

The Mid-term Impacts of “Girl-friendly” Schools:

Evidence from the BRIGHT School Construction Program in Burkina Faso

**Presentation at the 3ie Conference: Making impact
Evaluation Matter**

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Presented by Emilie Bagby

Burkina Faso Threshold Country Program

- Millennium Challenge Corporation (MCC) funded a three-year, \$12.9 million grant in 2005
- Build 132 “girl-friendly” primary schools
 - 3 classrooms (grades 1-3)
 - Teacher housing
 - **Separate latrines for girls**
 - **Dry food rations**
 - Water-pump
 - **“soft” interventions**
- Program administered by USAID; implemented by the BRIGHT consortium (Plan International, CRS, TinTua, FAWE)

Typical School and BRIGHT School



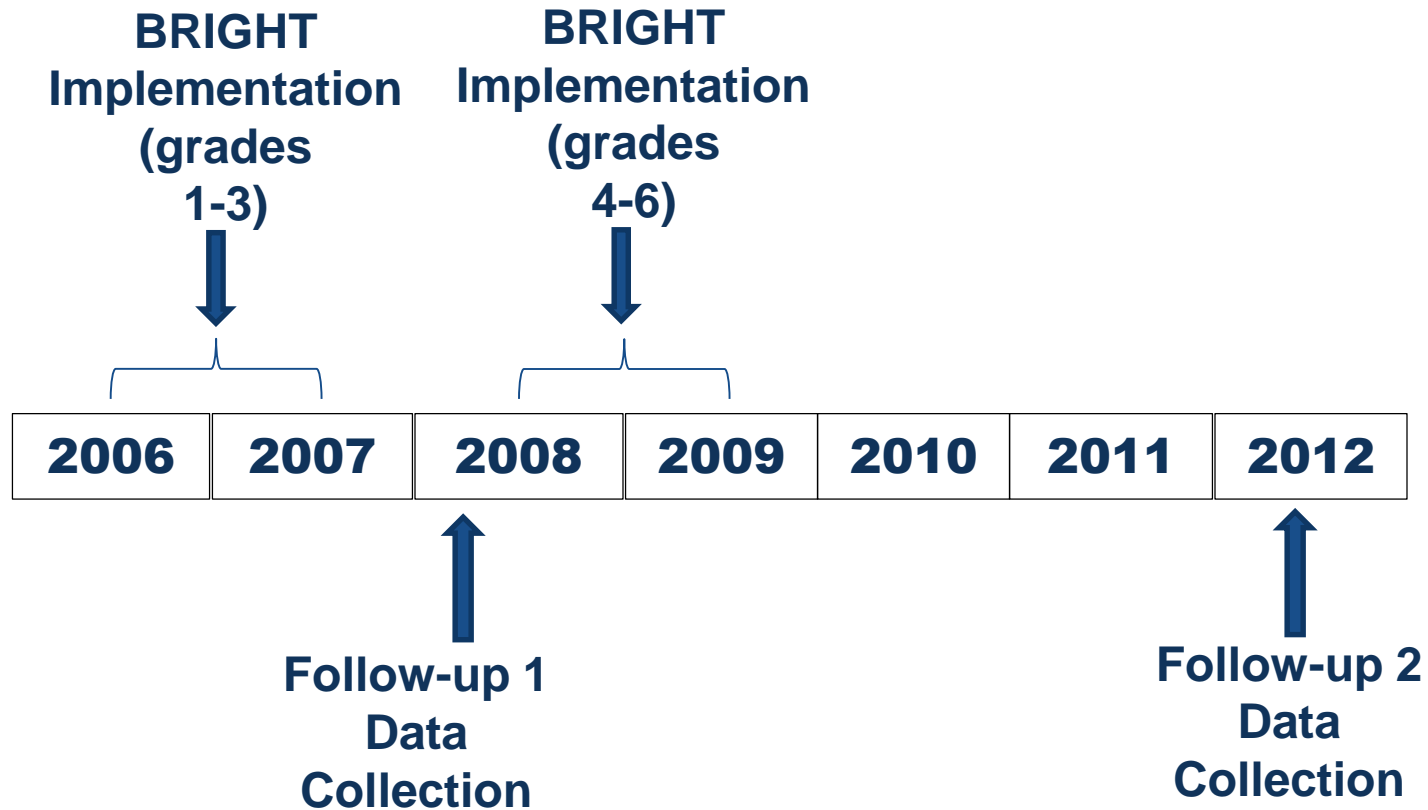
Short-term Impacts were Positive and Significant

- Program had **statistically significant impacts** on:
 - Availability of School (33 percentage points)
 - Enrollment (15-20 percentage points)
 - Test Scores (0.4 standard deviations)
- **Significant Impacts for both boys and girls:**
 - Enrollment: Slightly larger for girls
 - Test Scores: About the same for boys and girls
- Impact for 6-12 year old children

Burkina Faso Compact

- In July 2008, MCC signed a five-year, \$480.9 million compact with the Government of Burkina Faso
- One component was to expand the BRIGHT programs:
 - Three additional **classrooms** (grades 4-6) and teacher housing; and
 - Continuing **soft interventions** such as textbooks, mothers' literacy training and take home rations.

BRIGHT Evaluation Timeline



Key Evaluation Questions

Seven years after the start of the BRIGHT programs:

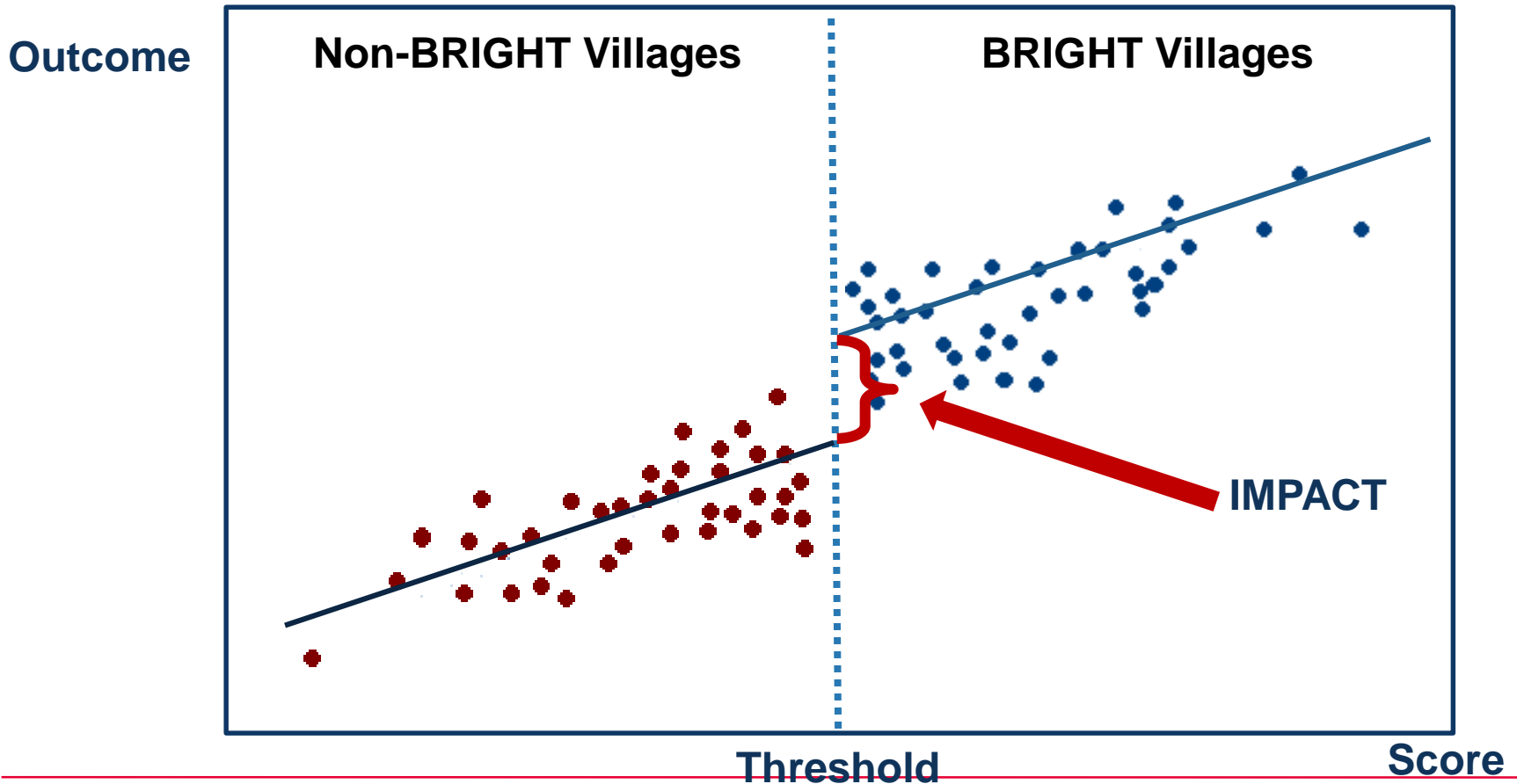
- What was the impact on **school enrollment**?
- What was the impact on **test scores**?
- What was the impact **on child health and labor**?
- Were the impacts **different for girls**?

Selection of Villages

- Applications from 293 villages
- Each application was scored based on need
- Within each department, the villages with the highest scores were selected for the program
- Suitable evaluation design: regression discontinuity

Evaluation Design

- Regression discontinuity allows us to identify a comparison group



Impact Evaluation Sample

- **Data Sources:**

- Application data
- Household survey (6-17 year olds)
- School survey

- **Sample Sizes:**

- 129 participant villages, 161 comparison villages

Key Outcome Variables

- **Enrollment in school (self-reported)**
- **Test Score**
 - **Math and French tests were administered to children during household survey**
 - **Test scores were normalized for each age group**
- **Anthropometric outcomes**
- **Child labor outcomes**

BRIGHT Schools are More Accessible

Characteristics	Selected villages	Not-selected villages	Estimated Impacts
Village has a school	95.7%	85.8%	9.9 pp**
Direct route reported	91.2%	85.8 %	5.4 pp**
Estimated travel time (in minutes)	21.08	28.93	-7.85***

pp = percentage points

***Coefficient statistically significant at the 1% significance level.

BRIGHT Schools Have Better Educational Infrastructure and More Resources

Characteristics	Selected villages	Not-selected villages	Estimated Impacts
Panel A: Operation of school			
Years in operation	12.13	8.19	3.94***
Highest grade offered	5.82	4.96	0.86***
School is oversubscribed	19.9%	37.5%	-17.6 pp***
Panel B: School resources			
Number of usable classrooms	5.48	3.18	2.30***
Number of teacher accommodations	4.75	1.69	3.06***
Students without desks	9.5%	26.0%	-16.5 pp***
Has a canteen	82.9%	80.4%	2.5 pp
Has dry-ration program	64.7%	18.9%	45.8 pp***

pp = percentage points

***Coefficient statistically significant at the 1% significance level.

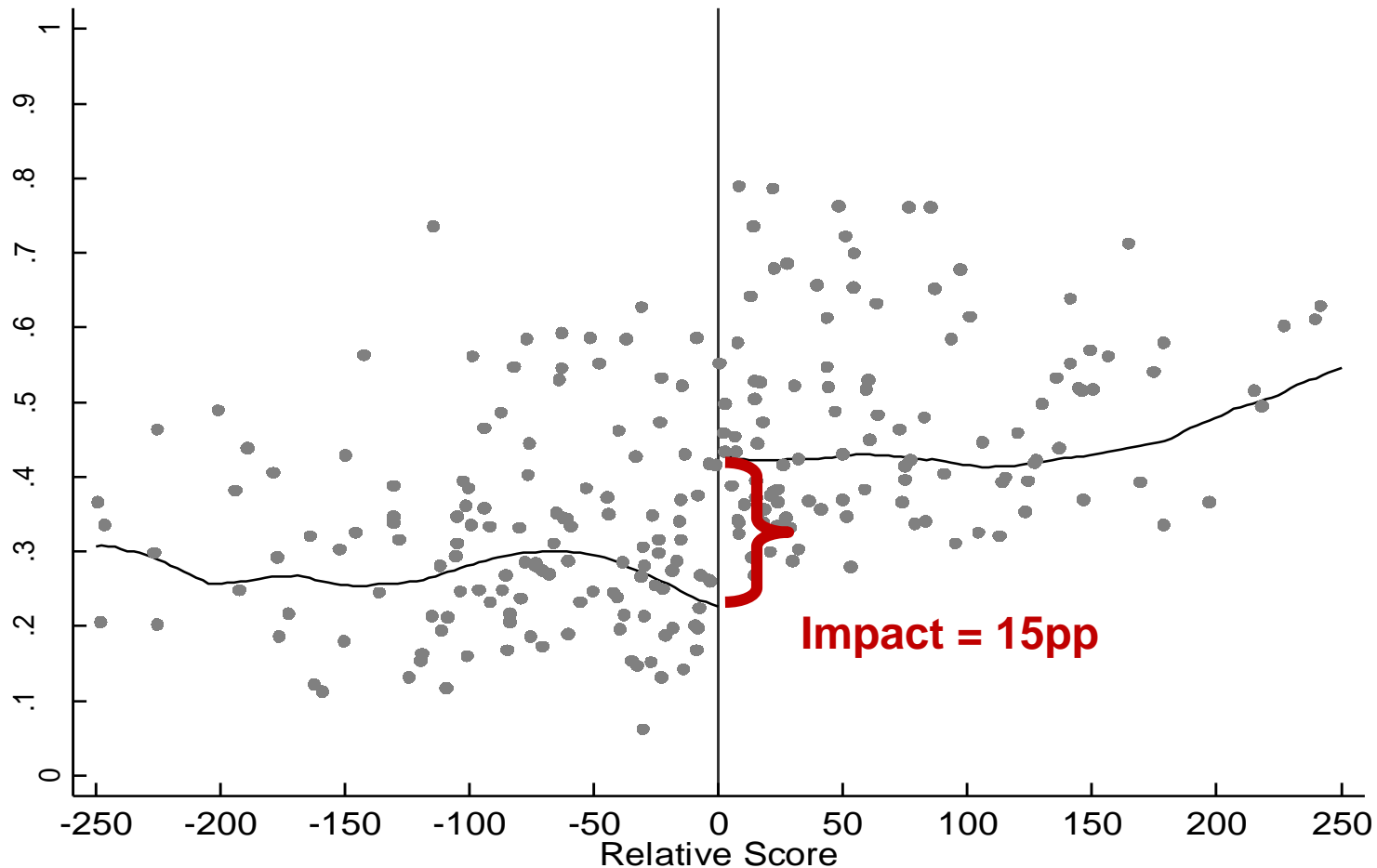
BRIGHT Schools Sustained their Girl-Friendly Characteristics

Characteristics	Selected villages (%)	Not-selected villages (%)	Estimated Impacts
Has dry-ration program for girls only	64.9	14.5	50.4 pp***
Has water supply	91.3	48.7	42.6 pp***
Has any toilets	98.1	64.4	33.7 pp***
Has gender-segregated toilets	89.6	35.2	54.4 pp***
Number of female teachers	2.54	1.00	1.54***
Teachers with gender-sensitivity training	35.2	19.3	15.9 pp***

pp = percentage points

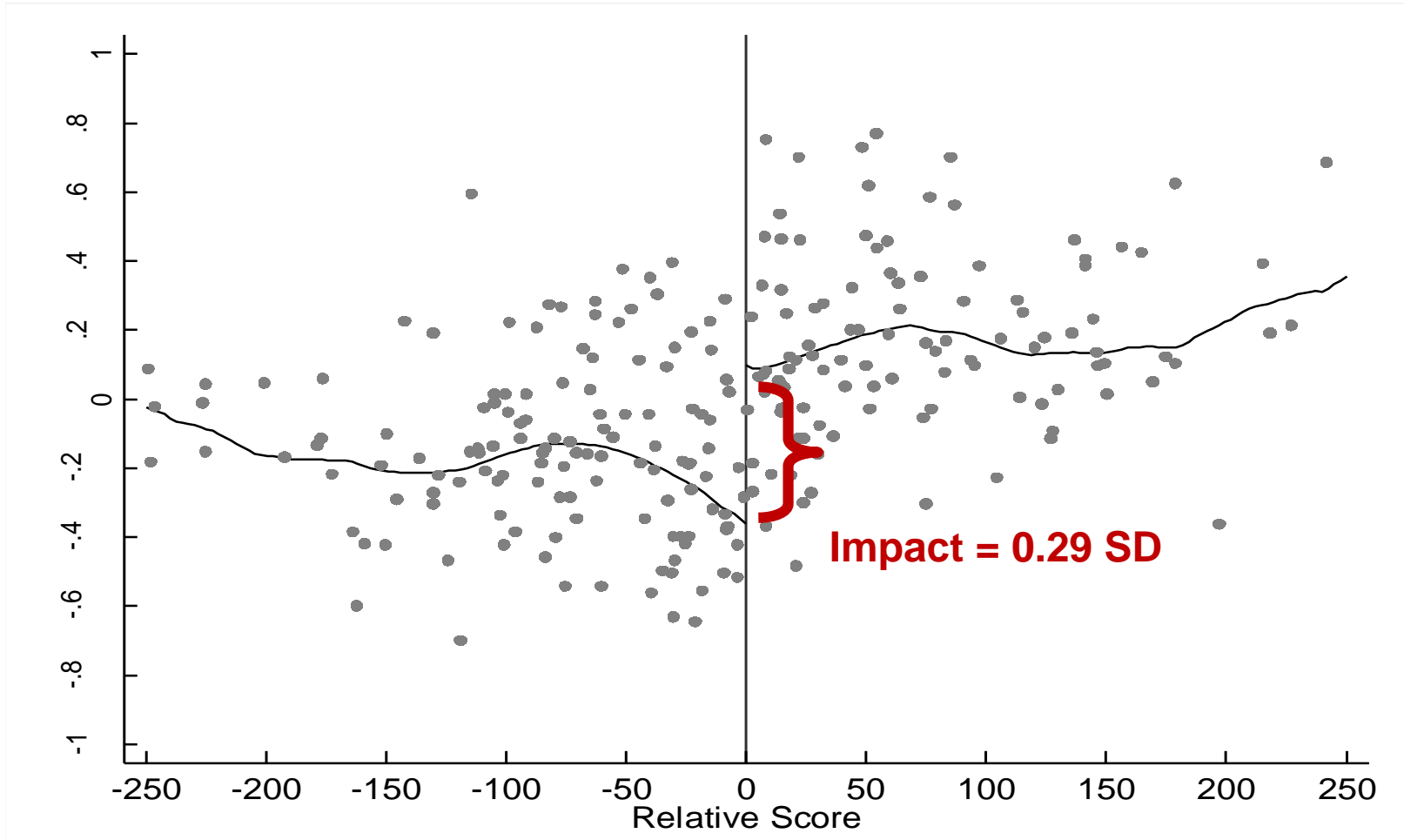
***Coefficient statistically significant at the 1% significance level.

Positive Impacts on Self Reported Enrollment



pp = percentage points

Positive Impacts on Test Scores



SD = standard deviation

No Impacts on Health Outcomes

	Selected villages	Not-selected villages	Estimated impacts
Arm circumference (mm)	162.97	161.87	1.10
Height for age	-1.0	-0.95	-0.05
Weight for age	-1.04	-0.96	-0.08
Weight for height	-0.25	-0.25	0.00
BMI	16.17	16.15	.02

Impacts on Child Labor

Dependent variables	Selected villages (%)	Not-selected villages (%)	Estimated differences
Firewood	37.9	44.0	-6.1 pp***
Cleaning	44.2	48.0	-3.8 pp***
Fetch water	68.6	72.5	-3.9 pp***
Watch siblings	49.3	52.1	-2.8 pp**
Tend animals	31.4	36.7	-5.3 pp***
Shopping	27.6	29.8	-2.2 pp*
Overall index (sd)	-0.09	0.05	-0.14 ***

pp = percentage points; sd = standard deviation

*/**/** Coefficient statistically significant at the 10%/5%/1% significance level.

Larger Positive Impacts on Enrollment and Test Scores for Girls than Boys

Dependent variables	Impact on Girls – Impact on Boys
Panel A: Academic outcomes	
Self-reported enrollment	11.3 pp***
Total test score (sd)	0.21***
Panel B: Anthropometric outcomes	
Upper-arm circumference	-0.18
Height for age	-0.08*
Weight for age	-0.05
Weight for height	0.10
BMI	0.08

pp = percentage points.

*/**/** Coefficient statistically significant at the 10%/5%/1% significance level.

Larger Negative Impacts on Child Labor for Girls than Boys

Dependent variables	Impact on Girls – Impact on Boys
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Panel C: Child labor outcomes

Firewood	-6.7***
Cleaning	-3.8**
Fetch water	-0.5
Watch siblings	-0.5
Tend animals	0.1
Shopping	-0.4
Overall index (sd)	-0.05*

Impacts are in percentage points unless otherwise noted.

*/**/** Coefficient statistically significant at the 10%/5%/1% significance level.

Conclusions

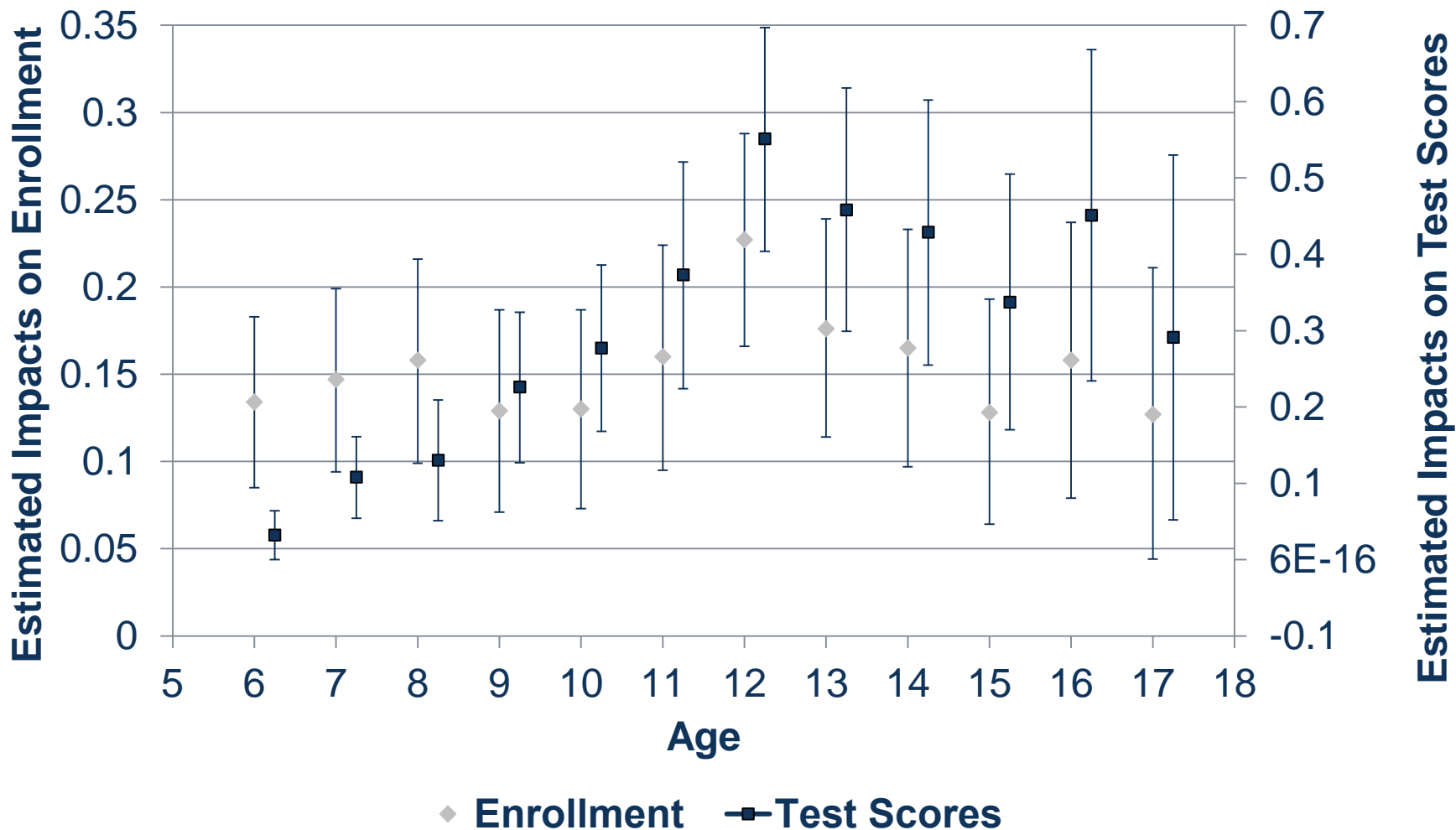
- Program had **statistically significant impacts** on:
 - Availability of school (9 percentage points)
 - Enrollment (15 percentage points)
 - Improvements in test scores (0.29 standard deviations)
 - Reduction in child labor
- **Impacts larger for girls than boys**
 - On both enrollment and test scores

For More Information

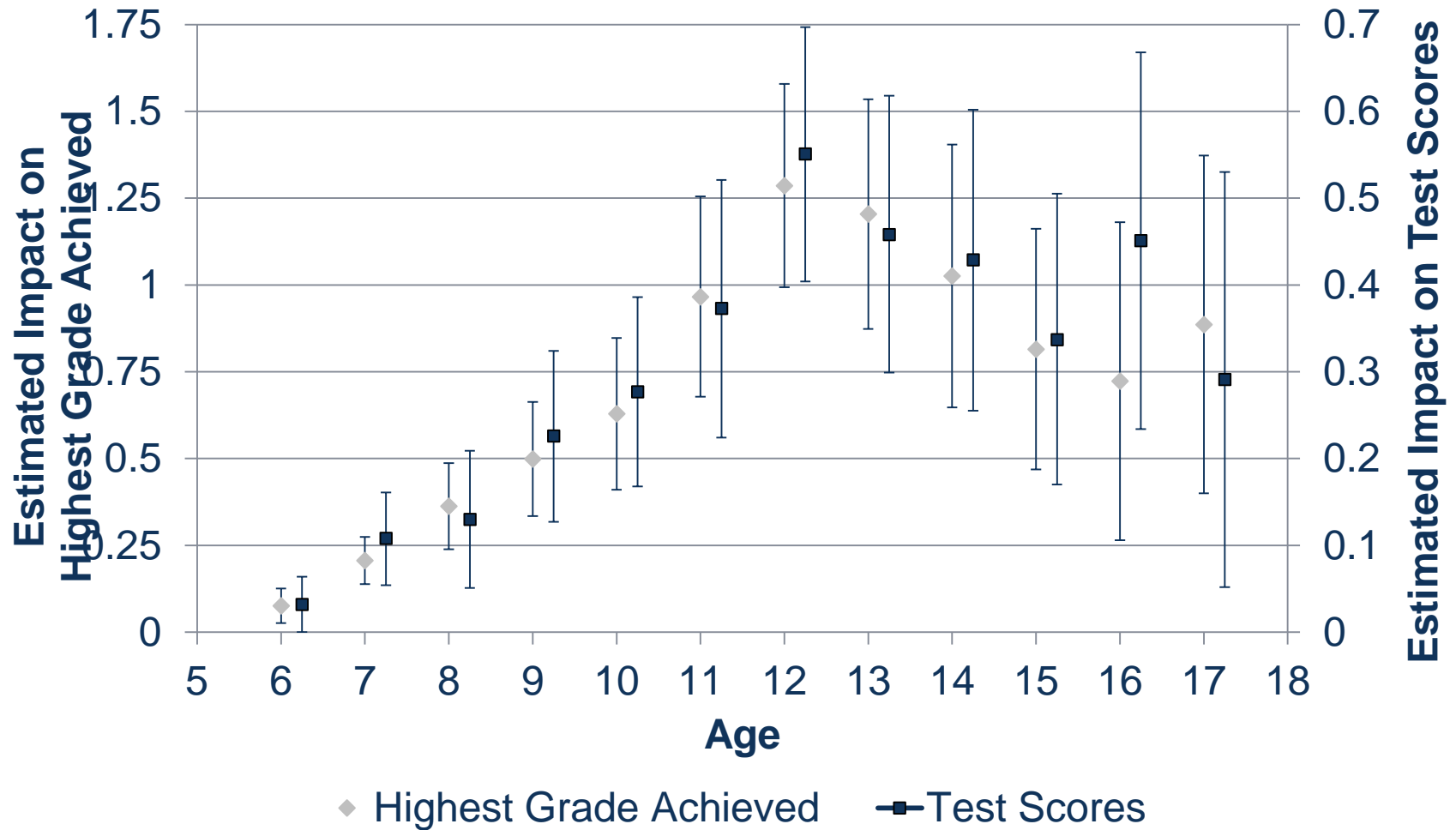
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Extra Slides

Impacts on Enrollment and Test Scores By Age



Impacts on Highest Grade Achieved and Test Scores, By Age



Impacts on Self Reported Enrollment

	Selected villages	Not- selected villages	Estimated impacts	Sample size
Mid-term impacts (2012 survey)				
Full sample (6–17 year olds)	47.6%	32.1%	15.5 pp***	26,427

pp = percentage points

***Coefficient statistically significant at the 1% significance level.

Impacts on Self Reported Enrollment

	Selected villages	Not- selected villages	Estimated impacts	Sample size
Mid-term impacts (2012 survey)				
Full sample (6–17 year olds)	47.6%	32.1%	15.5 pp***	26,427
Short-term impacts (2008 survey)				
Full sample (6–12 year olds)	54.9%	35.2%	19.7 pp***	17,984

pp = percentage points

***Coefficient statistically significant at the 1% significance level.

Impacts on Self Reported Enrollment

	Selected villages	Not- selected villages	Estimated impacts	Sample size
Mid-term impacts (2012 survey)				
Full sample (6–17 year olds)	47.6%	32.1%	15.5 pp***	26,427
Restricted sample (6–12 year olds)	49.0%	33.8%	15.2 pp***	19,627
Short-term impacts (2008 survey)				
Full sample (6–12 year olds)	54.9%	35.2%	19.7 pp***	17,984

pp = percentage points

***Coefficient statistically significant at the 1% significance level.

Impacts on Test Scores

	Selected villages	Not- selected villages	Estimated impacts	Sample size
Mid-term impacts (2012 survey)				
Full sample (6–17 year olds)	0.13	-0.16	0.29***	23,461
Restricted sample (6–12 year olds)	-0.02	-0.26	0.24***	17,495
Short-term impacts (2008 survey)				
Full sample (6–12 year olds)	-0.13	-0.54	0.41***	17,970

***Coefficient statistically significant at the 1% significance level.

Impact Estimation Method

- Estimate the following regression equation:

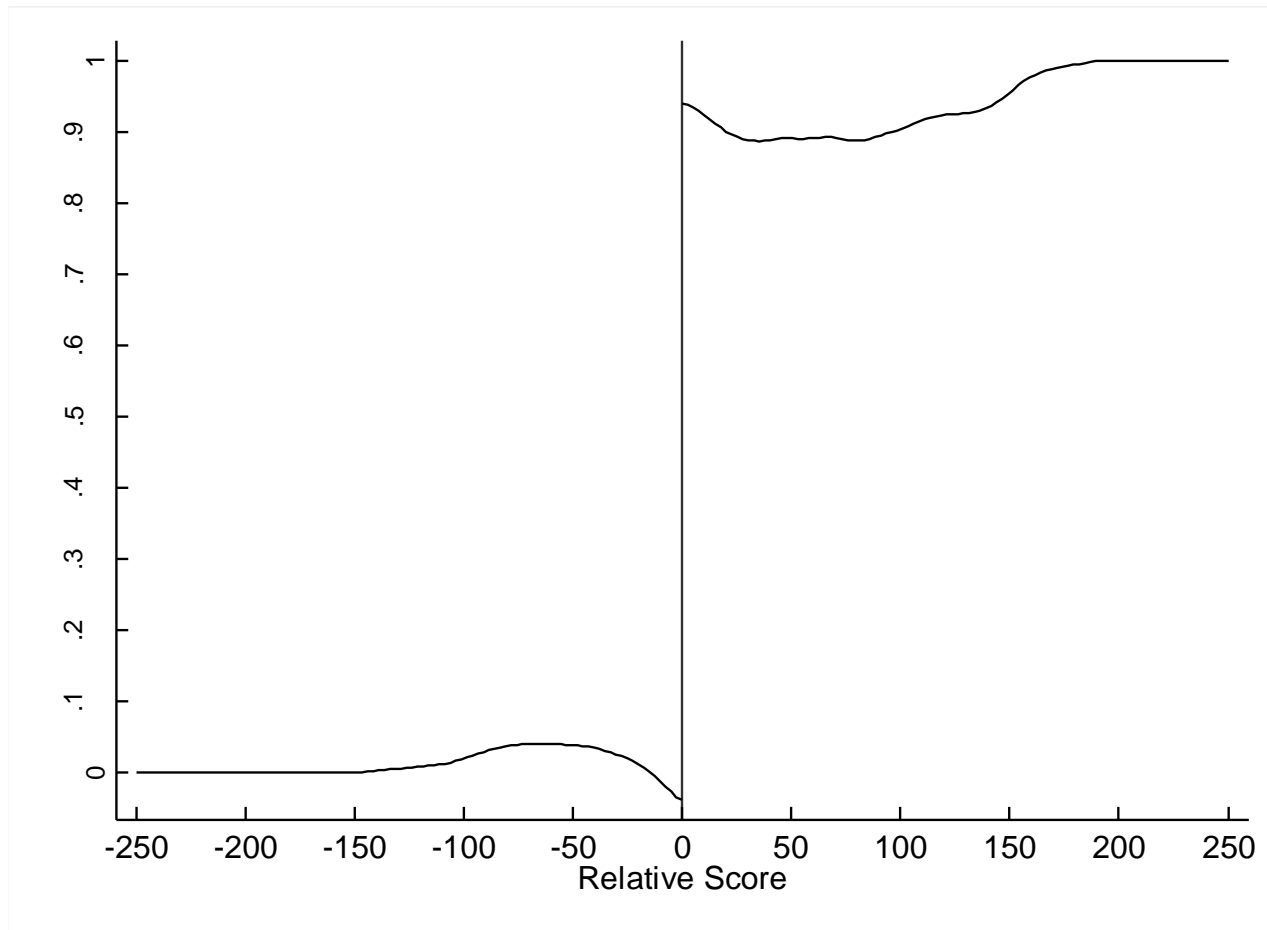
$$Outcome_{ihj} = \beta_0 + \beta_1 BRIGHT_j + \beta_2 f(Rel_Score_j) + \beta_3 X_{ihj} + u_{ihj}$$

– where β_1 represents the impact of BRIGHT

- Rel_Score for a village is calculated relative to the threshold score in the department where the village is located
- $f(\text{Rel_Score})$ is a polynomial expansion of Rel_Score; results are robust to a wide range of polynomials
- Regressions were run at the child level. Huber-White standard errors were used to account for within-village correlations

Appropriateness of Evaluation Design

Probability of receiving the BRIGHT programs, by relative score



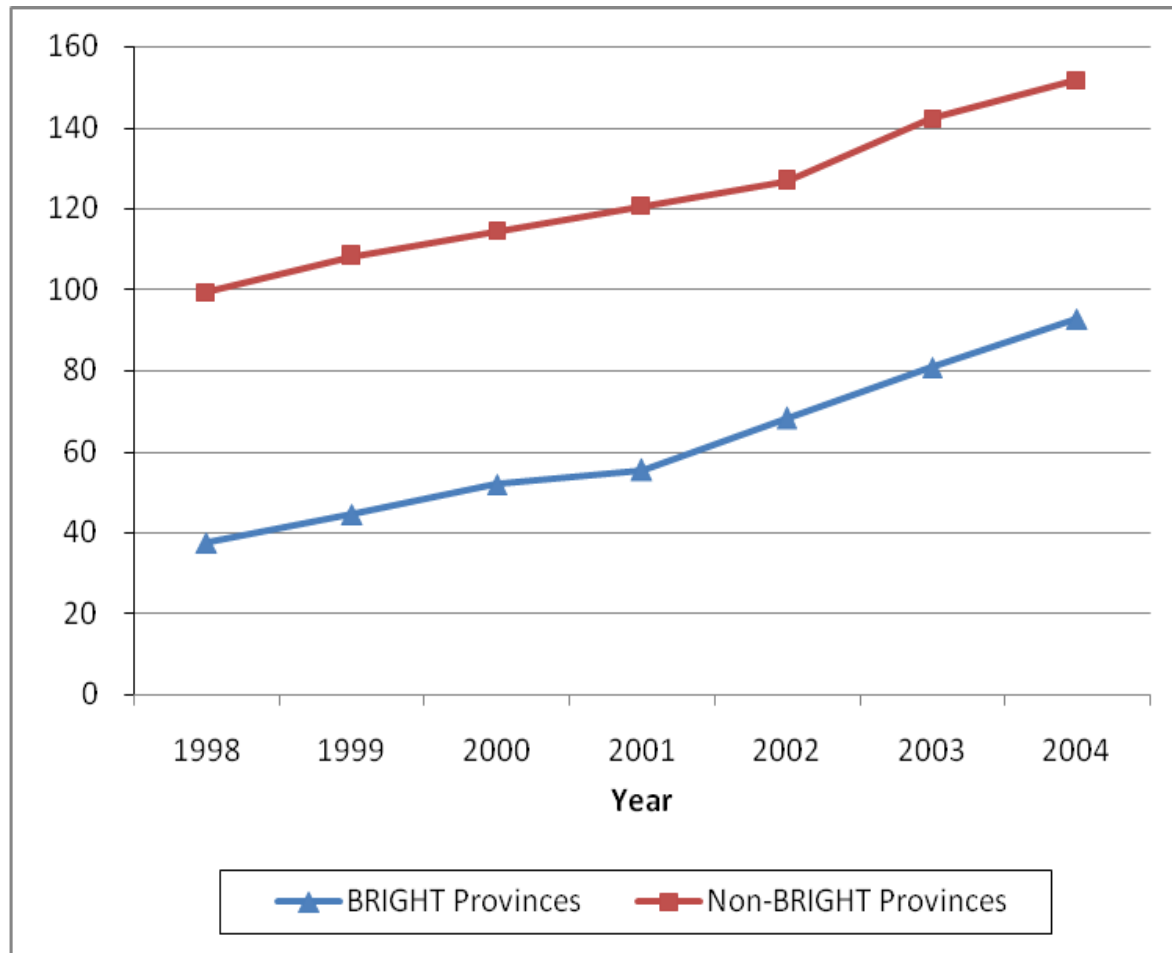
No Discontinuity in Child and Household Characteristics

	Not selected villages	Discontinuity estimate
Child is female (%)	48.3***	1.5pp**
Child of household head (%)	86.9***	-0.1pp
Child's age	10.254***	0.078
House quality index	-0.025	0.180***
Asset index	0.159***	0.004
Number of household members	9.316***	-0.268
Number of children	5.576***	-0.148
Years household in village	36.802***	-0.798

No Discontinuity in Household Head Characteristics

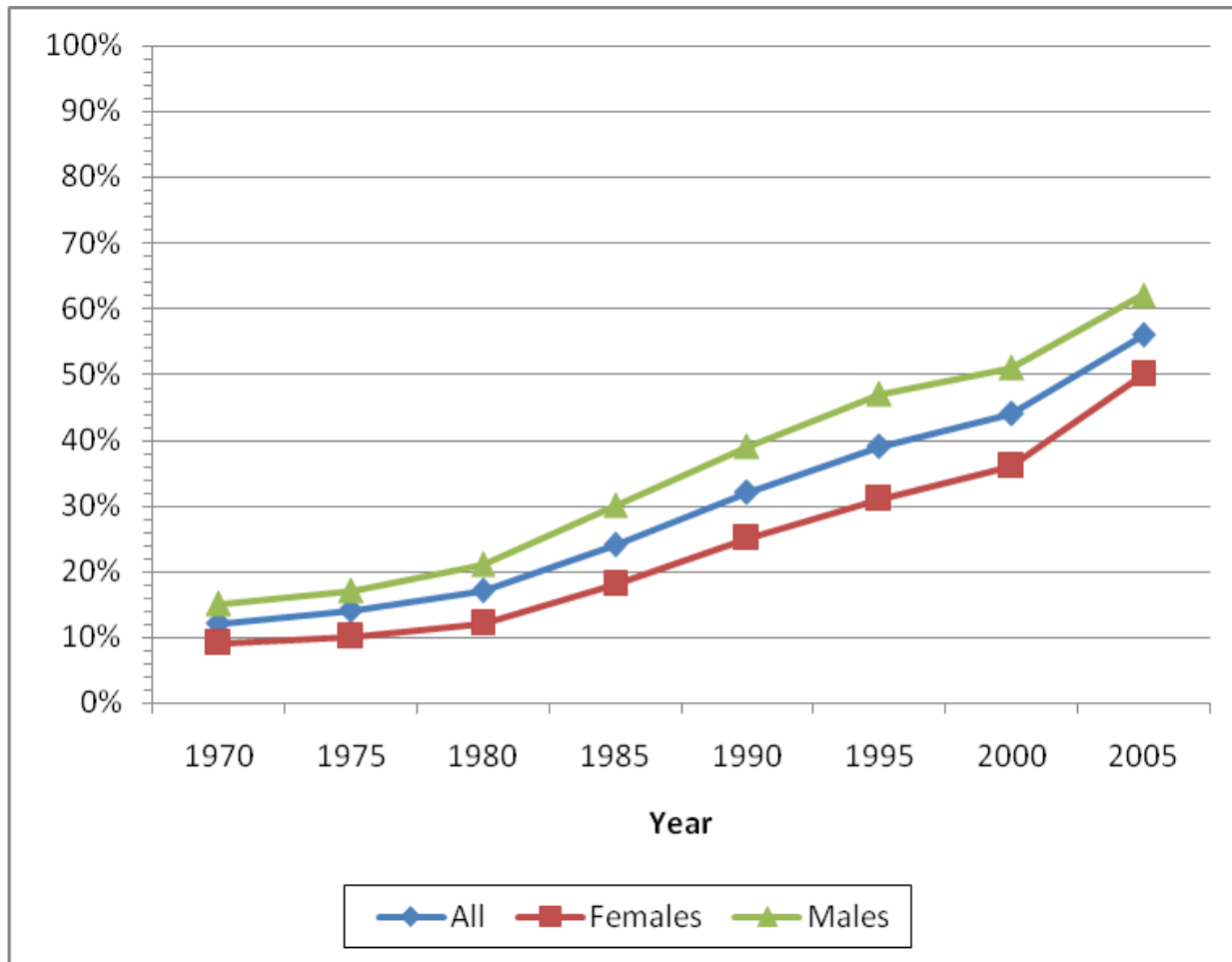
	Not-selected villages	Discontinuity estimate
Has some formal education (%)	12.3***	3.0pp**
Religion:		
Muslim (%)	60.8***	0.2pp
Christian (%)	15.8***	2.6pp
Animist (%)	22.7***	-2.5pp
Ethnicity:		
Mossi (%)	42.0***	3.6pp
Peul (%)	17.1***	3.4pp
Gourmanche (%)	26.1***	-3.0pp
Other (%)	10.0***	-1.0pp

Availability of Primary Schools Was Increasing Prior to BRIGHT



Source: UNESCO Institute for Statistics.

Primary School Enrollment Rate Was Increasing Prior to BRIGHT



Source: UNESCO Institute for Statistics.