The impact of parental health on child labor: the case of Bangladesh

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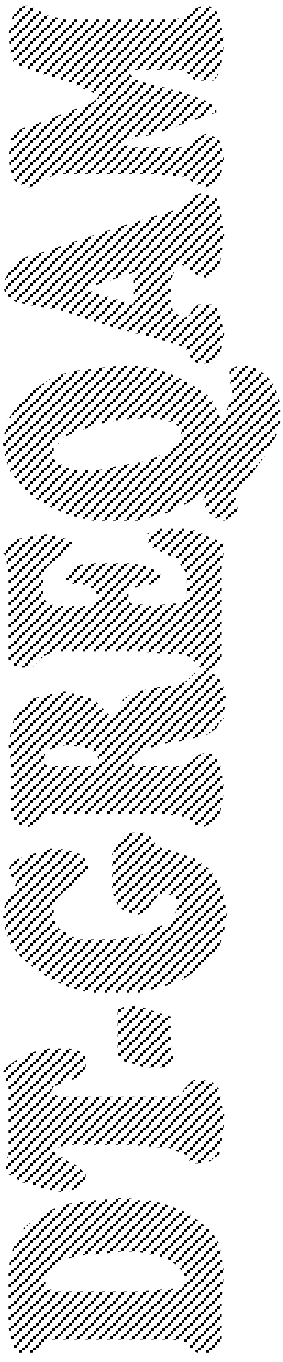

The Impact of Parental Health on Child Labor
Evidence from Bangladesh

Stephen Bazen[a] and Claire Salmon[b]

Abstract

Using data for Bangladesh we find evidence of added worker effects resulting from father's health problems on both children's and (to a lesser extent) spouse's labor supply. In particular, when illness is short-lived or if treatment is required (when there are 'health shocks') children's participation tends to increase. Our results suggest that income replacement through sickness benefit could significantly reduce child labor.

Keywords: child labor, health shocks, added worker effects

JEL Classification: J.13, J.22, J.82, O.15

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Introduction

In recent years, there has been a marked increase in the number of empirical studies that examine the determinants of children's labor supply (see Edmonds (2007) for a recent survey). In this literature, a child is sometimes considered to be the last economic resource of the household, in the sense that is he/she is sent to work when the earning potential elsewhere in the household is exhausted (Salmon, 2005). If this potential is reduced for some reason, the probability of the child being sent to work will increase. This relation is related to the "the luxury axiom" developed by Basu and Van (1998), in so far as parents send their children into the labor market only if they are unable to meet basic needs of the household.

The idea that child labor and variations in school attendance is an important part of family self-insurance seems already broadly supported by the literature. In a context of credit constraints and the absence of formal insurance, child labor tends to increase in case of economic shocks. This relation has been studied in the case of crop shocks (Beegle, Dehejia and Gatti (2006), Pouliot, (2006), Kochar, (1999), Jacoby and Skoufias, (1997)), and in case of financial crises (Yang (2008) ; Skoufias and Parker (2006)). However, one issue that has not been addressed in this literature is the role that the health shocks for adult members of the household could have for child labor. This issue is addressed in this paper using data for Bangladesh.

We examine the relationship between parental health and family labor supply decisions using a bivariate probit model with data from the 2000 Household Expenditure Survey (HES). This survey provides information on the health, expenditure, income and employment status of more than 38,000 individuals in 7,440 households. There are nearly 10,000 children in the 5 to 14 age group living in around 5,000 two-parent families. We find evidence of added worker effects resulting from father's health problems on both child and mother's labor supply. Our results suggest that income replacement through sickness benefit could significantly reduce child labor. We begin by a descriptive analysis of the child labor in section 1 followed by a more thorough analysis using a bivariate probit model in section 2. Our conclusions and assessment of the policy implications are presented in the final section.

1. Child Labor and Parental Health in Bangladesh

Several papers have analysed the determinants of child labor supply in Bangladesh. Among the most recent studies, Amin *et al* (2007), Shafiq (2007a, 2007b), Khanam (2006), show that Bangladeshi children are often prevented from attending school due to market and household work. Amin et *al.* (2004) find evidence in support of the luxury axiom, as poverty appears as one of the main predictors of child labor. Ravallion and Wodon (2000) have focused on the effect of a targeted school subsidy on child labor and school attendance in rural areas. Using data collected in Dhaka slums in 1996, Delap (2001) examined the extent to which child labor is determined by economic and cultural forces. None of these studies have addressed the possible impact of the health of parents or adults of the household on the labor supply of children, or more generally the degree to which the decision concerning a child's labor force participation is conditional on its parents' participation.

The number of child workers (5 to 14 years old) in Bangladesh is estimated to stand at 7.9 million in 2000 according to the Labor Force Survey (LFS). The figure is 4.6 million according to the Household Expenditure Survey (HES). This large discrepancy is mainly explained by the difference in definition of the labor force (essentially whether unpaid labor within the household is included) which was adopted in these surveys[1]. It is important to note that in the HES parents reported that their child worked only when labor constituted a significant activity. This also leads to the underestimation the labor force participation of children, particularly those working small amounts of time or engaged in household economic activities.

Table 1 shows that around 11.5 per cent of children aged 5 to 14 in the survey worked, and there is very little difference between rural and urban areas. The proportion is higher among boys than girls but this is largely due to the restrictive definition of work adopted in this survey. In line with findings elsewhere, children whose parents are not in the household have a higher participation rate. This is often attributed to parents favouring the own children to the detriment of other people's children who are in their charge. In the current case, these children could be domestic workers such as maids or servants who are sent by their own parents to

[1] The LFS cases uses an *extended* definition of the labour – which includes unpaid labour – while in the HES the definition excludes certain economic activities undertaken within and for the household.

work in other households, and thus they are more likely to be classified as workers. The actual status of these children is difficult to identify in the data as no information on their own parents is given. As a consequence, they are not studied in this paper.

Table 1 : Labor force participation rates of children (percentages)

	Both sexes	**Girls**	**Boys**	**Daughter**	**Not daughter***	**Son**	**Not son***
Total	11.56	9.04	14.01	8.01	29.05	12.91	35.08
Rural	11.64	8.31	14.80	7.77	24.79	13.90	33.90
Urban	11.40	10.74	12.11	8.61	33.06	10.73	37.62

Source: authors' calculations based upon the HES 2000.

Note : *not the daughter or son of a member of the household

2. Health and labor supply

The effect of one individual's bad health on the labor supply of other family members is generally studied as an "added worker effect". In theory, a negative health shock can have several effects on the labor supply of the other healthy members of the family. In a couple, the healthy member may increase his/her labor supply, as the household has suffered a drop in income. This effect is thought to be particularly large in developing countries where there is almost no insurance apparatus (Gertler et al, 2003). On the other hand, the healthy spouse may also decrease their labor supply if the health shock has resulted in a change in home production opportunities and caring for the patient. Thus the effect of the health event on the spouse's labor supply is theoretically ambiguous (see Coile, 2003 on American data). In developing countries, studies show that added worker effects may be experience by wives and children (Skoufias and Parker, 2006).

In Bangladesh, where there is almost no insurance provision, so that a reduction in income as a result of illness or handicap experienced by the head of the family could be an important determinant of the labor force participation of the mother but also of the children. The general state of the Bangladeshi population is poor. Less than 40 per cent have access to a modern

health centre, only a quarter of pregnant women receive pre-natal care and the extent of child malnutrition is one of the highest in the world.

(a) Descriptive analysis

Table 2 provides different indicators of health status, based declared state of health and expenditure on health treatment. In general women are more prone to health problems than men, and it is striking that 24 per cent of women and 21 per cent of men aged 15 or over declare that they suffer from a chronic illness. Nearly one-fifth of the adult population report having been ill in the past 30 days and around 15 per cent have had treatment.

Table 2 : Health and health expenditures

	Men (adult)	**Women (adult)**	**Boys (child)**	**Girls (child)**
% of disabled, (cannot work)	0.8	1.2	0.4	0.1
% of persons temporarily ill during the last 30 days	18.2	20.3	26.5	24.3
% of persons for whom treatment was purchased during the last 30 days	14.7	16.3	17.6	16.2
% of persons reporting chronic disease during the last 12 months	21.5	24.0	4.6	3.9
% of health expenditures the last year	3.7	4.0	4.2	4.1

Notes: someone is said to suffer from a chronic illness if the illness lasted for at least a year. Temporary illness means suffering from certain symptoms such as diarrhea, fever, pain, injury, blood pressure, palpitation, breathing trouble, weakness or dizziness in the past 30 days.

Table 3 shows the interactions between the health status of mother and father and the labor market participation of each member of the family. It is clear that independently of health factors, the participation rate of mothers is very low at around 7.5%. Parents declaring chronic illness record a lower participation rate than the healthy parents. There is no correlation between the health status of the father and the participation rate of the mother, and it would appear that it is the son, rather than the mother who replaces the father when he is ill in order

to maintain the family's income. The participation rate of the daughter only increases when the mother is ill or receives treatment.

Table 3. Interactions between parents' health status and labor force participation of members of the household

		participation rate on the labor market			
		son	**daughter**	**father**	**mother**
Health status :					
mother sick					
(during the last 30 days)	**no**	12.91%	**7.81%**	96.49%	7.96%
	yes	13.85%	**9.13%**	97.45%	7.07%
		ns	*	ns	ns
mother received a treatment					
(during the last 30 days)	**no**	**12.77%**	**7.53%**	96.23%	7.76%
	yes	**15.04%**	**11.80%**	96.45%	7.59%
		**	***	ns	ns
mother is chronically ill	**no**	13.07%	7.90%	96.58%	**8.14%**
(during the last 12 months)	**yes**	13.39%	8.79%	95.28%	**6.68%**
		ns	ns	ns	*
		son	**daughter**	**father**	**mother**
father sick					
(during the last 30 days)	**no**	**12.02**	7.97	**97.10**	7.39
	yes	**15.89**	8.61	**94.04**	8.57
		***	ns	***	ns
father received a treatment					
(during the last 30 days)	**no**	**12.69**	**7.61**	96.37	7.85
	yes	**15.43**	**10.15**	95.53	7.17
		**	**	ns	ns
father is chronically ill	**no**	**12.21**	7.96	**97.11**	7.45
(during the last 12 months)	**yes**	**15.21**	8.57	**94.21**	8.36
		***	ns	***	ns

Note : Figures in bold indicate rejection of the null if identical proportions. *** significant at less than 1%, ** significant at less than 5%, * significant at less than 1%, ns : non-significant

(b) Modelling the effect of health on children's labor supply

The decision concerning whether or not a child works can be examined in a framework of family labor supply. In view of traditions and customs, decisions can be considered in a hierarchical manner, beginning with the father's labor supply. In almost all families in the

sample (95%), the father works compared to about 8% of mothers. We confine the sample to the 4,442 families where the father works[2]. In order to model the determinants of the labor supply choices made by the family, we treat mother's and children's labor market participation as separate but dependent processes using a bivariate probit model.

The specification of the model is as follows. Each participation decision is the outcome of a latent process :

$$y^*_{Mi} = x_{Mi}'\beta_M + u_{iM}$$

$$y^*_{Ci} = x_{Ci}'\beta_C + u_{iC}$$

where M and C refer to mother and child respectively, x is a vector of explanatory variables and u is an error term. In each case, y* is unobserved, but we assume that if $y^*>0$ then the person works. In the bivariate probit model, the error terms are assumed to have a bivariate normal distribution and are (potentially) correlated between a mother and her children :

$$\begin{pmatrix} u_{Mi} \\ u_{Ci} \end{pmatrix} \sim N\left(\begin{pmatrix} 0 \\ 0 \end{pmatrix}, \begin{pmatrix} 1 & \rho \\ \rho & 1 \end{pmatrix}\right)$$

where ρ is the correlation coefficient.

The model is estimated for a sample of 8,627 children. Obviously some of these children will have the same mother and we incorporate information on mother's labor market participation and father's health status with each observation. The explanatory variables are as follows. For both children and mothers, we include household size, the person's age, housing status, income quintiles, mother's education, whether the family lives in an urban area or not, and a series of indicators concerning the health status of both parents. For mothers, the presence of children under the age of five is also included and for children, the proportions of males and females in the household along with the age rank of the child in the family (eldest, middle,

[2] In the 218 cases where this is not the case, the mother does not work either as a rule (in 202 cases). Where neither parent works, there are 45 children who work. While these cases are of particular interest, they are excluded due to the additional complexity that would be introduced into the model.

youngest child). All variables mentioned hitherto are referred to as "control" variables in what follows. We use various health status indicators: illness of any kind, chronic illness, and having received treatment in the previous 30 days.

The first model estimated (presented in Table 4, columns 1 and 2) contains the various control variables and the effect of health is represented by a composite dummy variable indicator which takes the value one if the person has had a chronic illness in the last twelve months, had treatment in the last 30 days, is handicapped in some way, or experienced one or more of pre-determined set of symptoms (referred to as ILL). Since it is possible that unobserved environmental variables affecting father's health are correlated with unobserved factors influence the labor force participation of children and spouse, we test the hypothesis that the father's health is not endogenous in these two equations using a likelihood ratio test (see Monfardini and Radice, 2008). The LR statistic is 2.8 and well below the 5% critical value of 5.99. Father's health status can be regarded as exogenous for these participation decisions.

However, unobserved factors that influence mother's labor supply are positively correlated ($\hat{\rho} = 0.147$) with the unobserved factors influencing her children's labor supply. The key control variables influencing mother's labor supply are : being in a poor household (positive effect), owning their abode (-) , living in an urban area (+), living in a large household (-) and having limited education (-). Her participation probability declines with age and with presence of children under the age of five. The health of her husband and her own health have no impact on her labor supply. However, while it is not the most significant variable, father's health problems are found to increase child labor force participation in a statistically significant manner by an estimated 2.6 percentage points. Mother's health is not significant. The other key determinants of child labor supply other than health are age (+), sex (girls are far less likely to work) and mother being literate (+). Income and wealth variables have no statistically significant effect – a finding that is not uncommon in studies of the determinants of child labor.

In order to further explore the relationship between child labor and parents' health, we distinguish between chronic or long term health problems and short term health shocks. The former is captured by a dummy variable which takes the value one for persons having experienced a chronic illness in the last twelve months and zero otherwise (denoted CHRONIC).

Table 4 Bivariate probit estimates of mothers' and children's labor force participation

	Model 1			Model 2	
	Mother works	Child works		Mother works	Child works
Correlation coefficient (ρ)	0.160***			0.156***	
	(0.038)			(0.039)	
Age	-0.0005	0.158***		-0.0004	0.159***
	(0.004)	(0.008)		(0.004)	(0.008)
Boy		0.283***			0.286***
		(0.040)			(0.040)
Lowest quintile	0.532***	0.044		0.530***	0.043
	(0.058)	(0.052)		(0.058)	(0.052)
Second quintile	0.145***	0.069		0.143***	0.075
	(0.061)	(0.051)		(0.062)	(0.051)
House-owner	-0.405***	0.057		-0.414***	0.057
	(0.057)	(0.064)		(0.057)	(0.064)
Lives in urban area	0.304***	-0.065		0.304***	-0.067
	(0.054)	(0.051)		(0.054)	(0.051)
Mother's educ. level :					
None/only basic					
Level 1	-0.410***	-0.077		-0.411***	-0.082
	(0.082)	(0.057)		(0.083)	(0.057)
Level 2	-0.128*	-0.311***		-0.127*	-0.319***
	(0.071)	(0.067)		(0.071)	(0.067)
Level 3	0.814***	-0.613***		0.823***	-0.614***
	(0.121)	(0.22)		(0.121)	(0.22)
Household size	-0.075***	0.021		-0.075***	0.021
	(0.014)	(0.015)		(0.014)	(0.015)
Children under five	-0.142***			-0.142***	
	(0.051)			(0.051)	
Oldest child in family		0.084*			0.084*
		(0.043)			(0.043)
% males in household					
Aged 18-60		-0.079***			-0.081***
		(0.031)			(0.031)
Aged over 60		-0.152**			-0.155**
		(0.065)			(0.065)
% females in household					
Aged 18-60		0.005			0.008
		(0.036)			(0.036)
Aged over 60		-0.076			-0.083
		(0.064)			(0.064)
Health variables :					
Mother ill	0.022	0.028	Mother	-0.091*	-0.044
	(0.047)	(0.041)	chronically ill	(0.055)	(0.046)
Father ill	0.013	0.118***	Father	0.105**	0.047
	(0.047)	(0.04)	chronically ill	(0.051)	(0.044)
			Mother had	0.073	0.130***
			treament	(0.062)	(0.051)
			Father had	0.038	0.111**
			treament	(0.065)	(0.050)
Log likelihood	-4483			-4476	

Number of observations: 8627 *** significant at 1% ; ** significant at 5%; *significant at 10%

A second dummy variable is defined which takes the value one if the person has received medical treatment in the last 30 days (TREATMENT). The results (Table 4 columns 3 and 4) indicate that if the father has a chronic illness the wife has greater likelihood of working, whereas if the wife has a chronic illness, not unexpectedly she is less likely to participate. However that either parent has a chronic illness does not have an impact by itself on children's participation. What matters is if there a parent has recently had medical treatment, in which case the child has a greater likelihood of working. This suggests that short run health shocks give rise to an added worker effect through child labor due to loss of income and possibly the need for resources to pay for treatment.

5. Conclusions

The question of what determines the labor force participation of children in Bangladesh has been studied from a number of angles. In this paper, we have explored the effect of parental health on the labor force participation of family members, and a number of interesting results have been found. Firstly, overall it is clear that father's ill-health increases the likelihood of labor force participation of children. Second, children have a greater tendency to work when either parent has recently had treatment. Thirdly, the probability that the mother works is increased only when the father has a chronic illness. It would appear that the permanent nature of bad health has an effect on mother's participation whereas when the illness is short-lived or if treatment is required, then children's participation tends to increase. The results suggest that child labor is a in part short-term reaction to parental illness. One route to the reducing the extent of child labor in Bangladesh would be to set up a sickness insurance scheme paid for from payroll tax and/or employee contributions that provides temporary income replacement for sick adult workers.

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