

Medical Advice Quality and Availability in Rural India (MAQARI)



Karthik Muralidharan, UC San Diego

with Monisha Ashok, Jishnu Das, Alaka Holla, Michael Kremer, Aakash Mohpal

The MAQARI Project

- Panel study of our 2003 work on teacher/medical worker absence
 - Revisit the same PHC's/CHC's from 2003 provider absence study
- Nationwide mapping of **healthcare availability and quality** in rural India
 - 19 states, ~10 districts/state, ~8 villages/district (>1500 villages total)
 - Full census of healthcare providers in these villages
 - Provider quality (knowledge) measured with vignettes
 - Simple HH survey to understand health seeking behavior
- Detailed understanding of rural **healthcare markets** in one state (MP)
 - 100 villages across 5 districts
 - Full census of HH and all providers they go to (even outside the village)
 - Provider quality measured through day-long 'participant observation' (PO)
 - In 3 districts, we also measure provider quality with 'standardized patients' (SP)
 - Administer SP's to public doctors in both their both public and private practice
 - Detailed household survey to model household choice of providers

Nationwide Sample: What do we do?

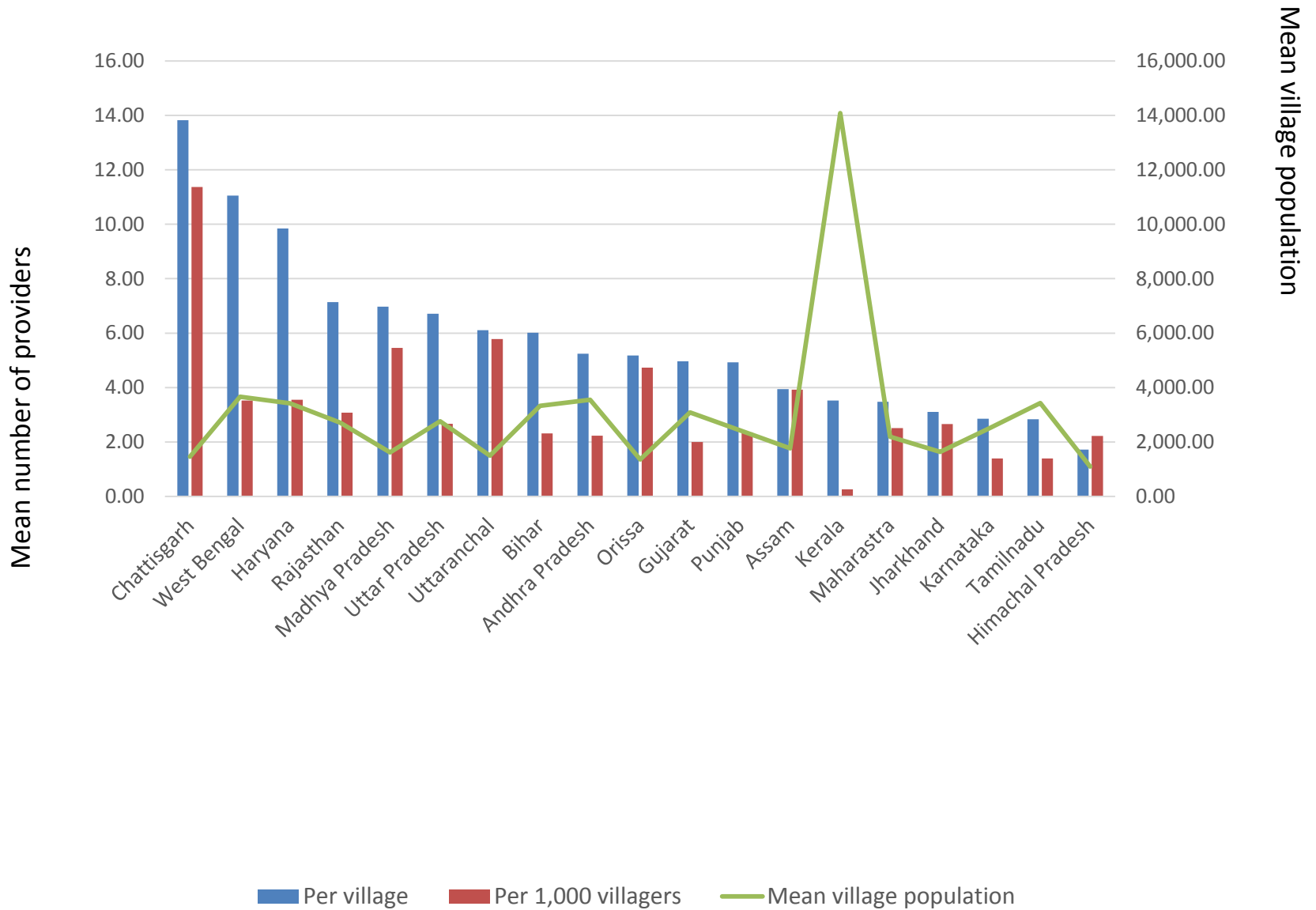
- Document provider availability (by practice type, qualification) across rural India
- Supplement with a short HH survey of ~15 HH/village to record basic health seeking behavior
- Measure the quality of providers using vignettes and estimate the correlates of quality
 - Tuberculosis; Pre-eclampsia, Diarrhea/Dysentery
- Three main sets of results:
 - Existence of providers (by type)
 - Household choices of provider type (by access)
 - Quality of medical providers and their correlates/distribution

Provider Census

Number of Providers Per Village

	Mean Number of Health Care Providers Per Village	Mean Number of Health Care Providers Per 1,000 villagers
Andhra Pradesh	5.25	2.23
Assam	3.95	3.89
Bihar	6.01	2.31
Chattisgarh	13.82	9.29
Gujarat	4.97	1.98
Haryana	9.84	3.38
Himachal Pradesh	1.73	2.22
Jharkhand	3.11	2.66
Karnataka	2.86	1.40
Kerala	3.53	0.26
Madhya Pradesh	6.98	5.35
Maharashtra	3.48	2.51
Orissa	5.18	3.94
Punjab	4.92	2.32
Rajasthan	7.14	2.82
Tamilnadu	2.84	1.39
Uttar Pradesh	6.71	2.56
Uttaranchal	6.11	5.65
West Bengal	11.05	3.34
India	5.86	2.79

Number of providers per village and per 1,000 villagers



Number of Public and Private Providers per Village

	Mean Providers Per Village	Mean Public Providers Per Village	Mean Public Doctors Per Village	Mean Public Nurses & ANMs Per Village	Mean Public Other Providers Per Village	Mean Private Providers Per Village
Andhra Pradesh	5.25	3.00	0.23	2.45	0.29	2.24
Assam	3.95	2.24	0.11	2.02	0.09	1.70
Bihar	6.01	0.31	0.11	0.16	0.04	5.70
Chattisgarh	13.82	6.39	0.38	5.26	0.74	7.43
Gujarat	4.97	3.84	0.25	3.10	0.50	1.13
Haryana	9.84	4.14	0.48	3.00	0.67	5.71
Himachal Pradesh	1.73	0.78	0.16	0.19	0.43	0.95
Jharkhand	3.11	0.56	0.07	0.40	0.10	2.55
Karnataka	2.86	1.74	0.28	1.37	0.09	1.12
Kerala	3.53	1.95	1.56	0.24	0.12	1.58
Madhya Pradesh	6.98	4.13	0.16	3.32	0.65	2.85
Maharastra	3.48	2.24	0.10	1.74	0.39	1.25
Orissa	5.18	3.15	0.25	2.72	0.18	2.03
Punjab	4.92	0.79	0.44	0.16	0.16	4.14
Rajasthan	7.14	4.43	0.50	3.49	0.41	2.71
Tamilnadu	2.84	1.78	0.10	1.57	0.04	1.06
Uttar Pradesh	6.71	2.53	0.50	1.79	0.24	4.18
Uttaranchal	6.11	3.95	0.20	3.44	0.31	2.15
West Bengal	11.05	1.65	0.24	1.24	0.17	9.40
India	5.86	2.49	0.31	1.90	0.27	3.38

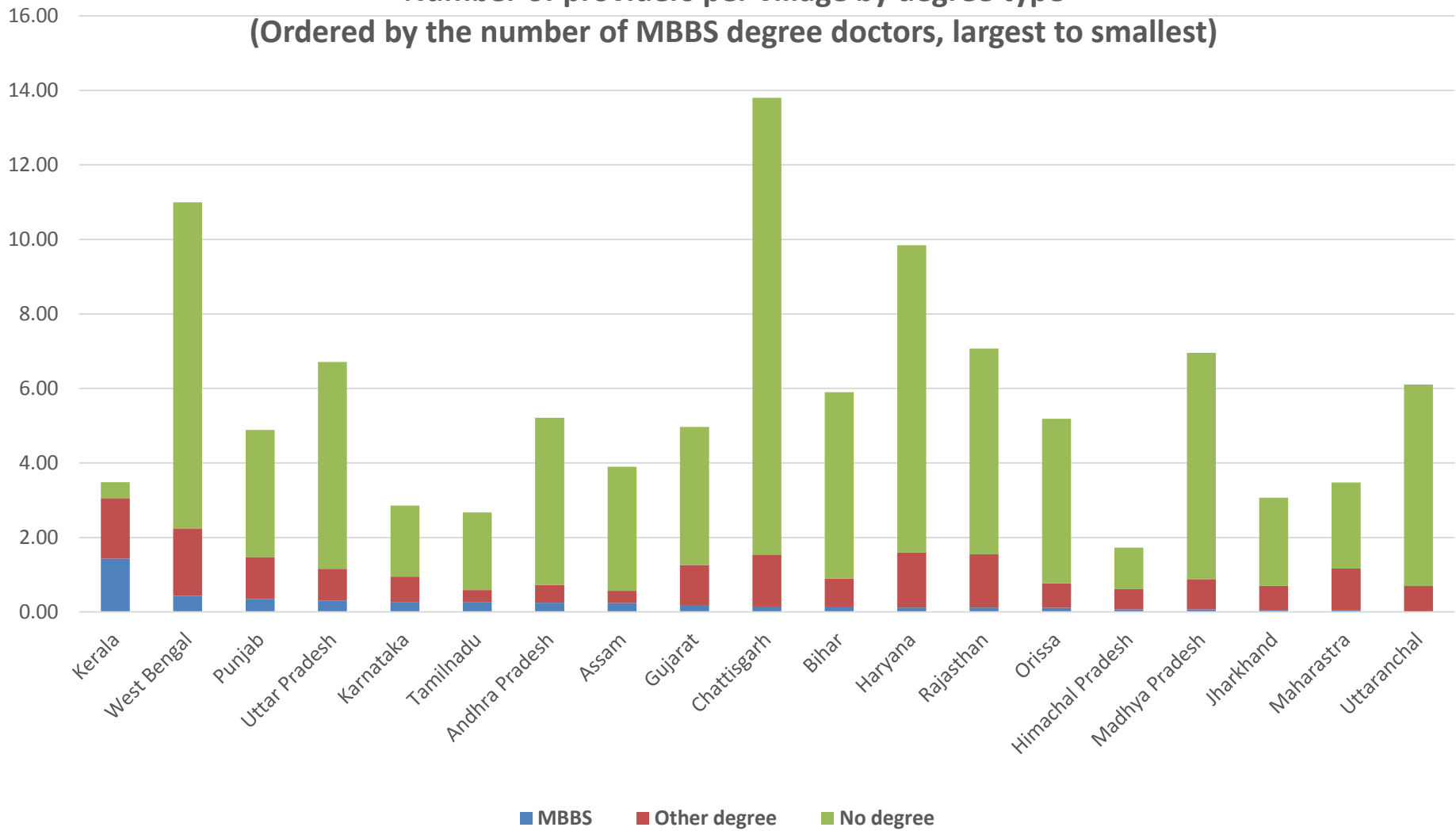
Number of Providers with Degrees per Village

	Mean MBBS Providers Per Village	Mean Providers with Other Degree Per Village	Mean Providers with No Degree Per Village
Andhra Pradesh	0.25	0.47	4.49
Assam	0.24	0.33	3.33
Bihar	0.13	0.76	5.01
Chattisgarh	0.15	1.38	12.27
Gujarat	0.19	1.08	3.71
Haryana	0.12	1.48	8.25
Himachal Pradesh	0.07	0.54	1.11
Jharkhand	0.06	0.64	2.37
Karnataka	0.27	0.68	1.91
Kerala	1.43	1.62	0.43
Madhya Pradesh	0.07	0.81	6.08
Maharastra	0.04	1.12	2.31
Orissa	0.11	0.66	4.42
Punjab	0.35	1.12	3.41
Rajasthan	0.12	1.43	5.53
Tamilnadu	0.27	0.32	2.09
Uttar Pradesh	0.31	0.85	5.55
Uttaranchal	0.02	0.68	5.41
West Bengal	0.43	1.81	8.76
India	0.24	0.94	4.64

Number of Public and Private Providers with Degrees per Village

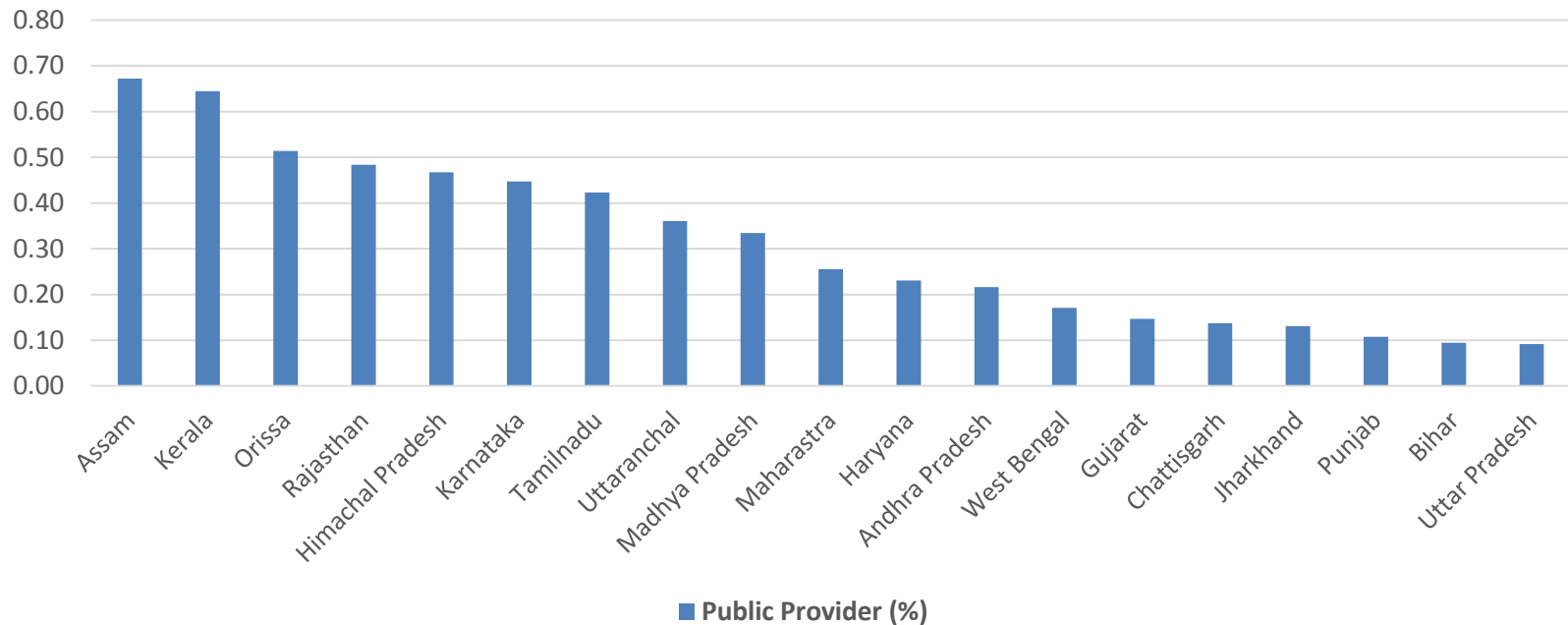
	Mean MBBS Providers Per Village	Public Doctors Mean Providers with Other Degree Per Village	Mean Providers with No Degree Per Village	Mean MBBS Providers Per Village	Private Providers Mean Providers with Other Degree Per Village	Mean Providers with No Degree Per Village
Andhra Pradesh	0.14	0.29	2.53	0.11	0.18	1.96
Assam	0.11	0.11	2.01	0.13	0.22	1.32
Bihar	0.06	0.11	0.14	0.07	0.65	4.87
Chattisgarh	0.08	0.40	5.91	0.07	0.98	6.36
Gujarat	0.11	0.31	3.42	0.07	0.77	0.28
Haryana	0.10	0.39	3.65	0.02	1.09	4.60
Himachal Pradesh	0.07	0.13	0.58	0.01	0.42	0.53
Jharkhand	0.01	0.18	0.37	0.05	0.46	2.00
Karnataka	0.12	0.16	1.46	0.15	0.52	0.45
Kerala	0.88	0.87	0.17	0.55	0.75	0.26
Madhya Pradesh	0.02	0.24	3.86	0.05	0.57	2.22
Maharashtra	0.02	0.28	1.93	0.02	0.84	0.37
Orissa	0.10	0.26	2.79	0.00	0.40	1.63
Punjab	0.25	0.24	0.27	0.11	0.88	3.14
Rajasthan	0.07	0.83	3.49	0.05	0.60	2.03
Tamilnadu	0.11	0.09	1.50	0.15	0.23	0.59
Uttar Pradesh	0.24	0.22	2.07	0.07	0.64	3.48
Uttaranchal	0.00	0.26	3.69	0.01	0.42	1.71
West Bengal	0.10	0.15	1.39	0.33	1.66	7.37
India	0.14	0.27	2.07	0.11	0.67	2.58

Number of providers per village by degree type
(Ordered by the number of MBBS degree doctors, largest to smallest)



Household Survey

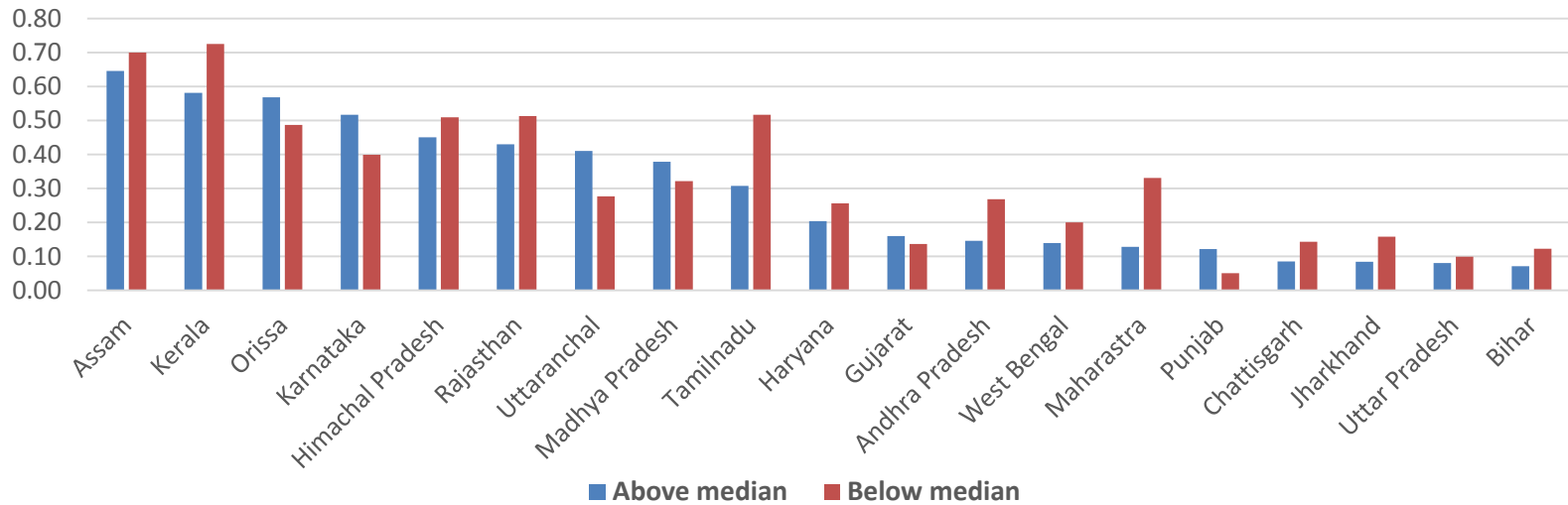
Percentage of people who visited a public provider for primary care by state



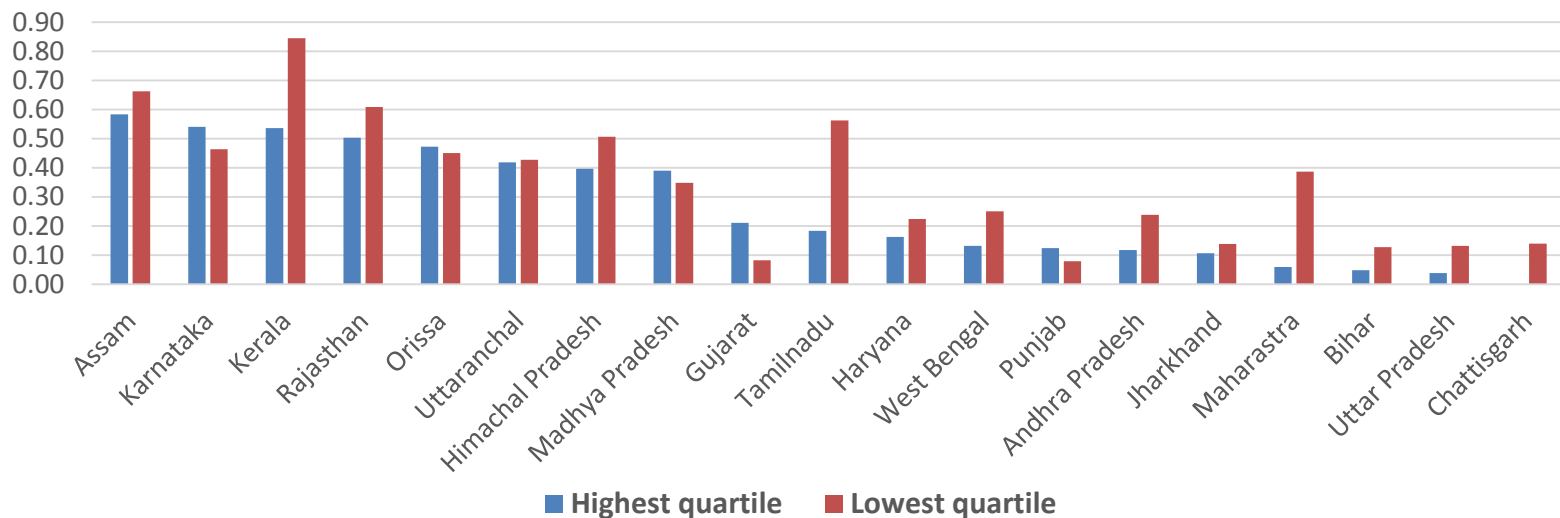
All-India mean is 23%

77% of primary care visits are to private providers

Percentage visiting a public provider for primary care by household income



Percentage visiting a public provider for primary care by household income



Where do households seek care in villages that have a public doctor?

	Village has a Public Doctor		Village has no Public Doctor	
	Public Provider (%)	Private Provider (%)	Public Provider (%)	Private Provider (%)
Andhra Pradesh	0.26	0.74	0.21	0.79
Assam	0.91	0.09	0.65	0.35
Bihar	0.15	0.85	0.09	0.91
Chattisgarh	0.22	0.78	0.12	0.88
Gujarat	0.23	0.77	0.13	0.87
Haryana	0.25	0.74	0.22	0.78
Himachal Pradesh	0.37	0.63	0.49	0.51
Jharkhand	0.13	0.87	0.13	0.86
Karnataka	0.43	0.57	0.45	0.55
Kerala	0.66	0.34	0.56	0.44
Madhya Pradesh	0.32	0.68	0.34	0.66
Maharashtra	0.54	0.46	0.21	0.78
Orissa	0.66	0.34	0.49	0.51
Punjab	0.14	0.86	0.10	0.90
Rajasthan	0.50	0.50	0.47	0.53
Tamilnadu	0.64	0.36	0.41	0.59
Uttar Pradesh	0.14	0.86	0.08	0.92
Uttaranchal	0.11	0.89	0.40	0.60
West Bengal	0.26	0.74	0.16	0.84
India	0.34	0.66	0.20	0.80

Where do households seek care in villages that have a public MBBS doctor?

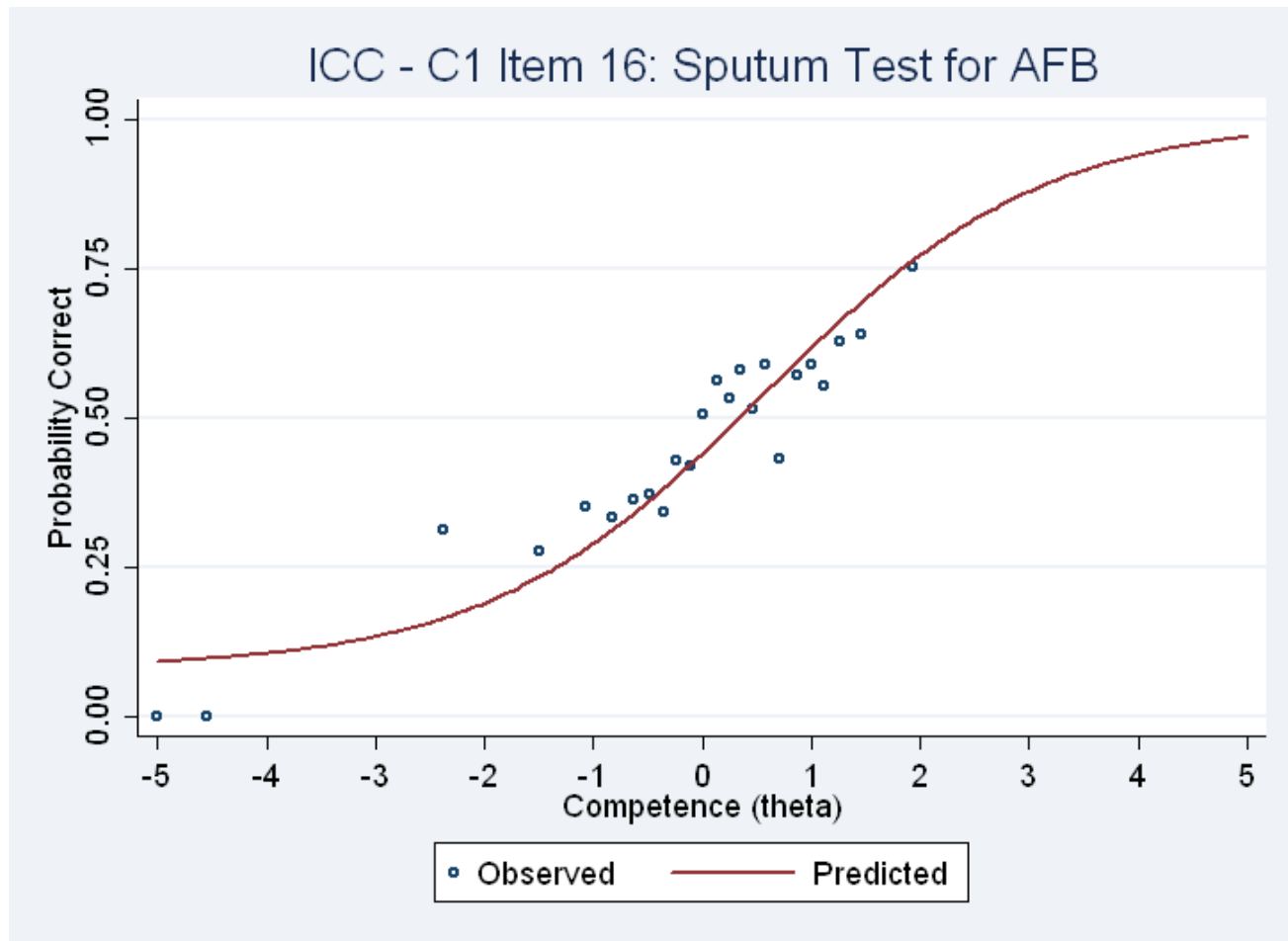
	Village has a Public MBBS Doctor		Village has no Public MBBS Doctor		Number of Villages with a Public MBBS Doctor
	Public Provider (%)	Private Provider (%)	Public Provider (%)	Private Provider (%)	
Andhra Pradesh	0.18	0.82	0.22	0.78	10
Assam	0.89	0.11	0.65	0.35	4
Bihar	0.16	0.84	0.09	0.91	3
Chattisgarh	0.61	0.39	0.13	0.87	3
Gujarat	0.24	0.76	0.14	0.86	8
Haryana	0.27	0.67	0.23	0.77	4
Himachal Pradesh	0.50	0.50	0.42	0.58	4
Jharkhand	-	-	0.13	0.87	0
Karnataka	0.33	0.67	0.47	0.53	9
Kerala	0.63	0.37	0.64	0.36	31
Madhya Pradesh	-	-	0.33	0.67	1
Maharastra	0.62	0.38	0.25	0.75	2
Orissa	0.88	0.12	0.50	0.50	4
Punjab	0.13	0.87	0.11	0.89	13
Rajasthan	0.80	0.20	0.48	0.52	4
Tamilnadu	0.69	0.31	0.42	0.58	6
Uttar Pradesh	0.23	0.77	0.08	0.92	4
Uttaranchal	-	-	0.36	0.64	0
West Bengal	0.38	0.62	0.15	0.85	5
India	0.41	0.59	0.21	0.79	115

Vignettes

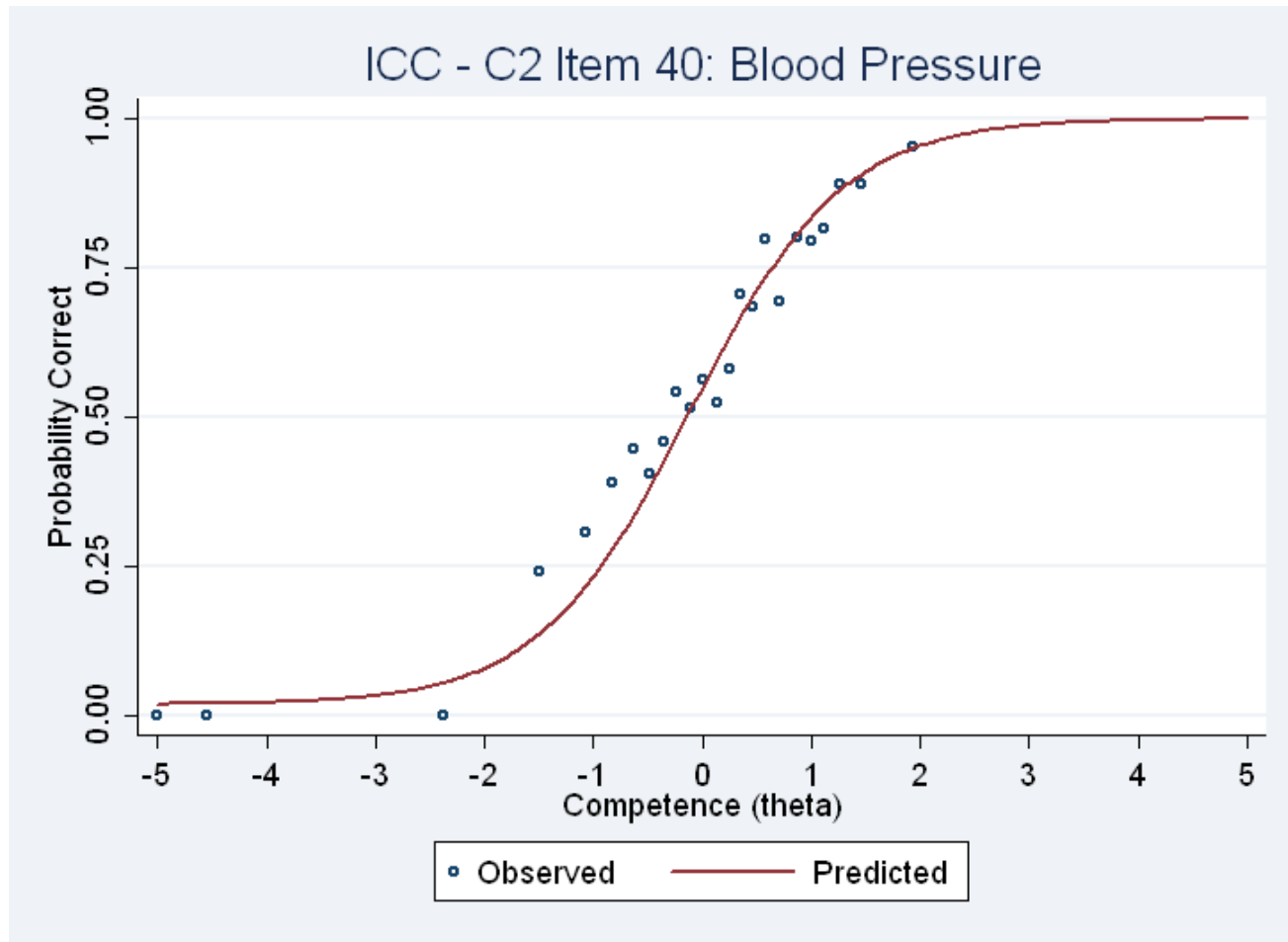
The Vignettes Sample (Villages)

	Number of Providers	Number of Public Providers	Public					Private		
			Doctors	Nurses	Others	Some Degree	No Degree	Number of Private Providers	Some Degree	No Degree
Andhra Pradesh	156	50	9	34	7	13	30	104	12	88
Assam	80	45	7	37	1	9	24	34	8	12
Bihar	166	7	2	5	0	4	2	157	19	117
Chattisgarh	136	40	15	18	7	13	23	93	26	59
Gujarat	118	69	10	43	16	10	49	48	35	6
Haryana	200	52	13	29	10	8	23	141	18	83
Himachal Pradesh	66	31	5	5	21	2	24	32	16	14
Jharkhand	118	17	3	12	2	8	6	96	16	65
Karnataka	85	39	11	28	0	8	28	41	27	10
Kerala	106	37	31	6	0	27	2	48	32	5
Madhya Pradesh	166	69	4	50	15	5	38	94	20	50
Maharastra	124	49	7	26	16	10	33	69	47	9
Orissa	115	45	14	22	9	14	22	68	10	48
Punjab	189	24	13	9	2	11	8	159	24	99
Rajasthan	142	61	24	34	3	22	21	81	19	45
Tamilnadu	75	52	3	48	1	7	30	20	6	6
Uttar Pradesh	194	18	9	8	1	4	9	174	26	117
Uttaranchal	110	44	5	39	0	6	27	65	14	39
West Bengal	364	52	10	38	4	10	39	310	65	208
India	2,710	801	195	491	115	191	438	1,834	440	1,080

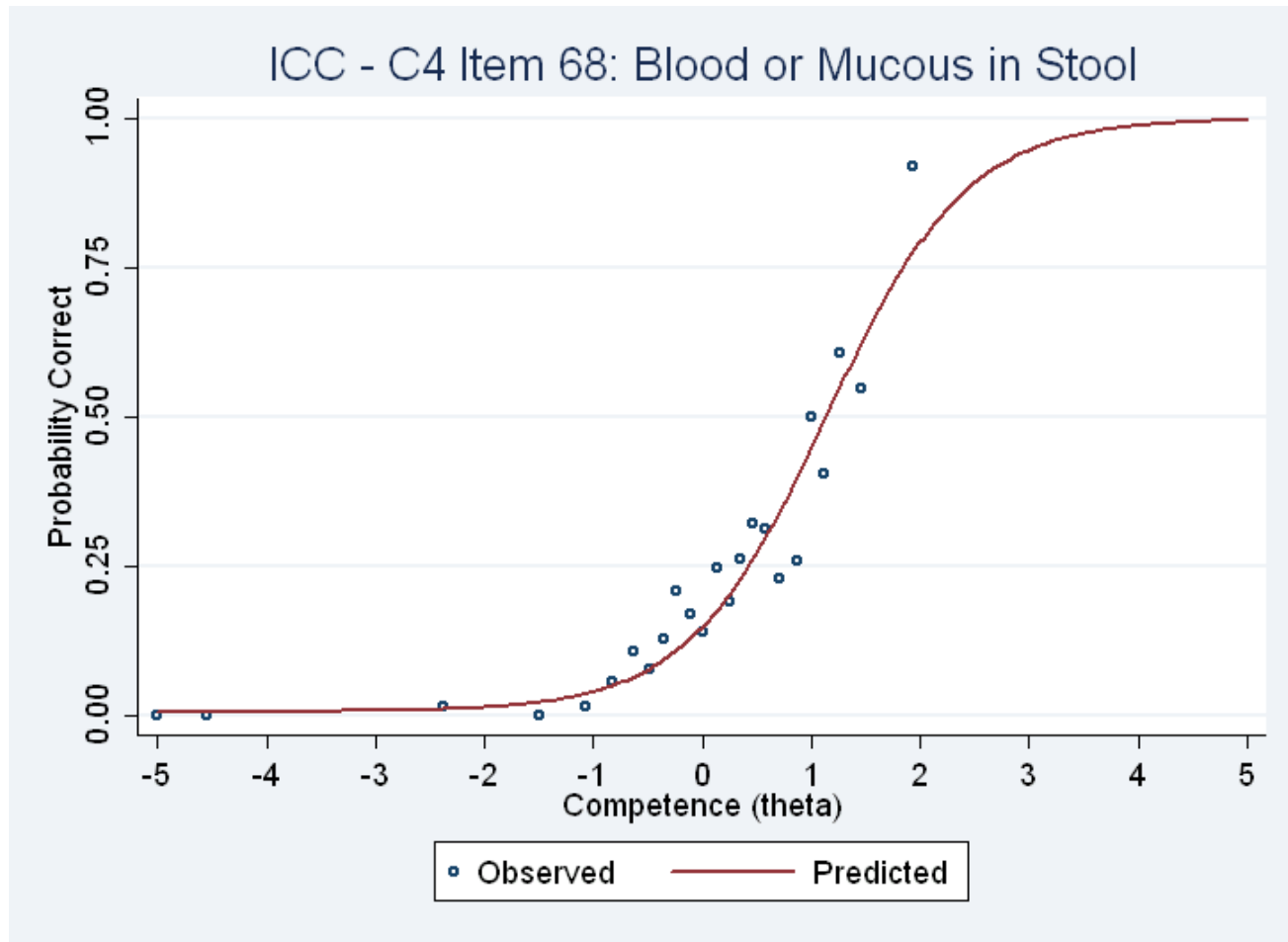
Tuberculosis: Sputum Test for AFB



Pre-Eclampsia: Blood Pressure



Dysentery: Blood or Mucous in the Stool



Competence by Quintiles

	Mean Competence
Least Competent	-4.22
Second Quintile	-0.99
Average Competence	-0.05
Fourth Quintile	0.62
Most Competent	1.42

Correlation of Competence & Diagnosis

	Total History Questions	Total Exams	% Who Asked Relevant Question/Exam	% of Providers who gave the Correct Diagnosis
TUBERCULOSIS (Relevant Exam: Sputum Test)				
Least Competence	0.31	0.95	0.10	0.40
Second Quintile	0.91	1.87	0.27	0.62
Average Competence	1.22	2.34	0.38	0.72
Fourth Quintile	1.86	3.45	0.49	0.81
Highest Competence	2.66	4.88	0.59	0.89
Total	1.39	2.70	0.37	0.69
PREECLAMPSIA (Relevant Exam: Blood Pressure)				
Least Competence	0.75	0.59	0.15	0.14
Second Quintile	2.30	1.67	0.36	0.28
Average Competence	3.16	2.22	0.49	0.42
Fourth Quintile	4.97	3.46	0.62	0.62
Highest Competence	7.24	5.07	0.70	0.82
Total	3.68	2.60	0.46	0.46

Correlation of Competence & Diagnosis

	Total History Questions	Total Exams	% Who Asked Relevant Question/Exam	% of Providers who gave the Correct Diagnosis
DIARRHEA (Relevant Question: Blood/Mucous in Stool)				
Least Competence	0.47	0.30	0.06	0.74
Second Quintile	1.07	0.91	0.16	0.78
Average Competence	1.42	1.15	0.23	0.77
Fourth Quintile	1.95	2.10	0.34	0.82
Highest Competence	2.48	3.56	0.46	0.86
Total	1.48	1.60	0.25	0.79
DYSENTERY (Relevant Question: Blood/Mucous in Stool)				
Least Competence	0.46	0.31	0.07	0.27
Second Quintile	1.10	0.91	0.19	0.37
Average Competence	1.46	1.15	0.26	0.39
Fourth Quintile	2.00	2.08	0.38	0.56
Highest Competence	2.55	3.51	0.50	0.71
Total	1.51	1.59	0.28	0.46

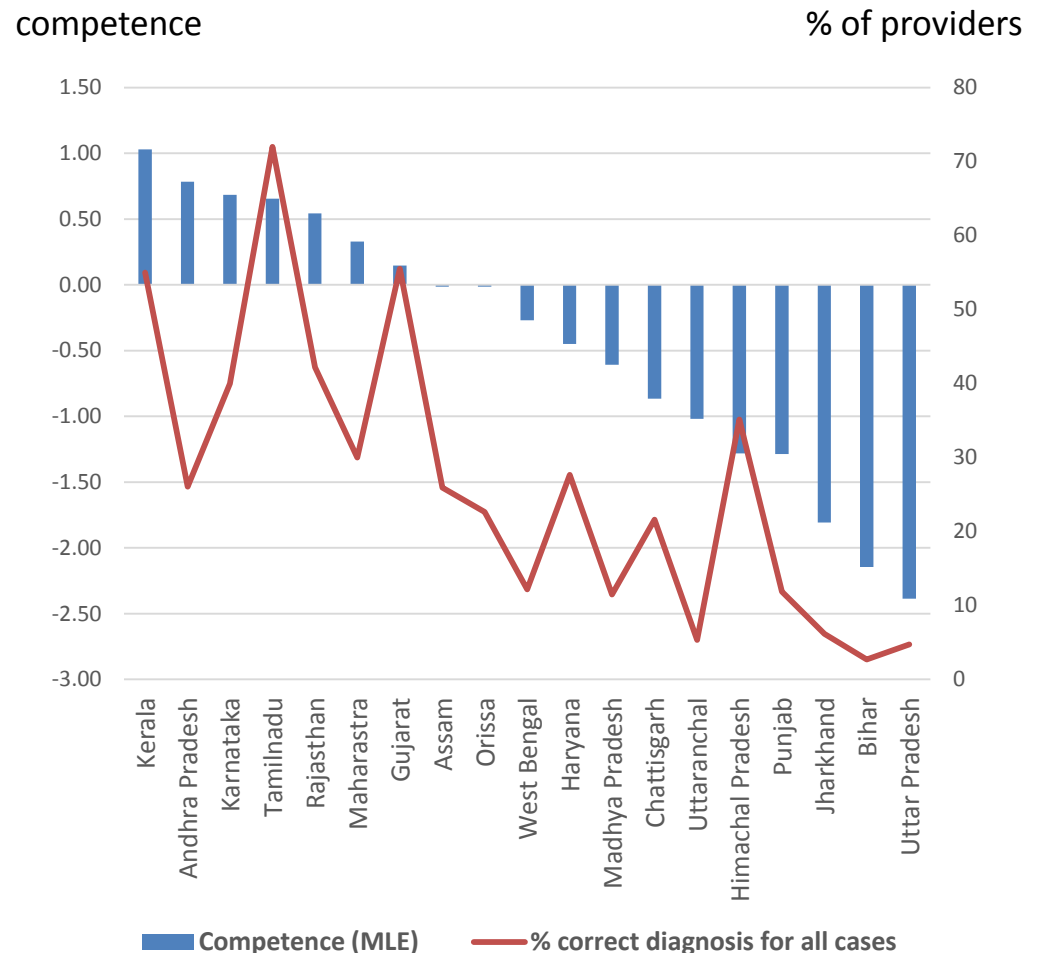
Correlation of Competence & Diagnosis

Competence quintile	% of Providers who gave the Correct Diagnosis for all cases	% of Providers who gave the Wrong Diagnosis for all cases
Least Competence	3	40
Second Quintile	10	22
Average Competence	17	15
Fourth Quintile	34	7
Highest Competence	56	2
Total	24	17

How does competence vary across states?

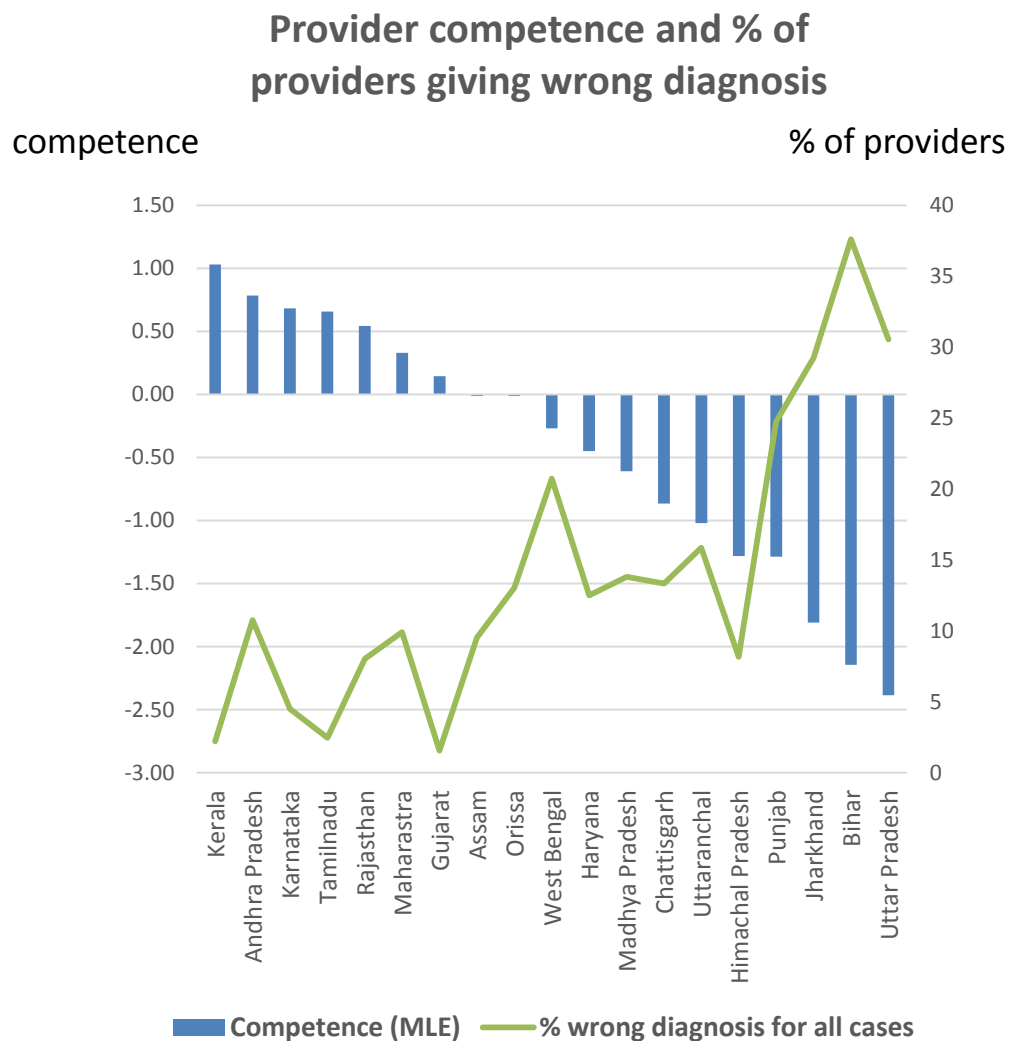
	Competence (MLE)	% who gave the correct diagnosis for all cases
Andhra Pradesh	0.78	26
Assam	-0.01	26
Bihar	-2.15	3
Chattisgarh	-0.87	22
Gujarat	0.14	56
Haryana	-0.45	28
Himachal Pradesh	-1.28	35
Jharkhand	-1.81	6
Karnataka	0.68	40
Kerala	1.03	55
Madhya Pradesh	-0.61	11
Maharashtra	0.33	30
Orissa	-0.01	23
Punjab	-1.29	12
Rajasthan	0.54	42
Tamilnadu	0.66	72
Uttar Pradesh	-2.39	5
Uttaranchal	-1.02	5
West Bengal	-0.27	12
India	-0.60	24

Provider competence and % of providers giving correct diagnosis



How does competence vary across states?

	Competence (MLE)	% who gave the wrong diagnosis for all cases
Andhra Pradesh	0.78	11
Assam	-0.01	10
Bihar	-2.15	38
Chattisgarh	-0.87	13
Gujarat	0.14	2
Haryana	-0.45	13
Himachal Pradesh	-1.28	8
Jharkhand	-1.81	29
Karnataka	0.68	4
Kerala	1.03	2
Madhya Pradesh	-0.61	14
Maharashtra	0.33	10
Orissa	-0.01	13
Punjab	-1.29	25
Rajasthan	0.54	8
Tamilnadu	0.66	2
Uttar Pradesh	-2.39	31
Uttaranchal	-1.02	16
West Bengal	-0.27	21
India	-0.60	17



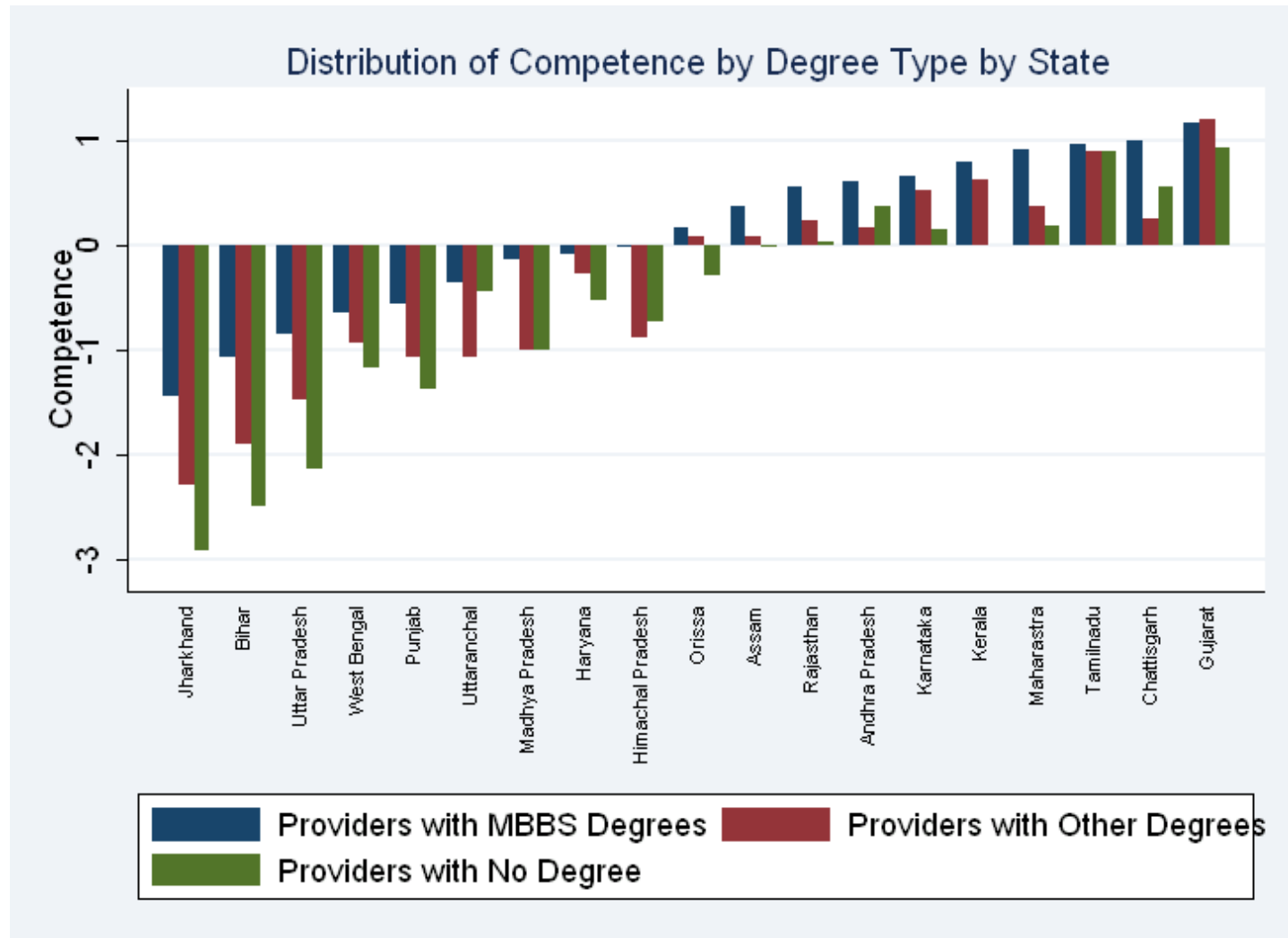
Competence by Qualification/Region?

	Degree type only	Degree type and state fixed effects	Degree type and SCR fixed effects
Has MBBS	1.6199*** (0.2435)	1.0624*** (0.2388)	1.2475*** (0.2669)
Has other degree	0.5425*** (0.1174)	0.3417*** (0.1012)	0.4349*** (0.1295)
Adjusted R-squared	0.0326	0.2592	0.3176
No. obs.	4,565	4,565	4,565

The Vignettes Sample (PHC's)

	Number of Facilities	Number of Providers	Doctors		Nurses and Other Providers			
			Doctors	MBBS Degree	Other Degree	Nurses and Other Providers	Other Degree	No Degree
Andhra Pradesh	78	194	79	60	16	113	94	14
Assam	79	621	251	187	56	370	3	292
Bihar	79	365	168	149	16	195	140	44
Chattisgarh	75	214	108	39	62	103	43	50
Gujarat	79	244	106	59	46	135	100	17
Haryana	80	370	155	126	26	210	93	108
Himachal Pradesh	71	173	93	89	2	80	50	25
Jharkhand	78	330	143	128	10	184	149	19
Karnataka	76	190	78	50	25	112	100	8
Kerala	72	189	84	78	2	104	101	0
Madhya Pradesh	69	194	81	65	12	110	41	61
Maharastra	79	364	121	69	45	204	101	88
Orissa	80	246	151	79	70	95	72	21
Punjab	71	192	108	68	34	84	66	15
Rajasthan	80	432	133	87	42	294	256	23
Tamilnadu	80	299	76	59	14	223	185	26
Uttar Pradesh	59	175	103	61	42	71	50	19
Uttaranchal	56	179	96	59	37	82	64	15
West Bengal	77	321	114	99	15	205	199	2
India	1,418	5,292	2,248	1,611	572	2,974	1,907	847

How does competence vary by degree type by state?



Summary

- The average Indian village has SIX medical providers
 - So “access” to healthcare per se is not poor
- Private unqualified providers are a very large part of the provider landscape (can’t ignore them)
 - They account for >75% of primary care (~2/3 even with a public doctor in the village; ~60% even with public MBBS)
- Overall quality of providers is quite low
 - Only 24% of providers could diagnose all 3 cases right
- Very large regional variation in quality
 - State fixed effects explain much more of the variation than even a formal MBBS qualification (variation in training quality/regulation?)
- First census of providers, and largest vignette study to date: aim to measure quality in an all-India representative sample
 - Almost certainly an upper bound (based on SP evidence)