**ICDDR,B WORKSHOP ON IMPACT OF MATERNAL AND CHILD HEALTH AND FAMILY PLANNING PROGRAMS ON WOMEN'S SOCIAL AND ECONOMIC EMPOWERMENT**

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The research we are conducting on women's social and economic empowerment is part of a larger project on long-term effects of health and development interventions in rural Bangladesh. This note contains

1.  Overview of the larger data collection project
2.  Brief summary of plans for analysis related to women's social and economic empowerment

**1. Overview of the full project:**

**Long-term Effects of Health and Development Interventions in Rural Bangladesh**

Interventions intended to improve health and human capital are common in the developing world. Few, however, have been introduced in designs that permit full assessment of their impacts. Even when evaluation is built in, long-term follow-up is rare, so that existing evaluation is limited to the short or medium term. Specifically, opportunities to study long-term consequences of disease prevention and family planning program interventions are extremely unusual. Matlab, Bangladesh, is one of the few settings in the world that combines quasi-randomization of interventions, long duration of follow-up (over 30 years), and detailed tracking of attrition across an unusually rich set of outcomes and for several generations of potential beneficiaries. A population of over 200,000 has been followed since the mid-1970s; quasi-randomized maternal and child health, and family planning programs began in the late 1970s; an approximately 10-year *experiment period* followed before comparable services began to spread throughout Matlab. By *quasi-randomized, we mean that evidence exists of pre-program similarities in key characteristics in the areas that did or did not receive the interventions.*

We are carrying out a new survey of this population that is linked to existing longitudinally collected data. With resulting datasets, the long-term effects of child health and family planning interventions can be studied against an extensively observed context in which other development changes are taking place and are well documented. These interventions and others in poverty alleviation and environmental protection pertain to four of the eight UN Millennium Development Goals. Program impacts on health, wealth, and life chances can be studied for four generations defined by age in the experimental period:

- *elders* ineligible for programs when interventions began, but for whom intergenerational effects may occur
- *adults*, some of whom had the opportunity to have fewer and healthier children through these interventions
- *children* who may have experienced health interventions and smaller number of siblings through these programs and have moved into adulthood, and
- the families of these children, especially their own children (referred to as *grandchildren*).

The *Matlab Health and Demographic Surveillance System (MHDSS)* was instituted by ICDDR,B (formerly the International Centre for Diarrhoeal Disease Research, Bangladesh) in 1966. It provides records from 1974 to the present of all vital events in what is now a 142-village, over 200,000 person study area, as well as household surveys or population censuses in 1974, 1982, 1993, 1996, and 2005. In 1996, the *Matlab Health and Socioeconomic Survey (MHSS1)* was conducted with NIA/NICHD funding by ICDDR,B, the University of Colorado at Boulder (CU), and partner institutions. It collected detailed data on health, social, demographic, and economic outcomes for 15 percent of MHDSS households and carried out a community and facility survey in the area. As part of this project, we are carrying out a 2012 follow-up, *MHSS2*.

ICDDR,B initiated the *Matlab Maternal and Child Health and Family Planning Program (MCH/FP)* in 1977. Part of the MHDSS area was designated a comparison area, in which no special services were provided until approximately a decade later. In the remaining area, the MCH/FP introduced a sequence of interventions in family

planning service delivery, immunization, and perinatal care. This well-documented geographic variation in programs is crucial to their evaluation. The interventions led to significant improvements in proximate outcomes such as vaccine uptake, contraceptive prevalence, lower mortality and fertility (Koenig et al. 1988, 1991, 1992, 1998; LeGrand & Phillips 1996; Phillips et al. 1988), and intermediate outcomes such as improved schooling and cognition during adolescence (Joshi & Schultz 2007; Barham & Calimeris 2008). Subsequent interventions include a major flood control/irrigation project in half of the MHDSS area and a micro-credit intervention again in half the MHDSS area, along with fundamental changes in education, women's status, labor, and migration. Matlab data are available before these interventions. New MHSS2 data, collected roughly 30 years after the initial interventions, will offer a rare opportunity to capture longer-term effects.

Children who were eligible for the MCH/FP interventions were at most young adults in MHSS1. Fifteen years later, in MHSS2, it will be possible to examine prime-age adult outcomes of childhood interventions. These include their health, labor force participation and income, and characteristics of their marriages as well as intergenerational outcomes, such as health of their parents and children.

To trace out individual and intergenerational effects of interventions, MHSS2 will follow a representative subset of MHSS1 households including all split-off or migrant households residing in Bangladesh. MHSS2 will emphasize areas in which intervention impacts have been demonstrated or hypothesized. The household survey will incorporate a broader range of measures of health, mental health and cognitive function, women's status and empowerment, children's schooling, and participation in intervention programs. The community and facility survey will address availability of new technologies such as wireless phones and will be expanded to include water sources, irrigation facilities, micro enterprises, and roads. Geographic Information Systems (GIS) data and histories for each facility will enable construction of detailed maps and spatial representations of household proximity and access to all facilities and interventions at any point in time.

Two new datasets will be produced. *MHSS2* will contain household survey and community/facility survey data. The *Matlab Historical Record (MHR)* will contain data for 1974-2011 drawn from the MHDSS and various ICDDR,B censuses and surveys for MHSS2 and related households and a sample of 1974 households that failed to survive to 1996. Linkable MHSS1 and MHSS2 household and community/facility survey data will be combined into the *MHSS1/2* and the latter combined with MHR in the *Matlab Linked Dataset (MLD)*.

The MLD will permit analyses that take characteristics prior to program interventions into account and analyses of attrition. It will provide opportunities for new longitudinal research in health, development, poverty, and aging and improvement on analyses of MHSS1 alone. MHSS1 is already a central source of secondary data for economic and demographic research on disadvantaged populations, and by 2008 had resulted in more than 70 publications or dissertations completed or in progress. It has been widely used in studies of the impact of population health programs, women's childbearing experiences, migration of family members, and women's empowerment on health, human capital, and welfare outcomes. The new datasets will dramatically increase access to Matlab/ICDDR,B data for researchers and policymakers within Bangladesh and worldwide.

**ICDDR,B and the Matlab Health and Demographic Surveillance System**

ICDDR,B, is the preeminent center for health and population research in Bangladesh. Established in Dhaka in 1962 with international and governmental support, ICDDR,B initially focused on cholera vaccine research in Matlab. It introduced the *Matlab Health and Demographic Surveillance System* (**MHDSS)** in 1966 to track the population of potential vaccine trial participants (Van Ginneken et al. 1998; Fauveau 1994; Menken & Phillips 1990). The MHDSS is maintained by the ICDDR,B Health and Demographic Surveillance Unit (HDSU), a partner in the current proposal. The MHDSS serves as a model for demographic surveillance methods throughout the developing world, a role it continues to play through its leadership in the INDEPTH network of population and health surveillance systems (http://www.indepth-network.net/). In 1977, ICDDR,B implemented the MCH/FP project in half the MHDSS villages. The data from the MHDSS have provided crucial information for a large number of significant demographic studies (Fauveau et al. 1989; Koenig et al. 1988, 1990; 2007; ICDDRB 1990; Muhuri & Preston 1991; Muhuri & Menken 1997; Bhuiya & Chowdhury 1997; Menken et al. 2003).

MHDSS **censuses** from 1974, 1982, and 1993 provide basic data on household membership (including age, sex, occupation), housing quality, some assets, education, and land holdings (only in 1982) for all households in the study area. MHDSS **vital registration data** provide prospective tracking of every birth, death, marriage, divorce, in- and out- migration occurring in the study area, including limited information on the circumstances surrounding the event (e.g., cause of death, migration destination, skilled birth attendance). It contains some of the most precise age data in the developing world. Estimates were made in 1966 for those living in the area at the time and are made at the time of in-migration for those who entered the area subsequently. Dates of birth for those born in Matlab since 1966 are exact to within a month. The Matlab *Record Keeping Syst*em (**RKS)** provides MCH/FP participation and service uptake data since 1976 for all households in the MCH/FP area, but not the comparison area. The *1996 and 2005 MHDSS Socioeconomic Surveys* (**SES)** collected data on household assets, housing conditions, women's status and remittances receipt for all MHDSS households.

MHDSS records enable effective tracking of individuals and households from MHSS1. Relevant MHDSS records for 1974-2011 will be incorporated into MHSS2 life history modules and into the Matlab Historical Record. They will provide information on the timing and cause of exit from the study population for individuals in MHSS1 who are not available for MHSS2. Most importantly, the MHDSS data will be used to create a representative sample of households in 1974, prior to the implementation of the MCH/FP, including prior socioeconomic background data, to be used for selection and attrition studies.

The **Matlab Geographic Information System (MGIS)** was constructed in 1996 by ICDDR,B and MHSS2 collaborator Michael Emch. This vector geographic information system (GIS) database of the Matlab field research area is comprised of the following layers: baris, rivers, roads and a flood-regulating embankment. Baris are patrilineally-related clusters of households. Each bari has an identification number which can be linked to MHDSS data within the structure of the GIS database. This allows attribute data to be linked to the spatial database. Thus, for example, disease incidence data can be linked to specific bari locations (Emch 1999).
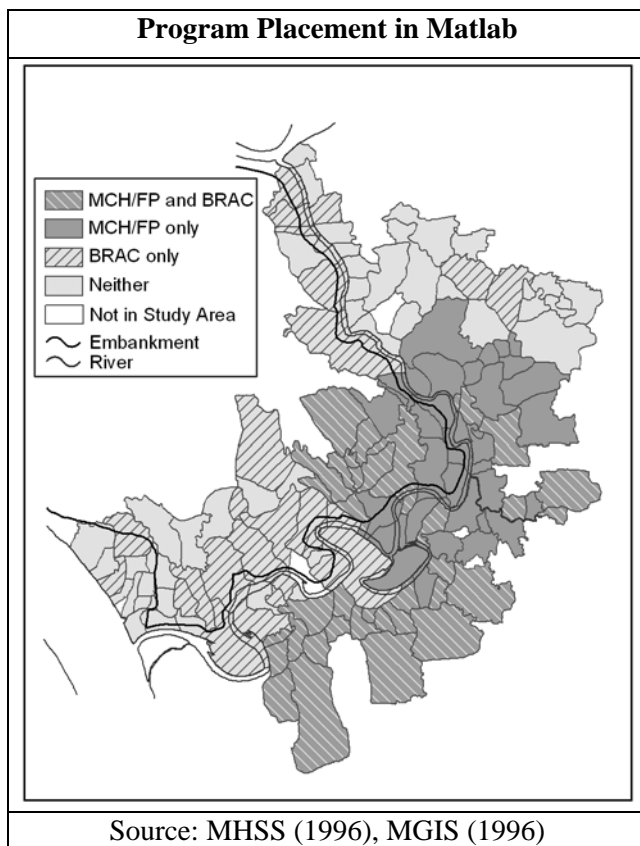
**Matlab Health and Socioeconomic Survey (MHSS1)**

MHSS1 was a collaborative effort of ICDDR,B, RAND, the Harvard School of Public Health, the University of Pennsylvania, the University of Colorado at Boulder, Brown University, and Mitra & Associates (funded by NIA Grant P01AG11952). MHSS1 has become a key resource in microeconomic analysis of family, intergenerational transfers and health status of adults and children.

The *MHSS1 household sample* design consisted of a primary and secondary sample of households linked by shared membership in the *bari*, or residential compound, which included on average 5.2 households. This sampling strategy was devised to address key MHSS1 research aims surrounding the functioning of social networks, economic interconnections, and the mutual insurance shared by households with a familial linkage (Foster 2005). A total of 2,687 *baris,* or 36 percent of the total number, were selected at random. In each *bari,* a first household, referred to as a ***primary sample household***, was selected at random. The primary sample included 2,687 households and was a 7 percent representative sample of Matlab households in 1996. A simple weight for the probability of household selection within-*bari* was calculated as the inverse of the total number of households in the *bari.* In each *bari* having more than one household, a secondary household was chosen purposively, based on relationship to the head of the primary household, according to the following priority: 1) father of primary household, 2) son of primary household, 3) sibling of primary household, and 4) random pick. For all MHSS1 households, demographic characteristics, education, income, and labor market participation were reported for all members. Members were selected for detailed adult and child interview modules based on separate criteria for adults (age 15+) and children (age 0-15).

Analysis of the total sample requires complex weights; all analyses we have carried out that do not examine within-bari relationships yield similar results for the primary sample and the entire sample; the secondary households add little statistical power.

## Matlab Maternal and Child Health and Family Planning Program (MCH/FP)



**Program Placement in Matlab**

MCH/FP and BRAC
MCH/FP only
BRAC only
Neither
Not in Study Area
Embankment
River

Source: MHSS (1996), MGIS (1996)

In 1977, ICDDR,B instituted the MCH/FP in an "MCH/FP" area comprising about half the MHDSS population. MHDSS data collection continued in this and the remaining "comparison" area which was geographically contiguous (see Figure). We refer to the placement of this intervention as *quasi-random* based on strong longitudinal evidence of pre-program similarities in key characteristics in the MCH/FP and the comparison area.

The intention of the MCH/FP program was to develop cost-effective interventions that could be scaled up to the national level. Because of limitations on women's mobility imposed by the *purdah* system, women of childbearing age received doorstep delivery of contraceptives and antenatal care. Children received in-home vaccination delivery, with increasing coverage of diseases phased in over time, as well as services directed toward prevention, management, and medical referral for childhood diarrhoeal and acute respiratory illness. Similar in-home child health interventions did not begin to be rolled out in the comparison area until 1989 and vaccinations where not available regularly in government clinics before 1988. Therefore, we refer to the 1977-1989 period as the experimental period. During this time there were greater improvements in maternal survival and child survival, and an immediate rapid fertility decline in the MCH/FP area

than in the comparison area.

## BRAC/ICDDR,B Microcredit Experiment

Beginning in 1992, the BRAC-ICDDR,B Joint Research Project gradually introduced BRAC microcredit programs in a cross-over design so that some parts of the MCH/FP and comparison areas had BRAC programs and others did not. The programs and their income generation activities have the potential to increase overall household budgets and to increase the amount of money controlled by women, who may invest more in children's well being. The programs may have further effects on women's autonomy and authority in decision-making with respect to childbearing and health care utilization (Bhuiya et al. 2001; Pitt & Khandker 1998). The Figure depicts the placement of BRAC services.

## Meghna-Dhonagoda Irrigation Project (MDIP)

The MDIP, completed in 1987, introduced large-scale water management to the Dhonagoda River that cuts through Matlab (shown by the two light grey lines on the Figure). It included a flood control embankment as well as a centralized irrigation and drainage system for villages along the tidal (left) bank of the river. Areas on the right bank had experienced little erosion damage and were largely unaffected by MDIP. A recent paper used a simple indicator of households protected and unprotected by the embankment to demonstrate substantial improvements in productivity, health, and changes in marriage outcomes associated with the placement of the MDIP (Mobarak, Kuhn, and Peters 2007). MHSS2 will offer new opportunities to study specific implications of MDIP using GIS data on exposure to the embankment and subsequent canal and road construction associated with it. Precise measures of embankment and canal proximity will better identify both potential beneficiaries of the embankment and those far inside who may have lost water access.

**Project plan and Timeline**

The first three project years relate to the collection of MHSS2 and the archiving of MHR. Fieldwork for MHSS2 is expected to being September 2012.

Preparation of an MHSS2 report and the documentation for the MHSS2 and other new datasets will take place in Years 4 and 5. MHSS2 data alone and linked with MHSS1 and with no GIS-based data will be released into the public domain as soon as possible. Because of the confidentiality concerns, the MLD file and any GIS-based information will be made available only to users presenting an approved IRB application. Public use and successful utilization of MHSS2 data will be promoted through online distribution of the survey report; through professional research meeting presentations, and through public presentations in Bangladesh.

Also in Years 4 and 5, we plan research on specific topics. A major one is the subject of this workshop on women's economic and social empowerment.

We expect this project to lead to exciting and seminar research in assessing the long-term effects of the major health and development interventions carried out in Matlab over a 30-year period.

We hope your advice will improve our analyses.

2. **Plans for research on women's economic and social empowerment**

Plans are at initial stages. We seek your input and advice. Below we list outcomes and pathways that we expect to consider.

Economic Empowerment Outcomes
- labor force participation, including labor outmigration
- use and repayment of micro-credit loans
- cash savings and bank accounts in their names
- household income and poverty as measured by per capita household expenditure/consumption
- household consumption of women's self-care products

Social Empowerment Outcomes
- decision-making power over household expenditures
- mobility outside the household for health, economic or social purposes
- own, husband's, and their children's perceptions of women's status, as assessed using a Gender Equivalence Scale
- participation in community organizations and decision-making
- knowledge of or participation in local and national political events

Mechanisms
- Health
- Cognition
- Education
- Family size/sibling competition
- All of these early characteristics may affect
  – Marriage
  – Migration

Possible discussion questions for the Workshop include:
- Based on your work in this area, are we on the right track? Are these outcomes plausible for the effect of MCH-FP programs on women's economic and social empowerment?
- Are there any other outcomes we should be looking at?

- Similarly, for mechanisms, are we on the right track? Are these the pathways/mechanisms you have observed?
- For your work, research/government/NGO, what information would be helpful to advance your work?
- For the future, what kinds of communication of research would be appropriate? Forum? Policy briefs?