

The Supply and Demand of Public Goods

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14.750x



Examples of public goods

- Roads
- Hospitals
- Schools
- Others?

Why does the state supply public goods?

- What are alternatives?
 - ?
 - ?
- What is the case for state funding?
 - ?
 - ?
- What is the case for state production?
 - ?
 - ?

Exploring failure in public education

- Education and health are two canonical public goods
- Most countries have some version of public action in education and health
- How to assure the quality of the output?
 - ▣ Why is this different from a car or peanut butter?

Background

- Across the developing world, dramatic increases in access to primary schooling
- Yet being in school does not seem to imply that children are learning
 - ▣ According to ASER, 59% of 4th graders and 44% of 5th graders in India read below 2nd grade level
 - ▣ 76% of 4th graders and 63% of 5th graders cannot do simple division
 - ▣ Very similar results in Pakistan (LEAPs report), Kenya (Duflo, Dupas, and Kremer), and Ghana

Theories?

- ❑ Lack of inputs (textbooks, etc.)
- ❑ Shortage of teachers
- ❑ Teaching/pedagogy
- ❑ Lack of demand
- ❑ Distorted beliefs
- ❑ (Health/Early childhood development)



Evidence on Inputs

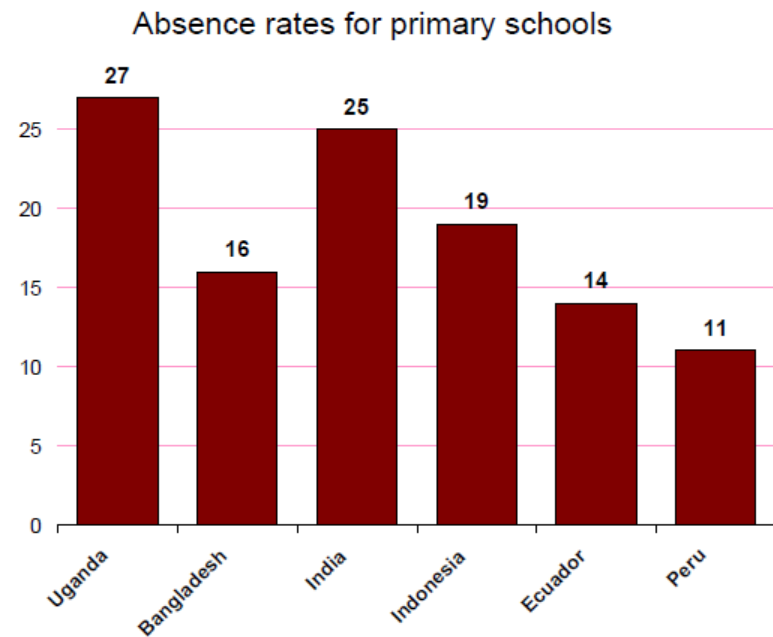
- Multiple studies by Kremer et al. in Kenya
- Essentially none found any impact
- Limited exception: textbooks matter for the best performing children
- On the other hand, access to school definitely matters (e.g. Duflo in Indonesia, Linden on village-based schools in Afghanistan)

Evidence on Student-Teacher Ratio

- Very little evidence of a positive effect
- Early RCT in Udaipur (Banerjee, Kremer, Jacob)
 - ▣ 20 randomly selected schools received extra teacher
 - ▣ School attendance went up, test scores unchanged
- Balsakhi Program in Mumbai and Vadodara (Banerjee et al.)
 - ▣ Pull-out program for remedial education
 - ▣ No improvement in those predicted to be left behind
- Similar results in Kenya (Duflo, Dupas, Kremer)

Teachers

- High absence rates documented in many countries (World Absenteeism Survey)
- Even when present, teachers often not teaching



Teachers: Reducing Absenteeism

- ❑ Camera monitoring in Rajasthan (Duflo, Hanna, and Ryan) - pay linked to attendance
- ❑ Teacher absence fell from 42 to 21 percent
- ❑ Test scores increased 0.2 standard deviations



Teacher Incentives

- Andhra Pradesh: small bonus ($\sim 3\%$ annual salary) for improvement in classroom-level or school-level test scores (Muralidharan and Sundararaman)
- After 2 years, increase of 0.27 s.d. in individual incentive schools, 0.16 s.d. in group incentive schools
- Much larger increases cumulatively after five years.
- No increase in attendance - channel was more teacher effort
- No evidence of teaching to test; contrast with Kenya results (Glewwe, Ilias, and Kremer)

Pedagogy: Teaching the child where she is

- Balsakhi Program mentioned earlier
- High school-educated local tutors, paid 1 000 Rs/month
- Large effects on test scores of lowest performing children: 0.6 s.d. after two years



Pedagogy: Teaching the child where she is

- A number of studies of Pratham's programs (Banerjee et al.)
 - ▣ In Jaunpur, Pratham recruited volunteers to teach “camp” for 2 months
 - ▣ Child who could read a letter at baseline were 26 percentage points more likely to read and understand a story compared to control
 - ▣ Similar results for Bihar volunteers:
 - works even for students who can read well
 - ▣ “1 sd” gains for attending summer schools

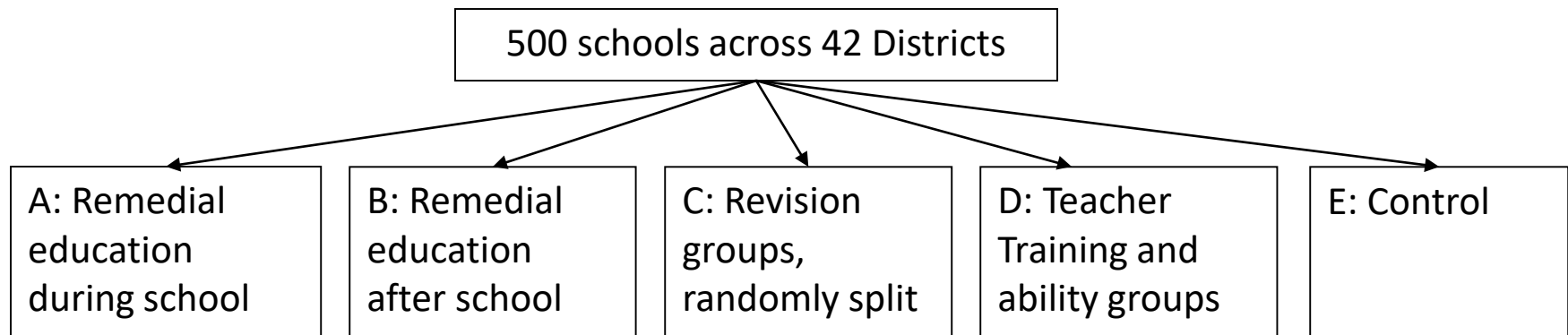


Teacher Community Assistant Initiative

- RCTs in India and Kenya: Focusing instruction at the child's level is key.
- How to adapt those ideas in a different context?
- A partnership with the Teachers Association, the Ghana National Association of Teachers and the Youth Employment Program

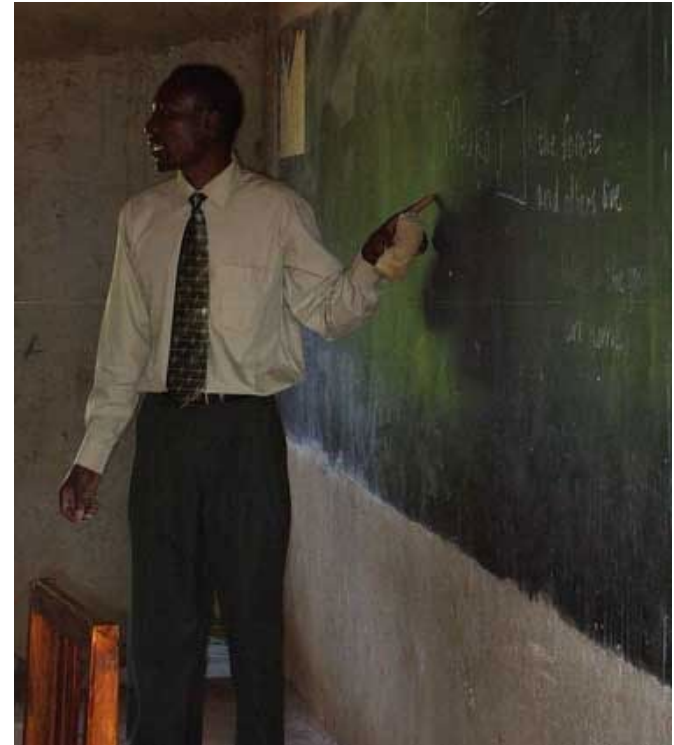


- Remedial education improved learning outcomes (especially basic skills) after 10 weeks.
- Impact overall highest after school – but higher during school when better school conditions.
- Teacher training had a small positive effect, but only on basic literacy in upper half of the class.



Tracking

- Schools in Kenya: huge class sizes
- Extra local teachers hired
 - ▣ Some randomly chosen classes split based on past student performance
 - ▣ Others divided randomly
 - ▣ Children in both tracked classes did better at all points in the distribution (0.2 s.d.)



Lack of Demand?

- Some evidence of low parent/child motivation
- Child attendance rates in ASER around 70 percent on days when school is open
- If you are totally lost in class, hard to be motivated
- Jaunpur program: only 8 percent of children attended camp
- No evidence that “school report cards” make any difference

Direct Evidence on Demand Effects

- Girls Scholarships in Kenya (Kremer, Miguel, and Thornton)
 - ▣ \$20 scholarship for girls in the top 15 percent of test scores
 - ▣ Effect of 0.2 s.d. on girls
 - ▣ Increase in teacher effort
 - ▣ Effect of 0.1 s.d. on boys and girls unlikely to win prize



Information and Demand

- Information about call center openings increased school participation for girls in India (Jensen)
- In Dominican Republic, perceived returns to schooling very low despite higher measured returns; students given information on returns completed more schooling (Jensen)
- Information for parents on average return to education in Madagascar (Nguyen)
 - ▣ 0.2 s.d. gain in test scores overall
 - ▣ 0.4 among parents who underestimated returns

Could it be all demand?

- One way to look at this is children who go to private schools - Lots of self-selection
 - ▣ Private school kids do better, but is it better education or selection?
 - ▣ Less of an issue in South Asia with \$1/month private schools
 - Voucher experiment in Andhra Pradesh
 - Muralidharan and Sundararaman
 - Randomly assigned school vouchers to families.
 - ▣ Useable at local private schools
 - No net effect on outcomes
 - ▣ Math, Telugu a little worse, more English, Hindi
 - Much cheaper
-

On the Other Hand...

- Much bigger effects from pedagogical interventions
 - ▣ In other words, private school teaching is much less effective, at least in improving the performance of the weakest children, than these often brief interventions by motivated but poorly trained teachers
- Suggests that demand is not the only problem
- What could be going on?

What Could Be Going On: Hypotheses

- The universally shared (public/private) pedagogy is grossly inappropriate
- Based on covering material rather than learning
 - ▣ Right to Education (RTE) in India legislates that schools must cover a fixed syllabus



What Could Be Going On: Hypotheses

- Results consistent with a theory that parents (incorrectly) see schooling as a lottery with long odds
- Parents and teachers take ability mostly as a given, focus on top students only
- Self-fulfilling prophecy: kids who miss something early on never catch up. Everyone decides they are stupid, gives up.

What Could Be Going On: Hypotheses

- This helps explain:
 - ▣ Why being in school generates learning but decreasing student-teacher ratios does not
 - ▣ Why textbooks only work for the best children
 - ▣ Why small teacher incentives work but private schools don't
 - ▣ Why children don't come to school and eventually drop out
 - ▣ Why remedial education is so effective
 - ▣ Why tracking works
 - ▣ Why government teachers perform so differently in summer schools
 - ▣ Why (accurate) information on returns to schooling increases attendance and test scores

Explaining failure in public health

- Strong theoretical reasons for why unregulated provision of health care by the private sector may be sub-optimal
 - ?
 - ?
- How is this different from education?
 - ?

Healthcare in Low-Income Settings

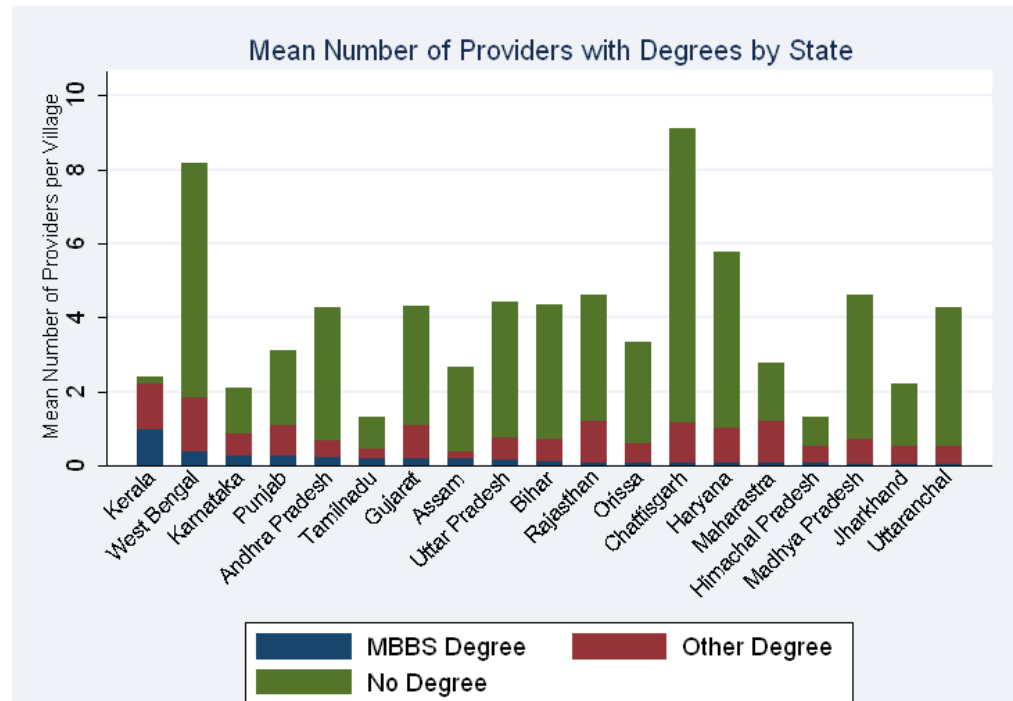
- Default view: Public clinics that provide free/highly-subsidized care for those who seek it
- Widely followed WHO norms on facilities and staffing (District hospitals, CHCs, PHCs, Sub-centers)
- Policy discussions: Large emphasis on strengthening this system
- India: National Rural Health Mission (NRHM) significantly increased public health expenditures during last decade
 - ▣ Better infrastructure, more providers in public clinics

But usage data (2009-10)...

- 80% of first-contacts (primary care) in India are with the fee-charging private sector: not covered by insurance.
- 77 percent of private providers in rural areas do not have a medical degree
- Public providers are more qualified, and offer free services, but have a ~20% market share!

77% of providers have no degree, 18% have some other degree (BAMS, BIMS, BUMS, BHMS), and only 4% have an MBBS degree (roughly equivalent to MD in the U.S.).

Average village has 3.36 providers with no degree, 0.80 providers with some degree, and 0.18 providers with an MBBS degree.



What is Going On?

- Hypothesis 1: High private share reflects non-availability of public options (and lack of adequate spending in the publicly-run health sector)
- Hypothesis 2: People do not know what is good for them. Two variants:
 - 'Fooled' by private providers, who are mostly 'quacks' with worthless treatments
 - Offer unnecessary medication that a well-regulated public sector will NOT provide in the patients' best interest
 - Example: Demand for injections/steroids leads to private sector delivering lower (medical) quality for higher cost
- Hypothesis 3: Usage shares reflect poor incentives and governance in the public sector

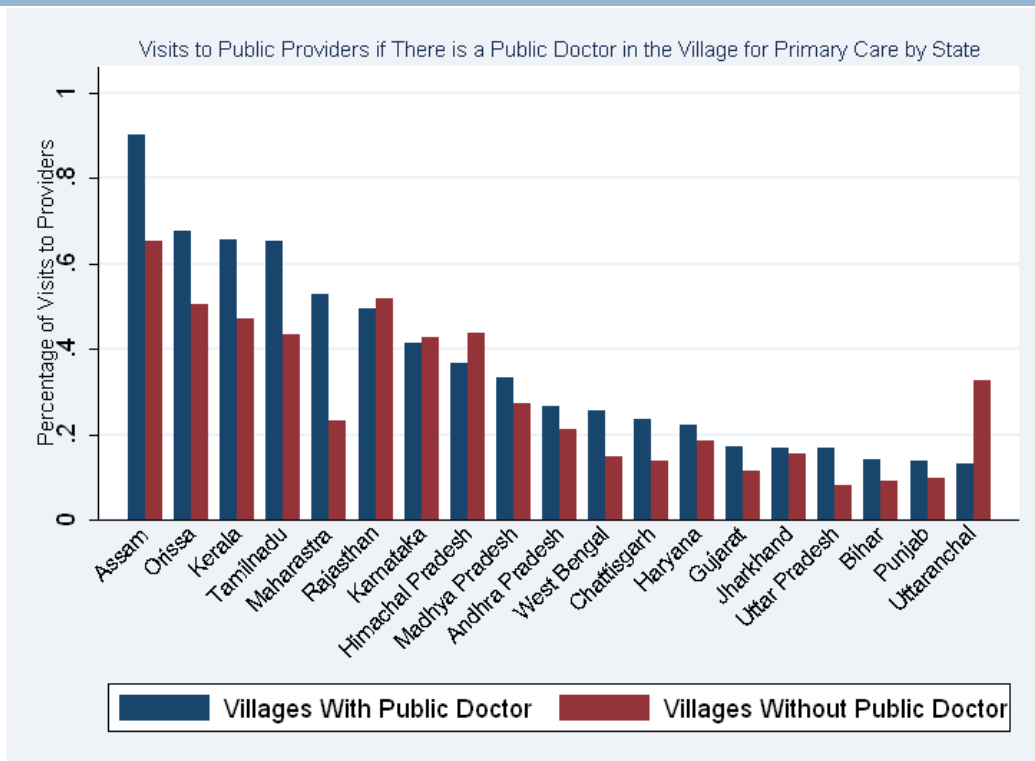
Access is only a small part of the story

Public share increases from 20% to 35% in villages where there is a public healthcare provider

But households still visit private providers in 65% of primary care cases.

So lack of 'access' to a public facility cannot be the main reason for the high market share of fee-charging private providers (who are typically LESS qualified)

What else?



Measuring quality

- Month 1: Standardized Patient (SP) visits healthcare provider and says: “Dr., I woke up this morning with crushing chest pain and I was feeling very anxious”
 - ▣ Answers questions, completes basic exams and provider recommends a treatment
 - ▣ Previous studies demonstrate low detection rates and show that provider behavior is consistent with their believing the SP
 - That is, providers do not come to the conclusion that the SP is “faking it”—in fact, the more they do with the patient, the more they are convinced that the SP has the condition that they are presenting with
- Months 3-6 (after completion of all SP cases): 2 surveyors visit the same provider and complete a test of knowledge using medical vignettes
 - ▣ Surveyor 1: Surveyor 2 will act as a patient who has come to you. You should try and behave exactly as you would with a real patient.
 - ▣ Surveyor 2: “Dr., I woke up this morning with crushing chest pain and I was feeling very anxious”
 - ▣ Provider asks questions, completes basic exams and recommends a treatment. Answers given by the hypothetical patient are identical across SPs and medical vignettes
- Compare performance in the clinical interactions with performance in the medical vignettes

Study Samples: Conditions covered and types of studies

Table 1: Description of the sample

Context	(1) Sample size	(2) Geography	(3) Sampling	(4) Sector coverage	(5) Type coverage	(6) Case 1	(7) Case 2	(8) Case 3	(9) Case 4	(10) Medical vignettes	(11) Repeat vignettes
Madhya Pradesh, India	939	Rural	Random	Public, private	Trained and untrained	Asthma	Diarrhea	Angina	-	Yes	Yes
Birbhum, West Bengal, India	396	Rural	Linked to experiment	Private	Untrained	Asthma	Diarrhea	Angina	-	Yes	Yes
Delhi, India	250	Urban	Purposive	Private	Trained and untrained	TB1 (naïve)	TB2 (naïve+)	TB3 (sputum +ve)	TB4 (MDR)	Yes	No
Mumbai, India	1583	Urban	Random	Private	Trained and untrained	TB1 (naïve)	TB2 (naïve+)	TB3 (sputum +ve)	TB4 (MDR)	No	-
Patna, India	1019	Urban	Random	Private	Trained and untrained	TB1 (naïve)	TB2 (naïve+)	TB3 (sputum +ve)	TB4 (MDR)	No	-
China	299	Rural and small towns	Random	Public	Trained and untrained	TB1	-	-	-	Yes	No
Nairobi, Kenya	166	Urban	Purposive	Public, private	Trained and untrained	Asthma	Diarrhea	Angina	TB1	No	-

Characterizing incorrect and over-treatment:

Definitions

- Call the correct treatment vector **A** (example for angina, “take aspirin, get an ECG”)
- Define:
 - ▣ **Correct Treatment:** Patient receives (at least one element of) **A** and nothing else; Example: “Get an ECG”
 - ▣ **Over treatment:** Patient receives **A** and **B**; Example: “Get an ECG and buy some antibiotics”)
 - ▣ **Incorrect Treatment:** Patient does not receive **A**; she could still receive **B**.
 - Set that can range from: “You need a knee X-ray and here are some antibiotics” to “Buy some pain medication”

Characterizing incorrect and over-treatment: Extent

- Across all study sites, SPs incorrectly treated in majority of visits

Table 2: Patterns of treatment

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Any correct treatment	Correct treatment	Over- treatment	Incorrect treatment	Gave an antibiotic (excl. diarrhea)	Gave a steroid (excl. asthma)	Referred to another provider	Number of cases
Madhya Pradesh	0.302	0.048	0.255	0.698	0.350	0.032	0.180	939
Birbhum	0.237	0.015	0.222	0.763	0.331	0.015	0.321	396
Delhi	0.108	0.008	0.100	0.892	0.540	0.092	0.104	250
Mumbai	0.292	0.033	0.258	0.708	0.566	0.198	0.086	1,583
Patna	0.310	0.051	0.259	0.690	0.679	0.096	0.057	1,019
China	0.361	0.237	0.124	0.639	0.512	0.000	0.191	299
Kenya	0.524	0.211	0.313	0.476	0.548	0.016	0.164	166

Notes: All figures are unweighted. In correct treatment definitions, referrals to a higher level of care alone are NOT considered the right treatment. The Birbhum data includes observations from the control group only.

Characterizing incorrect and over-treatment: Financial implications

- In example, where **A** is correct and **B is not**, assume:
 - Only **A** is given: Full cost of visit is necessary
 - **A and B** given: Marginal cost of **B** is avoidable
 - No element of **A** is given: The full cost of the visit (including consultation costs) are avoidable—patient gets nothing out of being told that his/her heart attack is due to ‘the weather’
- Caution: This an ex-post calculation and could be a lower or upper bound of overall costs
 - Upper bound: Parent takes the child to doctor and is given cough syrup for strep throat; parent brings child back 2 days later and doctor correctly gives antibiotics. We treat all costs from first visit as avoidable, even though information from the first visit helped diagnosis in the second
 - Lower bound: Factoring in health costs could substantially increase the cost of incorrect treatment
- We are also cognizant of the fact that there is no policy counterfactual; these numbers help establish the magnitude of different problems in the sector
 - For West Bengal experiment, we can provide the precise policy counterfactual

Table 3: Necessary and avoidable costs of treatment

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Cost breakdown (US dollars)			Fraction of total cost that is avoidable			Attributed to incorrect treatment	Number of cases
	Total	Consultation	Medicines	Avoidable	Total	Attributed to over- treatment		
Madhya Pradesh	2.083	1.597	0.496	1.334	0.695	0.031	0.664	939
Birbhum	0.689	0.183	0.506	0.562	0.861	0.129	0.731	396
Delhi	2.094	1.616	0.478	1.462	0.805	0.026	0.778	250
Mumbai	4.898	3.247	2.206	2.859	0.763	0.068	0.695	1,583
Patna	5.503	2.674	2.545	3.990	0.771	0.096	0.675	1,019
China	3.608	0.224	2.855	3.515	0.913	0.168	0.745	299
Kenya	4.293	1.553	3.846	3.335	0.760	0.233	0.527	166

Notes: We assume that all costs are necessary when a provider recommends the correct treatment and only the correct treatment. When a provider over-treats, we assume that the cost of consultation, and cost of indicated medicines are necessary, while the costs of unnecessary medicines are avoidable. Finally, when a provider recommends an incorrect treatment, we assume all costs (consultation and medicines) are unnecessary.

Characterizing incorrect and over-treatment: Extent

- Perhaps not surprising given large number of unqualified providers, but incorrect treatment also high for qualified private providers and in public sector

Table A4: Necessary and avoidable costs of treatment by provider type

Study	Provider type	(1) Total	(2) Cost breakdown (US dollars)		(4) Avoidable	(5) Total	(6) Fraction of total cost that is avoidable Attributed to over- treatment	(7) Attributed to incorrect treatment	(8) Number of cases
			Consultation	Medicines					
Madhya Pradesh	Public	5.240	4.647	0.591	2.745	0.667	0.013	0.653	254
	Private unqualified	0.633	0.325	0.313	0.500	0.743	0.023	0.720	483
	Private qualified	1.382	0.596	0.786	1.033	0.623	0.074	0.550	202
Birbhum	Private unqualified	0.689	0.183	0.506	0.522	0.861	0.129	0.731	396
Delhi	Private unqualified	1.556	1.303	0.253	1.212	0.868	0.007	0.860	180
	Private qualified	3.477	2.423	1.054	2.090	0.666	0.068	0.598	70
Mumbai	Private unqualified	1.900	1.387	0.673	1.661	0.913	0.018	0.895	996
	Private qualified	9.985	6.396	2.855	4.753	0.518	0.149	0.369	587
Patna	Private unqualified	2.018	0.231	2.009	1.938	0.984	0.019	0.965	302
	Private qualified	6.971	3.643	2.802	4.802	0.691	0.125	0.567	717
China	All	3.608	0.224	2.855	3.510	0.913	0.168	0.745	299
Kenya	Public clinics	1.442	0.018	1.955	1.137	0.648	0.225	0.423	55
	Private clinics	5.680	2.415	4.904	4.445	0.795	0.235	0.560	111

Notes: We assume that all costs are necessary when a provider recommends the correct treatment and only the correct treatment. When a provider over-treats, we assume that the cost of consultation, and cost of indicated medicines are necessary, while the costs of unnecessary medicines are avoidable. Finally, when a provider recommends an incorrect treatment, we assume all costs (consultation and medicines) are unnecessary.

Incentive effects?

	Representative sample			Dual practice sample		
	Time Spent (mins)	Percentage of checklist items	IRT score	Time Spent (mins)	Percentage of checklist items	IRT score
Panel A: SP and case fixed effects						
Is a private provider	1.222***	6.758***	0.512**	1.471***	8.888***	0.729***
	(0.250)	(2.488)	(0.211)	(0.267)	(1.762)	(0.178)
R-squared	0.305	0.160		0.237	0.219	
Number of observations	662	662	233	331	331	138
Mean of public	2.388	15.287		1.562	17.677	

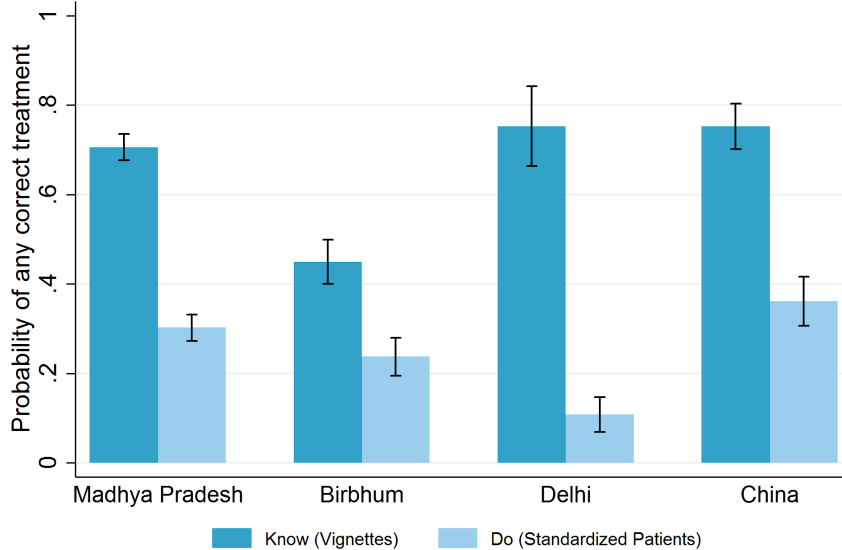
Incorrect treatment due to lack of knowledge?

- High levels of incorrect treatment even among qualified providers raises the possibility that this is not *just* due to lack of knowledge
- Directly measure knowledge using medical vignettes
 - ▣ First compare $E(\text{Performance with SPs})$ to $E(\text{Performance in Vignettes})$.
 - ▣ Then assess $E(\text{Performance in Audit} \mid \text{Performance in vignettes})$. This conditional expectation tells us how increases in knowledge alone translate into practice
 - Unlike the simple comparison of means, the conditional expectation will be attenuated due to measurement error in “know”

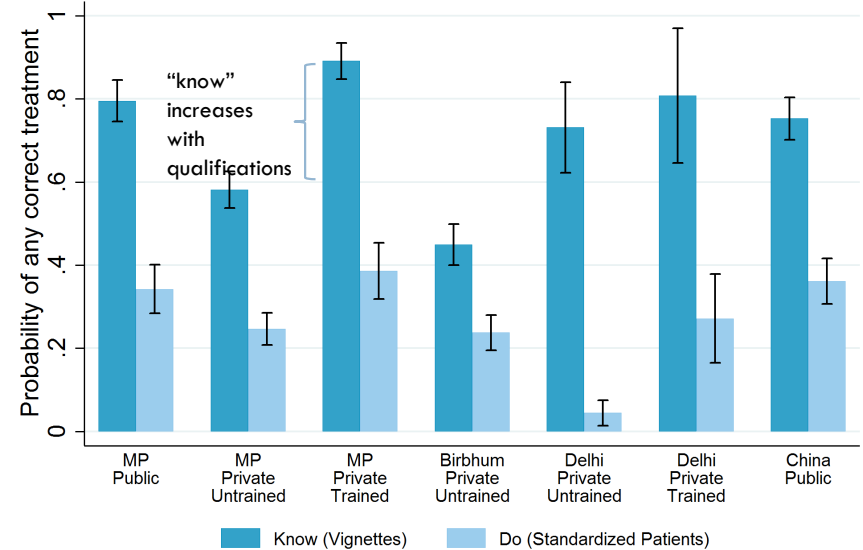
Absolute “know-do” gap

- Medical vignettes are used to measure knowledge. Graph shows the know-do gap. Also shows that “know” increases with qualifications.

The Know-Do Gap

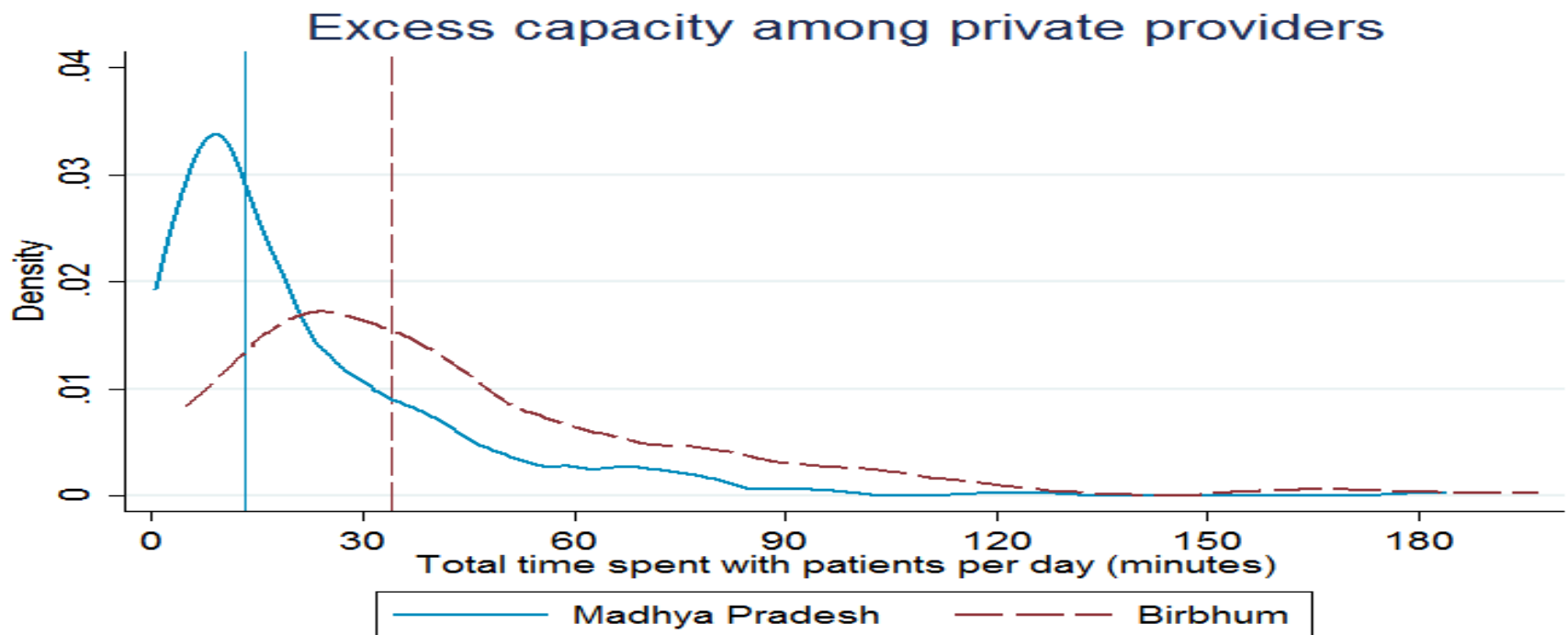


The Know-Do Gap, by Provider Type



In *all samples*, in medical vignettes providers were much more likely to correctly manage a case relative to the audits

Not because they are too busy



What could be going on?

- Patients are skeptical of the competence and incentives of their “doctors”
- As a result doctors try to stay on the safe side—prescribe what the patients expect
- Similar to the case of education
 - In what way?

Policy response

- Better regulation will increase credibility
- More training of RHCPs as well
 - ▣ An RCT in India where the RHCPs were trained for 9 months (2 days a week)
 - ▣ Did not change knowledge
 - ▣ Reduced know-do gap massively
 - ▣ Improved treatment