The Impact of Child Health on Schooling

Evidence from Bangladesh

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Outline

Effects of child health

- Child health has lasting effect on schooling (Lawlor et al., 2006; Black et al. 2007), future health and earning (Case et al., 2005; Smith, 2007)
- Good health & education lead to higher future standard of leaving (Schultz, 1999), hence, investment in human capital is crucial for increasing productivity and economic development
- Child health and child schooling are both the result of human resource investment decisions by households

Previous studies

- Chutikul (1986), Jamison (1986), Moock and Leslie (1986), and Gomes-Neto et al. (1997) found strong correlations between child health and school performance
- Most previous studies did not take into account the endogeneity of child health.
- Glewwe and Jacoby (1995), Berman & Lavy (1997), Behrman (1998), Glewwe (2001), Alderman et al. (2001) and Grira (2004): found evidence as weaker if control for endogeneity.
- Handa & Peterman (2007) using same approach as Alderman et al. (2001) but did not find significant relationship between child health and education.

Contributions

- In this study we use parental height as instrumental variable for child's height-for-age
- We apply overidentification test to examine the validity of our instruments
- We examine the effects of child health in three measures: enrolment, attendance and attainment

The survey

- Micronutrient and Gender Study (MNGS) in Bangladesh administered by the International Food Policy Research Institute (IFPRI)
- Covered children aged 5–17 years in rural areas with mother and father both are present from three survey sites: Saturia, Mymensingh and Jessore districts in 1996-1997
- The MNGS sampled a total of 957 households (5,541 individuals) from 47 villages
- Contents: economic, demographic, agricultural, and gender information; and
- Schooling, morbidity, reproductive history and mortality, hospitalisation, chronic diseases and use of health care facilities in the household.

Choice of vriables

- Child health is proxied by z-score of height-for-age: Normal if z-score is greater than -1; Mild malnutrition if z-score in (-2,-1); Moderate in z-score=(-3,-2); and Severe if z-score smalle than -3

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- Schooling:
  - Attendance: 1 if the child is attending school
  - Enrollment: 1 if the child enrolled at age of 6, 2 if the child enrolled later than 6, and 3 if the child never enroll
  - Grade attainment: 0 if the child attaint maximum grade for age, 1 if the child "falling behind"

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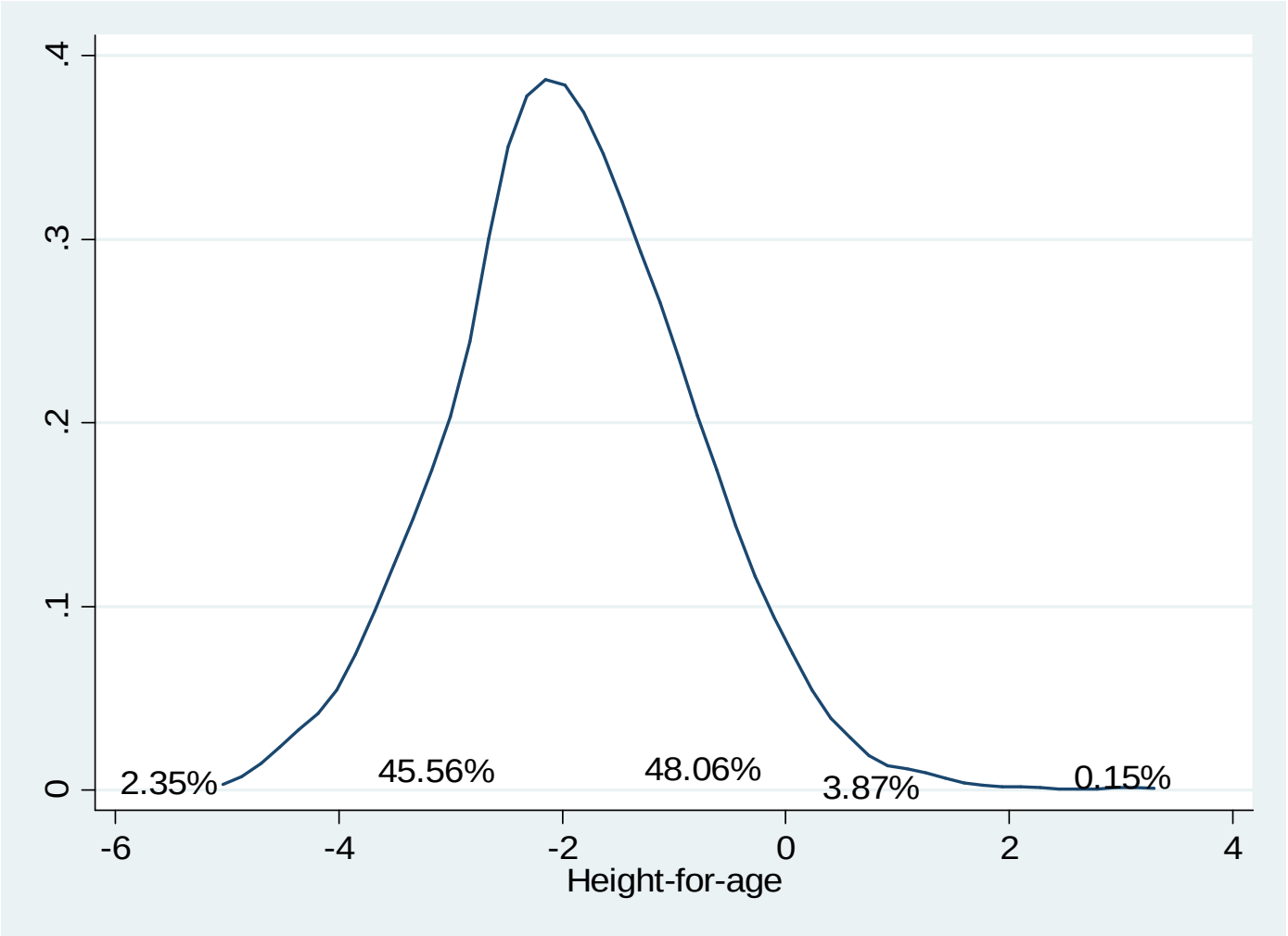
- Other covariates: child age, gender, household size, wealth (proxied by log of household consumption), education of parents (ability to R&W), education infrastructure (availability of school) and district dummies

Child schooling and health status

Schooling \ Health	Normal	Mild	Moderate	Severe	Total
Attending school	16.25	26.35	27.18	11.16	80.94
Not attending	3.26	6.23	5.92	3.64	19.06
Enrolled in time	11.62	13.59	10.02	1.75	36.98
Enrolled late	6.15	15.95	19.74	10.48	52.32
Never enroll	1.75	3.04	3.34	2.58	10.71
Right grade	12.22	14.43	10.33	1.90	38.88
Falling behind	7.29	18.15	22.78	12.91	61.12
Total	19.51	32.57	33.11	14.81	100.00

Kernel density plot of height-for-age



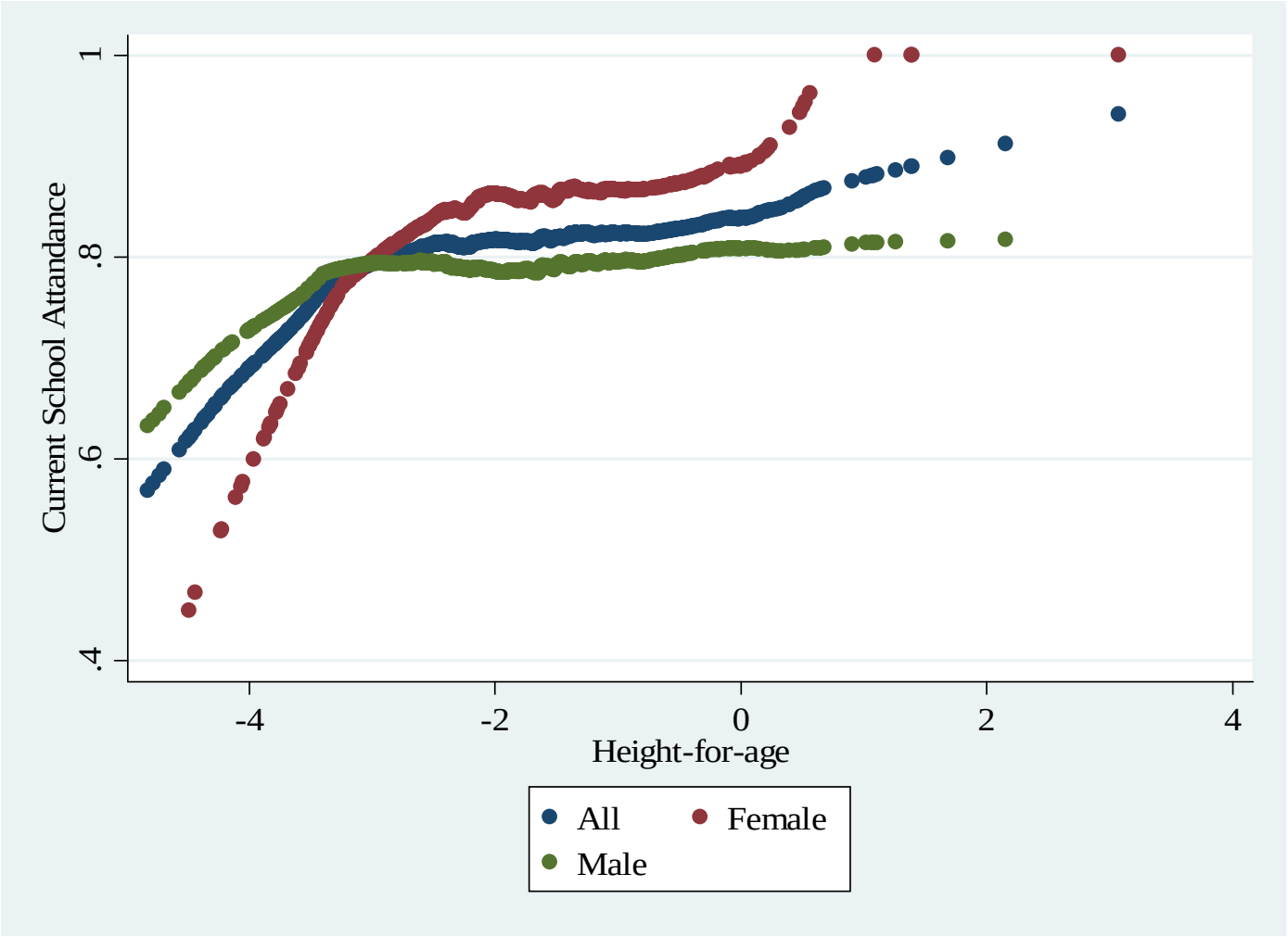
Descriptive statistics

Variables	Median	Mean	Std.	Min	Max
Height-for-age	-1.94	-1.90	1.08	-4.82	3.08
School attendance	1.00	0.79	0.41	0.00	1.00
Enrolment status	2.00	1.75	0.64	1.00	3.00
Grade attainment	1.00	0.62	0.49	0.00	1.00
Child's age (years)	11.00	11.16	3.46	5.00	17.00
Gender (female=1)	0.00	0.39	0.49	0.00	1.00
Household size	6.00	6.51	2.77	2.00	19.00
Log of hh cons.	2.91	2.96	0.35	1.54	4.38
Father can R&W	0.00	0.44	0.50	0.00	1.00
Mother can R&W	0.00	0.23	0.42	0.00	1.00

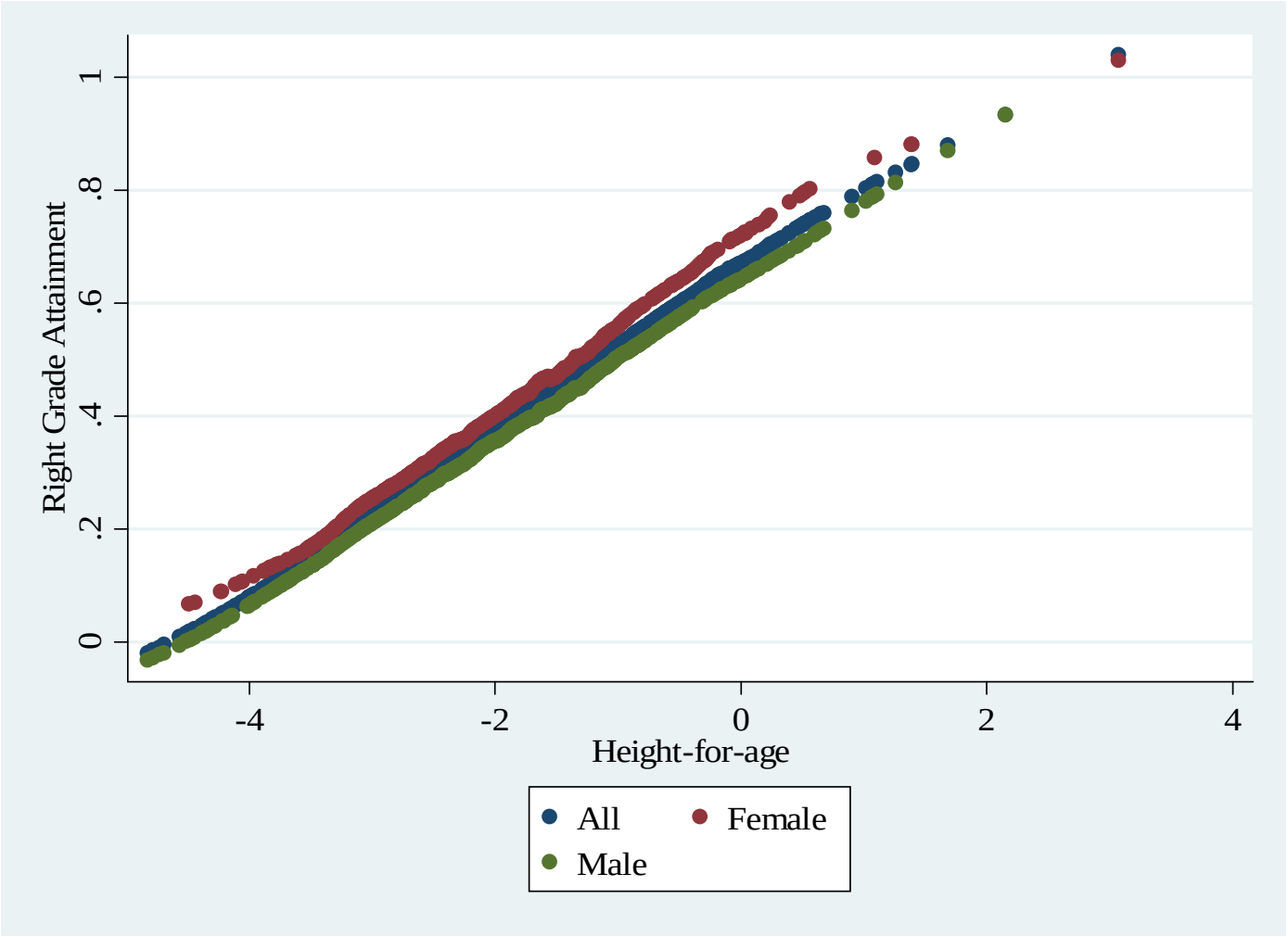
Descriptive statistics (cont.)

Variables	Median	Mean	Std.	Min	Max
Primary school	1.00	0.65	0.48	0.00	1.00
2dary mixed school	0.00	0.12	0.33	0.00	1.00
2dary girls' school	0.00	0.05	0.21	0.00	1.00
Father height (cm)	162.3	162.1	5.40	144.2	179.1
Mother height (cm)	149.9	149.8	5.23	133.4	167.1
Mymensingh	0.00	0.32	0.47	0.00	1.00
Jessore	0.00	0.35	0.48	0.00	1.00
Saturia	0.00	0.33	0.47	0.00	1.00

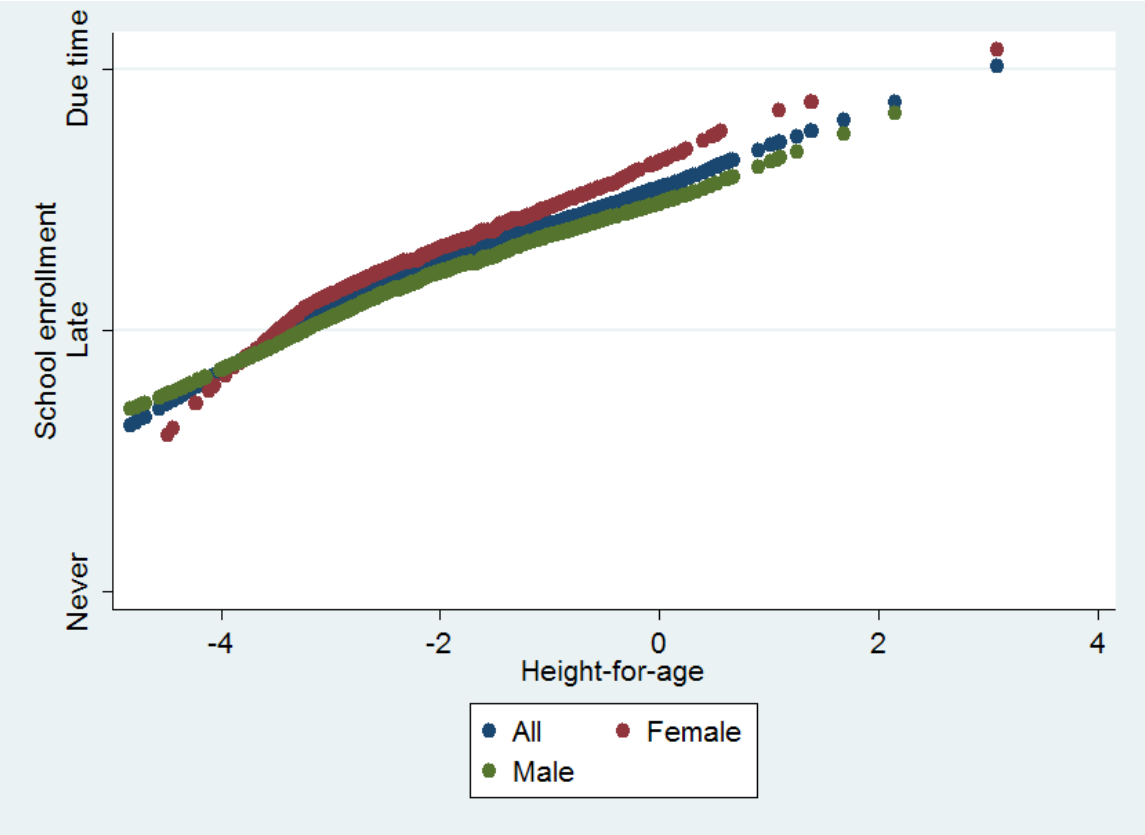
School Attendance



Grade Attainment



School Enrollment



Econometric model

$$S_i = \alpha_0 + \alpha_1 H_i + \alpha_2 X_i + \varepsilon_i \quad (1)$$

$$H_i = \beta_0 + \beta_1 Z_i + \varepsilon_i \quad (2)$$

- S_i is an indicator for child schooling;
- H_i is the health status of a child which is measured by height-for-age;
- X_i is a set of exogenous variables (e..g, child age, gender, household size, parental education, and school infrastructure); and
- Z_i is a set of exogenous variables that include X and a set of instruments for child health (i.e., mother and father heights)

The Estimator

- The conditional recursive mixed process estimator using the *CMP* command in STATA developed by Roodman (2007)
- Can apply for large family of multi-equation systems where dependent variable of each equation may have different format (i.e., binary, categorical, and continuous)

Current School Attendance

Variables	Coeff.	Std. Err	ME
Child health	0.122	0.093	0.043
Child's age	**-0.026	0.013	-0.009
Child gender	*0.151	0.090	0.051
Household size	0.010	0.016	0.004
Log of consumption	**0.291	0.134	0.102
Father can R&W	***0.333	0.094	0.105
Mother can R&W	*0.251	0.129	0.081
Primary school	0.083	0.092	0.030
2ndary girls' school	**0.868	0.435	0.221
2ndary mixed school	0.222	0.154	0.073

School Enrolment

Variables	Coeff.	Std. Err	Marginal effects		
			Due	Late	Never
Child health	***-0.235	0.078	0.056	0.014	-0.070
Child's age	*0.020	0.010	-0.005	-0.001	0.006
Child gender	-0.081	0.068	0.020	0.003	-0.023
Household size	-0.018	0.012	0.004	0.001	-0.005
Log of consumption	***-0.445	0.105	0.106	0.026	-0.132
Father can R&W	***-0.286	0.073	0.077	-0.003	-0.075
Mother can R&W	***-0.407	0.092	0.116	-0.015	-0.101
Primary school	0.044	0.178	-0.011	-0.002	0.013
2ndary girls' school	***-0.575	0.109	0.174	-0.043	-0.131
2ndary mixed' school	***-0.358	0.093	0.100	-0.009	-0.091

Grade Attainment (1=falling beind)

Variables	Coeff.	Std. Err	ME
Child health	*-0.164	0.092	-0.035
Child's age	***0.148	0.012	0.032
Child gender	-0.018	0.081	-0.004
Household size	-0.016	0.014	-0.003
Log of consumption	***-0.694	0.125	-0.149
Father can R&W	***-0.233	0.087	-0.057
Mother can R&W	***-0.578	0.106	-0.164
Primary school	0.108	0.090	0.025
2ndary girls' school	***-0.549	0.197	-0.154
2ndary mixed school	***-0.389	0.124	-0.102

Conclusions

- Significant effect of child health on schooling attainment, in particular on school enrolment and grade attainment
- The impact of child health is stronger for school enrolment compared to grade attainment
- Other important determinants of schooling are parents' education, income of the household and the availability of secondary school, especially girls' secondary school in the community