

AREC 345: Global Poverty & Economic Development

**Lecture 18:**  
**School Quality**

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Improving School Quality

## The Production of Human Capital

**What are the inputs needed to generate human capital in schools?**

- Students
- Teachers
- Physical capital (classrooms, desks, textbooks, etc.)

**Improving learning outcomes must involve one of the following:**

- Increasing the quantity or quality of one of the inputs
- Reorganizing the way inputs are used

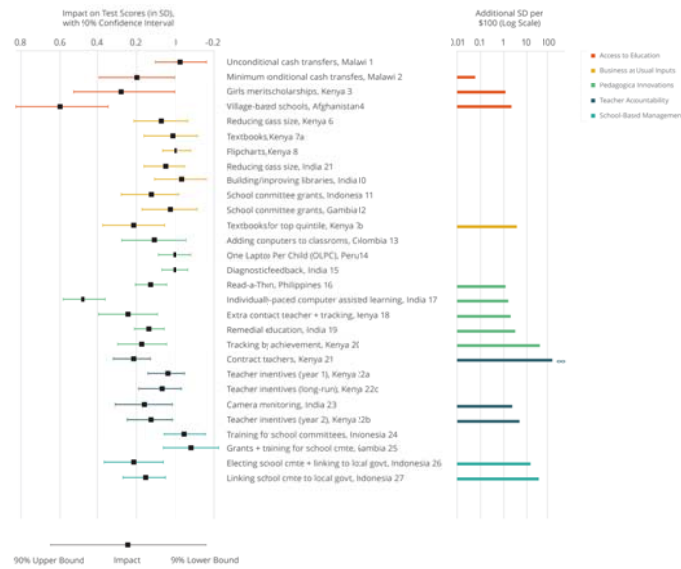
## Improving Physical Capital in Schools

**Good ideas that do not improve test scores:**

1. Building and improving libraries (India)
2. Free lunches in school (Kenya)
3. Distributing textbooks to students, classrooms (Kenya)
4. Distributing flipcharts to classrooms (Kenya)
5. Grants to school committees (Gambia, Indonesia, Kenya)
6. Introducing computers in classrooms (Colombia)
7. One Laptop Per Child (Peru)

**Conclusion:** unfortunately, there is little to no evidence that providing additional inputs has a significant positive impact on student test scores

## Improving Physical Capital in Schools



## Teachers Are Important, Too

Reducing absenteeism among teachers:

- Teachers are absent about 1 day per week
- Surprise visits suggests they are frequently “not teaching”
- Teachers are unionized gov’t employees
- Interventions aimed at improving attendance have not worked
  - ▶ Head teachers typically do not punish absence
  - ▶ Parents may not have sufficient bargaining power

What can be done to make teachers more effective?

## Reducing Class Size?

Class sizes in government schools are typically large

- Free primary education often leads to increases in class size: median class size in first grade in rural Kenyan primary schools is around 75

Does lowering class size improve educational outcomes?

- Teachers may be less effective in large classes
- Discouraged teachers may exert less effort

Problem: teachers are gov't employees, and they are expensive

- Potential solution:

## Reducing Class Size?

The **Extra Teachers Project** randomly assigned contract teachers to Kenyan primary schools's first grade classes, reducing class size

- 70 schools randomly assigned to control group
- 36 were randomly assigned to receive contract teachers
  - ▶ Within the treatment group, Grade 1 students were randomly assigned to either teachers' union teacher or contract teacher

**Research Questions:**

- Does the ETP program improve student outcomes?
- How do contract teachers compare to gov't teachers?

## Are the Treatment, Comparison Groups Similar?

	(1)		(2)	
	Comparison schools		ETP only schools	
	Mean	Std. dev.	Mean	Std. dev.
<i>Panel A. School characteristics prior to program inception</i>				
Primary school exit exam score (out of 400)	260	29	258	26
Total student enrollment, 2004	598	241	646	266
Number of TSC teachers, 2004	12	4	12	4
School-level pupil/teacher ratio, 2004	43	12	46	16
Average enrollment in grade 1, March 2005	95	41	93	34
Proportion of female grade 1 students, March 2005	0.51	0.06	0.49	0.06
Average enrollment in grade 2, March 2005	97	43	98	37
Class-based (rather than subject-based) assignment of TSC teachers <sup>a</sup>	0.03	0.18	0.03	0.17
Proportion of female teachers among TSC teachers, March 2005	0.71	0.46	0.69	0.46
Years of experience among TSC teachers, March 2005	17.04	9.26	15.03	8.97
Average age among TSC teachers, March 2005	43.17	8.49	41.84	8.81

## Regression Specifications

Because treatment is randomly assigned, we can interpret differences in outcomes (treatment vs. control) as the causal impact of the program

- Schools assigned to either the ETP treatment or the control group
- In ETP schools, students assigned to either regular government teacher or contract teacher brought on through the program

**Comparing ETP schools to control group schools:**

$$E[\text{Score}_j] = a + b \cdot \text{ETPSchool}_j$$

**Comparing gov't teachers in ETP to contract teachers, control:**

$$E[\text{Score}_j] = a + b \cdot \text{GovtTeacher}_j + c \cdot \text{ContractTeacher}_j$$

## Impacts on Student Outcomes

	(1) In class at spot check	(2) Math score	(3) Literacy score
Assigned to ETP	0.002 (0.013)	0.133 (0.083)	0.123 (0.106)

Overall, the ETP program did not improve attendance or performance

- ⇒ Lowering class size is not enough to improve test scores
- ⇒ Though coefficient estimates are positive and fairly large

## Impacts on Student Outcomes

	(1) In class at spot check	(2) Math score	(3) Literacy score
ETP: gov't teacher	-0.006 (0.013)	0.012 (0.081)	0.063 (0.112)
ETP: contract teacher	0.011 (0.013)	0.256*** (0.096)	0.185 (0.113)

However, contract teachers appear to have improved test scores

- Units are standard deviations to test scores; effects are large
- Mechanism does not seem to be through student participation

## Impacts on Teacher Effort

	(1) Teacher at school	(2) Teacher teaching	(3) Teaching, if at school
ETP: gov't teacher	-0.017 (0.024)	-0.157*** (0.038)	-0.174*** (0.040)
ETP: contract teacher	0.011 (0.037)	0.117** (0.047)	0.143*** (0.049)

Contract teachers exert greater effort than gov't teachers

- The ETP program **reduced** effort among gov't teachers

## The Extra Teachers Project: Takeaways

### Improving student outcomes is harder than increasing attainment

- Educational inputs typically have no effect on achievement
- Contract teachers can improve test scores, but potential gains are undermined by reduced effort among government teachers

Results contrast with major success stories in child health and schooling attainment (deworming, bednets, school construction, bikes, etc.)

- Systemic reform is much harder than input provision

## Absenteeism & Public Service Delivery

### How Big of a Problem is Absenteeism?

World Bank's **World Absenteeism Survey**:

- Surprise visits to schools, health clinics in 6 countries
- Document rates of unexplained absence among scheduled workers
- Ignores that fact that workers are often present but not working

For comparison:

- Teachers in New York State are absent 5 percent of the time
- Unionized factory workers in India are absent 10 percent of the time



## How Big of a Problem is Absenteeism?

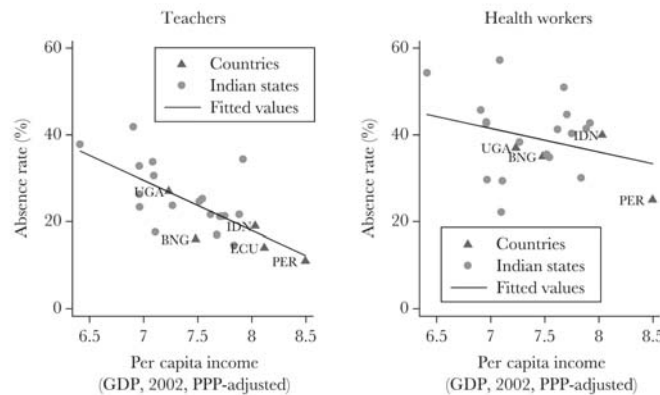
### Provider Absence Rates by Country and Sector

	Absence rates (%) in	
	Primary schools	Primary health centers
Bangladesh	16	35
Ecuador	14	—
India	25	40
Indonesia	19	40
Peru	11	25
Uganda	27	37
<b>Unweighted average</b>	<b>19</b>	<b>35</b>

*Notes:* Providers were counted as absent if they could not be found in the facility for any reason at the time of a random unannounced spot check (see text for further detail). In Uganda, the sampled districts were divided into subcounties, and schools in subcounties with level III health centers comprise the school sampling frame. This sampling strategy may have had the effect of understated slightly the national absence rate there, given that schools in more rural areas appear to have higher absence rates.

## Absenteeism is a Bigger Problem in Poorer Regions

### Absence Rate versus National/State Per Capita Income



*Source:* Authors' calculations.

*Note:* BNG = Bangladesh; ECU = Ecuador; IDN = Indonesia; PER = Peru; UGA = Uganda. India's national averages are excluded, due to the inclusion of the Indian states. For Indian states, incomes are the official per capita net state domestic products.

## Why Are Teachers Absent?

Stated Reasons for Teacher Absence						
<i>(% of those absent)</i>						
	Uganda	Bangladesh	India	Indonesia	Ecuador	Peru
Official work	21.3	53.5	33.5	18.7	24.5	12.7
Sick	14.5	9.5	6.1	13.0	12.9	9.3
Authorized leave	19.3	32.8	27.3	23.6	9.9	13.9
Collect salary	--	--	1.2	--	--	2.3
Left early/arriving late	19.3	2.2	4.9	12.7	9.3	2.3
Other reasons	4.0	--	--	3.7	1.1	8.1
Unauthorized absence	21.7	1.5	27.3	28.2	42.3	51.7
<i>Total Absence</i>	<i>100</i>	<i>100</i>	<i>100</i>	<i>100</i>	<i>100</i>	<i>100</i>

Note: Table gives the share of total absences for which each of the listed reasons was given by the facility director or other respondent.

Bosses condone absenteeism by allowing teachers (and nurses) to spend large amounts of time away from work, doing un-monitored activities

## Who Is Absent?

Is this simply a case of a few (or many) bad apples?

- One extreme case: **ghost workers** who don't actually exist
  - ▶ Prediction: workers are either always present or never present
- Other extreme: all workers are equally likely to be absent
  - ▶ Assume the probability that a worker is absent is  $x < 1$
  - ▶ Prediction: after 2 visits...
    - ▶ Probability of 0 absences is  $(1 - x)^2$
    - ▶ Probability of 1 absence is  $2x \cdot (1 - x)$
    - ▶ Probability of 2 absences is  $x^2$

## Who Is Absent?

### Distribution of Absences Among Providers

	Percentage of providers who were absent this many times in 2 visits (3 visits in India)				For comparison: expected distribution if all providers had equal absence probability			
	0	1	2	3	0	1	2	3
<b>Teachers</b>								
Bangladesh	73.4	23.5	3.2	—	70.6	26.9	2.6	
Ecuador	82.8	6.9	10.4	—	74.0	24.1	2.0	
India	49.1	32.7	13.5	4.8	42.2	42.2	14.1	1.6
Indonesia	67.7	27.5	4.8	—	65.6	30.8	3.6	
Peru	81.0	17.3	1.7	—	79.2	19.6	1.2	
Uganda	63.0	29.6	7.4	—	53.3	39.4	7.3	
<b>Medical workers</b>								
India	35.7	31.9	20.8	11.6	21.6	43.2	28.8	6.4
Indonesia	46.1	41.0	12.9	—	36.0	48.0	16.0	
Peru	56.4	33.5	10.1	—	56.3	37.5	6.3	
Uganda	52.0	38.0	10.0	—	39.7	46.6	13.7	

*Notes:* The left side of this table gives the distribution of absences observed for each type of provider in each country. For example, it shows that during two survey visits, 73.4 percent of teachers in Bangladesh primary schools were never absent; 23.5 percent were absent once; and 3.2 percent were absent during both visits. The right side of the table provides, for comparison, the distribution that would be expected if all providers in a country had an identical underlying absence rate equal to the average rate observed for that country. Bangladesh health workers are excluded, because the first-round survey was carried out for a different study, making it impossible to match workers across rounds and show the empirical distribution.

## Addressing Absence

Simple solution to reduce absenteeism: change incentives

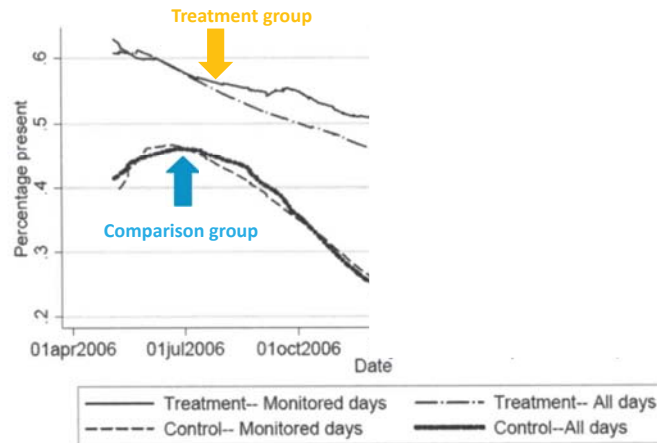
- Tie teacher, health worker salaries to attendance at work
- Similar program worked well in a small pilot study in NGO-sponsored non-traditional education centers in rural India

In 2006, Indian NGO Seva Mandir launched a program to monitor assistant nurse midwives (ANMs) in a random sample of health clinics

- Nurses required to sign and stamp logs three times a day
- Ministry of Health agreed to penalize those nurses who were absent (without an excuse or explanation) more than half the time
- Nurses required to sign and stamp logs three days per week

## Did the Program Reduce Absenteeism?

Large impacts on nurse absenteeism



## What Went Wrong?

Two types of days became more and more common

- Exempt days — worker indicates on the form that she is doing something else that counts as work, health official approves
- Machine malfunctions — many machines showed signs of tampering

Lesson: it is very difficult to impose a cost when a behavior is seen as socially acceptable by those involved (both nurses and their bosses)

- This intervention is much more complex than delivering bednets
  - ▶ Instead of giving something away, attempting to remove a privilege
  - ▶ Relies on local enforcement mechanisms that may not work
- One of many examples of failed attempts to reduce absenteeism

## Study Guide: Key Terms

- contract teachers
- absenteeism
- ghost workers