

Maternal Health, Child Well-Being and Intergenerationally Transmitted Chronic Poverty: Does Women's Agency Matter?

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Abstract

This paper is about interconnections between women's empowerment and maternal health, on the one hand, and the health of children and the escape probability from chronic poverty. The literature on intergenerationally transmitted chronic poverty identifies three channels working through economic asset, educational human capital and nutrition-productivity, respectively. The present paper underscores the importance of women's health as another channel through which transmission of poverty is possible. The basic message of this paper is that while household poverty is an important explainer of maternal and child deprivation, the role of women's agency is no less significant in making a difference to favorable outcomes. The empirical results for Bangladesh seem to suggest that women's agency can encourage strategic investments in mothers and children, including adoption of improved health care practices irrespective of gender of the child. And this can happen in case of non-poor and poor households alike, indicating the space for conscious choice in overcoming chronic poverty. The silent role of women's agency needs to be seen as an important supplement to conventional anti-poverty policies.

Keywords: Bangladesh, Chronic Poverty, Women's Agency, Maternal Health, Child Health

JEL Classification:

I. Introduction

Literature on transmission mechanisms on chronic poverty identifies three channels. The first of these focuses on the *economic asset channel* whereby households falling below the critical minimum level of physical and financial assets become entrapped in chronic poverty. Having collateralizable assets such as land assumes critical importance in the context of credit market imperfections, constraining the investment initiatives of the chronic poor critical for moving out of poverty (Bardhan 1996; Ray 1999). Such assets are also important to prevent against shocks inducing further slippage along the downward spiral of poverty (Morduch 1994; Jalan and Ravallion 1999). A number of panel studies have pointed out the importance of initial asset conditions in explaining persistence of poverty (Baulch and Hoddinott 2000; Hossain et al. 2002; May and Carter 2001; Sen 2003).

The second mechanism relates to the lack of adequate *educational human capital channel*, which constrains the choice of occupation and precludes entry into higher productivity activities (Birdsall et al 1997). The third mechanism draws attention to the *nutrition-productivity channel* whereby the importance of adequate nutritional intake for enhancing work efforts and productivity of the adult working members is highlighted (Dasgupta 1993).

The present paper points to the importance of yet another mechanism underscoring the role of *women's health channel* in shaping the nutritional status of their children having strong implications for overcoming intergenerationally transmitted (IGT) poverty.¹ A nutritionally malnourished mother is likely to give birth to a malnourished child, which has a direct bearing on the child's productive and cognitive ability and, as such, remains

¹ Two definitional issues need to be clarified here. *First*, women's health status defined in this paper refers to both health-seeking behaviour and nutritional dimensions of health broadly defined. It includes dimensions such as access to preventive, curative and promotive care (including health knowledge) as well as nutritional measures such as body-mass index (BMI). *Second*, intergenerationally transmitted poverty is used in this paper interchangeably with the term chronic poverty, as essentially both the categories draws attention to long-duration persistent poverty. When generation is defined over a 15 year period, there is clearly an overlap between the two, though depending on the poverty spells chronicity may well be defined within current generation and need not be conceived as intergenerationally poor.

influential in determining the child's future schooling performance, occupational choice, productivity, income earning and the escape probability from chronic poverty.

In discussing the importance of women's health channel for chronic poverty the insights from three strands of literature may be assembled and integrated. The pioneering attempt in each of these strands is indicated below. The first line of inquiry is based on panel data drawing attention to the links between mother's antenatal care, child's birth-weight and nutritional status, and future schooling performance using a large-scale longitudinal (panel) data. Glewwe and King (2001) perform this test on the longitudinal data of Philippines on mothers and children. The second set of evidence points to the importance of "foetal connections" that link women's health status and the nutritional status of children. Osmani and Sen (2003) show the long-term effects of mother's malnutrition on children up to the adolescent years based on cross-country data. A third line of inquiry highlights the role of women's empowerment in shaping her well-being (as captured by her control over fertility decisions) as well as reducing the gender inequality in child mortality. Murthi et al. (1995) tests these relationships based on the Indian district level data.

The present paper combines the insights from these three strands and presents them in the context of intergenerationally transmitted chronic poverty. Specifically, it tests three inter-related propositions. *First*, it examines whether mother's nutritional status is systematically linked with child's nutritional status both in general and across household poverty status. *Second*, if such links are indeed found to be cross-cutting then the factors influencing the health status of mothers becomes an important area of policy concern. The paper, therefore, explores the factors underlying the variation in mother's nutritional status. *Third*, while household poverty is an important explanator of maternal and child nutritional status, it is not the absolute determinant. As people move out of poverty they exercise considerable choice to adopt investment strategies which may be welfare-reducing in the short-term but are needed for creating the base for escape from poverty in the long-term. Women's agency can play an important role in this process by encouraging strategic investments on the part of poor households, including greater

spending on child's health, nutrition and education irrespective of gender of the child and economic position of the household. Such agency also brings favourable effects on the well-being of women themselves.²

In this paper we use Bangladesh Demographic and Health Survey, 2000 round data (BDHS) data for the purpose of analyzing the aforementioned interrelations. The advantage of using this round of BDHS data is that the survey contains not only standard nutritional information on the surviving children, mothers and household information on education, land and other assets, but also useful qualitative information on household poverty status. It should be noted that DHS data typically lacked information on income-poverty. However, the 2000 round of DHS for Bangladesh included a qualitative assessment of household poverty based on self-categorization.

Based on self-categorization, the households could be distinguished into four categories: always deficit (corresponding to extreme poor), sometimes deficit (moderate poor), neither deficit nor surplus (middle non-poor or vulnerable non-poor), and surplus (top non-poor). That this interpretation of the indicator of self-categorization is not mere subjectivism can be seen from a number of studies on Bangladesh which used the same questionnaire and found broad correspondence between the above classification and income-poverty status as well as several income and non-income indicators of well-being (see, Rahman and Hossain 1995; Sen and Begum 1998).³ This can be examined on the basis of DHS data for the year 2000 as well.

As may be seen from Table 1, about 65 per cent of the all households belong to the two bottom asset holding groups—roughly corresponding to the poverty rate prevailing in the year 2000 as per HIES data (World Bank 2002). About 93 per cent of the extreme poor households (as per self-categorization) belong to the two bottom groups in the asset ranking, while the matched figure for the moderate poor is 79 per cent. In contrast, only

² How women's agency is to be suitably defined is an important operational issue though (to be elaborated upon later in the empirical part of the paper).

³ For the correspondence between the subjective and objective poverty classifications see also Pradhan and Ravallion (2000).

23 per cent of the top non-poor households (as per self-categorization) belong to the asset-poor categories, while the matched figure for the middle non-poor households is 46 per cent. Obviously, the asset-ranking and consumption-ranking of the households are never exact⁴, but it is clear that for the purpose of the present analysis where we need to control for the poverty status of households to examine the effect of women's empowerment on health outcomes the subjective poverty ranking of the households give a reasonable differentiation of the sample in the poverty space.

**Table 1: Distribution of household by self perceived economic condition and asset score:
DHS-2000**

Economic condition	Asset score			
	0-7	8-14	15-21	22 and above
Extreme poor	59.3	33.9	5.7	1.1
Moderate poor	29.3	49.6	17.1	4.1
Middle non-poor	9.8	35.9	33.0	21.2
Top non-poor	2.5	20.1	33.3	44.0
All	25.6	39.4	21.8	13.2

The remainder of the paper is structured as follows. In Section II, we consider separately four empirical links: (a) between poverty and maternal/ child malnutrition, (b) between maternal nutrition and child well-being, (c) between women's agency and maternal nutrition, and (d) between women's agency and child well-being. While examining the bi-variate links between women's agency, maternal nutrition, and child well-being we control for the effects of household poverty. In Section III we examine the factors influencing the child and maternal nutrition through a multivariate framework with specific focus on the effects of women's agency as an independent causative factor. Section IV summarizes the results and their implications for policy.

⁴ This is partly because some asset items are more poverty sensitive than others. There is still a lack of satisfactory way of predicting current poverty from the set of asset indicators typically included in the DHS surveys.

II. Links between Poverty, Women's Agency, Maternal Health and Child Well-Being: Descriptive Findings

There is a range of indicators capturing maternal nutrition and child well-being. In the present exercise, given the availability of data, we specifically focus on body mass index (BMI) as the key summary indicator of maternal nutritional status.⁵ We present the estimates of both the average attainment for the group (i.e. mean BMI) as well as proportionate shortfall (proportion of mothers below 18.5 BMI for the weight indicator). We also consider a severe degree of maternal malnutrition by taking 16.0 as the cut-off point, as is the conventional practice in South Asia. Standard child anthropometric measures have been used as the key indicators of child well-being. There are three such measures i.e. proportion of children stunted (less than bio-medically recommended height compared to age), wasted (less than bio-medically recommended weight compared to height), and underweight (less than bio-medically recommended weight compared to age). Among these, the measure of stunting reflects the long-term deprivation in nutrition, the measure of wasting indicates deprivation in the short-term, while that for underweight is a mix of both. For each of these categories we also consider the degree of severity by separately presenting estimates for severe child malnutrition.

Link between Poverty and Nutrition

It is well-known from a large body of global evidence that both maternal and child malnutrition are closely affected by household poverty status. This has been documented by a series of World Bank publications on inequalities in health as well as a number of publications from WHO documenting the impact of household poverty on health (Wagstaff 2000; Gawatkin et al 2000; WHO 2001). The same has been observed in the context of Bangladesh. Thus, evidence collected from the DHS 2000 round also shows that both maternal and child malnutrition vary significantly with household poverty status

⁵ BMI, the body mass index is defined as weight in kilogram divided by the square of height in meters (kg/m²). For BMI a cut-off point of 18.5 is recommended for defining thinness or malnutrition.

(Tables 2). Thus, the proportion of malnourished mothers varies from 28 per cent for the top non-poor category to 53 per cent for the extreme poverty category. Similarly, the share of underweight children ranges from 35 per cent for the top non-poor category to 59 per cent for the extreme poor category. However, it is noteworthy that even for the top non-poor category the prevalence of maternal and child malnutrition is quite considerable suggesting the importance of factors other than income/wealth.

Table 2: Mother’s and Child’s Nutritional Status by Household Poverty Level

Consumption Poverty level	Mother’s Average BMI			Per cent children malnourished, <2SD (Severely Malnourished <3SD)		
	BMI	Percent below 18.5	Percent below 16	Underweight	Wasted	Stunted
Extreme poor	18.7	52.9	9.1	59.2 (19.9)	12.8 (1.5)	54.8 (26.4)
Moderate poor	19.1	45.9	5.9	49.8 (14.4)	10.6 (1)	46.7 (19.4)
Middle non-poor	20	35.3	4.5	40.9 (9.1)	10 (0.9)	39.5 (13.6)
Top non-poor	21	27.6	2.4	34.8 (5.8)	7.8 (1)	28.9 (10.2)

Given the focus of the present paper on the transmission mechanisms for chronic poverty, we start our inquiry from the other end of this relationship. To what extent women’s health and nutritional status can be considered as a causative factor of child nutritional status even within the context of similar economic resource position of the household, and what role women’s agency can play in making a difference to it?

Link between Maternal Nutrition and Child Well-Being

There is clear evidence that mother’s nutritional status is directly correlated with the nutritional status of the children (Table 3). This is true even when one controls for the variation in the household poverty status (Table 4). In case of extreme poverty group, proportion of children underweight for severely malnourished mothers (those with BMI less than 16) is 76 per cent while the matched figure for the well-nourished mothers is 53 per cent. Similarly, in case of middle non-poor group (i.e. those having neither deficit nor surplus) the matched figure for the severely malnourished mothers is 56 per cent as opposed to 33 per cent for the well-nourished mothers. The sharp contrast in the child nutritional status between the two polar groups of severely malnourished and well-

nourished mothers largely holds true for all three child anthropometric measures and all four household poverty categories.⁶

Table 3: Nutritional Status of the Children by Mother's Nutritional Status

Mother's Nutritional Status (BMI)	Per cent children malnourished (<2SD)		
	Underweight (W/A)	Wasted (W/H)	Stunted (H/A)
< 16	66.7	22.8	53.7
16- 16.99	61.6	13.7	53.9
17-18.49	55.4	12.1	47.8
18.50+	38.6	7.9	39.2
Per cent children severely malnourished (<3SD)			
< 16	27.9	2.7	24.8
16- 16.99	19.7	1.9	23.8
17-18.49	15.9	1.4	20.7
18.50+	8.6	0.6	14.7

Table 4: Per cent Children Malnourished (<2SD) by Maternal Nutrition (Measured by BMI) and Household Poverty Status: DHS-2000

Consumption Poverty Level	Mother's BMI			
	< 16	16-16.99	17-18.49	18.50+
Per cent stunted (H/A)				
Extreme poor	63.4	54.0	55.3	53.1
Moderate poor	57.4	53.5	49.9	42.1
Middle non-poor	41.7	55.4	42.7	35.9
Top non-poor	26.7	50.0	35.3	25.3
Percent wasted (W/H)				
Extreme poor	24.4	11.9	13.6	10.3
Moderate poor	22.4	12.8	10.7	8.7
Middle non-poor	23.6	16.9	12.8	7.0
Top non-poor	13.3	13.9	13.4	5.5
Percent underweight (W/A)				
Extreme poor	75.6	64.3	61.4	53.3
Moderate poor	70.4	59.7	56.2	41.7
Middle non-poor	55.6	62.2	53.0	32.6
Top non-poor	40.0	63.9	45.4	29.1

⁶ The only exception being rather modest contrast between the two polar categories of maternal malnutrition (as defined by the BMI criterion) in case of the "top non-poor" category when the proportion of children stunted is taken into consideration for which we do not have sufficient explanation. The other more interesting (and intriguing) pattern is the presence of considerable non-linearity in the middle range of maternal malnutrition. Thus, for both middle non-poor and top non-poor categories, the proportion of children stunted as well as underweight increases as one proceeds from severely malnourished (BMI less than 16) to moderately malnourished (BMI in the range of 16-18.49) declining only in case of well-nourished mothers (BMI more than 18.5). Whether this is due to the effects of rather arbitrary cut-off point in defining severe and moderate maternal malnutrition remains a topic for further research.

Other well-being measures are also indicative of the favorable effects of mother's nutritional status on child well-being. For example, proportion of children dead is much higher for severely malnourished mothers; a higher proportion of these women encounter premature termination of pregnancy due to still birth and miscarriage; and a higher ratio among them tend to deliver smaller size babies. Also, a greater proportion of their children remain more susceptible to sickness. Indeed one also finds that the malnourished mothers use much less contraception than their healthier counterparts and produce, on average, more children.⁷ Presumably, the motivation and need to replace the dead child acts as a barrier to contraception use and fertility control among the severely malnourished group.

The key message, therefore, is that even under similar socio-economic condition mother's health is able to contribute significantly towards the child's health. Alternatively, a worse health condition of the mother in otherwise similar circumstances can depress the child health significantly. This is, of course, a well-known bio-medically established fact. But, the fact that such bio-medical link is often gets ignored has important socio-economic consequences for long-term growth and overcoming chronic poverty. Since such link is found to be a cross-cutting moment across poverty groups, then what other non-poverty factors determine the health status of mothers becomes an important area of policy concern in its own right. It is in this context "women's agency" becomes an important area of investigation.

Link between Women's Agency and Maternal Nutrition

Women's agency has been put forward as an important factor influencing women's own well-being such as fertility status as well as child well-being such as child mortality (Murthi et al. 1995; Sen 1999). What is often less emphasized in the literature is that maternal nutrition also varies by a considerable degree with the level of women's agency,

⁷ For example, using DHS data the authors found statistically larger proportions of children suffered from health problems, such as fever, cough and diarrhoea, over the last 14 days if their mother's BMI was less than 16 and 16-17, compared with all other children with mothers who have a BMI of greater than 17. Similarly, the use of contraception is 46 per cent in case of acutely malnourished mothers (with BMI less than 16) compared with 56 per cent recorded for the well-nourished mothers (with BMI greater than 18.5).

the latter approximated by using the proxy indicators. The term “proxy indicators” is important to take note of however. “Agency” is a measure of the ability to take control over own lives and make own choices and not easy to capture directly from the conventional survey instruments. However, women’s agency can be indirectly captured in several ways. In this exercise we considered women’s education (level of formal schooling), her exposure to media (radio, TV or newspaper), and role in the “domestic decision making”.⁸ In empirical exercise for other countries women’s present work status (whether works for cash) is also taken as a proxy for women’s agency. However, in the Bangladesh context we found that labour force participation for female workers is mainly poverty-driven. The rural labour force participation rate for **female workers** is higher for the poorer households, irrespective of whether poverty is defined by land, income, or self-categorisation (Rahman and Hossain 1995; BIDS 2001; Mahmud 2003; Begum 1994; Labour Force Survey 2000). This is also true of DHS data used in the present exercise.⁹ Lack of data providing further disaggregation of the work status of women workers by the nature of employment arrangement is also an additional consideration here. Kabeer (2000), for instance, found that the modern (formal) employment arrangement is more agency-enhancing than the traditional (informal) jobs.¹⁰ Given the

⁸ We also tried to explore the independent influence of “women’s decision-making role” in the household context (assessing “freedom to choose”) as a distinct measure of female empowerment. This was assessed on 5 items i.e. (1) own health care, (2) child’s health care, (3) large household purchases, (4) household purchases of daily needs, (5) visits to relatives and friends (assessing freedom of physical mobility). In DHS there is an additional item relating to decision-making role regarding what food should be cooked everyday. But in the cultural context of Bangladesh women are often entrusted with the responsibility of cooking in any case so we decided to avoid this item. In order to assess women’s overall decision-making role from the view-point of empowerment, responses of the women have been assigned values as follows: decision by women alone=2, decision by women jointly with their husbands or with someone else in the family=1, decision taken by husband alone or someone else in the family=0. Scores on all items are then added together to get a single score for a woman, which ranges between 0 to 10 representing level of their overall decision-making role. Women with no decision-making role at all scored 0, those with full decision-making power scored 10. Those with intermediate decision making role scored 1 to 9. They were divided into two groups, one with “low status” scoring 1 to 5 and another with “medium status” scoring 6 to 9.

⁹ Again, this is to be seen only as an empirical statement specific to Bangladesh. For instance, in India the female labour force participation rate is found to be agency-enhancing and cited as an important factor for reducing female disadvantages in mortality and malnutrition (Murthi et al. 1995).

¹⁰ Using qualitative case studies Kabeer (2000) compares the women workers of ready-made garment industry employed under factory conditions in Dhaka with the home-based garment workers working under sub-contracting arrangements in London and found that the former are enjoying greater freedom and agency.

pre-dominant picture of poverty-driven participation in the labour market and lack of data on employment arrangement we dropped the present work status of women as being unsuitable for capturing the agency effect. The other possible indicator of women’s agency such as individual ownership of land or non-land productive assets by women—as argued by Aggarwal (1994) - also could not be used in this exercise due to lack of data.

For what it is worth all the proxy indicators of women’s empowerment available from DHS are found to be positively correlated with improved maternal nutrition. Indeed, mother’s nutritional status varies substantially with education and exposure to media. The proportion of malnourished mothers is 49 per cent for the uneducated mothers as opposed to 9 per cent for the highly educated ones (Table 5). These figures in case of women with ‘some exposure to media’ and ‘no exposure to media’ are 35 and 50 per cent respectively. These variations in case of women’s domestic decision-making role are also considerable: 48 per cent for those with no decision making role as opposed to 32-41 per cent for their counterparts with medium and high decision making roles. The effect is especially consistent for the severely malnourished mothers since there is some degree of non-linearity in the upper decision-making categories for the overall group of malnourished mothers.

Table 5: Mother’s Nutritional Status by Empowerment Characteristics

	Mother’s BMI		
	Average BMI	Percent < 18.5	Percent < 16
Women’s education			
No education	18.8	49.2	7.6
Primary	19.1	44.5	4.9
Secondary	20.5	30.8	3.6
Higher	22.8	8.8	1.8
Decision-making role			
Nil (0)	19.0	48.4	6.8
low (1-5)	19.5	41.3	5.4
Medium (6-9)	20.2	32.2	5.3
High (10)	20.2	41.4	3.6
Exposure to media			
Some exposure	20.1	34.7	4.4
No exposure	18.7	50.4	7.2

The above results are based on aggregate decision making score considered over several dimensions of decision making. It is, therefore, of interest to see these dimensions considered individually actually capture women’s agency in some significant ways to make difference to maternal well-being. Table 6 presents disaggregated results with respect to maternal nutrition. Two key aspects are noteworthy. First, remarkably enough, for all aspects of decision making the favourable effect on maternal nutrition status tend to be higher when woman has complete control over decision as opposed to when decisions are taken by her spouse alone.

Thus, the proportion of well-nourished mothers is 63 per cent when she has control over decision about her own health care needs compared to 56 per cent when her spouse takes that decision. The matched difference for other key decision making roles such as exercising choice and control over child health, asset purchase, buying daily necessities and freedom to visit friends and relatives is of similar magnitude justifying their inclusion as empirical proxy indicators of women’s empowerment. Second, even when the decisions are jointly taken by both the partners the favourable effects on maternal nutrition are noticeable, although the extent of positive effects in this case is considerably less than in case of households where they are dominated by the male partners. Here again it is not the control and choice over a range of household decision making subjects that *per se* matters for maternal nutrition. It is the quality of active women’s agency—her autonomy and control—which is signaled by these household decision making roles that can drive a large part of the observed differences in maternal well-being outcomes.

Table 6: Distribution of mothers by decision-making role and BMI with reference to particular domestic decision-making role

Women’s decision making role	Mothers BMI		
	< 16	16- 18.49	18.50+
	Women’s own health care		
Women alone	5.4	31.6	63.0
Husband alone	6.5	37.1	56.4
Jointly by women and husband/others	4.8	36.3	58.8
	Health care of the children		
Women alone	4.7	31.1	64.2
Husband alone	7.0	38.6	54.4
Jointly by women and husband/others	5.0	35.6	59.4
	Large household purchase		

Women alone	4.7	29.4	61.5
Husband alone	6.5	39.6	53.9
Jointly by women and husband/others	5.3	33.9	60.8
	Purchase for daily needs		
Women alone	4.6	31.3	64.0
Husband alone	6.5	38.9	54.6
Jointly by women and husband/others	5.4	35.4	59.2
	Visit to family/friends/relatives		
Women alone	5.3	31.6	63.0
Husband alone	7.1	39.9	53.0
Jointly by women and husband/others	4.8	34.1	61.1

What has been observed above with respect to maternal nutrition also holds true when the effects of women’s agency as reflected in the various domestic decision making roles are considered in respect of other indicators such as access to antenatal care and TT injection.¹¹

Since women’s empowerment may be positively influenced by household resource position, it is important to isolate the specific influence of women’s agency on health and nutrition outcomes of the mothers as distinct from income/wealth effects (which in the present exercise is proxied by the household poverty status). It is observed that even within the same income-poverty group mother’s nutritional status varies positively with greater women’s empowerment. Across all poverty groups mother’s BMI increases with rise in the level of women’s education, exposure to media and higher decision-making role (Table 7).

Thus, in case of moderate poor group, proportion of women who are malnourished in terms of BMI is 50 per cent for those with no education compared to 13 per cent for those who have completed primary education. Among the poorest group those who have some exposure to media tend to have lower level of maternal malnourishment than those without such exposure (46 per cent vis-à-vis 55 per cent). The situation of mother’s

¹¹ For example, using the DHS data the authors found higher access to antenatal (TT) care for women with greater “voice” in various decision making roles in the household context—measured in terms of decision making ability either on her own or jointly with spouse—compared with those who lack such agency. Thus, a greater proportion of women received antenatal care in situations with greater control over decisions over “health care of the children” (44-46% as opposed to 35%), “purchase of daily needs” (43-49% as opposed to 34%), or “visit to friends and relatives” (44-48% as against 35%). The outcomes are consistently higher

malnutrition and severe malnutrition in terms of BMI declines substantially with the improvement in mother's domestic decision making role for all income categories except in case of the extreme poor. One possible reason is that the extreme poor group has relatively higher proportion of female-headed and female-managed households (Rahman and Hossain 1995) and hence the measure of independent decision making in this category is more of consequence of poverty rather than a reflection of the agency effect.

Table 7: Mother's Average BMI, Proportion of Mothers Malnourished and Severely Malnourished by Empowerment Characteristics across Poverty Level

Empowerment indicator	Household Poverty			
	Extreme Poverty	Moderate Poverty	Middle Non-Poor	Top Non-Poor
	Percent with BMI < 18.5 (<16)			
Women's education				
No education	53.1 (10.8)	49.5 (7)	43.9 (5.6)	47.7 (4.6)
Primary	47.7 (4.8)	47.4 (5.4)	41.7 (4.7)	33.6 (3.5)
Secondary	49 (7.8)	34.4 (4.3)	29 (3.9)	26.3 (1.6)
Higher	- (-)	13 (-)	7.6 (2.5)	9.6 (1.2)
Decision-making role				
Nil	54.8 (9.5)	51.5 (7.8)	41.9 (4)	35.9 (4.7)
Low	50 (8.1)	45.1 (5.4)	36.9 (5.3)	30.3 (2.9)
Medium	55.9 (12.7)	38.3 (5.9)	22.3 (2.9)	10.1 (-)
High	56.2 (9.4)	48.9 (4.3)	28.9 (-)	26.1 (-)
Exposure to media				
Some exposure	46.3 (8.7)	41.4 (4.8)	31.1 (3.9)	22.8 (2.2)
No exposure	54.5 (9.4)	50.6 (7.1)	45.2 (5.9)	50 (3.1)

Link between Women's Agency and Child Well-Being

Greater woman's agency matters not only for her own well-being, but also for the well-being of her children. The nutritional status of the children gets substantially better with increase in education of the mother, her exposure to media suggesting broader knowledge base and her domestic decision-making role signifying her ability to influence many critical factors of child wellbeing. All three anthropometric measures confirm this (Table 8). Several results are noteworthy.

when woman can take independent decisions as opposed to taking decisions jointly with her partner and much higher than in situations where she is deprived of any such decision making role.

Table 8: Proportion of Children Malnourished and Severely Malnourished by Women's Agency Characteristics

	Per cent children		
	Underweight (weight for age)	Wasted (weight for height)	Stunted (height for age)
	Percent malnourished <-2SD (Severely Malnourished <3SD)		
Mother's Education			
No education	55.4 (17.7)	12.2 (1.4)	52.6 (23.9)
Primary	49 (12.5)	10.2 (1.1)	46.1 (18.3)
Secondary	34.1 (5.4)	8.1 (0.4)	30 (8.1)
Higher	16.9 (2.7)	6.7 (0.8)	12.9 (2)
Domestic decision making role			
Nil	49.2 (14.4)	10.9 (1.3)	45.9 (21)
Low	47.5 (12.8)	10.3 (1)	44.3 (17.2)
Medium	42.4 (11)	10.9 (1.3)	39.4 (16.7)
High	42 (8.9)	8.9 (0.6)	41.4 (11.8)
Exposure to media			
Some exposure	40.6 (9.6)	9.3 (1)	36.9 (13.8)
No exposure	54.7 (16.6)	11.8 (1.2)	52.3 (22.6)

First, prevalence of child malnutrition can differ considerably with the extent of women's agency. Even for severely malnourished mothers, such difference is quite prominent. Thus, proportion of children underweight is 70 per cent for illiterate women, 65 per cent for primary educated and 56 per cent for those having secondary education. The corresponding figure for mothers who have some exposure to media is 61 per cent compared to 71 percent for those without any such exposure. Similarly, the proportion of underweight children is assessed at 49 per cent for households where mothers do not enjoy decision making autonomy compared to 42 per cent observed for households where mothers have high autonomy and control over household decisions. These differences are persistently pronounced for all three child anthropometric measures and for all categories of maternal malnutrition.

III. Determinants of Child and Maternal Malnutrition: Results of the Multivariate Analysis

The preceding section considered separately four empirical links: (a) between poverty and maternal/ child nutrition, (b) between maternal nutrition and child well-being, (c) between women's agency and maternal nutrition, and (d) between women's agency and child well-being. The underlying premise has been that both income-poverty and women's agency matter for maternal nutrition and directly or indirectly (via mediation of maternal well-being) influence child well-being. The latter, in turn, shapes the progress in reducing overcoming chronic poverty. In such bi-variate postulations, however, it is difficult to disentangle the individual (statistical) significance of poverty and women's agency on maternal and child well-being. This is because there are likely to be confounding influence of household income-poverty status as well as various individual characteristics of the mother and the child. In order to address this problem we now extend the analysis to a multivariate framework. Since maternal nutritional status is seen here as a causal determinant of child nutritional status we first cross-check its central importance in explaining the child nutrition (Table 9; col. 1). As a second step, we then would focus on the determinants of maternal malnutrition itself (Table 9; col. 2). In keeping in view of the main hypothesis of the paper, our interest is to see whether women's agency is an important factor in shaping women's own and her children's well-being.

For the child-level regression, the stunting measure is considered and z-score for height for age is used as the dependent variable. Mother's empowerment characteristics such as education, work status, decision-making role, exposure to media and mother's nutritional status are considered as the explanatory variables. Along with them few more factors--often considered important for the nutritional status of the children in Bangladesh such as, region, religion, sex of the child, mother's age, number of children ever born to mother, her access to health care, work status of the mother, membership in NGOs, access to sanitation and household's income-poverty status--have been included as the explanatory variables. The primary aim here is to control for their confounding effects so

that the specific impact of women's agency on maternal malnutrition and child well-being can be assessed.

Several results are noteworthy. First, mother's education among all women's agency variables affects most the child nutritional status. Mother's education up to primary level however, has only marginal impact but education beyond primary level influences the child well being significantly with such influences becoming stronger at above-secondary level education. Mother's education possibly matters for child well-being through channel of better knowledge about improved maternal and child care practices.¹² The key point is that it is not so much the access to formal knowledge per se (as embodiment of standard definition of human capital) that can make the crucial difference to child well-being status. Knowledge about improved health care practices can be imparted even to mothers with otherwise moderate or little education with the active role of the public health policy including through greater focus on behavioural change and communication. The implicit argument is that imparting such knowledge to mothers can strengthen their agency even without the accumulation of (formal) human capital. Second, as argued earlier, the factor of mother's income earning activities can be associated with child nutrition negatively, as in the Bangladesh context mother's outside economic activity till to date is mostly poverty-driven and does not stand for a proxy variable for women's agency as such.

Third, controlling for the effects of all other variables including household poverty condition mother's nutritional status emerged as a statistically highly significant explanatory of child well-being. Earlier we have observed that the distribution of

¹² Based on DHS data the authors found that the access to knowledge about improved child and maternal care practices increases secularly with the level of formal education of mothers. Thus, only 8% of the illiterate mothers reported medical check-up of their children right after the birth compared with 11% for those with primary, 21% with secondary, and 30% for post-secondary education. The vaccination rate for children (12-23 months) varies similarly from 53 for the illiterate, 60% for primary, 72% for secondary and 87% for post-secondary education. The proportion of mothers with access to antenatal visit likewise varies from 25% for illiterate, 37% for primary, 63% for secondary, and 96% for post-secondary education. This is not to say that formal education is an absolute requirement for higher access to improved health care practices. With appropriate institutional interventions the access-gap can be reduced substantially even for the illiterate mothers, however. Relatively high share of TT vaccination for all formal education groups is a case in point: the matched access is 74% for those with no formal education as opposed to 98% for those with post-secondary education i.e. much less than the gaps in other health care practices noted above.

malnourished mothers is not restricted to the poor households only. This brings to the question: what determines the mother's health in Bangladesh? To seek an answer to this a second round multivariate analysis has been carried out using mother's nutritional status as measured by body mass index (BMI) as the dependent variable and a range of explanatory variables similar to those considered for child nutrition regression as independent variables.

The maternal nutrition regression results indicate the strong presence of the factor of women's agency as a differentiating source of influence (Table 9; col. 2). Although in case of child nutrition only women's education among all agency indicators statistically mattered the agency-centric explanation gets all-round support in explaining variation in maternal well-being. In the latter case all the relevant agency variables--woman's education, her exposure to media, and her domestic decision making status--play statistically significant role. Again, there is support for considerable threshold effects: women's education below primary level does not play any important role but it matters and matters positively when attainment crosses the primary level, playing additionally stronger role after the secondary level. Women's exposure to media also affects their well-being positively while lack of decision making role influences it negatively. Women's health gets significantly worse when their domestic decision making role is extremely low or nil in a household or in the household dominated by husband or others.

Table 9: Determinants of maternal and child nutrition in Bangladesh

Other Independent variables	Dependent Variable (Model 1)	Dependent Variable (Model 2)
	Maternal nutrition	Child nutrition
Constant	17.446*	-1.125*
Region		
Barisal Urban	.483 ***	.109
Barisal rural	-.289	-.036
Chittagong urban	.638 *	-.063
Chittagong rural	.112	-.059
Dhaka Urban	.638*	-.109 ***
Dhaka rural	-.148	-.033
Khulna urban	.639*	-.002
Khulna rural	.131	-.080
Sylhet urban	.176	.080
Sylhet rural	-.274	-.101 ***
Rajshahi urban	.163	.071

Rajshahi rural (RC)	-	-
Mother's Education		
No education (RC)	-	-
Primary	-.114	.005
Secondary	.374*	.115*
Higher	1.259*	.340*
Exposure to Media		
No exposure (RC)	-	-
Some exposure	.317*	.045
Work Status		
Not-working (RC)	-	-
Currently working	-.169	-.074 ***
Mother's decision making role		
Nil (0)	-.473**	.031
Low (1-5)	-.353	.034
Low (6-9)	-.077	.088
High (10) (RC)	-	-
Mother's BMI		.038*
Economic Condition		
Extreme poor	-.679*	-.110 ***
Moderate poor	-.568*	-.016
Middle non-poor	-.411*	.009
Top non-poor (RC)	-	-
Sex of the child		
Male		-.007
Female (RC)		-
Sanitation		
Sanitary toilet	.844*	.073
Other toilet	.129	.012
Open space (RC)	-	-
Health care practice of the mother		
Practice is high	.403*	.114*
Practice is low (RC)	-	-
Religion		
Hinduism	-.196	.011
Buddhism	1.280*	.165
Christianity	.081	.394
Islam (RC)	-	-
Current age of the mother	.045*	.009***
Children ever born to the mother	-.079**	-.016
R ²	.218	.081
Number of cases	4233	5173

Note: RC-reference category for the group; * Significant at < .01 level, ** Significant at < .05 level, *** Significant at < .10 level.

It may be of interest to note that in the descriptive analysis although the household poverty condition measured by the consumption level was found highly correlated with both maternal and child nutritional status according to multivariate analysis its importance as a significant predictor is mostly in explaining maternal nutritional status (poverty as a factor of child malnutrition has a weak presence only in case of the extreme poverty group). Women's well-being gets adversely affected even when a household moves slightly along economic scale. Another interesting observation has been that sex of the child matters little for the nutritional well-being of the children in Bangladesh.

IV. Discussion of the Results: Implications of Women's Agency for Overcoming Chronic Poverty

Five findings constitute the core message of this paper. *First*, maternal nutritional status independent of all other factors is a strong predictor of nutritional status of the children in Bangladesh, and working through this channel, chronic poverty can transmit itself across generation. Besides being direct victim of household poverty the children under chronic poverty condition remain additionally disadvantaged for nutrition due to malnutrition of their mothers. Our results confirm the findings of the literature that malnourished mothers give birth to babies that are born stunted and thin. Besides, proportion of children dead is much higher for severely malnourished mothers; a higher proportion of these women encounter premature termination of pregnancy due to still birth and miscarriage; and a higher proportion among them tend to deliver smaller size babies. Also, a greater proportion of their children remain more susceptible to sickness. In this way, under-nutrition is handed down from one generation to another as a terrifying inheritance. These children do not experience much catch-up growth in subsequent years, remain vulnerable to diseases, enter school late, do not learn well and are less productive as adults (Gillespie and Haddad, 2003). All of these contribute in perpetuation of chronic poverty in the successive generations. In the context of chronic poverty, mother's health and well-being thus assume special importance and can prove well an intervention point for poverty alleviation.

Second, agency can make considerable difference to how well-being is shaped within intra-household and extra-household contexts (see also, World Bank 2005). The central role of maternal malnutrition in shaping child well-being and hence chronic poverty outcomes also points to the important causal role of women’s “agency”. We found considerable support for this in the empirical exercise based on DHS data. Although the limited information typically available from such surveys restricted our operationalization of the agency variable to a few factors such as woman’s education, her exposure to media, and her exercise of autonomy, control and choice over domestic decision making processes the results demonstrate the significance of agency as a differentiating source of influence over maternal nutrition and improved well-being in terms of better health care access and practices. The favourable effect of agency is upheld *even after* controlling for other confounding factors such as income-poverty, location, and standard demographic characteristics of the household.

Third, the results suggest that the overall effect of women’s agency on child nutrition (indeed child well-being at large) can percolate through both direct and indirect channels. The *indirect* effect of agency works through its influence on maternal nutrition. Some aspects of agency such as the level of education leading to improved child health care practices seem to have *direct* impact, though there appears to be threshold effects here. Only women’s education *beyond* primary level appears to have significant direct impact on child nutrition. Here the term “education” may not be equated only with the access to formal education since knowledge about nutrition, hygiene, and health care can also be imparted as a tool of *strengthening female agency* as well within a favourable public health policy framework to women with less or little education.

Fourth, although the present paper highlights the role of women’s agency as a way of improving maternal nutritional status and child well-being as an important instrument to overcome chronic poverty this need not be seen as an alternative to the role anti-poverty policies. Along with women’s agency income-poverty continues to be a major constraint to achieving maternal nutrition and child well-being, especially in case of the extreme poor households. Women’s agency and income-poverty both are important and

independent causative factors of chronic poverty and one needs to pay attention to both. Any interventions combining income-poverty reducing policies and women's empowerment enhancing policies designed to make a difference to maternal and child health outcomes would be a welcome policy stance.

Fifth, the DHS results also show the presence of high maternal and child malnutrition in case of considerable segment of non-poor households adversely influencing the overall national average. Such regressive (below group-average) performance cannot be explained by the household wealth attributes alone. While further work needs to be done to understand the deviant behavior, it seems that attitude and aspiration also matter for women's agency and health outcomes. The persistence of a culture of patriarchy goes a long-way to explain the overall low women's empowerment and high malnutrition in case of these deviant non-poor households (or in case of certain poverty-wise advanced but health-wise backward regions of the country such as rural Sylhet). Public policies and appropriate institutional interventions designed to bring about favorable attitudinal changes (ranging from conscious encouragement of women's autonomy to fighting social taboos and restrictive customs) are needed to address these social/ regional pockets of health-darkness and to accelerate the present modest pace of progress in reducing maternal and child malnutrition.

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