# Divergent Maternal and Child Health Outcomes in Bangladesh: A Tale of Two Upazilas

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This paper attempts to seek answer to the question why some regions being economically better-off are performing poorly in respect of maternal and child health outcomes compared with those which are otherwise (economically) worse-off than the former. Analysing the data obtained from two purposively selected upazilas (sub-district) in Bangladesh, it also tries to explore the factors responsible for better maternal and child health outcomes. This paper found that the impact of better health service delivery system is much stronger than that of growth and the other factors on health outcomes. It also found that ensuring "accountability" of the health service providers is a key factor to provide better health service delivery.

## I. INTRODUCTION

Literature suggests that there are significant spatial differences in economic and social progress in Bangladesh. While some regions have been able to make good progress in income poverty reduction, others have been able to make progress in respect of some other variables. Literature also suggests that there is no one to one correspondence in this respect (Sen and Hulme 2006, Ali and Begum 2006, Sen and Ali 2009). "Rajnagar" being the better-off *upazila* from the point of view of economic indicators, its maternal and child health outcomes are worse-off than that of "Saturia" which is economically worse-off *upazila* compared to the former. The questions here are: what are the reasons for this mismatch? What are the drivers of better maternal and child health outcomes in Bangladesh? The paper attempts to seek answers to these questions.

Bangladesh has made decent progress in income poverty reduction as well as achieving social MDGs over the past two decades. The pace of progress in some

social MDGs has been even faster than income poverty reduction. The country has been able to manage lowering the overall incidence of income poverty by one percentage point per year during the 1990s (GoB 2003, GoB and UNDP 2005) and one and half percentage points per year during the first half of the present decade (BBS 2007). Progress after 2005 in this respect is not known, as no further Household Income and Expenditure Survey (HIES) data is available to make meaningful comparison between pre- and post-2005 periods. Despite progress in income poverty reduction, income inequality has shown an increasing trend over the same period (GoB and UNDP 2005, GoB 2003, Sen and Hulme 2006, BBS 2007). Consequently, rich-poor divide has been even sharper than in the past. Also, a large number of people (nearly 63 million) are still living below poverty level income as the head-count ratio is still hovering around 40 per cent despite progress in income poverty reduction (Sen and Hulme 2006, GoB 2005, BBS 2007).

In respect of social MDGs, Bangladesh's achievement is mixed. While the progress in some indicators is on track (e.g. primary enrolment and child malnutrition), the progress is not up to the mark (i.e. not on track) for some other indicators (e.g. adult literacy and infant mortality). With respect to child malnutrition, some good progress has been achieved. Child underweight has declined significantly from 68 per cent in 1990 to 51 per cent in 2000 and 47.5 per cent in 2004 (Ali and Begum 2006). However, child malnutrition in Bangladesh remains among the highest in the world. Regarding immunisation, the percentage of fully immunised children increased from 53 per cent in 1990 to 69 per cent in 2000 and 73 per cent in 2004 which has been below expectation (GoB and UNDP 2005, Ali and Begum 2006). While there has been an appreciable drop in under-five mortality from 151 per thousand live births in 1990 to 92 in 2000, the rate has slowed down since then and reached only 88 in 2004 (Ali and Begum 2006). Unless Bangladesh can achieve a reduction rate of 3 per thousand live births per annum from now on, it would be difficult to achieve MDG 4 (to reduce under-five mortality by two-third) by 2015.

Maternal mortality ratio in Bangladesh is also among the highest in the world although it has declined from 578 per 100,000 live births in 1990 to 400 in 2000 and 391 in 2002 (Ali and Begum 2006). Proportion of births attended by skilled health personnel is also low although it has increased from 10 per cent in 1993/94 to 22 per cent in 1999/00 and 27 per cent in 2004. And proportion of births in the institutions has increased from a mere 3 per cent in 1993/94 to only 8 per cent in 1999/00 and 10 per cent in 2004 (Ali and Begum 2006). These increases are insignificant as the majority of the mothers still do not receive such services.

Despite some good progress that Bangladesh has made in achieving social MDGs by now, current status of certain MDG indicators is quite appalling and the

country is still far from achieving those MDGs by 2015. Under-five mortality, delivery assisted by medically trained persons and maternal mortally are worth mentioning in this respect. More importantly, there has been significant spatial variations and social differentiations in almost all MDG outcomes in Bangladesh (including the ones that have registered significant progress) (World Bank 2005a, Sen and Ali 2009, Sen and Hulme 2006, Ali and Begum 2006).[1] World Bank report on MDGs in Bangladesh (World Bank 2005b) outlines a significant divisional variation in MDG outcomes in the country with respect to child malnutrition, under-five mortality, and primary school completion. Further disaggregated analyses of selected social indicators including human poverty index carried out in several studies (Sen and Ali 2009, Sen and Hulme 2006, and Ali and Begum 2006) point out significant inter-district variation as well as social differentiation in certain social MDGs. Some of the districts emerged as over-achievers in certain MDGs while others remain as under achievers (Sen and Ali 2009). These raise three important concerns: (i) National level averages do not speak out what has been going on in different parts of the country as the spatial differences are significantly high; (ii) Even if the country becomes successful in achieving certain MDGs at the aggregate level, a large proportion of the people in the country will still remain far from these achievements; and (iii) Why are these variations? Are these because of poverty? Are these because of differences in attitudes and culture? Or, Are these because of problems in service delivery? Addressing above questions deserves attention in attaining MDGs both nationally and at all possible disaggregate levels.

There has been quite a large body of literature on maternal and child health, immunisation, primary health care, and health service delivery in Bangladesh that dealt with trends and patterns of health outcome indicators and mortality, nature and causes of changes, and issues related to service delivery (Gwatkin, Bhuiya and Victora 2004, Jamil, Bhuiya, Streatfield.and Chakrabarty 1999, Hussain, Ali and Kvale 1999, Routh, Thwin, Barb and Begum 2004, Schuler, Bates and Islam 2001; Jahan 2003, Begum and Sen 2005, Sen and Hulme 2006), but, little on spatial differences, particularly on explaining the root causes of these differences. The studies that have made some attempt to analyse regional variations are largely based on secondary data and discussed the variations at the levels of administrative divisions from which variations in local level inputs in explaining the variations in outcomes could not be ascertained.

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[1] PRSP document, however, claims that the progress in achieving MDGs has been shared at the disaggregated levels, namely socio-economic categories and spatial dimensions (GoB 2005).

Given the above, the paper tries to look into the differences in health MDGs (through selected outcome indicators) and explain why there are those differences focussing on health outcomes, health programme inputs and service delivery in two purposively selected *upazilas*–one being identified as the *upazila* of over-achiever, and the other one as under-achiever with respect to maternal and child mortality. The main purpose of the paper is, therefore, to explore the factors that are responsible for differential outcomes at local levels with respect to maternal and child health in Bangladesh. The main points of investigation in this paper include: exploring the determinants; quality of service delivery; and similarities and differences of "inputs" in an effort to explain the differences in "outcomes."

## II. DATA AND METHODOLOGY

A combination of quantitative and qualitative research methods has been applied here to collect data from a variety of sources. The categories of respondents include: government health facilities at *upazila*, union and community levels; health service providers; patients; and households. The instruments that have been used for data collection include structured questionnaire, semi-structured interview schedule and checklists for focus group discussion and observation.

### *Sampling*

Two *upazilas* were selected purposively based on their performances in reducing maternal and infant mortality over the past years–one being the over-achiever in reducing maternal and child mortality and the another being under-achiever.These two sites do not necessarily constitute a sample that is representative of Bangladesh, but they are chosen as extremes of performance in the hope of gaining analytical richness and insight into the object of this research: the factors responsible for differential health outcomes.

Before selecting the *upazila*s, two districts were selected to ease the selection of the *upazila*s. The selection of the districts was made based on Sen and Ali (2009) where some of the districts emerged either as over-achievers or under-achievers in attainting certain MDGs in Bangladesh. Manikganj was, therefore, selected as the district of over achiever with respect to maternal and child mortality, whereas Moulvibazar was selected as under-achiever. Selection of *upazila*s at the next stage was made as per the following criteria: (a) better performing *upazila* of over-performing district as the *upazila* of over-achiever; and (b) poorly performing *upazila* of under-performing district as the *upazila* of under-achiever. Saturia *upazila* of Manikganj district has, therefore, been selected as the *upazila* of over-achiever and Rajnagar *upazila* of Moulvibazar district as the *upazila* of under-achiever.

### Selection of Health Facilities

With respect to government health facilities, three health facilities were selected for investigation from each of the *upazila*s. They are: *Upazila* Health Complex (UHC); one Union Health and Family Welfare Centre (UHFWC); and one Satellite Clinic (SC). From each of the selected UHCs, 50 in-patients and 50 out-patients were interviewed in combination of gender and age for the present study. Similarly, about 50 patients of male-female and of different age categories were interviewed using a structured questionnaire from each of the selected UHFWCs and SCs. In addition, 12 semi-structured interviews were carried out with the health providers in the selected health facilities (i.e., two interviews in each of the facilities). Also, in-depth observations on each of the health facilities were also carried out to look into the physical infrastructure, utilities, equipment, hygienic condition, cleanliness, staff deployed, staff present on the day of observation, and the services provided to the patients.

### Selection of Households

A total of 400 households were selected using a systematic random sampling technique from 8 villages (i.e. 50 households from each village) selected from both the *upazila*s (i.e. 4 villages from each *upazila*). Selection of villages was made as follows: one village from within the close proximity (one kilometre) of UHC; one village from the *sadar* union of *upazila* but distant (more than three kilometres) from UHC; one village from the catchments area of the selected UHFWC and also from within the close proximity (one kilometre); and one village from the catchments area of the selected UHFWC but distant from (more than three kilometres) UHFWC.

Before selecting the households in each of the villages, a social mapping was carried out to identify the total number of households in the villages, their location, and, more importantly, the households that registered live births, and maternal and child (under five) mortality during the past five years preceding the survey. Once the social mapping was done, selection of households was made as follows: all the households of the village that registered maternal and child mortality during the past five years; and the rest of the household were selected from the list of the households that registered live births during the past five years using the systematic random sampling technique (e.g., every alternate, every third, or every fourth, etc. depending on total number of households with under-five children in the villages). Selected households were then interviewed using a structured questionnaire.

In addition to household survey, 16 focus group discussions (FGDs) were carried (with one male group and one female group in each of the 8 villages) to get further insights of the issues related to healthcare practices, particularly of maternal

and child healthcare, and service delivery in the government health facilities available at union and *upazila* level.

### Data Collection

Patients were interviewed face to face visiting the health facilities. For young patients, particularly children, attendants were interviewed on behalf of the patients. For out-patient interviews were carried out just before they left the health facilities. Households were also interviewed face to face visiting each of the selected households. Household questionnaire had two modules: one for the households in general and the other for mother and children. Respondents of the first module were either the head of the households or any other adult member of the households. Respondents of the second module were specifically the concerned mothers.

## III. MATERNAL HEALTH AND MATERNAL MORTALITY

In the selected four villages in Saturia, a total of 384 live births (total number of households is 782) were reported during the past five years preceding the survey and no maternal death was reported during the same period. In Rajnagar, total number of reported live births was 253 (against the total households of 518) and there were reports of two maternal deaths during the past five years preceding the survey. This information was collected through social mapping carried out in all the selected villages before conducting the main survey.

### Maternal Healthcare Received at the Household Level

Results demonstrate significant difference between the two *upazila*s in terms of most of the indicators taken into consideration in this study. While 91 per cent of the mothers in Saturia received anti-natal care, it is only 74 per cent for Rajnagar. About 90 per cent of mothers in Saturia either consulted or were visited by medically trained persons during pregnancy compared to 70 per cent in Rajnagar. It is also observed that about 27 per cent of the mothers in Rajnagar did not consult anybody during their last pregnancy. These indicate a better delivery of maternal healthcare services in Saturia than that of Rajnagar. This is also supported by the responses received against the following two questions: Were you told about the signs of pregnancy complications by any medically trained persons during your last pregnancy? Were you told where to go if you had those complications? In both the cases, mothers in Saturia were better advised than that of Rajnagar. In terms of TT vaccines and intake of iron tablets, needless to mention that mothers in Saturia are ahead compared to mothers in Rajnagar (see Annex Table A.1 for details).

Regarding pregnancy complications, mothers in Rajnagar face more complications than that of Saturia which goes in line with the nature and quality of healthcare services that they receive. Regarding an important aspect of maternal

health care—"deliveries assisted by medically trained person"—there are significant differences between the two *upazila*s. While 54 per cent of the deliveries are assisted by medically trained persons (including trained TBA) in Saturia, it is only 24 per cent for Rajnagar. A large majority of deliveries in Rajnagar are actually assisted by untrained TBAs or relatives and neighbours. In terms of first check up after delivery, mothers in Saturia receive quicker service (within 7 days on an average) than that of Rajnagar (13 days).

### Determinants of Good Maternal Health: A Multivariate Analysis

In an effort to determine the factors (whether health programme related and/or others) that affect the good maternal health outcomes, a multivariate analysis has been carried out using logistic regression. "Good maternal health" has been defined here using three separate indicators: (i) if mother has received TT vaccine and taken iron tablet during last pregnancy; (ii) if mother has her last delivery assisted by medically trained person; and (iii) if mother has her last delivery in the institutions. Results of the multivariate analyses of the relationships between the health outcome indicators and health programme factors and other variables are shown in Table 1. For these analyses, the results are best expressed through odds ratio for the main effects.

### *Socio-Demographic and Economic Factors*

Some interesting results are found in this respect. More educated mothers are more likely to receive TT vaccine and iron tablet during pregnancy. Mothers who have some education (basic literacy) are 2.1 times more likely to receive TT vaccine and iron tablet during pregnancy compared to mothers who are illiterate. Having access to sanitary toilet has significant positive relationship with TT vaccine and intake of iron tablet. Impact in this respect is also more than twice for those who have this access compared to those who lack it. Regarding delivery assisted by medically trained persons, mother's age demonstrates significant inverse relationship. Older mothers are 45 per cent less likely to have delivery assisted by medically trained persons. Electricity in the house has significant positive impact on mother's delivery assisted by medically trained persons. Where there is electricity in the houses, probability of mothers' delivery by medically trained persons is twice as much as the probability of the mothers who do not have electricity in their houses. Poverty status also plays a significant role in this respect. As observed, mothers in the non-poor households are 1.8 times more likely to have deliveries assisted by medically trained persons compared to the mothers of poor households. With respect to deliveries in the institutions, only significant variable, as emerged from the analysis, is poverty status. Likelihood of deliveries in the institutions is more than twice in the case of the mothers of non-poor households compared to that of poor households.

### Health Programme Factors

Three measures of health programme inputs were considered here using the household level data. They are: whether the mothers consulted or were visited by medically trained persons during pregnancy; whether they have consulted the medical person; and whether the mothers were told about the signs of pregnancy complications by any medically trained persons during their last pregnancy. Results show that both consultation with medically trained persons and advice received from medical person regarding pregnancy complications have significant positive relationship with mothers received TT vaccine and iron tablet. Mother consulting medically trained persons is 4.6 times more likely to have received TT vaccine and iron tablet compared to others. Likewise, mothers receiving pregnancy advice are 3 times more likely to receive TT vaccine and iron tablet than others. With respect to deliveries assisted by medically trained persons, consultation with medically trained persons appeared to have highly significant positive relationship with it. Mothers consulting medical persons are 14 times more like to have delivery assisted by medically trained persons. For deliveries in the institutions, no health programme inputs appeared to have significant relationship with it.

TABLE I
**DETERMINANTS OF MATERNAL HEALTH, DELIVERY ASSISTED BY MEDICALLY TRAINED PERSONS, AND DELIVERY IN THE INSTITUTIONS: A LOGISTIC APPROACH**

| Demographic, Socio-economic and Health Programme Factors | Good Maternal Health (*odds ratio*) | Delivery Assisted by Medically Trained Persons (*odds ratio*) | Delivery in the Institutions (*odds ratio*) |
|---|---|---|---|
| Age of mothers | -.996 | 1.001 | 1.008 |
| Number of live births in 5 years | 1.225 | -.554** | -.784 |
| Education of mother | 2.100** | 1.378 | 2.009 |
| Education of household head | 1.014 | -.840 | 1.556 |
| Occupation of household head | 1.234 | 1.098 | 1.308 |
| Ownership of cultivable land | -.753 | -.716 | 1.065 |
| Type of dwelling | 1.397 | 1.595 | -.616 |
| Type of toilet | 2.753** | 1.705 | 2.656 |
| Availability of electricity in the house | -.854 | 1.947** | 1.200 |
| Poverty status | -.636* | 1.819** | 2.217** |
| Antenatal care received by mother | 4.670* | 14.088** | 3.541 |
| Provider of antenatal care | -.893 | -.402 | 1.037 |
| Mothers told about the signs of pregnancy complications | 3.002** | -.920 | 1.431 |
| Constant | -.059** | -.069** | -.007** |
| -2 Log likelihood | 426.57 | 456.01 | 311.64 |
| R Square | .31 | .227 | .202 |

** Significant at 5 per cent level. * Significant at 10 per cent level.

### IV. CHILD HEALTH AND CHILD MORTALITY

Total number of children died before reaching age at five in the four villages in Saturia was 5 as against of total live births of 384 over the past five years preceding the survey. The corresponding figure for Rajnagar is 10 deaths against 253 live births. This gives the rates of under-five mortality as 40 per thousand live births in Rajnagar compared to 13 in Saturia. Based on the data obtained here (fairly small for estimating child mortality though), child mortality is much more apparent in Rajnagar than that of Saturia.

**Immunisation**

Immunisation is an important factor when it comes to defining the good health of children, particularly for less than five years of age. Two definitions of immunisation have been used in the analysis: (i) whether the child has immunisation card or received any immunisation to be protected from diseases; and (ii) whether the child has received immunisation for measles. While the first indicator is expected to capture at least partial immunisation status of children, the second is specifically about the coverage of measles immunisation.

In both the cases, immunisation rates are higher in Saturia than that of Rajnagar. This difference is much more pronounced for measles immunisation (77 per cent for Saturia against 62 per cent for Rajnagar) than that of the partial immunisation coverage (see Annex Table A.2).

**Child Healthcare Received at the Household Level**

Mothers were also asked about the health seeking behaviour and the healthcare services that they receive for their children (under-five) from the healthcare facilities available in the area. As in the case of maternal health care, results in this case also demonstrate significant difference between the two *upazila*s in terms of most of the indicators taken into consideration in the research.

From the point of view of child nutrition, colostrums as baby's first food after born has been recognised as an important behavioural as well as health programme factor. Children born in Saturia are better nourished in this respect than that of Rajnagar as reported by the mothers of the children. Regarding acceptance of vitamin-A dose during the last six months, again, children in Saturia are ahead of the children in Rajnagar.

With respect to the illness of the children during the last two weeks preceding the survey, higher proportions of children in Rajnagar were found ill in response to all the illness related questions (fever, cough, rapid breathing, difficulty in breathing,

chest problem and diarrhoea). While the proportion of children in Saturia suffering from the diseases mentioned above varies between 13 for chest problem and 41 per cent for fever, the matched figures for Rajnagar vary from 24 per cent to 59 (see Annex Table 3 for details).

**Determinants of Child Mortality, Better Child Health and Immunisation: A Multivariate Analysis**

As done for maternal health, an attempt has also been made here to explore the determinants of child mortality and better child health and immunisation outcomes in a multivariate framework using logistic regression. "Better child health" has been defined here as follows: if the child had not suffered from any of the diseases mentioned earlier (viz., fever, cough, rapid breathing, difficulty in breathing, chest problem, or diarrhoea) during the past 2 weeks preceding the survey. Results of the multivariate analyses of the relationships between child mortality and child health outcome indicators and health programme factors and other variables are shown in Tables II and III. For these analyses, results are presented in odds ratio which expresses the main effects best.

### *Determinants of Child Mortality and Better Child Health*

Number of live births has significant positive relationship with child mortality. As the result shows, higher order children are 3.6 times more likely to die before reaching at age five compared to lower order children. Immunisation (as proxied here by measles immunisation) also has significant influence on child mortality. Immunised children are 81 per cent less likely to die before age five compared to the children without immunisation. None of the socio-economic variables appears as significant factor in explaining variation in child mortality. In contrast, it is the health programme inputs—and only health programme inputs (although the number of live births is a demographic factor, it is in fact largely an outcome of health programme inputs related to fertility control)—emerge as significant factors to reduce child mortality. If we examine the spread of these health inputs across *upazila*s, we see that the health service deliveries with respect to all these inputs are poorer in Rajnagar compared to Saturia and, consequently, child mortality in Rajnagar is also higher.

In explaining variations in better child health (as defined earlier), good sanitary practices appeared as significant factor. Children in the households with sanitary toilets are 2.6 times more likely to have better health compared to children without access to sanitary toilets.

TABLE II
**DETERMINANTS OF CHILD MORTALITY AND CHILD HEALTH: A LOGISTIC APPROACH**

| Demographic, Socio-economic and Health Programme Factors | CMR (*odds ratio*) | Child Health (*odds ratio*) |
|---|---|---|
| Age of child | -.978 | -.994 |
| Sex of child | 1.218 | -.742 |
| Age of mothers | -.959 | -.985 |
| Number of live births in 5 years | 3.678** | -.908 |
| Education of mother | 1.064 | 1.036 |
| Education of household head | 3.234 | 1.281 |
| Occupation of household head | -.598 | -.784 |
| Ownership of cultivable land | 2.836 | 1.522 |
| Type of dwelling | 1.420 | -.854 |
| Type of toilet | -.522 | 2.599** |
| Availability of electricity in the house | .827 | -.919 |
| Poverty status | 2.320 | -.672 |
| Provider of antenatal care | 15.430 | 1.551 |
| Mothers told about the signs of pregnancy complications | -.828 | 1.060 |
| Antenatal care received by mother | -.054** | 2.008 |
| Vitamin A received by child | 1.040 | 1.047 |
| Measles immunisation | -.194** | 1.375 |
| Constant | -.009* | -.113** |
| -2 Log likelihood | 71.84 | 394.69 |
| R Square | .351 | .142 |

** Significant at 5 per cent level. * Significant at 10 per cent level.

### Determinants of Immunisation

With respect to partial immunisation (defined earlier), age of the child appeared to have positive relationship with it. Birth order, however, shows negative relationship with partial immunisation. Higher order children are 56 per cent less likely to receive immunisation compared to lower order children. Children of the mothers received medical advice during pregnancy are about 6 times more likely to receive immunisation compared to other children. There are also significant positive relationships between immunisation and children receiving vitamin-A dose. Regarding measles immunisation, only the age of the child and acceptance of vitamin-A dose demonstrate positive relationships with it.

TABLE III
**DETERMINANTS OF PARTIAL AND MEASLES IMMUNISATION: A LOGISTIC
APPROACH**

| Demographic, Socio-economic and Health Programme Factors | Immunisation (*odds ratio*) | Measles Vaccination (*odds ratio*) |
|---|---|---|
| Age of child | 1.784** | 2.791** |
| Sex of child | 1.393 | 1.004 |
| Age of mothers | 1.018 | 1.005 |
| Number of live births in 5 years | -.439** | -.887 |
| Education of mother | 1.018 | 1.478 |
| Education of household head | 1.037 | 1.136 |
| Occupation of household head | 1.492 | 1.164 |
| Ownership of cultivable land | 2.164 | -.927 |
| Type of dwelling | -.529 | 1.801 |
| Type of toilet | -.529 | 1.592 |
| Availability of electricity in the house | 1.688 | 1.260 |
| Poverty status | -.608 | -.844 |
| Antenatal care received by mother | -.839 | -.451 |
| Provider of antenatal care | 1.137 | 2.539 |
| Mothers told about the signs of pregnancy complications | 5.866** | 1.362 |
| Vitamin A received by child | 22.009** | 5.562** |
| Constant | -.794 | -.039** |
| -2 Log likelihood | 122.57 | 291.76 |
| R Square | .508 | .483 |

** Significant at 5 per cent level.

### V. CAUSES OF DIVERGENT OUTCOMES: SATURIA VS. RAJNAGAR

As observed, several socio-economic and demographic as well as health programme factors are responsible for better health outcomes. Education of the "mother," access to improved sanitation, and electricity connection in the houses have appeared as significant factors for better maternal health outcomes. In respect of health programme inputs, consultation with medically trained persons and advice received from medical persons regarding pregnancy complication have emerged as significant indicators for promoting better maternal health outcomes.

For better child health as well, several health programme inputs like immunisation, improved sanitary practices and antenatal care received by mother have appeared as significant explanatory variables.

Now, if we compare health services, programme inputs and quality of service delivery between the two selected *upazilas*, we observe several commonalities and

differences between them. Similarities and differences in inputs in an effort to explain the outputs in the two upazilas are summarised below (see Annex Matrix 1).

People in Rajnagar are better off in terms of most economic indicators (housing, land, income, etc.) as well as education compared to Saturia. On the other hand, people in Saturia are advanced in terms of behavioural factors (e.g. sanitary practices) and knowledge and attitudes towards healthcare practices compared to Rajnagar. People in Saturia were found more aware about health problems and quite prompt in seeking treatment. They were also found quite liberal (e.g. women can go to the health centres alone) and receptive to modern healthcare treatment compared to that of Rajnagar.

Between the similar government health facilities available in both the upazilas, the facilities in Saturia are performing much better than that of Rajnagar. Better performance of health facilities in Saturia is manifested in almost all areas of service delivery including better maintenance of the health facilities, more medical staff deployed, less absenteeism of doctors and other medical staff, more time dedicated to the patients, and better services delivered to the clients. This is evident from the visits of the research team in the respective health facilities as well as from the data obtained from both households and patients. Patients of the health facilities in Saturia are better satisfied compared to the patients in Rajnagar in almost all the services they receive (Ali and Rahman 2006 provides further details on this).

Monitoring of health services provided in the health facilities by higher authority better in place in Saturia than that of Rajnagar. Proximity of Saturia to the Capital may have some effect on the monitoring of these facilities. The health providers in Saturia pointed out that since they are close to the Capital, they are frequently visited by higher authority. Moreover, they are also regularly visited by respective local higher authority. The local government representatives (UP Chairman) in Saturia was also found quite active in health service delivery issue which not only facilitates proper implementation of the programme at the local level, but also provides monitoring from the bottom and held the providers accountable to them. On the observance of national immunisation day, local union parishad chairman in Saturia were found busy in observing the programme in different parts of his union. While talked with him, he candidly mentioned that "*as the local people's representative, it is also our responsibility to monitor whether people are getting the right kind of services that they are supposed to receive.*" He further added that "*we keep eyes on the health providers whether they are providing proper service to the people or not and whether they are visiting the villages timely or not.*" In both respects, situation in Rajnagar is fairly poor. Neither the respective higher authority nor the local government was reportedly found active in monitoring the activities of the health facilities there. Clearly, health service providers in Saturia

are more accountable to both the higher authority and the local government, which contributed better health outcomes in Saturia than that of Rajnagar.

What has been observed here is that there are considerable differences between the qualities of services delivered in the two *upazilas* with Saturia providing better services. And, these differences in services are producing different levels of outcomes in the two *upazilas*. Now, the question is what determines these differences in delivery? From the data presented here, two points emerged: (i) "monitoring" of service delivery by the higher authority; and (ii) "participation" of local government in the delivery of health service inputs at the local levels. That means, ensuring "accountability" of the service providers is key to ensure implementation of better health programme inputs at the local levels that contributes to improved health outcomes.

## VI. CONCLUSION

Both maternal and child health outcomes are much better in Saturia than that of Rajnagar with respect to most of the indicators including receiving antenatal care, TT vaccine during pregnancy, delivery assisted by medically trained persons, child mortality, child immunisation, and child health in general.

Multivariate analyses carried out in this study suggest that there are significant positive relationships between various health programme inputs and health outcomes for both the mother and the children. To cite an example, mothers being able to consult medically trained persons during pregnancy are 14 times more likely to have delivery assisted by medically trained persons. Similarly, Children of the mothers who received medical advice during pregnancy are 6 times more likely to receive immunisation compared to others.

The positive health outcomes that are observed in Saturia (which is far better than that of Rajnagar) are likely to be the outcome of the health delivery system operational in the area which is far better than that of Rajnagar. Influence of social and economic factors is negligible as the situations in Saturia in these respects are poorer compared to Rajnagar.

The behavioural factors and knowledge and attitude may have some effect on health outcomes, but this is again related to effective health service delivery in terms of awareness raising and motivation regarding health problems and healthcare practices. In Saturia, visits of the health workers to the communities are much more frequent compared to Rajnagar. This helps people living in specific communities to have up-to-date information on health issues and also to be motivated to follow those instructions. Although the attitudes of the people cannot be changed overnight,

this can be influenced substantially through effective awareness raising and motivational programme. There are examples of successful campaign of this kind in Bangladesh (e.g. use of contraceptives, diarrhoea prevention, etc.).

The key message here is that the impact of better health service delivery system on health outcomes is much stronger than that of growth and the other factors, and better health service delivery system could bring good health to the people, particularly the poor and the disadvantaged groups. And, to provide better health service delivery, ensuring "accountability" of the health service providers is a key factor.

### Implications for Policy

In order to achieve the MDGs on maternal and child health not only at the aggregate level, but also in all possible geographic regions (with particular focus on small areas, e.g., *upazila* or beyond) by 2015, Bangladesh needs to have right strategies implemented properly at all levels and in all regions. Some important policy lessons we could draw from the present analysis, which are summarised below.

In the poorly performing areas, it is likely that people are less aware about health problems; they lack motivation, and are less careful about seeking treatment. Conservatism (e.g. women's mobility) and religious orthodoxy (reluctance to accept modern treatment) can also play some role in this respect. However, effective awareness raising and motivational programme could bring significant change here.

Doctor's availability in the health facilities and time spent for the patients is extremely important in order to deliver services to the patients. But, at the same time, attitude and behaviour of the doctors and other medical personnel with the patient also have important role not only with respect to deliver quality services, but also to inspire the patients to come to the health facilities as and when required. Availability of basic minimum supplies, maintenance of the facilities and discipline are also important in order to ensure quality service to the patients.

What have been pointed out above are important. But the most important thing is to have a proper monitoring system in place and to make the health providers at all levels accountable to respective higher authority as well as to the users of the facility, the local community and the local government. Without these, no intervention is going to produce much of the benefits. The success in Saturia is, no doubt, because of better delivery of services compared to Rajnagar, but what contributed behind this good delivery of services is regular monitoring by the higher authority and active participation of local government which held the providers at

the lower end accountable to them. Devising and implementing an appropriate monitoring system to make the providers accountable is, therefore, key to ensure delivery of quality services at the local levels.

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## *Annex Tables*

TABLE A.1
**NATURE OF MATERNAL HEALTHCARE RECEIVED AT THE HOUSEHOLD
LEVEL**

| Variable | Saturia | Rajnagar |
|---|---|---|
| Antenatal care for this pregnancy received by mothers (%) | 91.4 | 73.7 |
| *Antenatal care received from (%)* | | |
| None | 9.0 | 26.9 |
| Qualified doctor(MBBS) | 28.5 | 25.9 |
| Trained medical personnel | 60.0 | 43.8 |
| Trained TBA | 0.0 | 1.5 |
| Untrained Persons | 2.5 | 2.0 |
| *Reason for not seeking antenatal care (%)* | | |
| No one to take care and give company | | 13.3 |
| Expected cost high or financial incapability | | 13.3 |
| Fear and lack of awareness | | 6.7 |
| Ignorance and lack of seriousness | 100.0 | 33.3 |
| Lack of transport and facilities | | 33.3 |
| *Antenatal care, received a health check or for illness (%)* | | |
| Had a problem | 9.4 | 27.3 |
| Just to check-up | 90.6 | 72.7 |
| Average number of times of health check-up during pregnancy | 2.62 | 3.83 |
| Mothers told about the signs of pregnancy complications (%) | 83.3 | 63.0 |
| Mothers told where to go in case of pregnancy complication (%) | 86.6 | 72.7 |
| TT injection received by mothers during pregnancy (%) | 93.4 | 78.9 |
| Iron tablet or iron syrup received by mothers during pregnancy (%) | 68.0 | 58.8 |
| Mothers having long labour around the time of delivery (%) | 13.1 | 18.4 |
| Mothers having excessive bleeding around the time of delivery (%) | 3.5 | 5.6 |
| Mothers having high fever with bad smelling vaginal discharge around the time of delivery (%) | 0.5 | 8.3 |
| Mothers having convulsion around the time of delivery (%) | 0.5 | 3.1 |
| Assistance sought for the problems around the time of delivery (%) | 83.3 | 77.4 |

*(Contd. Table A.1)*

| Variable | Saturia | Rajnagar |
|---|---|---|
| *Reason for not seeking treatment for the problems around the time of delivery (%)* | | |
| No one to take care and give company | 25.0 | 8.3 |
| Expected cost high or financial incapability | 50.0 | 25.0 |
| Fear and lack of awareness | 0.0 | 8.3 |
| Ignorance and lack of seriousness | 25.0 | 33.3 |
| Lack of transport and facilities | 0.0 | 16.7 |
| Poor quality services anticipated | 0.0 | 8.3 |
| *Post-delivery check-up done by (%)* | | |
| None | 9.0 | 26.9 |
| Qualified doctor(MBBS) | 28.5 | 25.9 |
| Trained medical personnel | 60.0 | 45.3 |
| Untrained Personnel | 2.5 | 2.0 |
| Average number of days after delivery taken before first check-up | 7.33 | 13.12 |
| *Reason for not receiving check-up on baby's health (%)* | | |
| No one to take care and give company | 28.6 | 14.3 |
| Expected cost high or financial incapability | 28.6 | 14.3 |
| Fear and lack of awareness | 0.0 | 14.3 |
| Ignorance and lack of seriousness | 42.9 | 14.3 |
| Lack of transport and facilities | 0.0 | 42.9 |
| *Reason for not seeking treatment for illness of the newborn (%)* | | |
| No one to take care and give company | 0.0 | 46.2 |
| Expected cost high or financial incapability | 0.0 | 23.1 |
| Fear and lack of awareness | 50.0 | 23.1 |
| Ignorance and lack of seriousness | 25.0 | 7.7 |
| Lack of transport and facilities | 25.0 | 0.0 |
| *Reason for not seeking treatment for diarrhoea of the newborn (%)* | 0.0 | 100.0 |
| Expected cost high or financial incapability | 100.0 | 0.0 |
| Fear and lack of awareness | | |

TABLE A.2
**RATES OF IMMUNISATION OF CHILDREN**

| Status of immunisation | Saturia | Rajnagar |
|---|---|---|
| Immunised (%) | 93.0 | 85.6 |
| Measles vaccine received (%) | 77.0 | 62.2 |

TABLE A.3
**NATURE OF CHILD HEALTH PROBLEMS AND HEALTHCARE RECEIVED**

*(Per cent)*

| Variable | Saturia | Rajnagar |
|---|---|---|
| Baby given colostrums immediately after birth | 90.9 | 84.7 |
| Child received Vitamin A dose within last 6 months | 82.9 | 72.7 |
| Fever in last two weeks | 40.8 | 57.7 |
| Ill with cough in last two weeks | 35.1 | 59.3 |
| Rapid breathing in last two weeks | 19.1 | 29.7 |
| Difficulty in breathing in last two weeks | 18.2 | 28.4 |
| Chest problems in last two weeks | 12.9 | 24.2 |
| Diarrhoea in last two weeks | 25.4 | 42.5 |
| More than usual quantity of liquid offered to the child during diarrhoea | 28.0 | 16.9 |
| Packet saline given during diarrhoea | 92.0 | 91.6 |
| Home-made saline given during diarrhoea | 26.0 | 21.3 |
| Water given during diarrhoea | 98.0 | 90.4 |
| Any other liquid given during diarrhoea | 18.4 | 10.0 |
| Advice or treatment sought for diarrhoea | 92.0 | 87.7 |
| Treatment sought for diarrhoea from government health facility | 55.3 | 46.6 |

ANNEX MATRIX A.1
**ROLE OF SERVICE DELIVERY IN HEALTH OUTCOMES: SIMILARITIES AND DIFFERENCES BETWEEN SATURIA AND RAJNAGAR**

| | Saturia | Rajnagar |
|---|---|---|
| Household Characteristics | ▪ Average housing for most people<br>▪ Better sanitary toilet for majority of the people<br>▪ Better health | ▪ Large family size<br>▪ More land<br>▪ More asset<br>▪ More income<br>▪ Better education<br>▪ Higher Inequality |
| Community Characteristics | ▪ More aware<br>▪ Receptive<br>▪ Open to ideas | ▪ Scattered houses<br>▪ Less communication between people<br>▪ Culturally conservative<br>▪ More traditional belief |

*(Contd. Matrix A.1)*

| | Saturia | Rajnagar |
|---|---|---|
| Functioning of Local Government | ▪ More active<br>▪ Participatory | ▪ Traditional |
| Service Delivery Systems and Health Programme Inputs | ▪ Similar health facilities<br>▪ Better maintenance<br>▪ Better staffed<br>▪ Less Absenteeism<br>▪ Better organised<br>▪ More staff-time available for the patients<br>▪ Easily accessible<br>▪ More visits to the community by medical personnel<br>▪ Better communication with the people<br>▪ Better services even down at the local level<br>▪ More options | ▪ Similar health facilities<br>▪ Poor maintenance<br>▪ Poorly staffed<br>▪ High Absenteeism<br>▪ Unorganised<br>▪ Less staff-time available for the patients<br>▪ Restricted accessibility<br>▪ Infrequent visits to the community by medical personnel<br>▪ Poor communication with the people<br>▪ Poor services everywhere but more so at the local level<br>▪ Less options |
| Monitoring and Accountability | ▪ Close to the Capital<br>▪ Better monitored by the higher authority<br>▪ Participation of local government also ensures monitoring from local level | ▪ Rarely monitored by the higher authority |
| Health outcomes | ▪ Lower mortality<br>▪ Better maternal health<br>▪ More deliveries by medically trained persons<br>▪ Higher immunization<br>▪ Better child health | ▪ Higher mortality<br>▪ Poorer maternal health<br>▪ Less deliveries by medically trained persons<br>▪ Lower immunisation<br>▪ Not so good child health |
| Lessons | 1. Economic factors themselves do not contribute much in bringing better health outcome.<br>2. Better health service delivery could produce much of it.<br>3. Ensuring accountability and proper monitoring could contribute in better service delivery.<br>4. Participation of local government could also contribute in better service delivery at the local level.<br>5. Changes of knowledge and attitudes could generate demands for better service delivery. | |