

# Quality and Accountability in Healthcare Delivery: Evidence from an Audit Study of Healthcare Providers in India

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# Background

- Enormous worry about the “burgeoning” private sector and whether the care is worse or much worse than the public
- But comparative studies of the two sectors are not apples for apples with differences in
  - Patients
  - Providers
  - Resources
- What would a like for like comparison give us?

# This presentation

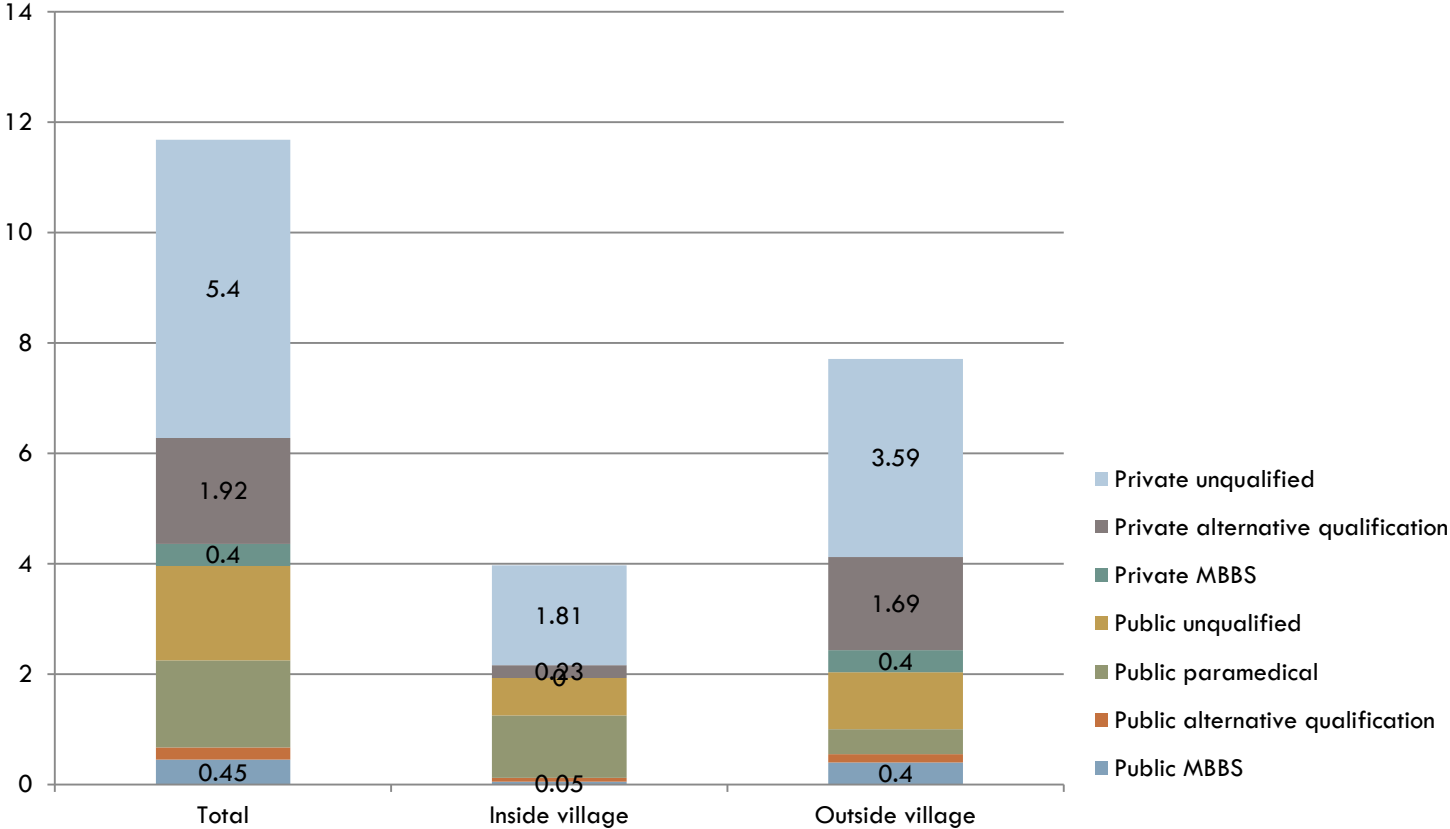
- Thought experiment
- Experiment 1: Send the *same* patient to representative samples of public and private providers
  - Captures difference in average public and average private provider
  - But these providers are very different
- Experiment 2: Send the *same* patient to the *same provider* in his/her public and private clinic
  - Captures difference net of provider differences
  - More accurate picture of what “private” provision does

# Setting

- 100 representative villages in Madhya Pradesh, one of the poorest and least educated states in India
  - ▣ Virtually no *de facto* regulation in private sector
  - ▣ No formal insurance beyond tax funded public sector
  - ▣ No subsidies for private sector
  - ▣ Market, rather than administratively determined prices in private sector
  - ▣ Salaried providers in public sector, with salary the only source of revenue in their public sector jobs
- Contrast with OECD countries
  - ▣ Price-quality regressions first glimpse into what is rewarded in health markets of the “Wild East”

# Basic Sample Description

## Type and Distribution of Providers in Average Health Market of a Village



	Madhya Pradesh (5 districts, 100 villages)			SP Sample Villages (3 districts, 46 markets)		
	(1) Total	(2) Inside village	(3) Outside village	(4) Total	(5) Inside village	(6) Outside village
<b>Panel B: Composition of demand from census of households in sampled villages</b>						
Fraction of households that visited a provider in last 30 days	0.46 (0.50)			0.58 (0.49)		
Fraction provider visits inside/outside village		0.66 (0.47)	0.34 (0.47)		0.69 (0.46)	0.31 (0.46)
Distance traveled to visited provider (km)	1.61 (2.14)	0.40 (0.65)	3.83 (2.14)	1.37 (2.37)	0.38 (1.16)	3.51 (2.84)
Fraction of visits to MBBS doctor	0.04 (0.19)	0.01 (0.09)	0.09 (0.29)	0.02 (0.13)	0.00 (0.00)	0.06 (0.23)
Fraction of visits to private sector	0.89 (0.31)	0.92 (0.28)	0.85 (0.36)	0.96 (0.21)	0.97 (0.18)	0.93 (0.26)
Fraction of visits to private sector (conditional on public availability)	0.88 (0.33)	0.89 (0.31)	0.83 (0.38)	0.95 (0.22)	0.96 (0.20)	0.91 (0.28)
Fraction of visits to private sector (conditional on public MBBS availability)	0.83 (0.37)	0.84 (0.36)	0.79 (0.41)	0.93 (0.25)	0.98 (0.15)	0.90 (0.30)
Fraction of visits to unqualified providers	0.77	0.87	0.55	0.82	0.89	0.64
<b>Panel C: Sample Characteristics from household census of provider choice</b>						
Number of villages	100			46		
Average village population	1,149			1,199		
Average number of households per village	233			239		
Number of reported provider visits	19,331			12,122		
Average number of visits per household per month	0.83			1.10		

# Same Patient: Standardized patients

- SPs
  - ▣ 22 SPs recruited from the local community
    - Important so that their appearance and manner conform closely to providers' expectations
  - ▣ Thoroughly trained to make plausible excuses to avoid invasive exams
  - ▣ “palm” medicines if required
- 150+ hours of training
- First tried in Delhi pilot
  - ▣ No adverse events; <1% detection rate

# Standardized patients

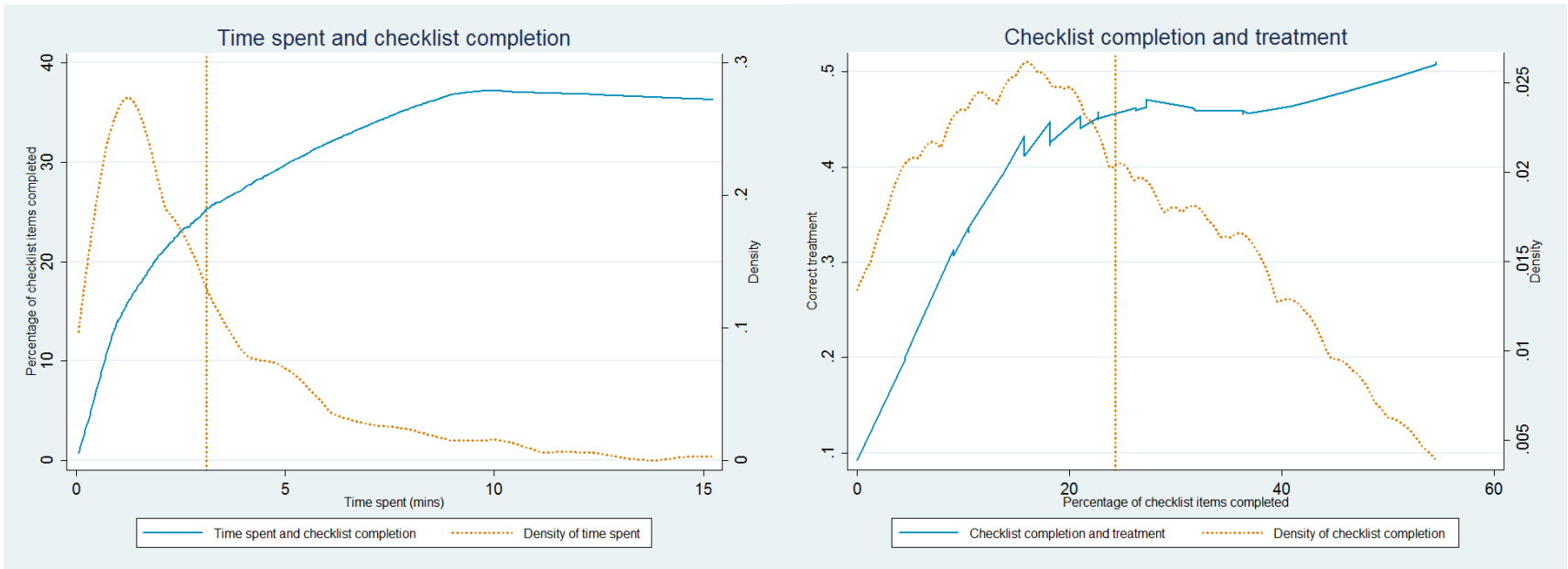
- Three standardized cases
  - ▣ Unstable Angina: “Doctor, this morning I had a pain in my chest” – *Ramlal*, Male, 45 years old
  - ▣ Proxy Dysentery: “Doctor, my 2 year old child has been suffering from diarrhea for 2 days” – *Shankarlal*, Male, 25 years old
  - ▣ Asthma: “Doctor, last night I had a lot of difficulty in breathing” – *Rajesh* (Male) or *Radha* (Female), 25 years old



# Standardized patients

- What is measured
  - ▣ Quality of care through adherence to required and essential checklist of questions and examinations that the provider should complete for each patient
  - ▣ Treatment: correctness, incorrectness, use of antibiotics and steroids for cases where they are not required
  - ▣ Direct Effort: Time spent, total questions asked, total examinations completed

# Relation between quality measures



1. Worry: Doctors under-treat because they figured out that these were not “real patients”. But then, we should see that “correct treatment” is less likely for doctors who spend more time and complete more of the checklist, since they would be more likely to figure out that the patient is not “real”. We find exactly the opposite
2. Little evidence of signaling through medically irrelevant costly effort: more effort leads to better treatment through 90 percent of the distribution

# Basic Sample Description

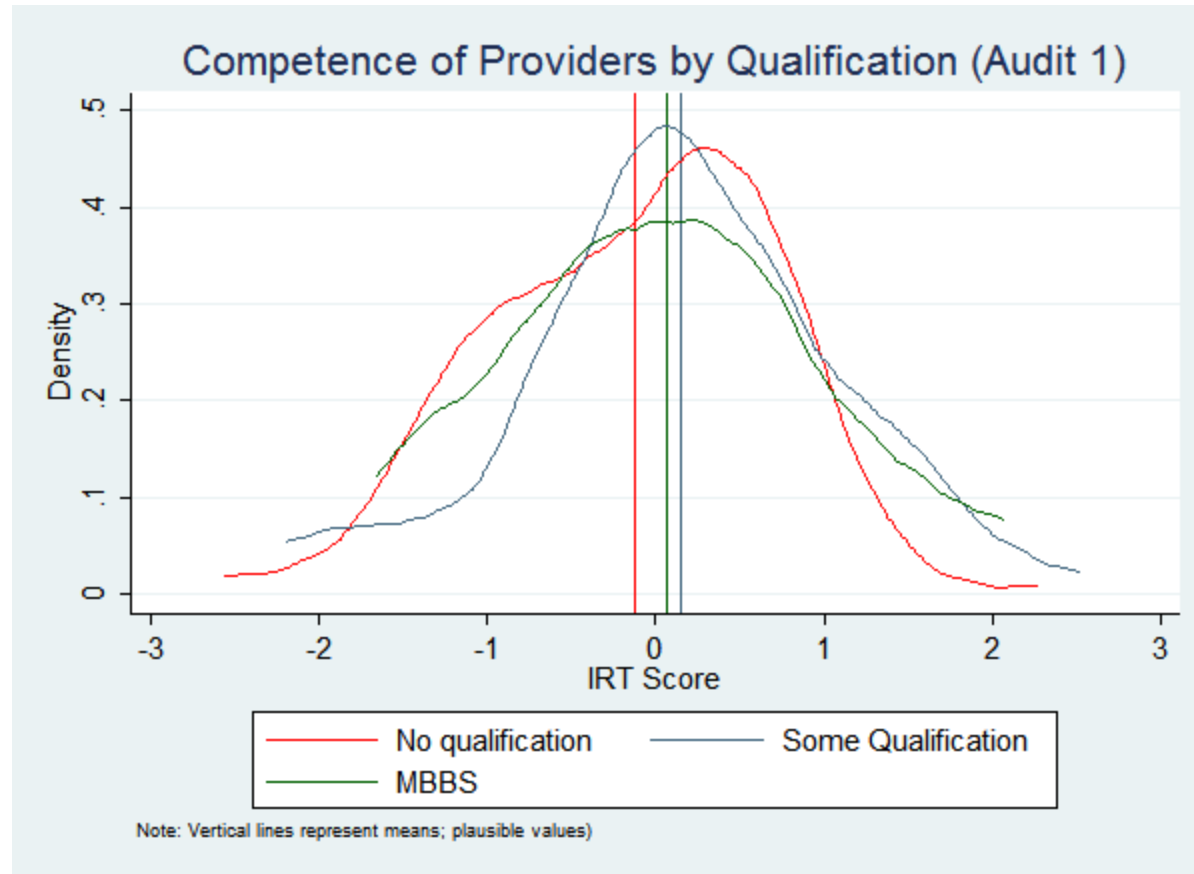
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	Representative Sample			Representative sample of Public MBBS providers				Dual Practice sample		
	(3 districts)			(5 districts)				(5 districts)		
	Public	Private	p-value of (1)-(2)	All public	Public without dual practice	Public with dual practice	p-value of (5)-(6)	Public	Private	p-value of (8)-(9)
<b>Panel A: Provider characteristics</b>										
Age of Provider	46.92	43.51	0.10	44.52	44.74	44.43	0.89			
Is male	0.86	0.96	0.02	0.87	0.96	0.84	0.10	0.84	0.85	0.87
More than 12 years of basic education	0.58	0.52	0.48	0.64	0.52	0.69	0.09			
Has MBBS degree	0.25	0.07	0.00	1.00	1.00	1.00				
Has alternative medical degree	0.11	0.21	0.18	0.00	0.00	0.00				
No medical training	0.61	0.68	0.42	0.00	0.00	0.00				
Number of practices	1.14	1.07	0.21	1.83	1.16	2.13	0.00			
Tenure in years at current location	15.22	13.70	0.42	6.15	5.11	6.56	0.28			
<b>Panel B: Clinic characteristics</b>										
Dispense medicine	1.00	0.81	0.00							
Consultation fee (Rs.)	3.65	51.24	0.00	3.75	3.15	3.92	0.00	3.92	57.93	0.00
Number of patients per day (self reported in census)	28.06	15.74	0.00	31.85	31.30	35.00	0.74	35.00	17.59	0.07
Number of patients per day (from physician observations)	5.72	5.75	0.98	16.04	13.72	16.86	0.31	16.86	5.63	0.00
Electricity	0.94	0.95	0.93	1.00	1.00	1.00		1.00	1.00	
Stethoscope	0.97	0.94	0.47	1.00	1.00	1.00		1.00	1.00	
Blood pressure cuff	0.83	0.75	0.34	1.00	1.00	1.00		1.00	1.00	
Thermometer	0.94	0.92	0.64	0.97	0.94	0.98	0.20	0.98	0.97	0.63
Weighing Scale	0.86	0.52	0.00	0.94	0.94	0.94	0.96	0.94	0.82	0.04
Handwash facility	0.89	0.81	0.30	0.84	0.84	0.85	0.93	0.85	0.81	0.56
Number of providers	36	188		103	31	72		72	84	

# Results

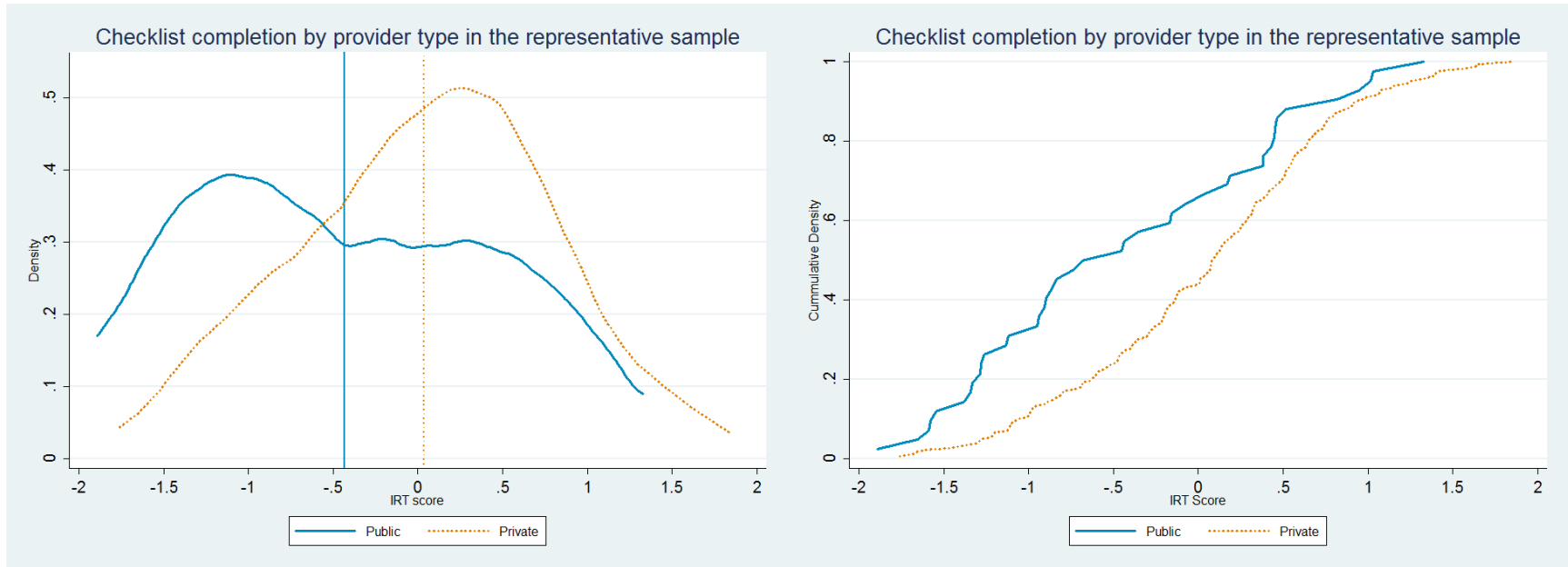
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- Checklist adherence
- Treatment
- Prices

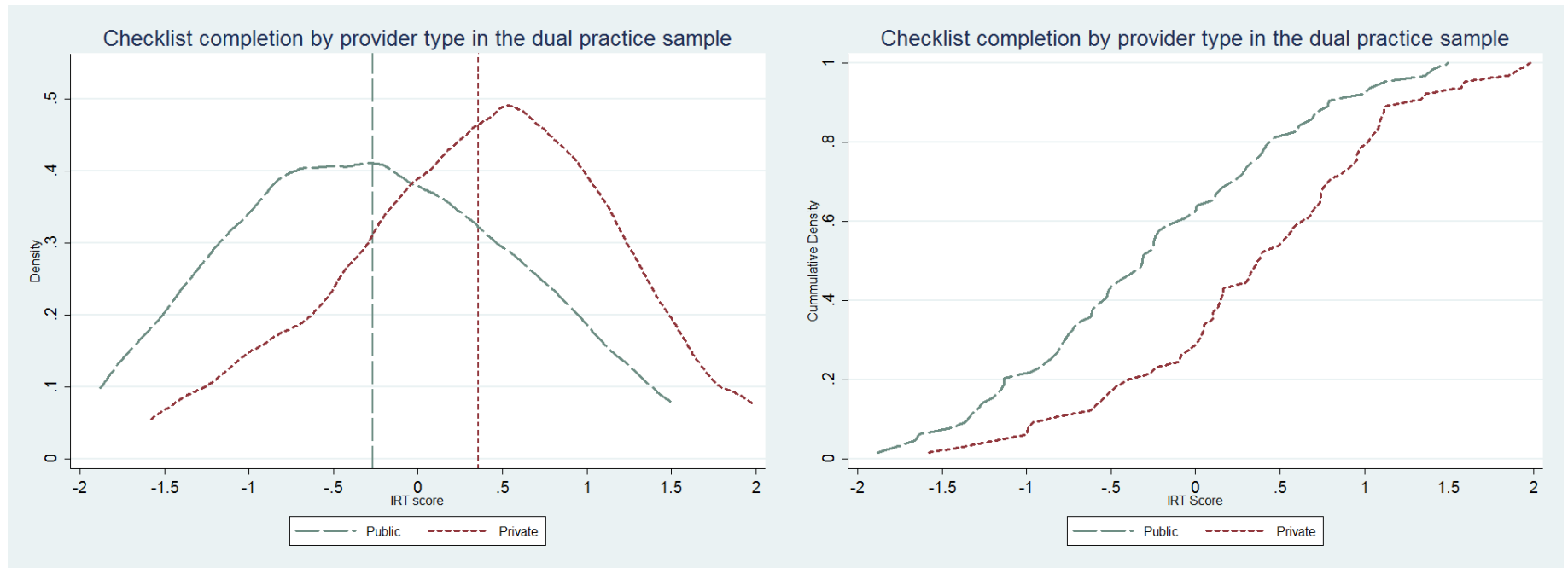
# Checklist adherence by Qualification



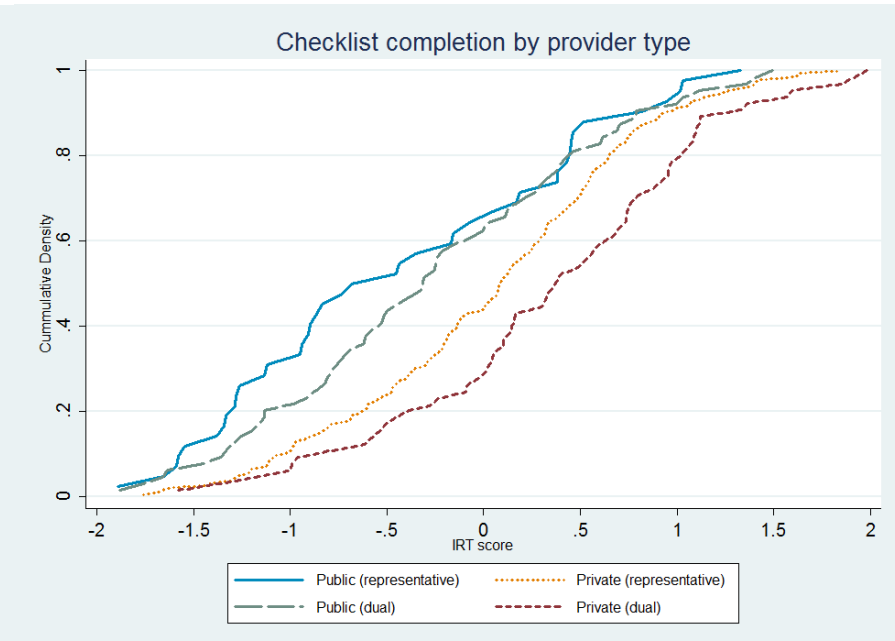
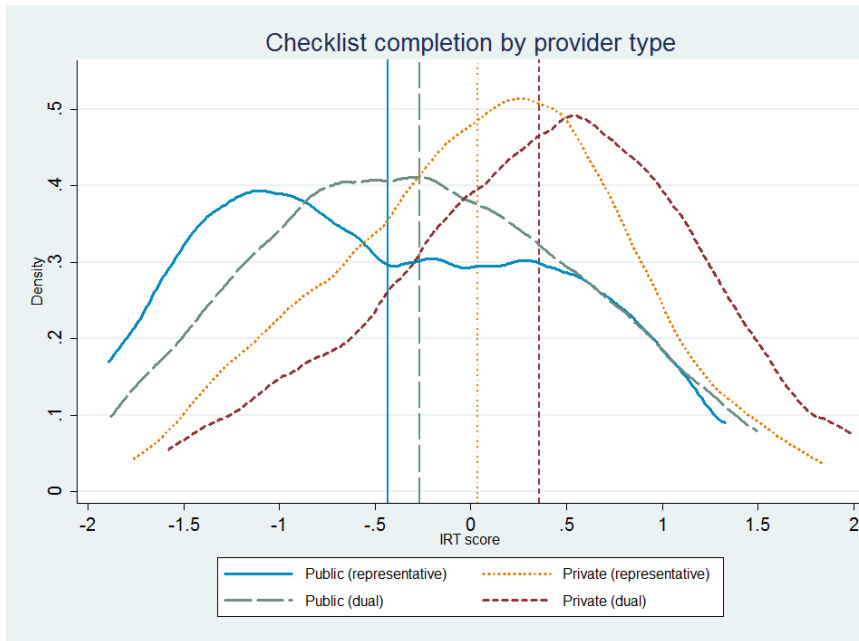
# Checklist adherence by Sector



# Checklist adherence (Dual Sample)



# Checklist adherence (Full Sample)





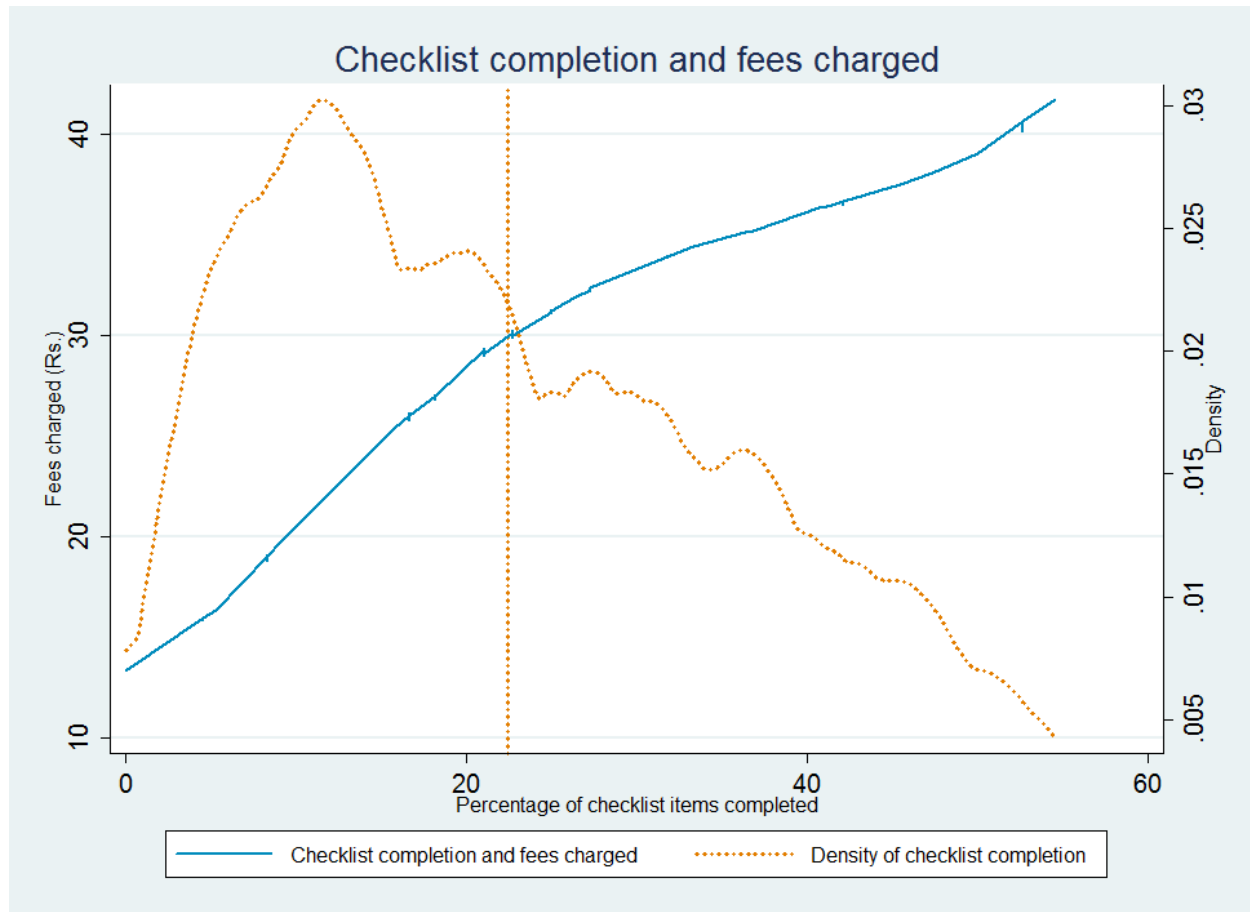
	Representative sample			Dual practice sample		
	Public	Private	Difference (2)-(1)	Public	Private	Difference (4)-(3)
<b>Panel A: Unstable Angina</b>						
<i>History questions</i>						
where is the pain	0.486	0.694	0.208***	0.528	0.645	0.117
when started	0.270	0.389	0.119*	0.167	0.129	-0.038
severity of pain	0.162	0.278	0.116*	0.167	0.419	0.253**
radiation	0.108	0.150	0.042	0.222	0.387	0.165*
previous similar	0.270	0.417	0.146**	0.278	0.387	0.109
since when	0.216	0.272	0.056	0.111	0.323	0.211**
shortness of breath	0.081	0.150	0.069	0.056	0.032	-0.023
sweating	0.270	0.294	0.024	0.194	0.452	0.257**
beedi-cigarette	0.054	0.072	0.018	0.083	0.194	0.110*
family history	0.000	0.017	0.017	0.000	0.097	0.097**
<i>Examinations</i>						
pulse	0.243	0.422	0.179**	0.417	0.677	0.261**
bp	0.135	0.350	0.215***	0.222	0.548	0.326***
auscultation (either front or back)	0.189	0.500	0.311***	0.444	0.613	0.168*
temperature attempt	0.108	0.139	0.031	0.028	0.258	0.230***
ecg in/outside clinic	0.243	0.228	-0.015	0.278	0.355	0.077
<i>Number of observations</i>	37	180		36	31	

# Treatments



	Representative sample			Dual practice sample		
	Public	Private	Difference (2)-(1)	Public	Private	Difference (4)-(3)
<b>Panel A: Unstable Angina</b>						
Correct treatment	0.04	0.08	0.05	0.03	0.30	0.27***
Correct treatment (alternate)	0.55	0.48	-0.07	0.42	0.61	0.20*
Aspirin	0.03	0.04	0.02	0.03	0.23	0.20***
Anti-platelet agents	0.03	0.01	-0.02	0.00	0.03	0.03
Referred	0.30	0.24	-0.05	0.22	0.32	0.10
ECG	0.24	0.23	-0.02	0.28	0.35	0.08
ECG & Referred	0.11	0.12	0.01	0.08	0.16	0.08
Antibiotic	0.14	0.17	0.03	0.28	0.23	-0.05
Unnecessary treatment	0.66	0.74	0.09	0.67	0.77	0.11
Number of observations	37	180		36	31	
<b>Panel B: Asthma</b>						
Correct treatment	0.47	0.61	0.14*	0.58	0.68	0.10
Bronchodilators	0.33	0.36	0.03	0.52	0.59	0.07
Theophylline	0.13	0.22	0.09*	0.31	0.31	0.00
Oral Corticosteroids	0.15	0.31	0.16**	0.16	0.24	0.09
Antibiotic	0.38	0.40	0.02	0.59	0.46	-0.14*
Unnecessary treatment	0.73	0.82	0.09	0.91	0.83	-0.08*
Number of observations	39	184		64	70	
<b>Panel C: Dysentery</b>						
Correct treatment	0.08	0.14	0.06	0.33	0.22	-0.11*
ORS	0.08	0.13	0.05	0.33	0.22	-0.11*
Asked to see child	0.33	0.14	-0.20***	0.27	0.42	0.15**
Antibiotic	0.44	0.61	0.18**	0.75	0.61	-0.13*
Unnecessary treatment	0.11	0.41	0.30***	0.43	0.33	-0.10
Number of observations	39	183		63	67	

# Prices and Checklist Adherence



# Prices and treatment

- Prices positively correlated with measures of quality
  - ▣ Time spent, fraction of checklist items completed, correct treatment
  - ▣ In multiple regressions, 'correct treatment' not significant (highly correlated with checklist completion)
- Market rewards providers for quality, but unnecessary treatments not penalized
  - ▣ Concerns regarding credence goods may apply

# Wages and Quality in Public Sector

- Public sector pay in India follows a matrix
- Composed of: rank, tenure, qualifications
- Not surprisingly
  - ▣ No effect of checklist adherence, treatment, likelihood of discussing diagnosis on wages
  - ▣ Some (negative) effect on time spent, vanishes when controlled for provider qualifications
- There is NO evidence of any reward to higher quality in provider compensation in the public sector

# Comparison of Costs of Care

**Table 10: Cost in the public sector**

<b>Staff per facility</b>	<b>N</b>	<b>Average monthly wage (Rs.)</b>
Medical Officer in Charge/Medical Officer	1.92	Rs.32,245
GNM/ANM/VHN/LHV	3.24	Rs.16,305
MPW/MNA/Assistant/Compounder	1.43	Rs.16,657
Pharmacist/Chemist/Lab		
Assistant/Technician	0.8	Rs.16,571
Paramedic/other	6.08	Rs.13,387
All	13.47	Rs.17,315
Number of facilities	115	
<b>Visits to the public facilities per month</b>		
Year 2008	111,039	
Year 2009	113,230	
Year 2010	111,473	
<b>Average per patient cost</b>		
Year 2008	Rs.241.87	
Year 2009	Rs.237.66	
Year 2010	Rs.241.61	

# Summary

- Like for like comparisons show that
  - ▣ Private unqualified providers = public providers
  - ▣ Private qualified providers > public qualified providers, when they are the *same person*
- Widely believed that
  - ▣ Accreditation/Standards = Quality
  - ▣ Credentials and Peer-monitoring (administrative accountability) in public systems sufficient to ensure quality
- What we find
  - ▣ Qualification is not quality (by a long way)
  - ▣ Administrative accountability in its current form does not ensure quality in the public health care system
  - ▣ Customer accountability does better in two ways
    - Gets doctors to exert more effort in the private relative to public sector
    - Prices do reflect quality, providing incentives for effort
    - BUT, prices do not penalize unnecessary medications, which may be demanded by the patient



# Policy Implications

- Results do not mean that the state does not have an important role
  - Location; Equity; Information
- Marginal returns to training likely to be higher in the private sector; while returns to improving incentives for effort likely to be higher in the public sector
- Policy seems to be doing exactly the opposite
  - Deep resistance to training/providing legitimacy to the private providers (though they are first line of primary care)
  - Lots of attention paid to training public providers
- Attempts to improve equity should try to retain elements of customer accountability in healthcare markets

# Additional regressions and tables



	(1)	(2)	(3)	(4)	(5)	(6)
	Representative sample			Dual practice sample		
	Time Spent (mins)	Percentage of checklist items	IRT score	Time Spent (mins)	Percentage of checklist items	IRT score
<b>Panel A: SP and case fixed effects</b>						
Is a private provider	1.222*** (0.250)	6.758*** (2.488)	0.512** (0.211)	1.471*** (0.267)	8.888*** (1.762)	0.729*** (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	

What about conditioning on geographical location or patient load? Next slide

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**Panel C: SP, case and market/district fixed effects**

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Is a private provider	1.246***	5.999**	0.500*	1.452***	9.414***	0.770***
	(0.319)	(2.338)	(0.301)	(0.268)	(1.827)	(0.190)
Has MBBS	-0.156	3.285	0.043			
	(0.568)	(2.940)	(0.257)			
Has some qualification	-0.131	2.518	0.157			
	(0.299)	(1.716)	(0.151)			
Age of provider	-0.004	-0.046	0.000	0.005	-0.064	0.004
	(0.012)	(0.071)	(0.008)	(0.015)	(0.102)	(0.101)
Gender of provider (1=Male)	0.653	-0.949	0.212	-0.077	-1.383	-0.288
	(0.544)	(3.529)	(0.327)	(0.386)	(2.639)	(0.309)
Patient load during visit	-0.096*	-0.144	0.082**	-0.106*	-0.283	0.013
	(0.052)	(0.554)	(0.040)	(0.062)	(0.424)	(0.517)
R-squared	0.399	0.259		0.275	0.233	
Number of observations	638	638	221	302	302	126
Mean of public	2.543	16.995		1.512	16.584	

What is driving these results? Basic questions and investigations, or case-specific items?

	Representative sample						Dual practice sample					
	Correct treatment	Helpful treatment	Unnecess- ary treatment	Correct treatment Only	Antibioti- c	Poly- pharmac- y	Correct treatment	Helpful treatment	Unnecess- ary treatment	Correct treatment Only	Antibioti- c	Poly- pharmac- y
<b>Panel A: SP and case fixed effects</b>												
Is a private provider	0.068	0.014	0.056	-0.020	0.016	0.130*	0.147**	0.029	-0.031	-0.009	-0.119*	0.075
	(0.056)	(0.055)	(0.074)	(0.021)	(0.062)	(0.068)	(0.064)	(0.063)	(0.054)	(0.024)	(0.068)	(0.048)
R-squared	0.302	0.051	0.070	0.029	0.079	0.054	0.271	0.041	0.075	0.018	0.114	0.138
Number of observations	334	365	392	440	440	440	199	200	201	201	201	201
Mean of public	0.267	0.662	0.696	0.026	0.263	0.697	0.380	0.730	0.820	0.030	0.480	0.800
<b>Panel B: SP, case and market/district fixed effects</b>												
Is a private provider	0.026	-0.001	0.104	-0.022	0.086	0.165**	0.148**	0.028	-0.031	-0.010	-0.121*	0.076
	(0.071)	(0.075)	(0.076)	(0.024)	(0.069)	(0.069)	(0.064)	(0.062)	(0.054)	(0.025)	(0.068)	(0.048)
R-squared	0.450	0.261	0.265	0.061	0.239	0.219	0.294	0.090	0.118	0.067	0.130	0.177
Number of observations	334	365	392	440	440	440	199	200	201	201	201	201
Mean of public	0.283	0.667	0.689	0.030	0.273	0.697	0.380	0.730	0.820	0.030	0.480	0.800

# Diagnosis

- Problem: 67% interactions there is no diagnosis
- Problem noted in pilot
- Final survey: randomized SSPs into 2 groups
  - ▣ 1 group turns around as they are leaving and ask the provider “Doctor, what is wrong with me?”
  - ▣ Increases rate of diagnosis provision by 20-25 p.p. in all groups (but still below 50%)
- Hence, we show diagnosis results for completeness, but caveat the large amount of censoring
- Current results conditional on provision of diagnosis
  - ▣ Unconditional results similar

	(1)	(2)	(3)	(4)	(5)	(6)
	Representative sample			Dual practice sample		
	Gave diagnosis	Correct diagnosis (conditional)	Correct diagnosis (unconditional)	Gave diagnosis	Correct diagnosis (conditional)	Correct diagnosis (unconditional)
<b>Panel A: SP and case fixed effects</b>						
Is a private provider	0.168*** (0.052)	-0.014 (0.057)	0.016 (0.022)	0.095 (0.068)	-0.050 (0.105)	0.018 (0.053)
R-squared	0.130	0.121	0.075	0.130	0.114	0.054
Number of observations	440	178	440	201	88	201
Mean of public	0.263	0.150	0.039	0.380	0.395	0.150
<b>Panel B: SP, case and market/district fixed effects</b>						
Is a private provider	0.188*** (0.072)	-0.019 (0.093)	0.023 (0.031)	0.089 (0.069)	-0.067 (0.109)	0.018 (0.054)
R-squared	0.218	0.301	0.145	0.149	0.176	0.066
Number of observations	440	178	440	201	88	201
Mean of public	0.242	0.125	0.030	0.380	0.395	0.150

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**Panel B: Asthma**

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*History questions*

current breathing probes	0.385	0.647	0.262***	0.422	0.671	0.250***
cough	0.590	0.696	0.106	0.453	0.686	0.233***
expectoration probes	0.077	0.163	0.086*	0.016	0.071	0.056*
previous breathing problems	0.333	0.462	0.129*	0.266	0.543	0.277***
since when problems	0.385	0.495	0.110	0.234	0.414	0.180**
shortness constant or episodic	0.051	0.114	0.063	0.047	0.129	0.082**
what triggers	0.077	0.125	0.048	0.094	0.229	0.135**
fever	0.231	0.326	0.095	0.219	0.386	0.167**
chest pain	0.154	0.375	0.221***	0.172	0.286	0.114*
weight loss	0.000	0.000	0.000	0.016	0.014	-0.001
beedi-cigarette	0.026	0.016	-0.009	0.016	0.071	0.056*
family history	0.000	0.027	0.027	0.031	0.043	0.012

*Examinations*

pulse	0.256	0.554	0.298***	0.313	0.457	0.145**
bp	0.205	0.293	0.088	0.109	0.357	0.248***
auscultation (either front or back)	0.333	0.554	0.221***	0.484	0.800	0.316***
temp attempt	0.103	0.179	0.077	0.063	0.100	0.038

*Number of observations*

39	184	64	70
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**Panel C: Dysentery**

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*History questions*

age of child	0.795	0.945	0.150***	0.921	0.939	0.019
qualities of stool	0.077	0.186	0.109**	0.159	0.379	0.220***
frequency	0.179	0.311	0.132**	0.270	0.470	0.200***
quantity of stool	0.000	0.060	0.060*	0.016	0.045	0.030
urination	0.000	0.022	0.022	0.016	0.000	-0.016
active/playful	0.026	0.033	0.007	0.000	0.000	0.000
fever	0.077	0.191	0.114**	0.222	0.364	0.141**
abdominal pain	0.077	0.120	0.043	0.222	0.288	0.066
vomiting	0.077	0.246	0.169***	0.254	0.333	0.079
source of water	0.000	0.027	0.027	0.000	0.030	0.030*
what has eaten	0.000	0.060	0.060*	0.032	0.152	0.120***
taking fluids	0.000	0.027	0.027	0.048	0.076	0.028

*Number of observations*

39	184		63	67
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