

# Improving Primary School Education in India: An Impact Assessment of DPEP I

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# Outline of talk

- Introduction
- DPEP program
- Evaluation problem
- Data
- Results
- Interpretation of results
- Conclusions

# What is common amongst these?

- **NFE**      Non-formal education (1982)
- **OBB**      Operation Blackboard (1986)
- **TLC**      Total Literacy Campaign (1988)
  
- **MDM**      Mid-day meals (1982)
- **SK**      *Shiksha Karmi* (1987)
- **LJ**      *Lok Jumbish* (1988)

# Have these programs had an impact?

Limited evidence!

## Census 1991

- National literacy rate: 52 percent
- National female literacy rate: 39.3 percent
- Female literacy rate in rural areas: 30.6 percent
- Some rural areas, female literacy rate: 11.6 percent
- Scheduled caste literacy rate: 37 percent
- Scheduled tribe literacy rate: 32 percent

## Government of India launches the District Primary School Education Program (DPEP) in 1993-94

- Provide access for all children to primary school or its equivalent non-formal education
- Reduce overall dropout rates
- Increase average learning achievement levels
- Reduce gaps in enrollments, dropouts, and learning among gender and social groups
- Establish capacity at the district, state and national level to plan, manage and monitor program

# Funding of the DPEP

- 85 percent borne by the central government and remainder by the individual states
- Central government's contribution funded by World Bank, EU (Madhya Pradesh), DFID (HP, Orissa, WB and AP) and UNICEF (Bihar) and Netherlands (Gujarat)
- By 2001, US \$1.5+ billion committed to the program and 50 million children covered under the program
- States had to maintain 1991-92 expenditures on elementary education at the state level *but had discretion to re-allocate expenditures across districts*
- At the district level, maximum allowed allocation was US \$8 million (over 7 years) irrespective of school-age population

# Interventions?

Focus on interventions to improve quality of education with construction expenses restricted to 24 percent and management costs to 6 percent

- Community mobilization and participation
  - ◆ Establish Village Education Committees, Mother-Teacher Associations to increase awareness about the importance of primary school education
- Textbook recreation
  - ◆ Develop and introduce textbooks based on minimum levels of learning (MLLs)
  - ◆ Stressed on importance of availability of textbooks in major tribal languages

- Professional development of teachers

- ◆ Most teachers in DPEP schools possess a one year pre-service teacher certification degree. DPEP introduced regular in-service training ranging from 3-20 days.

- Improved classroom practices

- ◆ Teachers were encouraged to make classrooms less intimidating and more sensitive to needs of female and minority children

- Provide early childhood education

- ◆ The expectation was that enrollments and retention of girls would increase by providing alternate sibling care during school hours

- Reform in educational management and planning

- ◆ Strengthen educational planning and management capacities in the project states



## Did the interventions work?

- Objective of this paper is to assess the impact of the DPEP in terms of broad education indicators
- Focus on DPEP Phase-1 districts implemented in 1993-94 in 42 districts across 7 states (Assam, Haryana, Karnataka, Kerala, Madhya Pradesh, Maharashtra, TN)
- 310.5 million dollars were committed over 7 years covering a little over 5 million students

# Evaluation problem

- *Naive estimator* focuses primarily on changes in educational outcomes that have happened *within* DPEP districts -- probably seriously overestimates the impact
- *Simple estimator* compares project with non-project districts -- still incorrect, because project districts were *not chosen randomly*
- *Net impact* of the program -- improvements in primary school education in a DPEP district that can be *ascribed* to the program in addition to improvements that would have happened in “natural course of events”

# Problems faced in evaluating DPEP

## *Data*

- No data collected under the program on non-project districts
- Need to use secondary data. This means that we are able to assess the program in terms of general education indicators like enrollment rates and educational attainments rather than evaluate specific components of the project

## *Program Design and Evaluation Methodology*

- Program placement is not random so comparison of project with non-project districts not feasible.
- Use Propensity Score Methods to adjust for observed differences across treatment and control groups
- Difference in Difference matched estimator:  
$$(P^T - P^C)_{\text{post-program}} - (P^T - P^C)_{\text{pre-program}}$$
- Institutional differences in educational systems across states so have to find controls within states

# Which districts were chosen as treatments?

- Districts with female literacy rates below the national average
- Districts where Total Literacy Campaigns (community sponsored adult literacy programs) had been successfully implemented

# Table 1: DPEP-I Districts

(National female literacy rate: 39.4 percent)

## ASSAM

(Districts in 1991: 23)

1. Dhubri (23)
4. Darrang (30)
5. Karbi Anglong (30)
11. Marigaon (37)

## KERALA

(Districts in 1991: 14)

2. Kasaragod (75)
3. Wayanad (78)
5. Malappuram (84)

## HARYANA

(Districts in 1991: 16)

2. Kaithal (24)
3. Jind (24)
4. Hisar (24)
6. Sirsa (27)

## MAHARASHTRA

(Districts in 1991: 30)

2. Parbhani(23)
3. Nanded (24)
6. Aurangabad (28)
8. Latur (35)
10. Osmanabad (36)

## KARNATAKA

(Districts in 1991: 20)

2. Raichur (16)
6. Kolar (29)
7. Belgaum (31)
8. Mandya (32)

## TAMIL NADU

(Districts in 1991: 22)

1. Dharmapuri (32)
2. South Arcot (34)
5. TSambuvarayar(36)

# MADHYA PRADESH

(Districts in 1991: 47)

3. Rajgarh (9)

4. Guna (10)

5. Sidhi (11)

7. Surguja (13)

8. Shahdol (13)

11. Ratlam (14)

12. Chattarpur (14)

13. Panna (15)

15. Sehore (15)

17. Tikamgarh (15)

18. Dhar (16)

25. Mandsaur (20)

26. Raisen (20)

27. Bilaspur (21)

29. Satna (22)

30. Rajnandgaon (22)

32. Rewa (23)

33. Raigarh (23)

40. Betul (27)

# Data and Variables

## Data:

- Census 1991
- National Sample Survey data for 1993-94 (pre-program) and 1999-00 (post-program)

## Outcome variables:

- School enrollment rates for 5-11 and 12-15 year old (all children, male and female children, children from scheduled caste and tribes)
- Dropout rate for 5-11 year old and 12-15 year old
- Progression from primary to higher levels for 5-9 year old in 1993-94 (11-15 year old in 1999-2000)
- Proportion of children with no education for 12-15 year old
- Proportion of children with completed primary education for 12-15 year old
- Separate MP -- 2 state level interventions -Alternative Schooling and Education Guarantee Scheme – concurrently with DPEP Phase-I



## Table 2: Literacy rates across different sub-populations

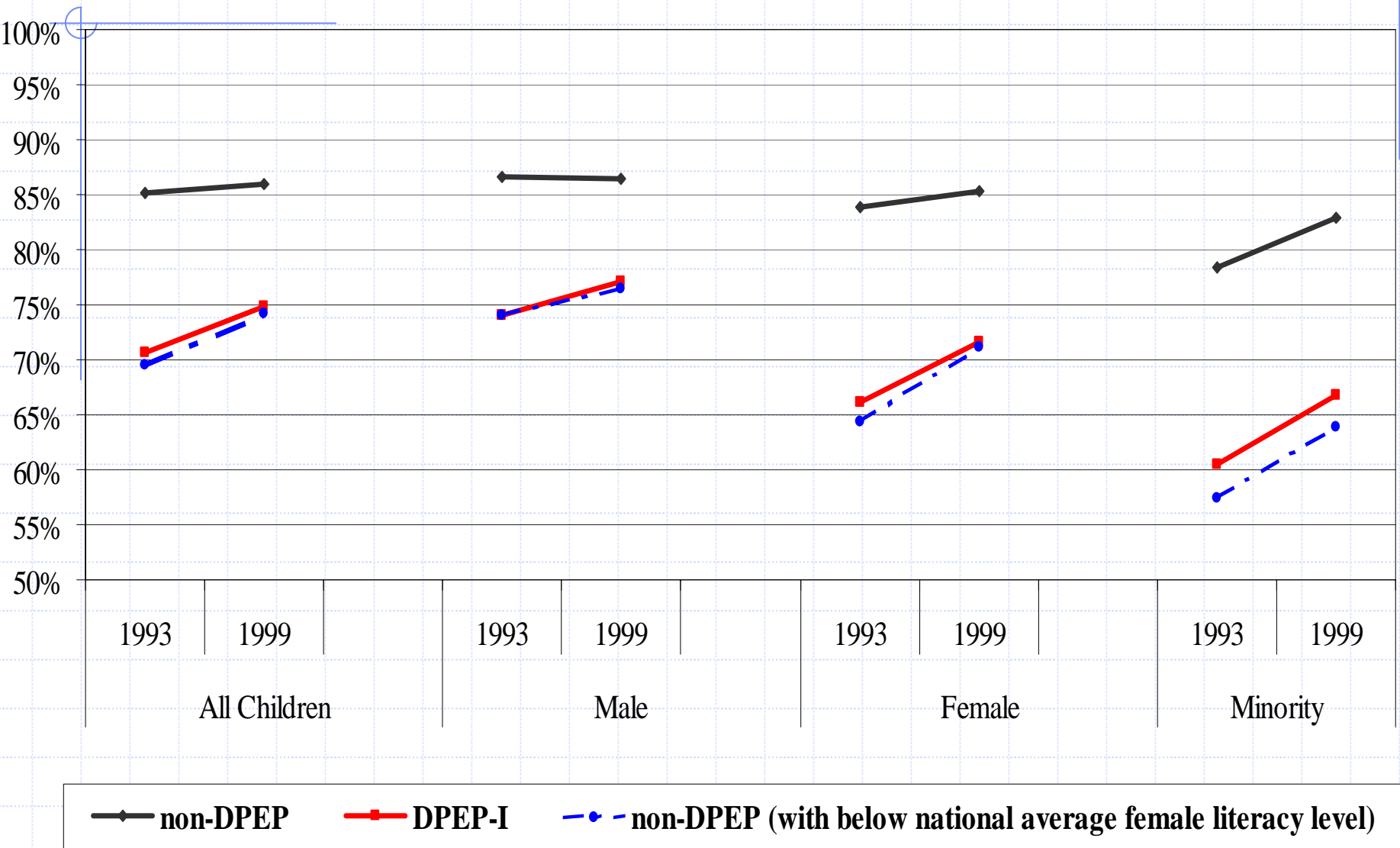
Indicator	DPEP I	Non-DPEP I
Female literacy rates	26.48 (15.7)	39.23 (18.1)
Male literacy rates	55.66 (12.4)	66.69 (11.6)
Scheduled caste (females) literacy rates	21.00 (14.90)	34.49 (19.50)
Scheduled tribe (females) literacy rates	15.89 (13.10)	27.68 (19.80)

Source: Census 1991

# Descriptive Statistics

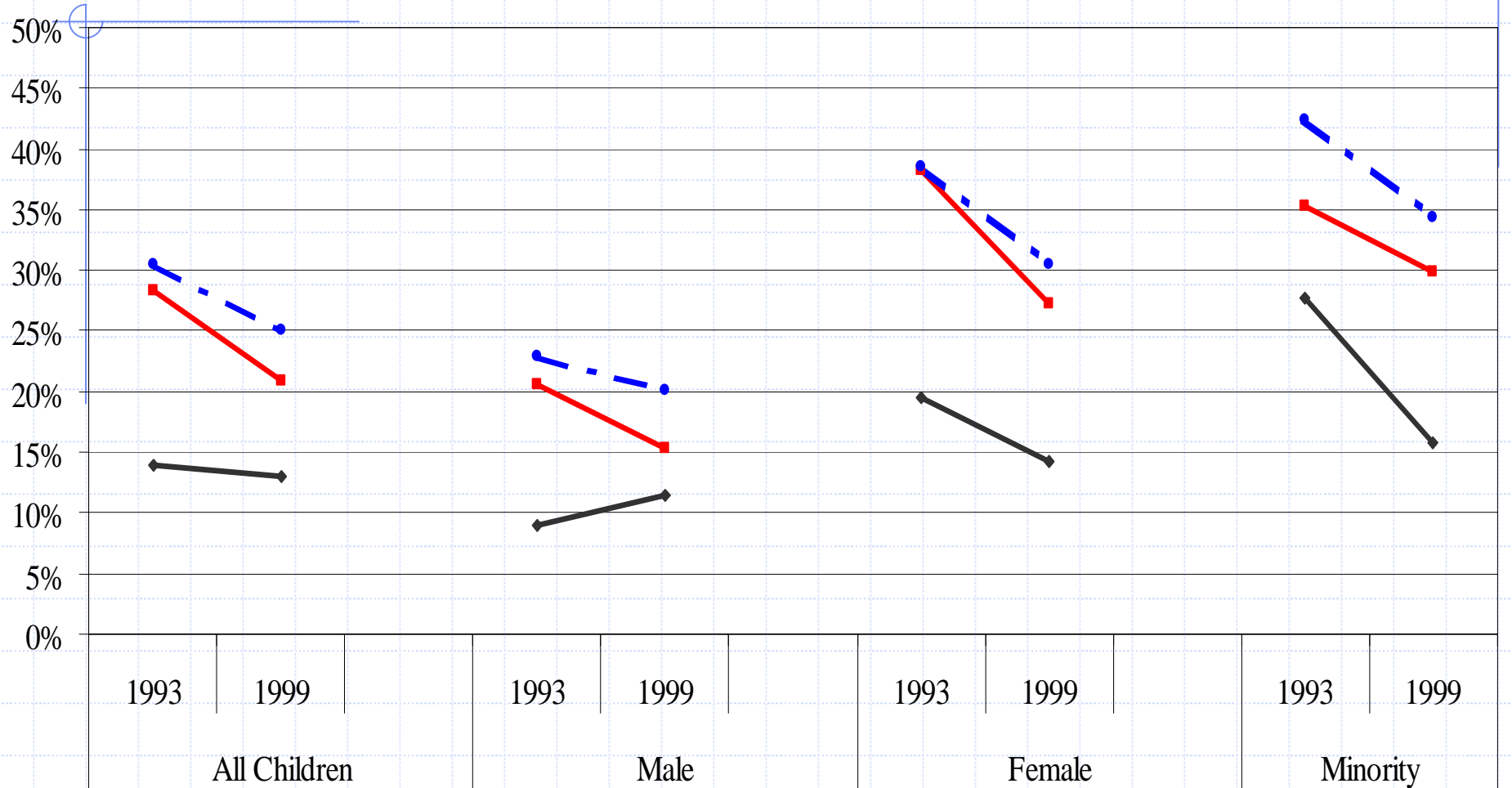
	50 <sup>th</sup> Round (1993-94)		55 <sup>th</sup> Round (1999-00)	
	DPEP	Non-DPEP	DPEP	Non-DPEP
No of households	5,986	12,576	5,438	13,027
Percent of children :5-11 years	15.51	14.60	15.75	14.90
:12-15 years	8.36	8.15	8.86	8.41
Percent of girls :5-11 years	8.32	7.94	8.45	7.77
:12-15 years	3.47	3.42	3.96	3.81
Percent of scheduled tribes	16.7	9.0	18.8	10.6
Percent of scheduled castes	18.0	16.8	19.6	19.4

# Enrollment Rate among 5-11 year old



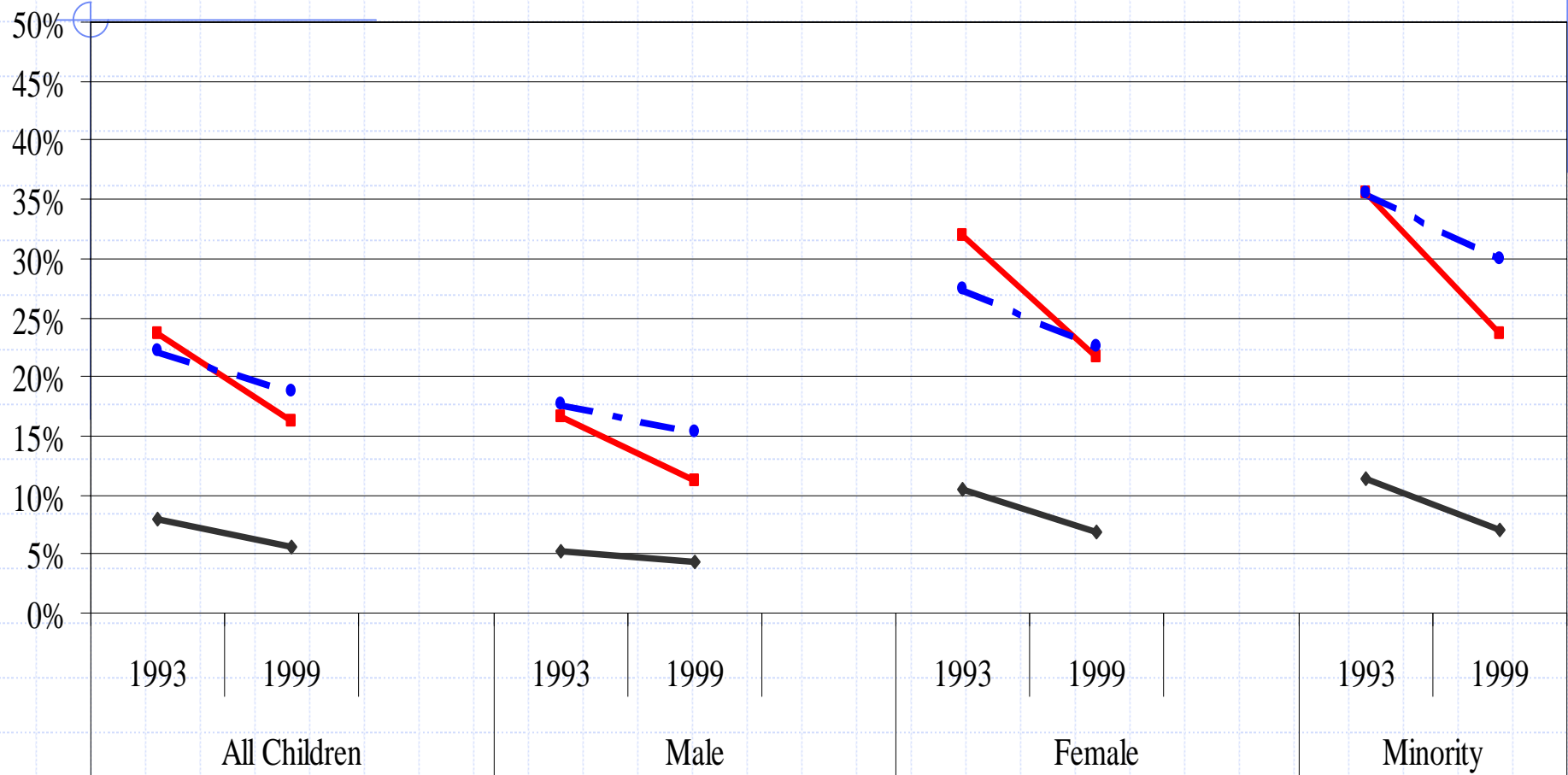
**non-DPEP**    **DPEP-I**    **non-DPEP (with below national average female literacy level)**

# Dropout Rate among 12-14 year old



**non-DPEP**    
 
**DPEP-I**    
 
**non-DPEP (with below national average female literacy level)**

# Proportion of Children among 12-15 years old with No Education



**non-DPEP**     **DPEP-I**     **non-DPEP (with below national average female literacy level)**

# Proportion of Children 12-15 years old with at least Completed Primary Education

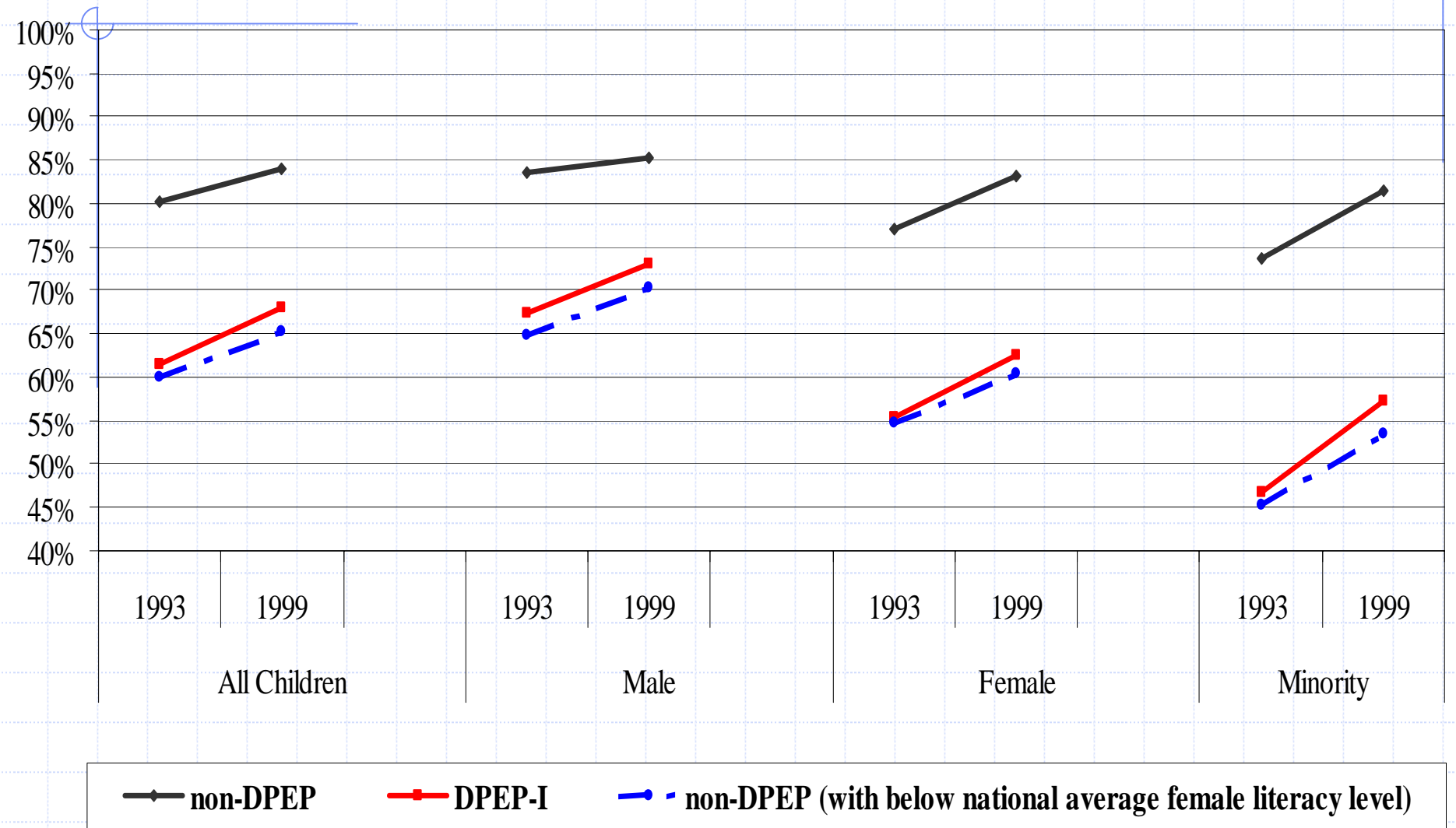


Table 4: Net impacts on enrollments

	5-11 years	12-15 years
All children	1.439 (1.02)	-1.241 (-.65)
Girls	.035 (.02)	.481 (.75)
Boys	-.624 (-.37)	-1.186 (-.52)
Minorities	4.561** (1.65)	-3.527 (.99)
<b>MADHYA PRADESH</b>		
All children	1.799 (.75)	3.382 (1.07)
Girls	-1.359 (-.41)	4.889 (1.04)
Boys	2.856 (1.00)	3.844 (1.04)
Minorities	17.143* (4.55)	9.626* (2.02)

Table 5: Net impacts on dropouts

	5-11 years	12-14 years
All children	-.173 (.13)	-3.263** (1.70)
Girls	1.358 (.71)	-3.831 (1.28)
Boys	.724 (.44)	-.554 (.24)
Minorities	-7.471* (1.96)	18.14* (3.20)

MADHYA PRADESH

All children	-1.147 (.48)	-6.136* (1.90)
Girls	2.506 (.75)	-10.225* (1.98)
Boys	-5.087** (1.79)	-3.613 (.94)
Minorities	-9.168** (1.73)	23.23* (2.98)



## Table 6: Net impacts on cohort progression

Difference between proportion of 11-15 year olds in 1999-00 enrolled in middle or high school and 5-11 year olds in 1993-94 enrolled in primary or pre-primary school

	DPEP I states	Madhya Pradesh
All children	2.651 (1.52)	4.162 (1.48)
Girls	1.568 (.66)	4.287 (1.12)
Boys	5.490* (2.44)	6.080* (2.19)
Minorities	7.324* (2.32)	19.149* (4.63)

Table 7: Net impacts on educational attainment (12-15 years old)

	No education	At least completed primary
All children	-3.837* (2.40)	.600 (.35)
Girls	-1.452 (.58)	4.147 (1.50)
Boys	-5.139* (2.85)	.497 (.21)
Minorities	1.235 (.37)	-9.744* (2.72)
<b>MADHYA PRADESH</b>		
All children	-6.450* (2.25)	5.414** (1.72)
Girls	-4.072 (.91)	12.480* (2.65)
Boys	-10.243* (3.28)	5.249 (1.314)
Minorities	-2.411 (.52)	-1.175 (.25)

# Interpretation of coefficient estimates

- Optimal amount of schooling is given by:

$$s = T - \frac{1}{(r-g)} \ln \left[ \frac{\theta}{\theta - \mu(r-g)} \right]$$

- *s=years of schooling, T=age of retirement, r=interest rate,  $\theta$ =returns to education, g=growth rate,  $\mu$ =ratio of private direct costs of schooling to opportunity cost of school time*
- DPEP provided additional \$9.1 per student per year in program districts. If average annual cost of educating a primary school student for one year is between \$20-\$50, then additional \$9 would lower costs by 20 to 40 percent.
- Calibrated estimates of DPEP on years of schooling: (T=60, r=.05, g=.025)

## DPEP funds represent:

	20 percent fall	Translating into increase in enrollment rates
$\theta = .1$	1.7	27.2 percentage points
$\theta = .2$	0.8	12.8 percentage points

# Potential problems with this interpretation

- Assumption is that DPEP funds represented a net increase in school spending in the program districts
  - *There is evidence that this is true at the state level, but no information about districts within the state. It was within the rights of the States to **re-allocate** expenditures across districts*
- DPEP emphasized improvements in school quality only with limited funds devoted to new school construction
  - *Improve **already enrolled** student's welfare without translating into increased enrollments*
- “District Collector” effect
  - *District collectors may move between districts in a state and carry the “DPEP human capital” that **diffuses** program effects*

# Conclusions

- Net program impacts on minority children are the most impressive especially in the state of Madhya Pradesh
- No impacts on girls especially on their enrollments. Limited impacts on other indicators
- Was 300 million dollars (cost of DPEP-I) wasted? **“NO”**. DPEP introduced a new approach to primary school interventions in India that cannot be well assessed from secondary data
- **Interventions must be accompanied by adequate data collection**