত্যাদি)	DSQ-143
	মুখের আওয়াজ/কথা (Speech)	দুটি অর্থবহ শব্দ বলে	DSQ-144
১৮ মাস	শারীরিক বিকাশ (Gross motor)	কিছু না ধরে বসা অবস্থা থেকে দাঁড়াতে পারে এবং এক পা, দু পা হাঁটে	DSQ-145
	হাতের কার্য (Fine motor)	নিজের হাতে খাবার খেতে পারে	DSQ-146
	দৃষ্টি শক্তি (Vision)	ছোট জিনিস দেখে (যেমনঃ মসুরের ডাল বা সরিষার একটি দানা, একটি পিঁপড়া)	DSQ-147
	শ্রবণ শক্তি (Hearing)	কানে শুনতে পায় (শব্দের দিকে মাথা ঘুরায়, দৃষ্টি বাহিরে থেকে ডাকলে সাড়া দেয়)	DSQ-148
	বোধ শক্তি (Cognition)	জিজ্ঞাসা করলে শরীরের একটি অঙ্গ দেখাতে পারে / জিনিস বা ছবির নাম বললে চেনে বা দেখাতে পারে (যেমন: বল, কান, পুতুল, চিরুনি ইত্যাদি)	DSQ-149
	সামাজিকতা (Socialization)	অন্যের প্রতি আগ্রহী (যেমন: সমবয়সী শিশুদের সাথে খেলতে আগ্রহী, অন্যের সাথে আগ্রহী হয়ে আদান-প্রদানের খেলা খেলে, অন্যের অনুভূতি বুঝতে পারে, অন্যের আনন্দের সাথে নিজেকে এবং নিজের আনন্দের সাথে অন্যকে একাত্ত করে)	DSQ-150
	আচরণ (Behavior)	পরিস্থিতির প্রতি মেলাখোলী (খাওয়া, খেলা, অভ্যর্থনা, বিদায় ইত্যাদি)	DSQ-151
	মুখের আওয়াজ/কথা (Speech)	চারটি অর্থবহ শব্দ বলে	DSQ-152

১৯ মাস	শারীরিক বিকাশ (Gross motor)	কিছু না ধরে বসা অবস্থা থেকে দাঁড়াতে পারে এবং এক পা, দু পা হাঁটে	DSQ-153
	হাতের কাজ (Fine motor)	নিজের হাতে খাবার খেতে পারে	DSQ-154
	দৃষ্টি শক্তি (Vision)	ছোট জিনিস দেখে (যেমনঃ মসুরের ডাল বা সরিষার একটি দানা, একটি পিঁপড়া)	DSQ-155
	শ্রবণ শক্তি (Hearing)	কানে শুনতে পায় (শব্দের দিকে মাথা ঘুরায়, দূরের বাহিরে থেকে ডাকলে সাড়া দেয়)	DSQ-156
	বোধ শক্তি (Cognition)	জিনিস বা ছবির নাম বললে চেনে বা দেখাতে পারে (যেমন: বল, কাপ, চুপড়ান, চিরুনী ইত্যাদি)	DSQ_157
	সামাজিকতা (Socialization)	অন্যের প্রতি আগ্রহী (যেমন: সমবয়সী শিশুদের সাথে খেলতে আগ্রহী, অন্যের সাথে আগ্রহী হয়ে আদান–প্রদানের খেলা খেলে, অন্যের অনুভূতি বুঝতে পারে, অন্যের আনন্দের সাথে নিজেকে এবং নিজের আনন্দের সাথে অন্যকে একাত্ম করে)	DSQ-158
	আচরণ (Behavior)	পরিস্থিতির প্রতি মনোযোগী (খাওয়া, খেলা, অভ্যর্থনা, বিদায় ইত্যাদি)	DSQ-159
	মুখের আওয়াজ/কথা (Speech)	চারটি অর্থবহ শব্দ বলে	DSQ-160
২০ মাস	শারীরিক বিকাশ (Gross motor)	কিছু না ধরে বসা অবস্থা থেকে দাঁড়াতে পারে এবং এক পা, দু পা হাঁটে	DSQ-161
	হাতের কাজ (Fine motor)	নিজের হাতে খাবার খেতে পারে	DSQ-162
	দৃষ্টি শক্তি (Vision)	ছোট জিনিস দেখে (যেমনঃ মসুরের ডাল বা সরিষার একটি দানা, একটি পিঁপড়া)	DSQ-163
	শ্রবণ শক্তি (Hearing)	কানে শুনতে পায় (শব্দের দিকে মাথা ঘুরায়, দূরের বাহিরে থেকে ডাকলে সাড়া দেয়)	DSQ-164
	বোধ শক্তি (Cognition)	জিনিস বা ছবির নাম বললে চেনে বা দেখাতে পারে (বল, কাপ, চুপড়ান, চিরুনী ইত্যাদি)	DSQ-165
	সামাজিকতা (Socialization)	অন্যের প্রতি আগ্রহী (যেমন: সমবয়সী শিশুদের সাথে খেলতে আগ্রহী, অন্যের সাথে আগ্রহী হয়ে আদান–প্রদানের খেলা খেলে, অন্যের অনুভূতি বুঝতে পারে, অন্যের আনন্দের সাথে নিজেকে এবং নিজের আনন্দের সাথে অন্যকে একাত্ম করে)	DSQ-166
	আচরণ (Behavior)	পরিস্থিতির প্রতি মনোযোগী (খাওয়া, খেলা, অভ্যর্থনা, বিদায় ইত্যাদি)	DSQ-167
	মুখের আওয়াজ/কথা (Speech)	চারটি অর্থবহ শব্দ বলে	DSQ-168

DEVELOPMENTAL SCREENING QUESTIONNAIRE (DSQ)
(০ - ২৩ মাস)

সাধারণ তথ্য ঃ

পরিবারের নম্বর ঃ

☐   ☐   ☐   ☐☐☐☐   DSQ.A

এরিয়া /সাইট /   মহল্লা /বাড়ির নম্বর

মায়ের নম্বর ঃ

☐   DSQ.B

শিশুর নম্বর ঃ

☐☐   DSQ.C

সাক্ষাৎকার গ্রহণকারীর নম্বর ঃ

☐☐   DSQ.D

সাক্ষাৎকার গ্রহণের তারিখ (দিন / মাস / সন)ঃ   ☐☐   ☐☐   ☐☐☐☐   DSQ.E

দিন   মাস   সন

শিশুর নাম ঃ .... DSQ.F

শিশুর বাবার নাম ঃ .... DSQ.G   বয়সঃ ....   DSQ.H

শিশুর মায়ের নাম ঃ .... DSQ.I   বয়সঃ ....   DSQ.J

বাবার শিক্ষাগত যোগ্যতা ঃ

☐   DSQ.K

১। কখনও স্কুলে যান নাই২। প্রাথমিক   ৩। অষ্টম শ্রেণি
৪। এস.এস.সি (দশম শ্রেণি)   ৫। এইচ.এস.সি (দ্বাদশ শ্রেণি)
৬। স্নাতক (............ ইত্যাদি)   ৭। স্নাতকোত্তর (. .... ইত্যাদি)

শিশুটি কি নয় মাসে জন্মগ্রহন করেছে?   ☐   DSQ.L

১। হ্যাঁ

২। না, ৮ মাস ১৫ দিন আগে

৩। জানা নেই

শিশুটির জন্ম কোথায় হয়েছে? □ DSQ.M

১। বাড়ী

২। মাতৃসদন

৩। ক্লিনিক

৪। হাসপাতাল

৫। অন্যান্য:..........

ডেলিভারী কার সাহায্যে হয়েছে ? □ DSQ.N

১। ডাক্তার

২। নার্স

৩। প্রশিক্ষীত ধাত্রী

৪। ধাত্রী

৫। পরিবারের সদস্য

৬। জানা নেই

শিশুটি কি জন্মের সাথে সাথে কেঁদেছে? □ DSQ.O

১। হ্যাঁ

২। না, ৫ মিনিটের মধ্যে

৩। ৫ মিনিট পরে

৪। জানা নেই

জন্মের সময় শিশুর শরীরের রং কেমন ছিলো? □ DSQ.P

১। স্বাভাবিক

২। নীল বর্ণ

৩। ফ্যাকাসে

৪। জানা নেই

জন্মের পর পর শিশু কেমন ছিলো? □ DSQ.Q

১। সচেতন

২। নেতিয়ে ছিল

জন্ম পরবর্তী ৭ দিনের মধ্যে শিশুর শারিরীক অবস্থা কেমন ছিলো ? ☐ DSQ.R
১। মৃদু জন্ডিস
২। তীব্র জন্ডিস
৩। খিঁচুনী
৪। প্রজোয্য নয়

গত এক বছরের মধ্যে শিশুর কি জ্বর ছাড়া খিঁচুনী হয়েছে? ☐ DSQ.S
১। না
২। হ্যাঁ

শিশুর জন্ম তারিখ (দিন / মাস / সন) ঃ ☐☐ ☐☐ ☐☐☐☐ DSQ.T
দিন মাস সন

শিশুর বয়স ঃ ☐☐ ☐☐ ☐☐☐☐ DSQ.U
দিন মাস সন

শিশুর বয়স (মাসে) ঃ ☐☐ ☐☐ ☐☐☐☐ DSQ.V
দিন মাস সন

শিশুর লিঙ্গ ঃ ☐ DSQ.W
১। ছেলে ২। মেয়ে

শিশু সম্পর্কে প্রশ্নের উত্তর কে দেবেন? ☐ DSQ.X

১। শিশুর মা ২। শিশুর বাবা
৩। শিশুর দাদী/নানী ৪। শিশুর ভাই/বোন
৫। শিশুর অন্য কোন আত্মীয় ৬। অন্যান্য (উলেস্নখ করুন ....)

প্রধানতঃ শিশুটির দেখাশুনা কে করেন? ☐ DSQ.Y

1| ‌‌‍‍‍‍‍‍‍‍‍‍‍ 2| ‌‌‍‍‍‍‍‍‍
3| ‌‌‍‍‍‍‍‍‍‍‍ 4| ‌‌‍‍‍‍‍‍‍‍‍
5| ‌‌‍‍‍‍‍‍‍
6| ‌‌‍‍‍‍‍ (‌‌‍‍‍‍‍ ....)

DEVELOPMENTAL SCREENING QUESTIONNAIRE (DSQ)
Child's ID:

‌‌‍‍‍‍‍:

Age in months	Domain	Item no.	Result	Problem
	‌‌‍‍‍‍‍ ‌‌‍‍‍‍‍		হ্যাঁ / না	
	‌‌‍‍‍‍‍ ‌‌‍‍‍‍‍©		হ্যাঁ / না	
	‌‌‍‍‍‍‍ ‌‌‍‍‍‍‍		হ্যাঁ / না	
	‌‌‍‍‍‍‍ ‌‌‍‍‍‍‍		হ্যাঁ / না	
	‌‌‍‍‍‍‍ ‌‌‍‍‍‍‍		হ্যাঁ / না	
	‌‌‍‍‍‍‍		হ্যাঁ / না	
	‌‌‍‍‍‍‍		হ্যাঁ / না	
	‌‌‍‍‍‍‍ ‌‌‍‍‍‍‍/‌‌‍‍‍		হ্যাঁ / না	

‌‌‍‍‍‍‍: ‌‌‍‍‍‍‍ ‌‌‍‍‍‍‍ (হ্যাঁ বা না) ‌‌‍‍‍‍‍ (O) ‌‌‍‍‍‍‍| ‌‌‍‍‍‍‍ ‌‌‍‍‍‍‍ ‌‌‍‍‍‍‍ ‌‌‍‍‍‍‍ ‌‌‍‍‍‍‍|

‌‌‍‍‍‍‍ ‌‌‍‍‍‍‍ ‌‌‍‍‍‍‍ ‌‌‍‍‍‍‍:
‌‌‍‍‍‍‍ ‌‌‍‍‍‍‍: ‌‌‍‍‍‍‍ ‌‌‍‍‍‍‍ ‌‌‍‍‍‍‍ ‌‌‍‍‍‍‍ ‌‌‍‍‍‍‍ ‌‌‍‍‍‍‍ ‌‌‍‍‍‍‍ ‌‌‍‍‍‍‍ ‌‌‍‍‍‍‍| ‌‌‍‍‍‍‍ ‌‌‍‍‍‍‍ ‌‌‍‍‍‍‍ ‌‌‍‍‍‍‍ ‌‌‍‍‍‍‍ ‌‌‍‍‍‍‍ ‌‌‍‍‍‍‍ ‌‌‍‍‍‍‍ (Domain) ‌‌‍‍‍‍‍ ‌‌‍‍‍‍‍ ‌‌‍‍‍‍‍ ‌‌‍‍‍‍‍ ‌‌‍‍‍‍‍ ‌‌‍‍‍‍‍ (Problem) ‌‌‍‍‍‍‍ (√) ‌‌‍‍‍‍‍ ‌‌‍‍‍‍‍ ‌‌‍‍‍‍‍|

‌‌‍‍‍‍‍ ‌‌‍‍‍‍‍ ‌‌‍‍‍‍‍ ‌‌‍‍‍‍‍ ‌‌‍‍‍‍‍ ‌‌‍‍‍‍‍ ‌‌‍‍‍‍‍ ‌‌‍‍‍‍‍ ‌‌‍‍‍‍‍ ‌‌‍‍‍‍‍ ‌‌‍‍‍‍‍ ‌‌‍‍‍‍‍|

সাক্ষাতৎকার গ্রহণকারী ঃ
এই শিশুটিকে ক্লিনিক্যাল এসেসমেন্টের জন্য প্রেরণ করা হল। কারণ, সানাক্তকরণে ফলাফল পজেটিভ।

১। না   ২। হ্যাঁ   **DSQ.Z.1**

এই শিশুটিকে ক্লিনিক্যাল এসেসমেন্টের জন্য প্রেরণ করা যেতে পারে কেননা নিচে বড় বাক্সে একটি ✳ চিহ্ন আছে।

১। না   ২। হ্যাঁ   **DSQ.Z. 2**

TEN QUESTIONS PLUS (TQP)
দশটি প্রশ্ন ও অতিরিক্ত
(প্রতিবন্ধী শিশু সনাক্তকরণ প্রশ্নমালা)
(২ - ৯ বছর)

সাধারণ তথ্য   :

পরিবারের নম্বর   :   ☐ ☐ ☐ ☐☐☐☐   HF 1

এরিয়া / সাইট / মহল্লা /বাড়ির নম্বর

মায়ের নম্বর   :   ☐   MC1

শিশুর নম্বর   :   ☐☐   TQP.1

সাক্ষাৎকার গ্রহণকারীর নম্বর :   ☐☐   TQP.2

সাক্ষাৎকার গ্রহণের তারিখ :   (দিন / মাস / সন) ঃ   ☐☐   ☐☐   ☐☐   TQP.3
দিন   মাস   সন

শিশুর নাম : ....

শিশুর বাবার নাম : .... বাবার বয়স: ....

শিশুর মায়ের নাম; .... মায়ের বয়স: ....

বাবার শিক্ষাগত যোগ্যতা:   ☐   TQP.4

১। কখনও স্কুলে যান নাই   ২। প্রাথমিক   ৩। অষ্টম শ্রেণী
৪। এস.এস.সি (দশম শ্রেণী)   ৫। এইচ.এস.সি (দ্বাদশ শ্রেণী)
৬। স্নাতক (............ ইত্যাদি)   ৭। স্নাতকোত্তর (...................... ইত্যাদি)

শিশুর জন্মের তারিখ (দিন / মাস / সন) :   ☐☐   ☐☐   ☐☐   TQP.5
দিন   মাস   সন

শিশুর বয়স :   ☐☐   ☐☐   ☐☐   TQP.6
দিন   মাস   বছর

শিশুর লিঙ্গ :   ১। ছেলে   ২। মেয়ে   ☐   TQP.7

পরিবারের নম্বর : ....

এরিয়া / সাইট / মহল্লা / বাড়ী নম্বর

TEN QUESTIONS PLUS (TQP)
(প্রতিবন্ধী শিশু সনাক্তকরণ প্রশ্নমালা)

শিশুটির জন্ম কোথায় হয়েছে? ☐ TQP.8

১। বাড়ী

২। মাতৃসদন

৩। ক্লিনিক

৪। হাসপাতাল

৫। অন্যান্য:..........

শিশুটি কি নয় মাসে জন্মগ্রহন করেছে? ☐ TQP.9

১। হ্যাঁ

২। না, ৮ মাস ১৫ দিন আগে।

৩। জানা নেই

ডেলিভারী কার সাহায্যে হয়েছে ? ☐ TQP.10

১। ডাক্তার

২। নার্স

৩। প্রশিক্ষীত ধাত্রী

৪। ধাত্রী

৫। পরিবারের সদস্য

৬। জানা নেই

শিশুটি কি জন্মের সাথে সাথে কেঁদেছে? ☐ TQP.11

১। হ্যাঁ

২। না, ৫ মিনিটের মধ্যে

৩। ৫ মিনিট পরে

৪। জানা নেই

পরিবারের নম্বর : ....

এরিয়া / সাইট / মহল্লা / বাড়ী
নম্বর

TEN QUESTIONS PLUS (TQP)
(প্রতিবন্ধী শিশু সনাক্তকরণ প্রশ্নমালা)

জন্মের সময় শিশুর শরীরের রং কেমন ছিলো?   ☐ TQP.12

১। স্বাভাবিক

২। নীল বর্ণ

৩। ফ্যাকাসে

৪। জানা নেই

জন্মের পর পর শিশু কেমন ছিলো ?   ☐ TQP.13

১। সচেতন

২। নেতীয়ে ছিল

জন্ম পরবর্তী ৭ দিনের মধ্যে শিশুর শারিরীক অবস্থা কেমন ছিলো ?   ☐ TQP.14

১। মৃদু জন্ডিস
২। তীব্র জন্ডিস
৩। খিচুনী
৪। প্রজোয্য নয়

শিশুটি কি নিয়মিত স্কুলে যায় ?   ☐ TQP.15

১। না, কখনো যায়নি   ২। না, ছেড়ে দিয়েছে
৩। হ্যা, তবে অনিয়মিত   ৪। হ্যা, নিয়মিত

শিশু সম্পর্কে প্রশ্নের উত্তর কে দেবেন?   ☐ TQP.16

১। শিশুর মা   ২। শিশুর বাবা
৩। শিশুর দাদী/নানী   ৪। শিশুর ভাই/বোন
৫। অন্য কোন আত্মীয়   ৬। অন্যান্য (উলেস্নখ করুন...............................)

শিশুটির দেখাশুনা প্রধানত: কে করেন?   ☐ TQP.17

১। শিশুর মা   ২। শিশুর বাবা

৩। শিশুর দাদী/নানী   ৪। অন্য কোন আত্মীয়

৫। শিশুর ভাই/বোন   ৬। অন্যান্য (উলেম্নখ করুন ....)

পরিবারের নম্বর : ....

এরিয়া / সাইট / মহলস্না / বাড়ী নম্বর

TEN QUESTIONS PLUS (TQP)
(প্রতিবন্ধী শিশু সনাক্তকরণ প্রশ্নমালা)

১। অন্যান্য শিশুদের তুলনায় আপনার শিশুটির বসতে, দাঁড়াতে অথবা হাঁটতে খুব বেশি দেরী হয়েছিল কি?

     না   হ্যাঁ*   TQP.18

যদি উত্তর 'না' হয় তবে ২নং প্রশ্ন জিজ্ঞেস করুন।

যদি উত্তর 'হ্যাঁ' হয় তবে প্রশ্ন করুন শিশুটি কি ২ বছর বয়সের মধ্যে হেঁটেছে?

     না   হ্যাঁ   TQP.19

২। অন্যান্য শিশুদের তুলনায় শিশুটির দিনে অথবা রাতে **চোখে দেখতে** অসুবিধা হয় কি?

     না   হ্যাঁ*   TQP.20

৩। শিশুটির **কানে শুনতে** কোন অসুবিধা আছে বলে মনে হয় কি?

     না   হ্যাঁ*   TQP.21

৪। যখন আপনি শিশুটিকে কিছু করতে বলেন তখন সে **কথাটি বোঝে** বলে আপনার মনে হয়?

     না*   হ্যাঁ   TQP.22

৫। শিশুটির কি **হাঁটতে** অথবা **হাত নাড়াতে** অসুবিধা হয় অথবা তার কি **হাত / পা দুর্বল** অথবা **হাত / পা** শক্ত / জড়সড় আড়ষ্ট?

     না   হ্যাঁ*   TQP.23

যদি উত্তর না হয় তবে ৬নং প্রশ্ন জিজ্ঞেস করুন।

যদি উত্তর হ্যাঁ হয় তবে প্রশ্ন করুন ঃ

হাটার জন্য তার কি কোন সাহায্যের প্রয়োজন হয়?

     না   হ্যাঁ   TQP.24

     TQP.25

পৃষ্ঠা নং ৪

কোন জিনিস তোলার জন্য সে কি তার হাত ব্যবহার করতে পারে?

না   হ্যা

....

পরিবারের নম্বর : ....

এরিয়া / সাইট / মহল্লা / বাড়ী
নম্বর

TEN QUESTIONS PLUS (TQP)
(প্রতিবন্ধী শিশু সনাক্তকরণ প্রশ্নমালা)

৬। শিশুটির কি কখনও **ফিট/খিচুনী** হয় অথবা সে শক্ত হয়ে যায় অথবা অজ্ঞান হয়ে পড়ে?

☐ ☐ TQP.26
না হ্যা*

....

৭। শিশুটি কি তার সমবয়সী অন্যান্য শিশুদের মতই সবকিছু **শিখতে** পারে ?

☐ ☐ TQP.27
না* হ্যা

....

৮। শিশুটি কি আদৌ **কথা বলতে** পারে? সে কি কথা বলে নিজের ভাব প্রকাশ করতে পারে?
অন্য লোকে বোঝে এমন কোন কথা (অর্থপূর্ণ) সে কি বলতে পারে?

☐ ☐ TQP.28
না* হ্যা

....

৯। ৩ থেকে ৯ বছর বয়সের শিশু সম্পর্কে প্রশ্ন করুন ঃ
শিশুটির কথা বলার ক্ষমতা কি স্বাভাবিক শিশুদের চেয়ে কোন না কোন ভাবে ভিন্ন?

☐ ☐ TQP.29
না হ্যা*

(তার পরিবারের লোকজন ছাড়া অন্য কেউ ভাল ভাবে বুঝতে পারে না) ?

২ বছর বয়সের শিশু সম্পর্কে প্রশ্ন করুন ঃ
শিশুটি কি কমপক্ষে একটি জিনিসের নাম বলতে পারে?

☐ ☐ TQP.30
না* হ্যা

(যেমন একটি পশুর নাম, একটি খেলনার নাম, একটি চায়ের কাপ, একটি চামচ)

যদি উত্তর 'না' হয় তবে প্রশ্ন করুন ঃ
সে কি জিনিস বোঝাতে তার নিজস্ব শব্দ/ভাষা ব্যবহার করে?

☐ ☐ TQP.31
না হ্যা

(যেমন-কুকুর বোঝাতে ঘেউ ঘেউ বা অন্য কিছু শব্দ করে)

....

পরিবারের নম্বর : .... :............

এরিয়া / সাইট / মহল্লা / বাড়ী
নম্বর

TEN QUESTIONS PLUS (TQP)
(প্রতিবন্ধী শিশু সনাক্তকরণ প্রশ্নমালা)

১০। সমবয়সী অন্যান শিশুদের তুলনায় সে কি **বুদ্ধির দিক থেকে পিছিয়ে আছে** অথবা ধীরে বোঝে? ☐ ☐ TQP.32
না হ্যাঁ*

....

আচরণ :

ক) আপনি কি মনে করেন আপনার শিশুর আবেগজনিত অসুবিধা অথবা মনোযোগে ☐ ☐ TQP.33
বা আচরনে সমস্যা অথবা সামাজিক মেলামেশায় অসুবিধা আছে? না হ্যাঁ*

(যদি উত্তর 'হ্যাঁ' হয়, তবে 'খ' নং প্রশ্ন করার প্রয়োজন নাই ।
উত্তর 'না' হলে, 'খ' নং প্রশ্ন করুন।)

খ) তার কোন কার্যকলাপ আপনাকে কি উদ্বিগ্ন করে? ☐ ☐ TQP.34
না হ্যাঁ*

'ক' অথবা 'খ' প্রশ্নের উত্তর 'হ্যাঁ' হলে, তবে কোন ধরণের সমস্যা তা লিপিবদ্ধ করুন : ....

স্বাস্থ্য :

স্বাস্থ্যগত এমন কোন গুরুতর সমস্যা আছে কি যা এখানে উলেস্খ করা হয়নি? ☐ ☐ TQP.35
না হ্যাঁ

যদি উত্তর 'হ্যাঁ' হয়, তবে কোন ধরণের সমস্যা তা লিপিবদ্ধ করুন : ....

TEN QUESTIONS PLUS (TQP)
(প্রতিবন্ধী শিশু সনাক্তকরণ প্রশ্নমালা)

প্রতিবন্ধী শিশু সনাক্তকরণের সর্বোপরি ফলাফল ঃ

সাক্ষাৎকার গ্রহণকারী ঃ শিশুটির সনাক্তকরণের ফলাফল পজিটিভ অথবা নেগেটিভ কিনা নির্ণয়ের পর নিচের উত্তর লিখুন। প্রাপ্ত ফলাফল তখনই পজিটিভ বলে গন্য হবে যদি প্রদত্ত দশটি প্রশ্নের মধ্যে যে কোন একটি অথবা একাধিক উত্তরে 'হ্যা' (*) চিহ্ন পড়ে, TQP তে আছে দশটি প্রশ্ন , আচরণ সমস্যা সম্পর্কিত প্রশ্ন , দৃষ্টি সনাক্তকরন এবং শ্রবন সনাক্তকরণ প্রশ্ন । যদি কোন উত্তর "না" হয় ও "না" উত্তরের পাশে (*) চিহ্ন না থাকে তবে ফলাফল নেগেটিভ বলে বিবেচিত হবে।

সনাক্তকরণ ফলাফল যদি পজেটিভ হয় কোন একটি বিষয়ের পাশে যদি (*) চিহ্নিত থাকে তাহলে একটি ক্লিনিকাল এসেসমেন্টের জন্য সময় নির্ধারণ করুন।

সাক্ষাৎকার গ্রহণকারী :

এই শিশুটিকে ক্লিনিকাল এসেসমেন্টের (ফেজ-২) এর জন্য প্রেরণ করা যেতে পারে । কারণ, সনাক্তকরণ ফলাফল পজেটিভ (যে কোন বিষয়ের জন্য একটি * চিহ্ন আছে।?

    ১। না   ২। হ্যা   ☐ TQP.36

এই শিশুটিকে ক্লিনিকাল এসেসমেন্টের (ফেজ-২) এর জন্য প্রেরণ করা যেতে পারে । কেননা নীচে বড় বাক্সে একটি* চিহ্নিত আছে।

                      ☐   TQP.37

Participation Check List

বয়স	১-পরিবার Yes=1,No=2	২.সমবয়সীদের সাথে Yes=1,No=2	৩.কৃষ্টি সম্পর্কীয় ক্ষেত্রে Yes=1,No=2	4.শিক্ষা Yes=1,No=2	৫.অর্থনৈতিক Yes=1,No=2
০ - < ২ বছর	১.১) পরিবারের সদস্যরা কি শিশুর সাথে খেলাধুলা করে?	২.১) খেলার সময় সমবয়সীরা শিশুর পছন্দের গুরুত্ব দেয় কিনা?	৩.১) পারিবারিক বিভিন্ন অনুষ্ঠানে (বিয়ে,জন্মদিন, মিলাদ) শিশুর খেলাধুলার সুযোগ থাকে কিনা?	৪.১) পরিবারের সদস্যরা কি শিশুকে কবিতা শুনায় বা ছবির বই থেকে ছবি দেখায়?	৫.১) এই শিশুর মাধ্যমে কি পরিবারের কোন আয় হয়?
	১.২) খেলাধুলা করার সময়ে কি শিশুর পছন্দের গুরুত্ব দেয়া হয়? (শিশু যে খেলাটা খেলতে চায় সেটাই খেলা হয় কিনা)	২.২) শিশু যার/যাদের সাথে খেলতে চায় তাদের সাথে খেলতে দেয়া হয় কিনা		৪.২) কবিতা শুনা বা ছবির বই থেকে ছবি দেখার সময় কি শিশুর পছন্দের গুরুত্ব দেয়া হয়?	
	১.৩) কোথাও বেড়াতে যাবার সময়ে কি শিশুর ইচ্ছার গুরুত্ব দেয়া হয়? (যেতে না চাইলে জোর করে নিয়ে যাওয়া হয় কিনা বা যেখানে যেতে চায় সেখানে নিয়ে যাওয়া হয় কিনা?)				
	১.৪) কাপড় পরার ক্ষেত্রে কি শিশুর পছন্দের গুরুত্ব দেয়া হয়?				
২-৫ বছর	1.1) পরিবারের সদস্য এবং যারা শিশুর দেখাশুনা করেন তারা শিশুর সাথে খেলাধুলা করে কিনা?	২.১) খেলার সময় সমবয়সীরা শিশুকে খেলতে নেয় কিনা?	৩.১) পারিবারিক বিভিন্ন অনুষ্ঠানে (বিয়ে,জন্মদিন, মিলাদ) শিশুর খেলাধুলার সুযোগ থাকে কিনা?	৪.১) পরিবারের সদস্যরা কি শিশুকে গল্প শুনায়? বা শিশুর সাথে বিভিন্ন বিষয় নিয়ে গল্প করে?	৫.১) এই শিশুর মাধ্যমে কি পরিবারের কোন আয় হয়?
	১.২) খেলাধুলা করার সময়ে কি শিশুর পছন্দের গুরুত্ব দেয়া হয়? (শিশু যে খেলাটা খেলতে চায় সেটাই খেলা হয় কিনা)	২.২) খেলার সময় তারা শিশুর পছন্দের গুরুত্ব দেয় কিনা?	৩.২) পারিবারিক বিভিন্ন অনুষ্ঠানে যোগদানের জন্য শিশুর পোষাক নির্বাচনের ক্ষেত্রে শিশুর পছন্দের সুযোগ থাকে কিনা?	৪.২) গল্প শুনা বা গল্প করার সময় কি শিশুর পছন্দের গুরুত্ব দেয়া হয়?	

	১.৩) কোথাও বেড়াতে যাবার সময়ে কি শিশুর ইচ্ছার গুরুত্ব দেয়া হয়? (যেতে না চাইলে জোর করে নিয়ে যাওয়া হয় কিনা বা যেখানে যেতে চায় সেখানে নিয়ে যাওয়া হয় কিনা?)	২.৩) শিশু যার/যাদের সাথে খেলতে চায় তাদের সাথে খেলতে দেয়া হয় কিনা		৪.৩) গল্প শুনা বা গল্প করার সময় শিশু যদি কোন প্রশ্ন করে তবে কি তাকে উৎসাহ দেয়া হয় ?	
	১.৪) কাপড় পরার ক্ষেত্রে কি শিশুর পছন্দের গুরুত্ব দেয়া হয়?				
	১.৫) সাধারন ঘরোয়া কাজে কি শিশুর সাহায্য নেয়া হয়?				
	১.৬) সাহায্য নেয়ার ক্ষেত্রে শিশুর মতামতের গুরুত্ব দেয়া হয় কিনা? (যে কাজগুলো করতে চায় সেই কাজ গুলো করতে দেয়া হয় কিনা?)				
৬ - ৯ বছর	১.১) শিশু কি পরিবারের সবার সাথে একসাথে বসে খায়?	২.১) স্কুলের বিভিন্ন কার্যক্রমে (দলীয় কাজ, প্রোজেক্ট) সমবয়সীরা শিশুকে অংশগ্রহনের সুযোগ দেয় কিনা?	৩.১) স্কুলের বিভিন্ন সাংস্কৃতিক অনুষ্ঠান, মিলাদ এবং স্পোর্টসে শিশুর অংশগ্রহনের সুযোগ থাকে কিনা?	৪.১) শিশুটি কি স্কুলে ভর্তি হয়েছে?	৫.১) শিশুটি কি কোন আয়মূলক কাজের সাথে জরিত?
	১.২) খাবার সময় শিশু প্রশ্ন করলে বা কিছু জানতে চাইলে কি পরিবারের সদস্যরা বিরক্ত হয়?	২.২) স্কুলে খেলার সময় সমবয়সীরা শিশুকে খেলতে নেয় কিনা?		৪.২) শিশুটি কি নিয়মিত স্কুলে যায়?	৫.২) এই শিশুর মাধ্যমে কি পরিবারের কোন আয় হয়?
	১.৩) মাঝে মাঝে কি বাড়িতে শিশুর পছন্দের খাবার রান্না করা হয়?	২.৩) খেলার সময় তারা শিশুর পছন্দের গুরুত্ব দেয় কিনা?		৪.২) শিশুটি কি মাঝে মাঝে স্কুলে যায়?	
	১.৪) পরিবারের বিভিন্ন কাজে কি শিশুর সাহায্য নেয়া হয়?	২.৪) শিশুর অংশগ্রহনের সুযোগ আছে এমন ধরনের খেলা তারা খেলে কিনা?		৪.৩) শিশুটি কি আর এখন স্কুলে যায় না?	
	১.৫) সাহায্য নেয়ার ক্ষেত্রে শিশুর মতামতের গুরুত্ব দেয়া হয় কিনা? (যে কাজগুলো করতে চায় সেই কাজ গুলো করতে দেয়া হয় কিনা?)				
	১.৬) পরিবারে কেউ বেড়াতে আসলে তার/তাদের সাথে শিশুর মেলামেশার সুযোগ থাকে কিনা?				
	১.৭) কোথাও বেড়াতে যাবার সময়ে কি শিশুর ইচ্ছার গুরুত্ব দেয়া হয়? (যেতে না চাইলে জোর করে নিয়ে যাওয়া হয় কিনা বা যেখানে যেতে চায় সেখানে নিয়ে যাওয়া হয় কিনা?)				
	১.৮) কাপড় কেনার ক্ষেত্রে কি শিশুর পছন্দের (কাপড়ের রং,ডিজাইন) গুরুত্ব দেয়া হয়?				
	১.৯) কাপড় পরার ক্ষেত্রে কি শিশুর পছন্দের গুরুত্ব দেয়া হয়? (যেটা পরতে চায় সেটা পরতে দেয়া হয় কিনা?)				

১০-১৬ বছর	১.১) পরিবারের শিশু সম্পর্কীয় সিদ্ধান্ত নেবার ক্ষেত্রে শিশুর মতামত নেয়া হয় কিনা (স্কুলে ভর্তি, বিষয় নির্বাচন, নাচ গান শেখার ক্ষেত্রে)	২.১) স্কুলের বিভিন্ন কার্যক্রমে (দলীয় কাজ,প্রোজেক্ট) সমবয়সীরা শিশুকে অংশগ্রহনের সুযোগ দেয় কিনা?	৩.১) স্কুলের বিভিন্ন অনুষ্ঠান উদযাপনের আগে (পিকনিক, পুরস্কার বিতরন,মিলাদ) শিশুদের সাথে আলাপ আলোচনা করা হয় কিনা?	৪.১) শিশুটি কি স্কুলে ভর্তি হয়েছে?	৫.১) এই শিশুর মাধ্যমে কি পরিবারের কোন আয় হয়?
	১.২) পারিবারিক কোন সিদ্ধান্ত নেবার ক্ষেত্রে শিশুর অংশগ্রহন থাকে কিনা?	২.২) স্কুলে খেলার সময় সমবয়সীরা শিশুকে খেলতে নেয় কিনা?	৩.২) স্কুলের বিভিন্ন সাংস্কৃতিক অনুষ্ঠান, মিলাদ এবং স্পোর্টসে শিশুর অংশগ্রহনের সুযোগ থাকে কিনা?	৪.২) শিশুটি কি নিয়মিত স্কুলে যায়?	৫.২) শিশুটি কি কোন আয়মুলক কাজের সাথে জরিত?
		২.৩) বিভিন্ন বিষয় নিয়ে গল্প করার সময়ে শিশুর অংশগ্রহনের সুযোগ থাকে কিনা?		৪.৩) শিশুটি কি মাঝে মাঝে স্কুলে যায়?	
		২.৪) শিশুর অংশগ্রহনের সুযোগ আছে এমন ধরনের খেলা তারা খেলে কিনা?		৪.৪) শিশুটি কি আর এখন স্কুলে যায় না?	

দশটি গুরুত্বপূর্ণ আভাস
Positive Parenting Advice
{ শিশু লালন পালনের ক্ষেত্রে পিতা-মাতা/অভিভাবকদের জন্য সহায়ক কিছু তথ্য: }

১। প্রত্যেক পরিবারের জন্য কিছু **সুনির্দিষ্ট নিয়ম** অনুসরণ করলে, পরিবারের শিশুদের সচেতনতা গড়ে উঠবে। যেমনঃ জামা, জুতা খুলে নির্দিষ্টস্থানে রাখা, খেলনা গুছিয়ে তোলা; গৃহস্থালী কাজে শিশুর দায়িত্ব পালন, অভিভাবকের অনুপস্থিতিতেও তার **আগ্রহ যথাযথ থাকবে।**

২। প্রতিদিনের কর্মকান্ড থেকে শিশুর **যথাযথ ভাল তিনটি কাজকে** তাৎক্ষনিক প্রশংসা করতে যত্নবান হবেন।

৩। শিশুর কোন **ভাল আচরনকে উৎসাহিত করার** জন্য মনোযোগ দান ও পুরস্কৃত করার পাশাপাশি তাকে জানিয়ে দিতে হবে যে আপনি ঐ আচরনে সন্তুষ্ট।

৪। শিশুর **ছোটখাট অযাচিত আচরণ সমূহকে লক্ষ্য না করে** এড়িয়ে যাওয়াই বেশী ভাল। এই অযাচিত আচরণ গুলি যেমন: ঘ্যান ঘ্যান করা, জেদ করা। এসময় শিশুর দিক থেকে সম্মুখ পরিবর্তিত করে তাকে পিঠ প্রদর্শন করুন। অযাচিত আচরন এভাবেই ধীরে ধীরে কমে আসবে।

৫। আপনার আচরণের সামঞ্জস্যতা বজার রাখুন। যদি শিশুকে কোন **কথা দিয়ে থাকেন** তা পূরণ করুন বা যদি কোন **প্রয়োজনীয় বিষয়ে শাসন** করে থাকেন, তবে তাতে স্থির থাকুন। বদলে যাবেন না।

৬। কোন নির্দেশনা শিশুকে যখন দেয়া হবে তা হবে - সুস্পষ্ট ও সরাসরি। সেই বিষয়ের নেপথ্যের কারণটি সম্বন্ধে আরো আগেই শিশুকে যা **অবহিত করা** থাকবে।

৭। শিশুর প্রতি পরিবারের সব সদস্যকে **একই নিয়ম** মেনে চলতে উৎসাহিত করতে হবে ।

৮। **প্রতিদিন - কিছু সময়** শিশুকে কেন্দ্র করে পরিকল্পনা করুন যেমন: কোন সুনির্দিষ্ট আচরণ সংশোধন করা, সম্পর্কের উন্নয়ন করা, ইতিবাচক আদান প্রদান গড়ে তোলা ইত্যাদি।

৯। কিছু দুঃসময় আসতে পারে আপনার জীবনে, তখন ভেঙ্গে না পরে, ভাবাযেতে পারে এভাবেঃ **সফলতার অনেক সোপান**, যা যা ইতিমধ্যে আপনি অর্জন করেছেন। সুতরাং ভাল সময়গুলিকে নিয়ে চিন্তা করুন।

১০। কখনো চারপাশের সব কিছু বিষন্ন মনে হলে- **ঘনিষ্ঠ আপনজন** কাউকে বেছে নিন, মন খুলে সবকিছু বলুন তখন ভাল লাগবে।

From: Dr. Carole Sutton, Parenting Positively, DeMonfort University
অভিযোজন ও ভাবানুবাদ-
ড. মনোয়ারা পারভীন, জেষ্ঠ শিশু মনোবিজ্ঞানী
ঢাকা শিশু হাসপাতাল

Diagnostic definitions with code

1. Cognitive delay and Learning Dificulties

Intellectual functions (ICF):
General mental functions, required to understand and constructively integrate the various mental functions, including all cognitive functions and their development over the life span .

Cognitive delay/ Intellectual impairment ---**(107.07)**

- Intelligent Quotient (IQ) below -2SD below the child's chronological age on Psychometric Test. 'Borderline' cases to be considered as 'mild' when IQ between -1SD and -2SD.
- Understanding (intellectual functions, socialization, self care) is below that expected given the child's chronological age in informal assessment in General Developmental Assessment)

Learning Disorders (DSM-IV) ---**(107.06)**

(Formerly Academic Skills Disorders)

1. **Reading disorder (DSM IV-315.00)**
   Reading achievement, as measured by individually administered standardized tests of reading accuracy or comprehension, is substantially below that expected given the person's age, measured intelligence, and age appropriate education

2. **Mathematics Disorder (DSM IV-315.1)**
   Mathematical ability, as measured by individually administered standardized tests, is   substantially below that expected given the person's age, measured intelligence, and age appropriate education

3. **Disorder of Written Expression (DSM IV-315.2)**
   Writing skills, as measured by individually administered standardized tests (or functional assessments of writing skills) are substantially below that expected given the person's chronological age, measured intelligence, and age appropriate education

Source:
1. International Classification of function (ICF)
2. Diagnostic and Statistical Manual (DSM IV-TR, 2000)

2. Expressive Language Difficulties

Speech delay -- **(132.03)**

Slow development of speech. Immature way of pronouncing words.

Stammering ---**(132.04)**

No known cause. May be problem of coordinating aspects of speech mechanism

Stuttereng---**(124.01)**

A.   Disturbance in the normal <u>fluency</u> and time patterning of speech (inappropriate for the individual's

age), characterized by frequent occurrences of one or more of the following:

    (1)sound and syllable <u>repetitions</u>
    (2)sound <u>prolongations</u>
    (3) <u>interjections</u>
    (4) broken words(e.g., pauses within a word)
    (5) audible or silent <u>blocking</u> (filled or unfilled pauses in speech)
    (6) <u>circumlocutions</u> (word substitutions to avoid problematic words)
    (7) words produced with an excess of physical tension
    (8) monosyllabic whole-word <u>repetitions</u> (e.g., "I-I-I-I see him")

B.   The disturbance in fluency interferes with academic or occupational achievement or with social communication.

C.   If a speech-motor or sensory deficit is present, the speech difficulties are in excess of those usually associated with these problems.

Language Delay --- **(132.05)**

Language delay is when a child's language is developing in the right sequence, but at a slower rate 'Catch-up' to age-appropriate levels is possible.

Expressive language disorder (DSM-IV-315.31) ---**(132.09)**

A.   The sores oblained from standardized individually administered measures of expressive language development are substantially below those obtained from standardized measures of both nonverbal in tellectual capacity and receptive language development. The disturbance may be manifest clinically by symptoms that include having a markedly limited vocabulary, making errors in tense, or having difficulty recalling words or producing sentences with developmentally appropriate length and complexity.

B.   The difficulties with expressive language interferes with social communication.

C.   Criteriat are not met for Mixed Receptive – Expressive or a pervasive Developmental Disorder.

Aphasia--**(132.00)**

Aphasia is a disorder that results from damage to portions of the <u>brain</u> that are responsible for language. For most people, these are areas on the left side (hemisphere) of the brain. Aphasia usually occurs suddenly, often as the result of a stroke or head injury, but it may also develop slowly, as in the case of a brain tumor, an infection, or <u>dementia</u>. The disorder impairs the expression and understanding of language as well as reading and writing. Aphasia may co-occur with speech disorders such as <u>dysarthria</u> or <u>apraxia of speech</u>, which also result from brain damage.

Source:.

1.   Diagnostic and Statistical Manual (DSM IV-TR, 2000)
2.   MedicineNet.com (internet)
3.   Your Child development and Behaviour Resources , University of Michigan Health system (<u>www.med.umich.edu/yourchild/topics/speechhfm</u>
4.   Handout of Moira Pook (Speech and Language Therapist, UK)

3. Developmental motor disorders

Developmental delay--**(104.00)**

A chronological delay in the appearance of normal developmental milestones achieved during infancy and early childhood, caused by organic, psychological, or environmental factors.

Developmental motor delay (non specific)--**(104.02)**

Motor development is delayed. No specific neurological signs or deficits is present. This may be associated with malnutrition, anemia, and other macro and micronutrient deficiencies.

Psychomotor delay ---**(107.10)**

Delay in achieving age appropriate motor skills that also involve some aspects of conceptual or psychological functioning. (PDI-BSID II)

Global Developmental Delay -- **(112.00)**

- • Developmental Fields:
  - **-** Gross motor and Fine motor
  - **-** Speech and Language
  - **-** Cognition
  - **-** Personal and social development
  - **-** Activities of daily living

- • Criteria of global delay
  1) Two or more components delay
  2) Performance 2 or more standard deviation below the mean

Source:
1. M Mahbub,N Bano, M Parveen, NZ Khan, Non-specific motor delayamong admitted children in Child Development and Neurology Unitof Dhaka Shishu Hospital;
   (Child) H J 2009;25 (1&2):16-20
2. L McDonald, A Rennie, J Tolmie, P Galloway, R McWilliam, Investigation of global development delay, Arc Dis Child2006; 91: 701-705
3. www.Springerreference.com/docs/html/chapterdbid/344273.html
4. www.medical-dictionary.thefreedictionary.com/developmental+delay

4. Cerebral palsy

Cerebral Palsy --**(100.00)**

Cerebral palsy is defined as a group of disorders of motor function, movement and posture; it is permanent but not unchanging and is caused by non-progressivelesions or brain abnormalities in the developing/immature brain.

Diplegia--- **(100.01)**

Usually indicates the legs are affected more than the arms; primarily affects the lower body.

Hemiplegia---**(100.02)**

Indicates the arm and leg on one side of the body is affected.

Tetraplegia or Quadriplegia -- **(100.03)**

Indicates that all four limbs are involved.

Dystonia -- **(100.06)**

Dystonia is a syndrome of sustained or repetitive involuntary muscle contractions that produce abnormal but patterned postures and movements of different parts of the body.

Spastic CP --- **(100.08)**

Spasticity implies increased muscle tone. Muscles continually contract, making limbs stiff, rigid, and resistant to flexing or relaxing. Spastic cerebral palsy is hypertonic and the injury to the brain occurs in the pyramidal tract and is referred to as upper motor neuron damage.

Monoplegia --- **(100.10)**

means only one limb is affected. It is believed this may be a form of hemiplegia/hemiparesis where one limb is significantly impaired.

Hypotonic CP --- **(100.11)**

Characterized by general muscular hypotonia that persists beyond 2-3 years of age and does not result from a primary disorder of muscle or peripheral nerve. A majority of these infants later develop spastic, dyskinetic and especially ataxic CP. But in some cases generalized hypotonia persists well into childhood

Athetoid or dyskinetic -- **(100.15)**

Persons with this type generally have involuntary body movements. The damage occurs to the extrapyramidal motor system and/or pyramidal tract and to the basal ganglia.
Source:
1.   (SCPE 2000) Jean Aicardi-Diseases of the Nervous System in Childhood. : 3rd Edition ;2009
2.   MyChild@ CerebralPalsy.org
3.   http:// emedicine.medscape.com   Date : 8/3/2013

5. Mental Health Disorders

Autism Spectrum disorder (ASD) --- **(114.00)**

Pervasive developmental disorder (PDD) (ICD F 84) --- **(114.00)**
Definition:

A.   A total of six (or more) items from (1), (2) and (3), with at least two from 1, and one each from (2) and (3):
   (1)   Qualitative impairment in social interaction, as manifested by at least two of the following:
      (a)   Marked impairment in the use of multiple nonverbal behaviours such as eye-to-eye gaze, facial expression, body postures, and gestures to regulate social interaction
      (b)   Failure to develop peer relationships appropriate to developmental level
      (c)   A lack of spontaneous seeking to share own enjoyment, interests, or achievements with other people (e.g., by a lack of showing, bringing, or pointing out objects of interest)
      (d)   Lack of social or emotional reciprocity
   (1)   Qualitative impairment in communication as manifested by at least one of the following:
      (a)   Delay in, or total lack of, the development of spoken language (not accompanied by an attempt to compensate through alternative modes of communication such as gesture or

mime)
- (b) In individuals with adequate speech, marked impairment in the ability to initiate or sustain a conversation with others
- (c) Stereotyped and repetitive use of language or idiosyncratic language
- (d) Lack of varied, spontaneous make-believe play or social imitative play appropriate to developmental level
- (1) Restricted, repetitive and stereotyped patterns of behaviour, interests, and activities, as manifested by at least one of the following:

    - (a) Encompassing preoccupation with one or more stereotyped and restricted patterns of interest that is abnormal either in intensity or focus
    - (b) Apparently inflexible adherence to specific, non-functional routines or rituals
    - (c) Stereotyped and repetitive motor mannerisms (e.g., hand or finger flapping or twisting, or complex whole body movements)
    - (d) Persistent preoccupation with parts of objects
- A. Delays or abnormal functioning in at least one of the following areas, with onset prior to age 3 years: (1) social interaction, (2) languages as used in social communication, or (3) symbolic or imaginative play.
- B. The disturbance is not better accounted for by Rett's Disorder or Childhood Disintegrative Disorder.

Pervasive developmental disorder NOS (PDD-NOS) (DSM 299.80) --------------------------------------- **(114.02)**

Definition:

This category should be used when there is a severe and pervasive impairment in the development of reciprocal social interaction associated with impairment in either verbal or nonverbal communication skills or with the presence of stereotyped behaviour, interests, and activities, but the criteria are not met for a specific Pervasive Developmental Disorder or Autism Spectrum Disorder or other mental health conditions in the DSM-IV.

This category includes 'Atypical Autism'- presentations that do not meet the criteria for Autism because of late age of onset, atypical symptomatology, or sub threshold symptomatology, or all of these.

Rett's Disorder --- **(134.03)**

- A. All of the following
- 1. Apparently normal prenatal and perinatal development
- 2. Apparently normal psychomotor development through the first 5 month after birth
- 3. Normal head circumference at birth

- B. Onset of all the following after the period of normal development:
- 1. Deceleration of head growth between ages 5 and 48 months
- 2. Loss of previously acquired purposeful hand skills between ages 5 and 30 months with the subsequent development of stereotyped hand movement (e.g. hand-wringing or hand washing)
- 3. Loss of social engagement early in the course (although of- ten social interaction develops later)
- 4. Appearance of poorly coordinated gait or trunk movements
- 5. Severely impaired expressive and receptive language development with severe psychomotor retardation

ADHD/ Hyperactive --- **(122.00)**

Definition:

A. Either (1) or (2):

1. Six (or more) of the following symptoms of inattention have persisted for at least six months to a degree that is maladaptive and inconsistent with developmental level:

IInattention
- Often fails to give close attention to details or makes careless mistakes in schoolwork, work, or other activities
- Often has difficulty sustaining attention to tasks or play activities
- Often does not seem to listen when spoken to directly
- Often does not follow through on instructions and fails to finish schoolwork, chores, or duties in the workplace (not due to oppositional behavior or failure to understand instructions)
- Often has difficulty organizing tasks and activities
- Often avoids, dislikes, or is reluctant to engage in tasks that require sustained mental effort (such as school work or homework)
- Often loses things necessary for tasks or activities (e.g., toys, school assignments, pencils, books, or tools)
- Is often easily distracted by extraneous stimuli
- Is often forgetful in daily activities

2. Six (or more) of the following symptoms of hyperactivity-impulsivity have persisted for at least six months to a degree that is maladaptive and inconsistent with developmental level:

Hyperactivity
- Often fidgets with hands or feet or squirms in seat
- Often leaves seat in classroom or in other situations in which remaining seated is required
- Often runs about or climbs excessively in situations in which it is inappropriate (in adolescents or adults, may be limited to subjective feelings of restlessness)
- Often has difficulty playing or engaging in leisure activities quietly
- Is often "on the go," or often acts as if "driven by a motor"
- Often talks excessively

Impulsivity
Often blurts out answers before questions have been completed
Often has difficulty awaiting turn
Often interrupts or intrudes on others (e.g., butts into conversations or games)
B. Some hyperactive-impulsive or inattentive symptoms that caused impairment were present before the age of 7 years.
C. Some impairment from the symptoms is present in two or more settings (e.g., at school [or   work] and at home).
D. There must be clear evidence of clinically significant impairment in social, academic, or   occupational functioning.
E. The symptoms do not occur exclusively during the course of a Pervasive Development Disorder, Schizophrenia, or other Psychotic Disorder and are not better accounted for by another mental disorder (e.g., Mood Disorder, Anxiety Disorder, Dissociative Disorder, or a personality disorder).

Developmental Coordination Disorder (DSM-315.4) -- **(122.01)**

Definition:

Developmental Coordination Disorder (DCD) - Diagnostic Criteria 315.40

The following criteria are necessary for a diagnosis of DCD to be given:

A.Performance in daily activities that require motor coordination is substantially below that expected, given the person's chronological age and measured intelligence. This may be manifested by:
- marked delays in achieving motor milestones (e.g., walking, crawling, sitting)
- dropping things
- clumsiness
- poor performance in sports
- poor handwriting.

A. The disturbance in Criterion A significantly interferes with academic achievement or activities of daily living.

B. The disturbance is not due to a general medical condition (e.g., cerebral palsy, hemiplegia, or muscular dystrophy) and does not meet criteria for a Pervasive Developmental Disorder.

C. If mental retardation is present, the motor difficulties are in excess of those usually associated with it.

Deficit in attention, motor activity and perception (DAMP) -- **(122.01)**

Definition:

In 2003, Gillberg revised his definition of DAMP. The new definition is as follows:
1. ADHD as defined in DSM-IV;
2. DCD (Developmental Coordination Disorder) as defined in DSM-IV;
3. condition not better accounted for by cerebral palsy; and
4. IQ should be higher than about 50 [Gillberg, 2003: box 1]. (In the WHO system, this would be a hyperkinetic disorder combined with a developmental disorder of motor function.) About half of children with ADHD are believed to also have DCD [Gillberg, 2003; Martin et al., 2006[5]].

The concept of DAMP (deficits in attention, motor control, and perception) has been in clinical use in Scandinavia for about 20 years. DAMP is diagnosed on the basis of concomitant attention deficit/hyperactivity disorder and developmental coordination disorder in children who do not have severe learning disability or cerebral palsy. As far as clinical practice goes, DAMP has been primarily accepted only in Gillberg's native Sweden and in Denmark [Gillberg, 2003, p.904], and even in those countries acceptance is mixed. Ref: The Gothenburg Study of Children with DAMP.

Disruptive behaviour disorder NOS (DSM 312.9)--**(107.08)**

Definition:

This category is for disorders characterized by conduct or oppositional defiant behaviours that do not meet the criteria for Conduct Disorder or Oppositional Defiant Disorder. For example, include clinical presentations that do not meet full criteria either for Oppositional Defiant Disorder or Conduct Disorder, but in which there is clinically significant impairment.

Conduct disorder --- **(107.09)**

Definition

A. A repetitive and persistent pattern of behavior in which the basic rights of others or major age-appropriate societal norms or rules are violated, as manifested by the presence of three (or more) of the following criteria in the past 12 months, with at least one criterion present in the past 6 months:

Aggression to people and animals:
1. Often bullies, threatens, or intimidates others
2. Often initiates physical fights

3. Has used a weapon that can cause serious physical harm to others (e.g., a bat, brick, broken bottle, knife, gun)
4. Has been physically cruel to people
5. Has been physically cruel to animals
6. Has stolen while confronting a victim (e.g., mugging, purse snatching, extortion, armed robbery)
7. Has forced someone into sexual activity

Destruction of property:
8. Has deliberately engaged in fire setting with the intention of causing serious damage
9. Has deliberately destroyed others' property (other than by fire setting)

Deceitfulness or theft:
10. Has broken into someone else's house, building, or car
11. Often lies to obtain goods or favors or to avoid obligations (i.e., "cons" others)
12. Has stolen items of nontrivial value without confronting a victim (e.g., shoplifting, but without breaking and entering; forgery)

Serious violations of rules:
13. Often stays out at night despite parental prohibitions, beginning before age 13 years
14. Has run away from home overnight at least twice while living in parental or parental surrogate home (or once without returning for a lengthy period)
15. Is often truant from school, beginning before age 13 years
    B. The disturbance in behavior causes clinically significant impairment in social, academic, or occupational functioning.
    C. If the individual is age 18 years or older, criteria are not met for Antisocial Personality Disorder.

School refusal --- **(138.00)**

Definition:

School refusal is broad term that encompasses a child motivated refusal to attend or remain at school resulting in prolonged absences.

Youths who miss long periods of school time, skip classes, arrive to school late, miss sporadic periods of school time, display severe morning misbehaviors in attempts to refuse school, attend school with great dread and somatic complaints that precipitate tendency for future nonattendance, fall along the school refusal spectrum (Kearney & Bates, 2005).

According to Kearney & Silverman (1995), school refusal is present in approximately 5% of school-aged children. Left untreated, school refusal may lead to many long-term dysfunctions. School refusal behavior is highly comorbid with a number of different mental health disorders such as, separation anxiety disorder (SAD), generalized anxiety disorder (GAD), oppositional defiant disorder (ODD) and depression (Kearney & Albano (2004).

Common elements among anxiety-based school refusal at the high school level include a high level of anxiety, a power struggle between students and one or both parents about the students' perceptions of helplessness, an inability to resist a powerful parent or parents, fear of not measuring up, thoughts that love is conditional on meeting parental standards, tendency to ignore or avoid difficult situations, and a fear of criticism and failure (Brand & O'Conner, 2004).

6. Seizure Disorders

Seizure:
Iis defined as paroxysmal involuntary disturbance brain function that may be manifested as an
•   impairment or loss of consciousness
•   behaviour abnormalities
•   abnormal motor activity
•   sensory disturbance

or an autonomic dysfunction

Generalized Seizure --- **(200.00)**

Are those which are bilateral and without local onset

Myoclonic Seizure -- **(201.00)**

Are those where sudden, involuntary and momentary contraction occurs in single muscle or group of muscle

Generalized Tonic-Clonic seizure --- **(204.00)**

Seizure where generalized tonic contraction is followed by clonic contraction i.e, rhythmic movement of limbs.

Generalized Tonic Seizure --- **(204.01)**

Where generalized tonic contraction with fall, apnoea, cyanosis with loss of consciousness occurs. At times it is preceeded by sudden cry, upward rolling eye balls.

Febrile Seizure -- **(215.00)**

Defined as a "seizure in association with a febrile illness in the absence of CNS infection or acute electrolyte imbalance in a child older than 6 months of age without prior afebrile seizures."

Source :
1.   Pediatric Neurology by Edward M. Brett, 3rd edi

7. Vision Impairments

Blindness -- **(108.00)**

The most severe form of visual impairment is blindness.
The legal definition of blindness is that vision in the best eye, after correction by glasses, is poorer than 20/200 or that the field of vision is so narrow that it compasses only 20 degrees rather than the normal 105 degrees or so. Restricted field of vision means that the person has tunnel vision. Many people who are legally blind, that is, with less than 20/200 vision, can still distinguish shades of light.
Totally blind people will not even have light and dark perception.

Low vision -- **(109.00)**

Low vision is a loss of eyesight that makes everyday tasks difficult. A person with low vision may find it difficult

or impossible to accomplish activities such as reading, writing, shopping, watching television, driving a car, recognizing faces.

Squint--**(109.01)**

Six small muscles that surround each eye coordinate the movement of the eyes. If the brain cannot accurately control these muscles, the eyes will not move synchrony and strabismus will result. Strabismus refers both to "crossed eyes" in which the eyes turn inward , and "wall eyes," in which they turn outward.
When the two eyes are not working in concert, the brain receives confusing images, which results in "double vision." If this persists, the brain corrects for the double vision by simply ignoring the weaker visual image transmitted by the nonpreferred eye. This eventually results in a permanent impairment of vision in the non used eye.

Night Blindness -- **(109.02)**

Retina has two types of light sensitive nerves cells, the rods and cones. Rods are involved in night vision. Cones are used for reading, seeing distant objects, and for color vision. Damage to the rods, associated with vitamin A deficiency and other causes, results in poor vision after dusk.

Delayed Visual Maturation -- **(109.03)**

Delayed Visual Maturation (DVM) is characterized by an otherwise normal eye exam in an infant that does not fix or follow or otherwise respond (e.g., blink to threatening object or bright flash of light) to a visual object. In an infant with DVM, the eyes, including the retinas and optic nerves, appear normal and the infant is otherwise neurologically normal. Infants with DVM do not have nystagmus and typically do not have "wondering" eye movements. Yet, the infant does not fixate on objects or track, even with jerking eye movements (saccades), objects that move across his/her visual field. By definition, however, at some point in time, usually by about 6 months of age, the infant will start to fix and follow and will then appear as a visually normal infant.

Source:
i.   Batshaw ML . Your Child has a Disability. First edition. Little, Brown and Company, Boston, 1991; 166,170
ii.   EyeSmart (www. Geteyesmart org/eye smart/dease/low vision.efm.
iii.   www. Ohiolionseyersearch.com/delayed_visual_maturation.htf

8. Hearing impairments

Deafness/Hearing Impairment ---**(110.01)**

A defect anywhere along the hearing pathway will result in hearing loss.
Types:

1.   **Conductive:**
     Conductive hearing loss occurs when there is a disorder of the outer or middle ear. In a conductive hearing loss, the inner ear and auditory nerves are normal, but sounds fail to reach the inner air at the normal intensity because of an abnormality or obstruction in the ear canal, ear drum, or middle ear.

2.   **Sensorineural:**
     Sensorineural hearing loss occurs when the inner ear or auditory nerve is damaged.

3.   **Mixed:**
     When there is both a conductive and sensorineural component to the hearing loss, it is called a mixed

type hearing loss.

Source:
1.   Batshaw ML . Your Child has a Disability. First edition. Little, Brown and Company, Boston, 1991; 166,170

9. Syndromes Inherited , Regressions and Anomalies

Myopathy --- **(111.01)**

The term myopathy is applied to the conditions with clinical features attributable to pathological, clinical   or electrical changes in the muscles fibres or interstitial tissues of voluntary muscles, in which the abnormal muscle function is not the result of disorder of the central or peripheral nervous system.

Cleft-plate --- **(125.00)**

Cleft of the palate is distinct entity closely related embryologically, functionally and genetically. It appears to represent failure of the palatal shelves to approximate or fuse.

Cong.anomally --- **(133.00)**

Congenital anomalies can be defined as structural or functional anomalies, including metabolic disorders, which are present at the time of birth - are also known as birth defects, congenital disorders or congenital malformations.

Down syndrome --- **(134.09)**

(Trisomy 21)

Down syndrome is a genetic condition in which a person has 47 <u>chromosomes</u> instead of the usual 46.In most cases, Down syndrome occurs when there is an extra copy of chromosome 21. This form of Down syndrome is called Trisomy 21. The extra chromosome causes problems with the way the body and brain develop.

Down syndrome is one of the most common causes of human birth defects.
Down syndrome symptoms vary from person to person and can range from mild to severe. However, children with Down syndrome have a widely recognized appearance.
The head may be smaller than normal and abnormally shaped. For example, the head may be round with a flat area on the back. The inner corner of the eyes may be rounded instead of pointed.
Common physical signs include:

*   <u>Decreased muscle tone</u> at birth
*   Excess skin at the nape of the neck
*   Flattened nose
*   Separated joints between the bones of the skull (sutures)
*   Single crease in the palm of the hand
*   Upward slanting eyes
*   Wide, short hands with short fingers
*   White spots on the colored part of the eye (Brushfield spots)

Physical development is often slower than normal. Most children with Down syndrome never reach their average adult height.

As children with Down syndrome grow and become aware of their limitations, they may also feel frustration and anger.
Many different medical conditions are seen in people with Down syndrome, including:
Birth defects involving the heart, such as an <u>atrial septal defect</u> or <u>ventricular septal defect</u>

Laurence-Moon-Biedl Syndrome --- **(135.00)**

an inherited disorder affecting especially males and characterized by obesity, mental retardation, the presence of extra fingers or toes, subnormal development of the genital organs, and sometimes by retinitis pigmentosa

Hydrocephalus --- **(139.00)**

Hydrocephalus means water in the brain , implies an excess of C.S.F with in the skull . More specifically it denotes the presence of an increased amount of C.S.F under increased pressure with enlargement of ventricular system

Developmental regression --- **(104.01)**

Developmental regression occurs when a child's mental or physical development stops and begins a reverse cycle. Examples are from brain damage, or a disease which would retard the growth cycle.

Source
1.   Pediatric Neurology by Edward M. Brett, 3rd edi
2.   Nelsion 18 th edition
3.   Jean Aicardi-Diseases of the Nervous System in Childhood. :3rd ed2009
4.   http://www.ncbi.nlm.nih.gov/pubmedhealth/PMH0001992/
        Last reviewed: May 16, 2012.
5.   Shttp://www.merriam-webster.com/
6.   Pediatric Neurology by Edward M. Brett, 3rd edi
7.   www.wiki.answers.com>categorise>health>conditions and diseases>what is develiomental regres-sion

এম চাট

আপনার সন্তান সাধারণত কেমন তা নিম্নলিখিত শুন্যস্থান পূরণ করে জানান। অনুগ্রহ করে প্রত্যেকটি প্রশ্নের উত্তর দিতে চেষ্টা করুন। যদি কোন আচরণ খুবই কম দেখা যায় (জীবনে দুই একবার দেখেছেন) তবে শিশুটি তা স্বাভাবিকভাবে করেন ধরে উত্তর দিবেন।

1. আপনার শিশুকে শুন্যে তুলে বা হাঁটুর উপর দোলালে কি আনন্দ পায় ? ☐ হ্যা ☐ না

2. আপনার শিশু কি অন্য শিশুরা কি করছে সেদিকে খেয়াল করে ? ☐ হ্যাঁ ☐ না

3. আপনার শিশু কি কোন কিছুর উপর উঠতে পছন্দ করে (যেমন, আসবাবপত্র, সিঁড়ি) ? ☐ হ্যাঁ ☐ না

4. আপনার শিশু কি উঁকি-টুকি/লুকোচুড়ি খেলতে আনন্দ পায় ? ☐ হ্যাঁ ☐ না

5. আপনার শিশু কখনও ভান করে কিনা (যেমন, মিছিমিছি ফোনে কথা বলা, পুতুলের যত্ন করা বা অন্য কিছু ভান করা) ? ☐ হ্যাঁ ☐ না

6. আপনার শিশুটি কি কখনও কিছু চাওয়ার জন্য আঙ্গুল নির্দেশ করে দেখিয়ে দেয় ? ☐ হ্যাঁ ☐ না

7. আপনার শিশুটি কি কখনও নিজের উৎসাহের প্রতি আঙ্গুল নির্দেশ করে দেখায় ? ☐ হ্যাঁ ☐ না

8. আপনার শিশুটি ছোট ছোট খেলনা (গাড়ী, গুঁটি) মুখে না দিয়ে, না চিবিয়ে বা না ফেলে যথাযথভাবে খেলে কিনা ? ☐ হ্যাঁ ☐ না

9. আপনার শিশুটি কি কখনও কোন জিনিস আপনার কাছে এনে দেখায় ? ☐ হ্যাঁ ☐ না

10. আপনার শিশুটি কি আপনার চোখের দিকে দু'এক সেকেন্ডের বেশী সময় ধ'রে তাকায় ? ☐ হ্যাঁ ☐ না

11. আপনার কি মনে হয় আপনার শিশু শব্দের প্রতি অতি প্রতিক্রিয়াশীল (যেমন, কোন শব্দ শুনলে কানে হাত দেয়) ? ☐ হ্যাঁ ☐ না

12. আপনার শিশুটি কি আপনাকে দেখে বা আপনার হাসির উত্তরে হাসে ? ☐ হ্যাঁ ☐ না

13. আপনার শিশুটি কি আপনকে অনুকরণ করে (যেমন, আপনার মুখভঙ্গী বা অন্যকোন ভঙ্গীর অনুকরণ) ? ☐ হ্যাঁ ☐ না

14. আপনার শিশু কি তার নাম ধরে ডাকলে সাড়া দেয় ? ☐ হ্যাঁ ☐ না

15. ঘরের অন্য প্রান্তে কোন খেলনার দিকে আঙ্গুল দিয়ে নির্দেশ করলে আপনার শিশু কি সেদিকে তাকায় ? ☐ হ্যাঁ ☐ না

16. আপনার শিশু কি হাঁটে ? ☐ হ্যাঁ ☐ না

17. আপনি কোন জিনিসের দিকে তাকালে, আপনার শিশু কি সেদিকে তাকায় ? ☐ হ্যাঁ ☐ না

18. আপনার শিশুটি কি ওর মুখের সামনে আঙ্গুলগুলি অস্বাভাবিকভাবে নাড়াচাড়া করে ? ☐ হ্যাঁ ☐ না

19. আপনার শিশুটি তার কোন কার্যকলাপের প্রতি আপনার মনোযোগ আকর্ষন করে ? ☐ হ্যাঁ ☐ না

20. আপনার কি কখনও মনে হয়েছে যে আপনার শিশুটি কানে শোনে না ? ☐ হ্যাঁ ☐ না

21. অন্য লোকেরা যা বলে, আপনার শিশু কি তা বুঝতে পারে ? ☐ হ্যাঁ ☐ না

1. আপনার শিশু কি এমনভাবে তাকায় যেন সে কিছুই দেখছে না বা উদ্দেশ্যহীন ঘুরতে থাকে ?   ☐   হ্যাঁ   ☐   না

2. অপরিচিত কিছু দেখে আপনার শিশুটি কি আপনার প্রতিক্রিয়া দেখার জন্য আপনার

   মুখের দিকে তাকায় ?   ☐   হ্যাঁ   ☐   না

M-CHAT research is ongoing at the University of Connecticut and Georgia State University. The follow-up study of the initial sample is expected to be published in the near future. This research is supported by funding from the National Institute of Child Health and Development, the Maternal and Child Health Bureau, and the National Alliance for Autism Research. For more information, please contact Diana Robins at drobins@g...edu or Deborah Fein at Deborah Fein@uconn.edu.

M-CHAT Scoring Instructions

A child fails the checklist when 2 or more critical items are failed OR when any three items are failed. Yes/No answer convert to pass/fail response. Below are listed the failed responses for each item on the M-CHAT. Bold capitalized items are CRITICAL items.

Not all children who fail the checklist will meet criteria for a diagnosis on the autism spectrum. However, children who fail the checklist should be evaluated in more depth by the physician or referred for a development evaluation with a specialist.

1.	No	6.	No	11.	Yes	16.	No	21.	No
2.	**No**	**7.**	**No**	12.	No	17.	No	22.	Yes
3.	No	8.	No	**13.**	**No**	18.	Yes	23.	No
4.	No	9.	No	**14**	**No**	19.	No		
5.	No	10.	No	**15**	**No**	20	Yes		

<u>Social Communication Questionnaire (Bangla)</u>
<u>Life time Version</u>

ID No.   পর্যবেক্ষনের তারিখঃ

শিশুর নামঃ

জন্ম তারিখঃ

প্রশ্নমালাটি পূরণ করার জন্য আপনাকে ধন্যবাদ ।

আপনার শিশুর যোগাযোগের ধরন এবং সামাজিক আচরণ সম্পর্কে আপনাকে প্রশ্ন করা হবে। শিশুর মধ্যে আচরণটি আছে কি নাই- আপনার ধারণা অনুযায়ী এই ব্যাপারে "হ্যাঁ" অথবা "না" বলুন

	"হ্যাঁ"	"না"
১. সে কি এখন ছোট ছোট শব্দ বা বাক্য ব্যবহার ক'রে কথা বলতে পারে ?	☐	☐

যদি উত্তর 'না' হয়, তবে সরাসরি ৮নং প্রশ্নতে চলে যান ।

২. আপনি যখন তার সাথে কথা বলেন তখন সে কি আপনার কথা বুঝতে পারে এবং সহজেই কথা/আলাপ চালিয়ে যেতে পারে ?	☐	☐
৩. সে কি কখনো <u>অর্থহীন</u> শব্দ ব্যবহার করে বা একই কথা একইভাবে বার বার বলে ? (যা সে হয়তো অন্যদের কাছ থেকে শোনে বা নিজে তৈরী করে নিয়েছে) ।	☐	☐
৪. সে কি এমন কোন প্রশ্ন করে/কথা বলে যা অন্যকে সামাজিকভাবে ব্বিতকর অবস্থায় ফেলে দেয়? যেমন- সে কি প্রায়ই ব্যক্তিগত কোন প্রশ্ন করে বা কথা বলে যেটা ব্বিতকর?	☐	☐
৫. সে কি সর্বনাম ব্যবহার করার সময় ভূল করে ? যেমন- 'আমি' বলতে গিয়ে 'তুমি' বা 'সে' বলে ?	☐	☐
৬. সে কি এমন কোন শব্দ ব্যবহার করে বা অদ্ভুত কায়দায় কোন কথা বলে যা সে নিজে তৈরী করেছে বলে মনে হয় --- যেমন, বাষ্পকে (ফুটনত পানির ধোঁয়া) বলে 'গরম বৃষ্টি' ।অথবা, প্রায়ই কথায় কোন জটিল/ প্রতীকি ভাষা ব্যবহার ক'রে ফেলে?	☐	☐
৭. সে কি একই কথা একইভাবে বারবার বলে অথবা আপনাকে একই কথা একইভাবে বারবার বলতে বাধ্য করে ?	☐	☐

	"হ্যাঁ"	"না"

৮. সে কি তার কাজগুলো কোন নির্দিষ্ট নিয়মে করতে পছন্দ করে বা আপনাকেও ঠিক সেভাবেই করতে বাধ্য করে?

৯. তার মুখের ভাবভঙ্গি কি পরিবেশ বা পরিস্থিতির সাথে উপযোগী মনে হয়? (যেমন- বাসার কোন বিপদ হলে, সবার মন খারাপ - কিন্তু সে নির্বিকার অথবা হাসছে)।

১০. সে কি আপনার হাতকে যন্ত্রপাতির মতো বা তার শরীরের কোন অংশের মত ব্যবহার করে? যেমন- আপনার আঙ্গুল দিয়ে কিছু নির্দেশ করে অথবা আপনার হাত দিয়ে দরজা খোলে?

১১. এমন কোন ধরনের আগ্রহ কি শিশুর আছে যা তাকে আচ্ছন্ন করে রাখে এবং যা কিনা অন্যলোক/অন্যদের কাছে অস্বাভাবিক মনে হয়?

১২. কোন খেলনা দিয়ে সঠিকভাবে খেলার পরিবর্তে আপনার শিশুকে কি খেলনার অংশসমূহের প্রতি বেশী আগ্রহী মনে হয়? যেমন- সে কি গাড়ি চালিয়ে না খেলে গাড়ীর চাকা ঘোরাতে বেশী পছন্দ করে?

১৩. কোন বস্তু বা বিষয়ের প্রতি শিশুটির কি তীব্রমাত্রায় আসক্তি/অস্বাভাবিক আগ্রহ আছে? (যেমন, ডাইনোসর, রেলগাড়ি)।

১৪. আপনার শিশুর কি কোন দর্শনীয় অনুভূতি, শব্দ, কোন বিশেষ স্বাদ, গন্ধ বা কোন মানুষের প্রতি তীব্রমাত্রায় আসক্তি আছে?

১৫. শিশুটির কি হাতের আঙ্গুল অস্বাভাবিকভাবে নাড়াচাড়া করার প্রবনতা আছে? যেমন- চোখের সামনে এনে আঙ্গুল নাড়ানো বা হাত কাঁপানো বা অদ্ভুত কায়দায় ঘুরানো?

১৬. তার কি সমস্ত শরীর অস্বাভাবিকভাবে/জটিলভাবে নাড়াচাড়া করার প্রবনতা আছে? যেমন- ঘুরপাক খাওয়া বা লাফানো।

১৭. সে কি কখনো ইচ্ছাকৃতভাবে নিজেকে আঘাত করে? যেমন- হাতে কামড় দেয়া অথবা মাথায় বারি মারা।

		"হাঁ"	"না"

১৮. নরম কোন খেলনা বা আরামদায়ক কোন বস্তু ছাড়া এমন কোন কিছু আছে কি যা সে সবসময় হাতে রাখতে চায় ? ☐ ☐

১৯. তার কি কোন বিশেষ বন্ধু বা ঘনিষ্ট কোন বন্ধু আছে ? (যাকে সে খুব পছন্দ করে।) ☐ ☐

২০. সে কি কখনো আপনার সাথে শুধুমাত্র ভাব করার জন্য কথা বলে ? কোন কিছু পাওয়ার জন্য নয়। ☐ ☐

২১. সে কি আপনাকে বা অন্য কাউকে স্বতঃস্ফূর্তভাবে কখনো অনুকরণ করে ? যেমন- বাগান করা, ঘর পরিস্কার করা। ☐ ☐

২২. সে কি শুধুমাত্র আপনাকে দেখানোর জন্য (সে নিজে কিছু নেয়ার জন্য নয়) তার আশপাশের কোন জিনিসের প্রতি/ আঙ্গুল নির্দেশ করে ? ☐ ☐

২৩. সে যা চাইছে, তা আপনাকে বোঝানোর জন্য সে কি কোন রকম ইশারা করে ? (আঙ্গুল দিয়ে নির্দেশ করা বা হাত ধরে টেনে,নেয়া ছাড়া)। ☐ ☐

২৪. সে কি কোন প্রশ্নের উত্তর "হাঁ" হলে মাথা নাড়িয়ে বলতে পারে ? ☐ ☐

২৫. সে কি মাথা নাড়িয়ে "না" বলে ? ☐ ☐

২৬. সে কি কথা বলা বা কোন কিছু করার সময় সরাসরি আপনার মুখের দিকে তাকায় ? ☐ ☐

২৭. সে কি আপনার হাসির উত্তরে হাসি দেয় ? ☐ ☐

২৮. সে কি তার পছন্দের কোন জিনিস এনে আপনাকে দেখায় বা আপনার মনোযোগ আকর্ষণের জন্য চেষ্টা করে ? ☐ ☐

২৯. সে কি কখনও খাবার ছাড়া অন্য কোন জিনিস বা বিষয় নিয়ে আপনার সাথে ভাগাভাগি/ গল্প (শেয়ার) করে ? ☐ ☐

৩০. সে কি আপনাকে নিয়ে তার কোন আনন্দ উপভোগ করতে চায় ? ☐ ☐

৩১. যখন আপনি আঘাত পান বা দুঃখ পান, তখন কি আপনাকে সান্ত্বনা দেওয়ার চেষ্টা করে ? ☐ ☐

SURVEY OF AUTISM AND NEURODEVELOPMENTAL DISORDERS IN BANGLADESH

গণপ্রজাতন্ত্রী বাংলাদেশ সরকার স্বাস্থ্য ও পরিবার কল্যাণ মন্ত্রনালয় ঢাকা