# Quality and Accountability in Healthcare Delivery: Audit-Study Evidence from Primary Care in India

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Online Appendix (Text, Figures, Tables)

## 1 Mapping and Sampling of Providers

### 1.1 Mapping of Providers: Representative Sample

We first randomly selected five districts in the state of Madhya Pradesh, stratified by region and an index of health outcomes. In each district, we sampled 20 villages by probability proportional to size (PPS). Because of the rural focus of the study, we restricted the sampling frame to villages with populations under 5,000. The sample of villages is thus representative of rural Madhya Pradesh.

In each sampled village, we conducted at least three participatory resource assessments in different locations within the village and obtained a list of all the healthcare providers that households' sought primary care services from. These lists were used primarily to identify the geographical locations that households sought care from. For instance, households may seek care from providers within the village, but also on the nearest highway. If 5 percent or more of households reported visiting a provider in an outside location, we identified that location as a "cluster village" and considered it a part of the "healthcare market" for the sampled village. Fifty-five sampled villages have one cluster village, 13 villages have two, and one village has three. The remaining 31 villages have no cluster villages (i.e. less than 5 percent of primary healthcare visits were to a location outside the village). For our sample as a whole, we identified 184 locations, including the 100 sampled villages.

Surveyors then visited each location and administered a *provider census* to all healthcare providers in the location - regardless of whether they had been mentioned in the participatory resource assessments. The provider census collects details on the providers' demographics, and practice and clinic characteristics.

After the provider census in the villages, we administered a short *household census* and obtained information on household demographics and healthcare seeking behavior. For each

household member, we asked about incidence of any illness in the past one month, if they sought medical attention for that illness, and (if yes), the name and address of the provider they visited (regardless of the location of the provider). Surveyors mapped the household visits to the providers lists; this is the mapping we use to compute the fraction of visits to public and private providers and providers with different qualifications in Table 1. In instances where households reported visiting providers not already on the list, we probed for the providers' names, addresses and practice details and added the providers to our listing and census exercise. We verified through this exercise that we had covered providers for at least 95 percent of all households in each village. This exhaustive mapping process ensured that we mapped the complete "healthcare market" where households in our sampled villages sought primary care services.

### 1.2 Sampling of Providers for SP visits: Representative Sample

To make the exercise tractable, we conducted the SP work in three out of the five districts in our sample. Although SPs were recruited from the local community, they needed plausible reasons for their presence in the village (which they were not from), and the typical narrative was that they were traveling and/or passing through the village. In order to minimize SP detection, we excluded 5 remote markets (as assessed by road access) from the possible 60 markets, where, after consultation with field staff, we believed that a traveling excuse might not be plausible.

We sampled providers for the SPs to visit from a smaller set of "eligible providers" than what we had mapped. All public nurses and midwives (ANMs), community health workers (ASHA), and day-care center workers (Anganwadi) were excluded from the sample as they primarily provide preventive care such as vaccinations. We also excluded mobile and itinerant providers, chemists, and pharmacists from the sample. Finally, we excluded 55 providers with whom we could not complete the provider census prior to sampling (typically due to the unavailability of provider, we were able to conduct the census with only 17 of these providers in subsequent rounds). These restrictions remove an additional 7 markets from our study, because there were no eligible providers in these markets. We also drop two other markets because they share a cluster with other sampled villages and do not have eligible providers inside the village. Our study in the representative sample therefore covers 46 markets in 3 districts of Madhya Pradesh (see Table A.1). Based on the eligibility criteria defined above, these 46 markets have 649 eligible providers (130 public and 519 private) from which we sample.

In each market we randomly sampled up to two eligible providers in each public clinic and up to six private providers in each market.[1] In the private sector, we sampled one provider

[1]One market in Gwalior district was an exception to this rule. In the cluster village of a particular market, we found 113 providers. In this market, we relaxed our sampling protocol and sampled 20 private providers.

per clinic. We also sampled all MBBS providers in both public and private sectors. Since the unit of analysis for the representative sample is the clinic and not the provider, this sampling procedure was equivalent to sampling private clinics with simple random sampling (after sampling all private MBBS doctors), and sampling larger public clinics (those with two or more eligible providers) twice. We sampled a total of 247 providers of which 45 are public providers and 202 are private providers (Appendix Table A.1).

### 1.3 Completion of SPs: Representative Sample

Based on the sampling methodology described above, we sampled 247 provider-clinics for the SP work in the representative sample. Since SPs sought care from whoever was practicing at the time of the visit, the relevant unit here is the provider-clinic. The sampled providers belong to 235 clinics, and the total number of unique providers sampled is 242 (5 sampled providers practice from multiple clinics and we treat these as different provider-clinic combinations for sampling). Of the 247, SPs completed at least one case in 224 provider-clinics for a completion rate of 91 percent.

At the case-level, SPs saw providers who were not originally sampled but were mapped in the first round in 27 interactions. Furthermore, for 18 interactions (corresponding to 8 public and 2 private clinics) SPs saw providers that we had not mapped and we do not know the identity of the provider. These were most likely staff present in the clinic who are not licensed to provide care, but who do so when the doctor is absent. The discrepancy between whom we sampled and whom we actually saw does not affect interpretation of our results in Panels A and B of Tables 3-5, but it does in Panel C, where we include controls for provider characteristics. Panels A and B present results without provider controls, so whether or not we have background data on the provider is irrelevant, because we know which market they were practicing in and whether they were public or private. This is why the public-private difference here should be interpreted as the difference in random visits to providers' clinics rather than providers. In Panel C, we present results including provider controls. Here, for 27 interactions where we saw providers we did not sample but mapped (and interviewed during the provider census), we use their background information. The 18 observations where we do not know the provider at all are dropped from the estimation sample.

### 1.4 Mapping of Providers: Dual Practice Sample

We obtained a list of all Primary Health Centers (PHCs) and Community Health Centers (CHCs) from the Ministry of Health of Madhya Pradesh. Excluding PHCs/CHCs which were mapped as part of the representative sample, we mapped 200 more facilities in this round. Of these 200 facilities, 40 did not have an MBBS provider posted (see Appendix

Table A.2). In the remaining 160 PHCs/CHCs we located 216 providers (some providers were mapped to multiple facilities). Our field team then undertook detailed field work to find out if these providers operated private practices and, if yes, to locate their private practices. We were able to locate a private practice for 132 of the 216 providers (61.1 percent) (this is the sample we call the "dual practice sample"). After the mapping, we administered the provider census to all providers. To the extent possible, the census was administered in the private clinic of the provider.

### 1.5 Sampling of Providers: Dual Practice Sample

We sampled one MBBS doctor from every PHC/CHC with preference for one with a dual practice when there were multiple MBBS doctors in the clinic. In cases where a provider was posted to multiple public facilities, and where there were no additional MBBS providers in these facilities, we randomly sampled the provider from one of the multiple facilities they were posted to. With this sampling strategy, we sampled from 139 of the 160 facilities we could have sampled from. Of the 139 providers, 91 operated private practices (65.5 percent, see Table A.2).

### 1.6 Completion of SPs: Dual Practice Sample

SPs completed interactions with 116 of the 139 providers sampled. The main reason for non-completion is that providers were absent or were away on "long leave" in the 6-month phase between the listing and the SP work. We made up to 3 (and in one case 4) attempts to complete the SP-case interaction, and were forced to stop trying at that point due to the heightened risk of detection. Of the 48 providers without private facilities, SPs completed interactions with 32 providers (66.7 percent). Of the 91 providers with private practices, SPs were able to complete at least one interaction with 84 providers (92.3 percent, either public or private, Panel B2 of Table A.2).

The number of dual practice doctors sampled is 91, with 227 cases allocated to the public clinics and 228 to private clinics (we randomly assigned the unstable angina case to either the public or a private clinic). Completion rate in the dual practice sample varies by sector due to high absence rate of doctors in the public clinics (see Panel C2 of Table A.2). Of the 91 public doctors, we successfully completed at least one case with 78 percent. In the private sector, we completed at least one case with 92.3 percent. At the case level, completion rates for public and private doctors in the dual sample was 74 percent and 90 percent respectively. The number of dual practice providers for whom we have at least one observation in both their public and private practice is 70. We discuss the robustness of our results to differential non-completion of SP cases across public and private clinics in Appendix D.1.

## 2 Standardized Patient Data Collection and Notes

### 2.1 Description of Tracer Conditions and Relevance for India

SPs presented either a case of unstable angina, asthma, or dysentery of an absent child.

- Unstable Angina: A 45-year-old male complains of chest pain the previous night. Appropriate history taking would reveal classic signs (radiating, crushing pain) and risk factors (smoking, untreated diabetes, and family history of cardiac illness) of unstable angina or an imminent myocardial infarction.

- Asthma: A 25-year-old male or female presents with difficulty breathing the night before the visit. When questioned appropriately, the SP reveals that the episode lasted for 10 to 15 minutes and involved a "whistling" sound (wheezing) and that he or she has had similar episodes before, often triggered by house cleaning and cooking smoke. The SP also reports a family history of similar symptoms.

- Dysentery: A 26-year-old father of a 2-year-old complains that his child has diarrhea and requests medicines. When probed, the SP reveals details of their water source and sanitation habits, in addition to the presence of fever and the frequency and quality of the child's stools.

For all cases, checklists of recommended history questions and examinations were developed together with an advisory committee and SPs were trained to recall the questions asked and examinations performed. These were then recorded during a debriefing with a field supervisor using a structured questionnaire within an hour of the interaction. In a recent study, we test the reliability of recall by comparing audio recordings with recall and find a very high correlation of 0.63 ($p<.001$) (Das et al., 2015*a*).

### 2.2 Relevance of Cases

Incidence of cardiovascular and respiratory diseases has been increasing, and diarrheal disease kills more than 200,000 children per year in India (Black et al., 2010; Patel et al., 2011) The Indian government's National Rural Health Mission (NRHM) has developed triage, management, and treatment protocols for unstable angina, asthma, and dysentery in public clinics, suggesting clear guidelines for patients presenting with any of these conditions (Jindal et al., 2005). The cases were also chosen to minimize risk to standardized patients since they could not portray any symptoms of infection given the documented high propensity to administer medicines intravenously with unsterilized needles and to use thermometers that have not been appropriately disinfected (Banerjee, Deaton and Duflo, 2004).

### 2.3 SP Recruitment, Script Development and Training

A total of 15 individuals were selected from an initial group of 45 who were extensively screened and trained for 3 weeks. The age and sex of recruited SPs corresponded to the relevant tracer conditions. For instance, angina was depicted by male SPs between 40 and 50 years old.

Scripts were developed under the guidance of a medical anthropologist with active SP participation that described the social and family contexts of the patient if a provider were to ask questions about these details. Joint script development and SP training ensured that the clinical symptoms and case history reflected the social and cultural milieu of which the SP was assumed to be a member and, second, the presentation of symptoms and answers to history were consistent with biomedical facts about the disease. SPs were trained to present symptoms and answer questions pertaining to case history that were medically correct. For example, all opening statements and questions pertaining to the type of cough and its duration were standardized. SPs were also trained to distinguish between questions to which answers could be improvised but had to be appropriate to the social role of the SP and answers that had to be given using local idioms but in a standardized format without any alterations.

All SPs underwent rigorous training for 100-150 hours that started with a focus on the cases and the development of scripts and proceeded to memorization and appropriate role-playing, as well as techniques to perfect recall of the questions asked and examinations completed during the interaction. Following the training, SPs visited doctors who were working with our team to provide feedback on their presentation and depiction of the cases. Finally, dry runs were completed with unannounced visits to consented providers to help build the confidence of the SPs and take them through a number of “real-life" situations. Field work started once protocols were in place for the variety of these experiences.

With consent from the Institutional Review Board at Harvard University, the study was first piloted in Delhi with 64 consented providers who had been previously informed that they would be visited by an SP within the next 6 months (see Das et al. (2012)). In the pilot phase of the study, a total of 248 out of a potential 256 SP interactions were completed. Within a month of the SP visit, field-workers visited the consented providers to inquire if they had been visited by an SP. In cases where the provider felt that an SP visit had occurred, we elicited the sex, approximate age and symptoms of the SP. We could confirm a match between the providers' suspicions and the actual SP sent to the provider in only 2 cases for a detection rate of less than 1 percent.

The Institutional Review Board of Innovations for Poverty Action and the Central and State governments in India granted permission for the overall study. To minimize detection in rural Madhya Pradesh, where providers are more likely to recognize their entire patient

population, the study proceeded as an audit, and providers were not aware that they were being visited by standardized patients. The Institutional Review Board at Innovations for Poverty Action granted clearance for this deception design. Clearance was granted because the risks to providers and their patients were minimal, whereas accurate measures of provider practice were nonexistent. The expected length of clinical interactions, patient loads, and levels of provider anxiety induced by the cases were thought to be small, and standardized patients had to pay providers whatever they charged. The waiver of consent is consistent with the principle that where the research subject provides a public service to other customers, the public have a right to know about the quality of the service provided (Norris, 2002).

### 2.4 Categorizing Treatment in SP Interactions

In rural Madhya Pradesh, as in much of India, providers often dispense medicines in the clinic rather than prescribe them for purchase from external chemists (some do both). Our field staff recorded names of all dispensed/prescribed medicines in SP exit interviews and used multiple resources to classify medicines as accurately as possible. Field staff were given a list of commonly used drugs in India along with their medical classification, and the CIMS Drug Information System (in print), which they used to record exact medicine names and classes. For drugs that were not immediately confirmed, they consulted local chemists and pharmacists and obtained correct names to the extent possible.

To construct our main treatment variables - correct, palliative, and unnecessary/harmful treatment - we obtained from a panel of doctors in the United States and India a full list of correct and palliative treatments/medicines for each case. These include nitrates, aspirin, clopidogrel, anti-platelet agents, blood thinners, beta blocker, morphine, other pain control, ACE inhibitor, and vasodilator for unstable angina; ORS, electrolytes, antibiotics, and zinc for dysentery; and inhaled-corticosteroids, leukotriene inhibitors, cromones, inhaled-anticholinergics, and oral-corticosteroids for asthma (see Table A.5).

After medicine coding in the field, the authors and members of the ISERDD team in Delhi verified the codes assigned to all medicines and recoded if them when necessary. To further ensure the coding was correct, we used a third party, a pharmaceutical consulting firm in Delhi, to independently verify our classification of medicines.

Medicine coding is relatively straightforward in instances where providers prescribe and SPs receive a written prescription. In cases where providers dispense, it was easier to obtain names when medicines came with packaging than when they did not. In the 1,123 complete SP interactions, SPs were recommended a total of 2,772 medicines corresponding to 969 unique medicines (by medicine names, ignoring unlabeled ones). We are unable to classify 14.18 percent of the all 2,772 medicines because they were unlabeled (providers dispensed them as loose samples or in crushed powder form). We are further unable to classify 3.64 percent of medicines (93 unique medicines by name) because we could not match them

to secondary information sources. SPs received at least one unclassifiable medicine in 268 interactions (23.9 percent of all interactions). However, in 211 of these interactions (18.8 percent), SPs received classifiable medicines along with the unclassifiable medicines. In only 57 interactions (5.1 percent) were all medicines unclassifiable.

We construct our main treatment variables - correct treatment, palliative treatment and unnecessary treatment - after completing the medicine coding process described above. For each interaction, we determine if any recommended medicines fall into correct, palliative and/or unnecessary treatments, treating all unlabeled and unidentifiable medicines as unnecessary. It is possible that the unlabeled and unidentifiable medicines are really correct or palliative treatment. However, the likelihood that the provider dispenses an unclassifiable medicine is decreasing in other measures of provider quality from the SP study. We are therefore confident that such medicines are more likely unnecessary treatments than not. Our results are also robust to excluding interactions that include unclassifiable medicines.

## 3 Theoretical Appendix

### 3.1 Problem Setup

A patient visits a provider endowed with a level of medical knowledge $K$, and presents a set of symptoms (this would correspond to the opening line of the SP script). The patient has a true illness denoted by $n^{true}$. Patients with different underlying illnesses may experience and present similar symptoms. In other words, given a set of symptoms, there is a distribution of $n^{true}$ associated with the symptoms (we assume for analytical tractability that this distribution can be expressed on a single-dimensional real line, with $n^{true}$ being a point on this line). A provider's job is to identify the true state of the patient and perform adequate treatments. The provider-patient transaction is modeled as a two-stage process: consultation and treatment. A subscript $i$ for the $i^{th}$ provider is used when there is a need to emphasize heterogeneity among providers, but is suppressed otherwise for notational simplicity.

### 3.2 Consultation Stage

The patient visits a provider and describes her symptoms based on which the provider forms a prior belief about the true illness that follows a normal distribution:

$$n^{prior} \sim N\left(\nu, \frac{1}{\alpha}\right)$$

The true illness of the patient ($n^{true}$) is unobserved to both the patient and the provider, and the prior belief can be thought of as the provider's belief about the distribution of illnesses in the region which cause the given symptoms. The provider exerts costly effort $e$ to learn about $n^{true}$. We can interpret $e$ as the number of checklist items completed by the

provider or time spent with the patient. The provider draws a noisy signal $s \sim N(n^{true}, \frac{1}{\beta})$ by exerting $e$ where $\beta = eK$. Thus, the marginal return to effort in terms of increased signal accuracy is higher when the provider's medical knowledge $K$ is higher.[2] We assume a quadratic cost-of-effort function, with the cost of effort being equal to $e^2$.

The patient can observe the amount of effort expended ($e$) but cannot observe the signal ($s$) drawn by the provider as a result of the effort. Given $s$, the provider updates his belief about $n^{true}$. The posterior belief of the true state is given by:

$$n^{post} \sim N\left(\underbrace{\frac{\alpha\nu}{\alpha+\beta} + \frac{\beta s}{\alpha+\beta}}_{\equiv\mu}, \frac{1}{\alpha+\beta}\right)$$

where $\mu$ is the posterior mean. This is the result of standard Bayesian normal updating, and hence, a separate proof is omitted. Note that $n^{post} \to n^{true}$ as $\beta \to \infty$.

### 3.3 Treatment Stage

In the second stage, the provider makes treatment choices based on the posterior belief about the true state. The choice of treatments is expressed as an interval $[\mu - n, \mu + n]$, which maps into the empirical observation that most providers in our setting provide multiple medications. A wider range of treatments has a higher probability of covering the true illness and curing the patient of the current ailment but also increases long-term health costs.[3] The long-term health cost of excessive medication is modeled as $h(n) = n^2$

Let $F_e$ denote the cumulative density function of the posterior belief given some level of effort $e$. Given $K$, the shape of the posterior belief is governed by $e$ ($e$ and $\beta$ are used interchangeably when $K$ is fixed). The probability that the interval $[\mu - n, \mu + n]$ includes $n^{true}$ is denoted by $P_e(n)$ where $P_e(n) = F_e(\mu+n) - F_e(\mu-n)$. The patient's expected health outcome given $n$ (which is a function of $e$) is $H$, which is given by $H(e, n) = P_e(n) - n^2$.

Note that for each individual patient, the interval either includes the true state or not with probability of $P_e(n)$ and $1 - P_e(n)$. Thus the optimal outcome for a patient is to receive only the correct treatment, and not receive any additional unnecessary treatments, and we can think of a high-quality provider as someone who provides this outcome, enabled by a precise posterior distribution of the true illness.

[2]Note that the marginal return to $e$ on signal accuracy diminishes as $e$ becomes larger as illustrated in Figure A.6 (Panel B). Also, as in Rosenzweig (1995) a doctor with more knowledge may also have a more accurate prior to begin with, in addition to learning more with additional effort. We abstract away from this point to focus on deriving predictions for effort, treatment, and health outcomes for the same doctor across public and private practices. This corresponds to our dual sample.

[3]This assumption can reflect multiple channels, including adverse reactions to unnecessary drugs, the building of resistance to drugs that are not needed now but may be useful in future, or by the potential for adverse interactions between drugs.

In practice, providers will choose effort and treatments to maximize their own utility, which may not be aligned with those of patients. We model provider utility as having two components. First, providers care about curing their patients and overall patient health. This can be attributed partly to altruism, intrinsic motivation to do the right thing, training and professionalism (Hippocratic oath), peer pressure and monitoring, and the liability and malpractice regime. We capture all of these factors with the parameter $\phi$, which should be thought about as representing the extent to which providers value patient health in their own utility function in a setting without high-powered financial incentives. Thus, a higher $\phi$ represents greater alignment between provider and patient utility.

Second, providers also care about financial rewards, which in turn depends on how they are compensated. Under market pricing, providers can charge a consultation fee ($\tau e$) that is a function of a piece rate $\tau_i$ (determined by their qualifications and reputation) and effort expended (which is observable to patients), and a dispensing fee that increases linearly with the number of medicines provided (this is consistent with the correlates of market prices reported in Table 6).

They also have an incentive for improving patient health because this helps build their reputation and raises future demand (which we can think of as an increase in their consulting piece rate over time). However, patients can observe whether they were "cured" more easily than the costs of excessive medication, and this creates an incentive to over-treat because over-treatment increases the probability of spanning the true illness and providing a correct treatment. We denote the observed health outcome as $H^o(e, n)$, and true health as $H(e, n)$. Note that the idea that there is wedge between what patients consider to be optimal treatment and what a medical professional would consider optimal can be motivated in several ways including differences in observability as well as by present-biased patients.[4]

### 3.4 Providers' Optimization Problem with and without Market Incentives

Denote the maximized utility of providers in the consultation stage and treatment stage by $V_1$ and $V_2$ respectively. Without market incentives, providers have low-powered incentives and maximize their utility:

$$V_1 = \max_e \left\{ -e^2 + V_2(e) \right\} \tag{1}$$

[4]In an earlier working paper version (Das et al. (2015*b*)), we incorporate a third channel that providers care about - which is responding to patient-driven demand. Patients have their own expectation about proper treatment, and providers may satisfy patients by meeting their demand for medication in order to avoid a communication cost of explaining to patients that they do not need the treatment that they seek. We drop this extension here because our data do not allow us to contribute any empirical insights regarding this channel. We also assume that private providers have dynamic incentives to acquire a positive reputation, but we do not endogenize these market incentives since a static framework is adequate to interpret our empirical findings. A theoretical extension where we provide one potential way of endogenizing market incentives is available on request but is also omitted here because our data do not allow us to study the dynamics of reputation and price setting.

$$V_2(e) = \max_n \{\phi H(e,n)\}$$

where $\phi$ governs the extent to which providers care about patients' health without high-powered incentives.

In a market environment, providers face market incentives in addition to low-powered incentives. Now, a provider $i$ charges a piece rate $\tau_i$ per unit of effort as a consultation fee and also charges $p$ per unit of $n$ for the treatment (we can think of $p$ as the profit margin on medicines dispensed or the commission on medicines prescribed). Providers also care about their reputation in the market, which is determined by the health outcomes of their patients. Health outcomes are not fully observed in the market because the long-term health cost of excessive treatment is not as easily observed as the immediate relief of symptoms. Instead, reputation is based on the observed health outcome $H^o$, which is given by $H^o(e,n) = P_e(n) - \gamma_o n^2$ where $0 < \gamma_o < 1$, and $\delta$, which is a parameter that governs the extent to which providers care about their reputation in the market. When there are market incentives, providers maximize their utility given by:

$$V_1(\tau_i) = \max_e \left\{-e^2 + \tau_i e + V_2(e)\right\} \tag{2}$$

$$V_2(e) = \max_n \{\phi H(e,n) + \delta H^o(e,n) + np\}$$

The first order conditions without market incentives are given by:

$$\phi f_e(\mu + n(e)) \frac{n(e)K}{\sqrt{\alpha + eK}} = 2e \tag{3}$$

$$f_e(\mu + n) = n \tag{4}$$

where $f_e$ is the probability density function of the posterior belief given $e$. The term $f_e(\mu+n)$ captures the marginal benefit of increasing $n$ through the higher probability of spanning the correct treatment, and the right hand side is the marginal cost of increasing $n$ through the higher health cost of excessive treatment. In the absence of market incentives, note that providers choose $n$ which maximizes $H$ at any given $e$.

The first order condition in the consultation stage with market incentives is given by:

$$\tau_i + (\phi + \delta) f_e(\mu + n(e)) \frac{n(e)K}{\sqrt{\alpha + eK}} = 2e \tag{5}$$

and the first order condition in the treatment stage is given by:

$$f_e(\mu + n) + \frac{p}{2(\phi + \delta)} = \left(\frac{\phi + \gamma_o \delta}{\phi + \delta}\right) n \tag{6}$$

It is easy to see from (4) and (6) that given $e$, providers choose larger $n$ when there are market incentives. Because there is a pecuniary benefit from $n$ and also because the cost of excessive $n$ is not fully observed in the market ($\gamma_o < 1$), given $e$, the marginal benefit of $n$ is always greater and the marginal cost is always smaller with market incentives. Thus, providers choose excessive $n$ where $H$ is decreasing in $n$ instead of where $H$ is maximized. This means that by slightly decreasing $n$, the health outcome can be improved.

Whether market incentives induce higher effort depends on the relative size of the rewards for $e$ and $n$ in the market. As long as the rewards for $n$ are not so large so as to dominate those for $e$, providers choose higher $e$ with market incentives (see Das et al. (2015*b*) for the proof). Since our empirical results find that private providers always exert more effort (in both the representative and dual samples) and we also find a robust positive relationship between prices charged and effort expended, it appears that the $\tau$ in our setting is high enough to induce additional effort from providers facing market incentives.

### 3.5 Market Incentives and Health Outcomes

However, while provider effort may be higher under market incentives, the impact of market incentives on health outcomes is ambiguous and will depend on parameter values. In particular, when $\phi$ is very low, it is possible that health outcomes under market incentives are better; however, as $\phi$ increases, health outcomes without market incentives may be better.

Figures A.6 and A.7 in the illustrate this mechanism. Panel (A) in Figure A.6 illustrates a case where market incentives induce higher effort. $MB_{with}$ and $MB_{without}$ are the left hand side of (5) and (3) with respect to $e$. $MC_{with}$ and $MC_{without}$ are the right hand side of (5) and (3) with respect to $e$. The terms $e^*_{with}$ and $e^*_{without}$ are the optimal levels of effort with and without market incentives, respectively, for small and large $\phi$ values. The rewards for effort in the market are sufficiently large in this case that $e^*_{with}$ is larger than $e^*_{without}$. With larger $\phi$ the optimal choice of $e$ is higher.

Panel (B) traces posterior variance $\frac{1}{\alpha+\beta}$, the inverse of posterior precision, as a function of $e$ holding $K$ constant. The y-intercept, $\frac{1}{\alpha}$, is the posterior variance when $e = 0$. The term $\frac{1}{\alpha+\beta}$ decreases with $e$ at diminishing rates because $\beta = eK$. When $\phi$ is small, a difference in $e$ is translated into a substantial difference in $\frac{1}{\alpha+\beta}$. When $\phi$ is large, the marginal effect of effort on $\frac{1}{\alpha+\beta}$ is small.

Panel (C) illustrates the optimal level of treatment with and without market incentives, $n^*_{with}$ and $n^*_{without}$, when the posterior variance with market incentives is substantially smaller than that without market incentives. $MB_{with}$ and $MB_{without}$ are the left hand side of (6) and (4) with respect to $n$. $MC_{with}$ and $MC_{without}$ are the right hand side of (6) and (4) with respect to $n$. The slope of $MC_{with}$ is smaller than one because the health cost of excessive treatment is not fully observed, and hence, penalties for additional treatment in the market are weaker than what providers would impose on themselves under low-powered incentives.

$p$, the unit price of $n$, is added to $MB_{with}$, so $MB_{with}$ asymptotes to $\frac{p}{2(\phi+\delta)}$ rather than to 0. When the posterior variance with market incentives is substantially smaller than that without incentives, the optimal level of $n$ with market incentives can be smaller in spite of incentives for excessive treatment. Panel (D) illustrates the optimal level of treatment when the posterior variance with market incentives is only slightly smaller than that without market incentives. In this case, the effects of market incentives on excessive treatment dominate, and the optimal level of $n$ is larger with market incentives.

Figure A.7 illustrates the health outcome produced with and without market incentives with different values of $\phi$. $H$ increases with $\phi$ because $e$ increases with $\phi$, and $n$ is invariant to $\phi$ given $e$ when there are no market incentives and decreases with $\phi$ when there are market incentives. At low levels of $e$, a small difference in $e$ is translated into a substantial difference in the posterior precision. Although market incentives induce excessive $n$, the effect of higher posterior precision on the health outcome dominates the offsetting effect of excessive $n$. However, as $\phi$ increases, $e$ under both environment increases, and the marginal effect of $e$ on the posterior precision, and hence on the health outcome, becomes smaller. At sufficiently high levels of $e$, higher $e$ with market incentives generates a difference in the posterior precision that is too small to offset the effect of excessive $n$. Thus, when $\phi$ is high, the health outcome without market incentives is higher.

This may be typical in high-income countries with better oversight of medical training and practice, which is the context where Arrow (1963) is implicitly set. However, in settings with very low $\phi$ as seen in India and other low-income countries - exemplified by high doctor absence rates (Chaudhury et al., 2006) - it is possible that market incentives may lead to better outcomes.[5] Thus, an important goal of our theoretical framework is to illustrate how ideas about the optimal organization of healthcare that may have been developed in high-income settings may not apply equally to low-income settings with weak state capacity for running a well-functioning public health system.

## 4 Differential Case Completion and Patient Sorting Across Sectors

### 4.1 Differential Case Completion Across Public and Private Sectors

As we mention in the text, in the dual sample, SPs were more likely to complete an interaction with MBBS doctors in their private clinics than in their public clinics due to the higher absence rates of doctors in their public sector practices. The differential completion rates

[5]See Muralidharan and Sundararaman (2011) for an adaptation of the multi-tasking framework of Holmstrom and Milgrom (1991) and Baker (1992) that yields similar insights in the context of performance-linked pay for teachers (showing that outcomes could improve under performance pay if the default level of teacher effort was low, but could worsen if the default level was high). A key difference in our context is that the high-powered incentives do not come from administratively set performance-linked bonuses, but market rewards for effort and reputation.

could bias our estimates comparing the quality of care across public and private practices of the same doctor (the problem is exactly analogous to differential attrition from treatment and control groups in a randomized experiment). If doctors who are more absent in their public practice also provide poorer care when they are present, our estimates of the public-private differences would represent a lower bound of the true differences. Conversely, if doctors who are more absent from public clinics provide better care when they are present, our estimates will be inflated.

Our data allows us to directly test for the likely direction of this bias, because we can compare effort and treatment outcomes by whether or not the case was completed in the first attempt in each sector or whether additional visits were needed. Panel A of Table A.13 reports means of effort and treatment outcomes by number of attempts and by sector. Panel B presents these differences in a regression format including case and SP fixed effects. In the private sector, we find no difference in either the IRT-score for checklist completion, or the likelihood of providing a correct treatment as a function of whether SPs managed to complete the case in the first attempt or made additional visits to do so. However, in their public practices, doctors who were not found on the first visit had significantly lower IRT scores and likelihood of providing a correct treatment. Thus, doctors who are more absent in the public sector are likely those who exert lower effort even when they are present. The coefficient on the interaction between "public practice" and "completed in first attempt" in Panel B formalizes this and shows that public doctors who were present on the first visit had significantly higher IRT scores and likelihood of providing a correct treatment.

To account for potential bias from differential non-completion of cases across public and private practices in the dual sample, we present re-weighted results in Table A.14. In each sector, we impute missing values (where cases were not completed due to doctor absence) with the average of outcome variables for those providers with whom cases were completed after multiple visits (the averages are calculated separately across public and private practices) and re-estimate equation **??**. Panel A presents the original estimates (corresponding to Tables 3 and 5) and in Panel B we report the re-weighted estimates. For each effort measure, the re-weighted estimates are larger than the original estimate (although they are not statistically different). Results are similar for the correct treatment outcome - the re-weighted estimate is 20.3 percentage points, which is larger than the original estimate of 15.1 percentage points. Overall, these results suggest that differential case completion across sectors attenuates our main results on effort and correct treatment, and that the estimates presented in the paper are likely to be a lower bound of the true differences in quality of care across public and private practices of the same provider.

### 4.2 Differential Patient Sorting Across Public and Private Sectors

As discussed in Section 6.2, a further consideration in interpreting our results is the issue of statistical discrimination. Specifically, while the use of SPs allow us to control for differential case mix across public and private providers by presenting the same case in both settings, it is possible that the cases presented may have been off the equilibrium path for either or both public and private clinics in this setting. Even if the presented cases map well into the overall morbidity patterns and care seeking behavior of the population, it is possible that patients choose to visit different provider types (public or private) for different types of conditions. Patients may choose public facilities for more serious conditions, or vice versa. If there are large systematic differences in the type of patient and case that is presented to public or private clinics, the quality of care differences we record across public and private clinics may partly reflect statistical discrimination.

Note that this is a very difficult problem to address in general because observing real provider-patient interactions precludes the concern of off-equilibrium behavior, but we cannot code the quality of care accurately because we do not know the underlying ailment. On the other hand, the SP method allows for better measurement of quality of care, but may represent an off-equilibrium interaction. But, it is challenging to solve both problems simultaneously. This is why we present results from both approaches in the main text and show that the results are consistent across Tables 3, 5 (SP) and Table 8 (real patient observations).

Here, we provide evidence against differential patient sorting using more data. In addition to observing real patient interactions (as described in section 6.1), we conducted patient exit interviews immediately after their provider interactions, where we asked patients the reasons for their visit, including a list of symptoms, their morbidity levels (measured by their ease of conducting activities of daily living), and other background and demographic questions. In Table A.17 we present estimates of differences in patient characteristics across public and private clinics. For the representative sample, for each outcome variable (rows of the table), Columns (1) and (2) present means in the public and private sectors respectively, and Columns (3) and (4) present coefficients from regressing the outcome variable on a private indicator with and without market fixed effects. Columns (5)-(8) repeat the same exercise for the dual sample except that we use district fixed effects instead of market fixed effects.

Overall, we see that for almost all illness symptoms, patients are equally likely to go to either a public or private provider (in both representative and dual practice samples). Out of the 18 patient and case characteristics comparisons presented in columns 4 and 8, we find significant differences in only two. Similarly, we find no difference in average morbidity among patients visiting public and private clinics (as measured by activities of daily living).

Where we do find some difference is in patient affluence and education (especially in the dual sample), which is not surprising because MBBS providers charge a higher fee. However,

as we discussed in the main text, the optimal *initial* effort and treatment in the cases we chose should not depend on the patients ability to pay for *follow up* treatments (for instance in the angina case, the patient could be given an aspirin and referred to a public hospital, which would have been coded as a correct treatment). Overall, the similarity in the type and intensity of symptoms presented across public and private clinics suggest that differential patient sorting across case type is not likely to affect our results.

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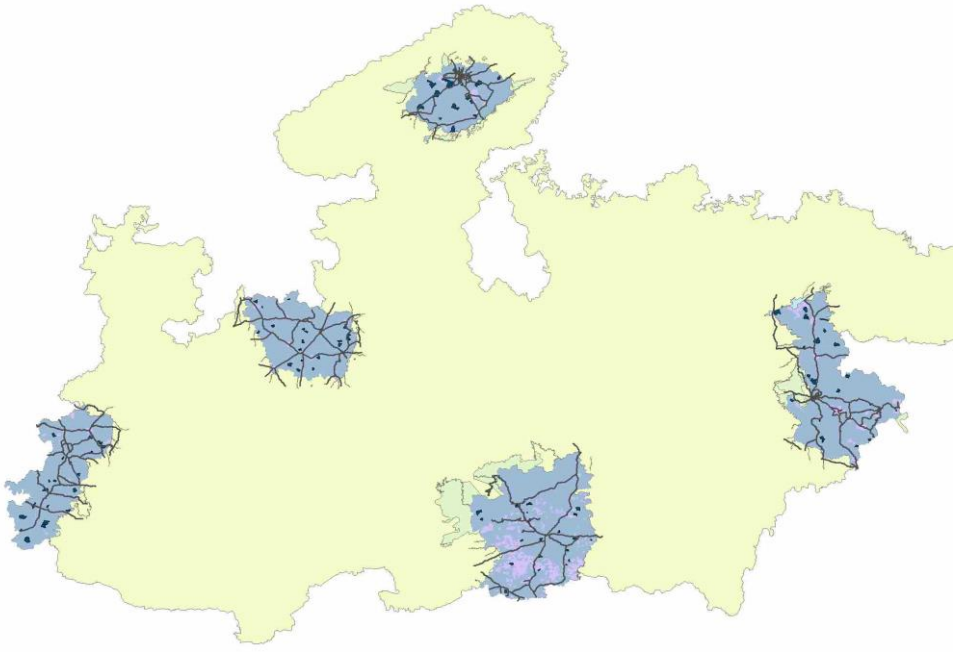
**Appendix Figures and Tables**


Panel A: Location of Madhya Pradesh in India



Panel B: Sampled Districts of Madhya Pradesh – Chhindwara, Gwalior, Jhabua Rajgarh, and Shahdol

Figure A.1

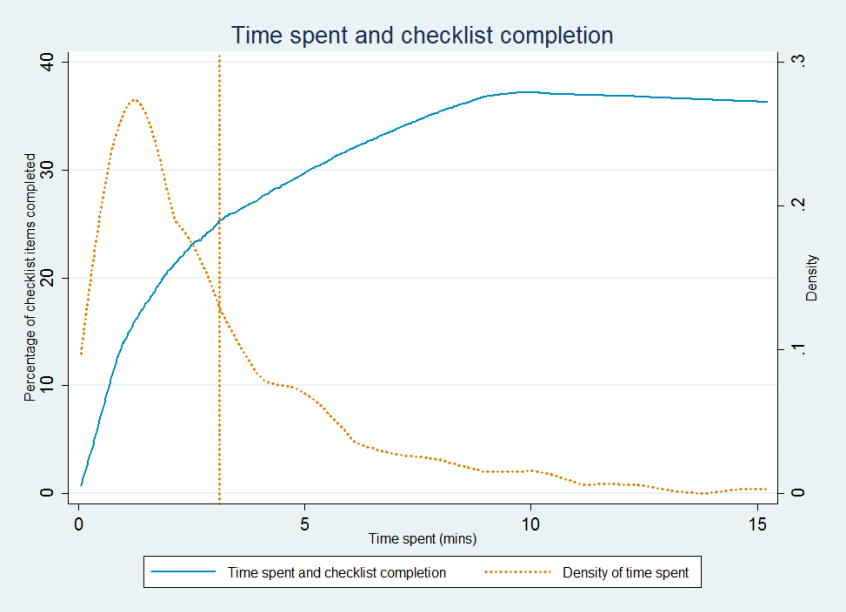



Figure A.2

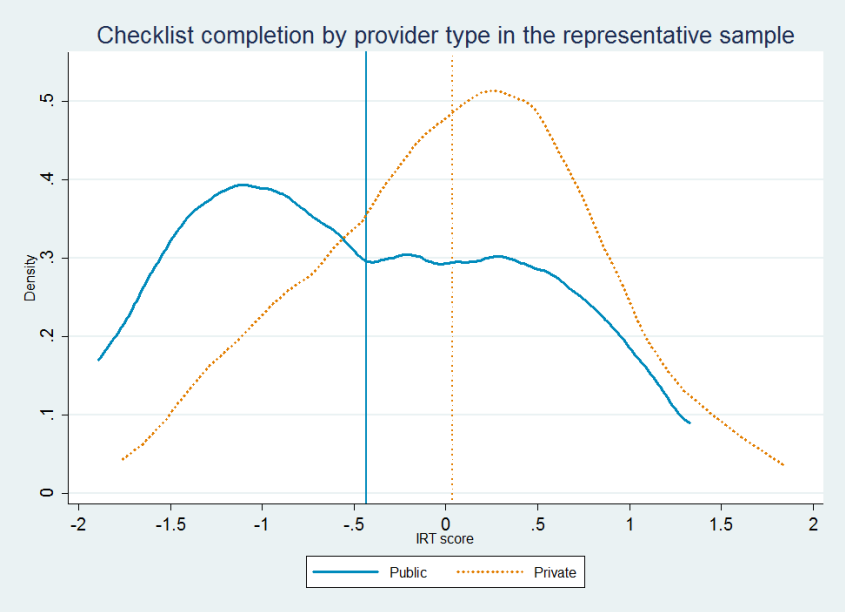



Figure A.3

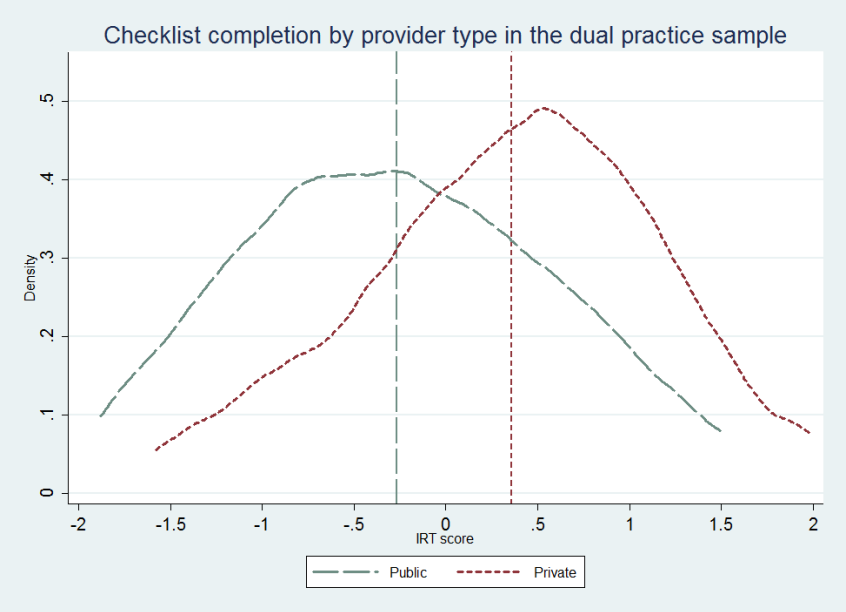



Figure A.4

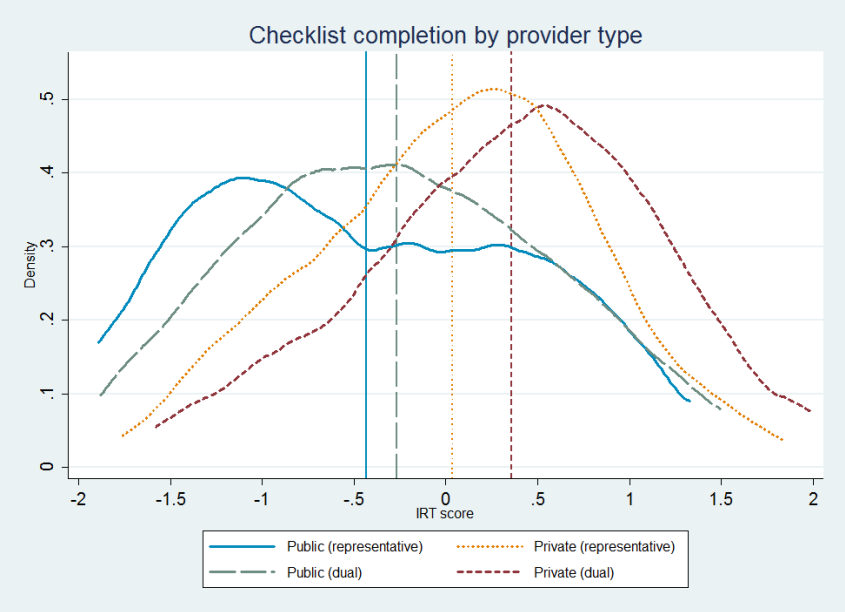
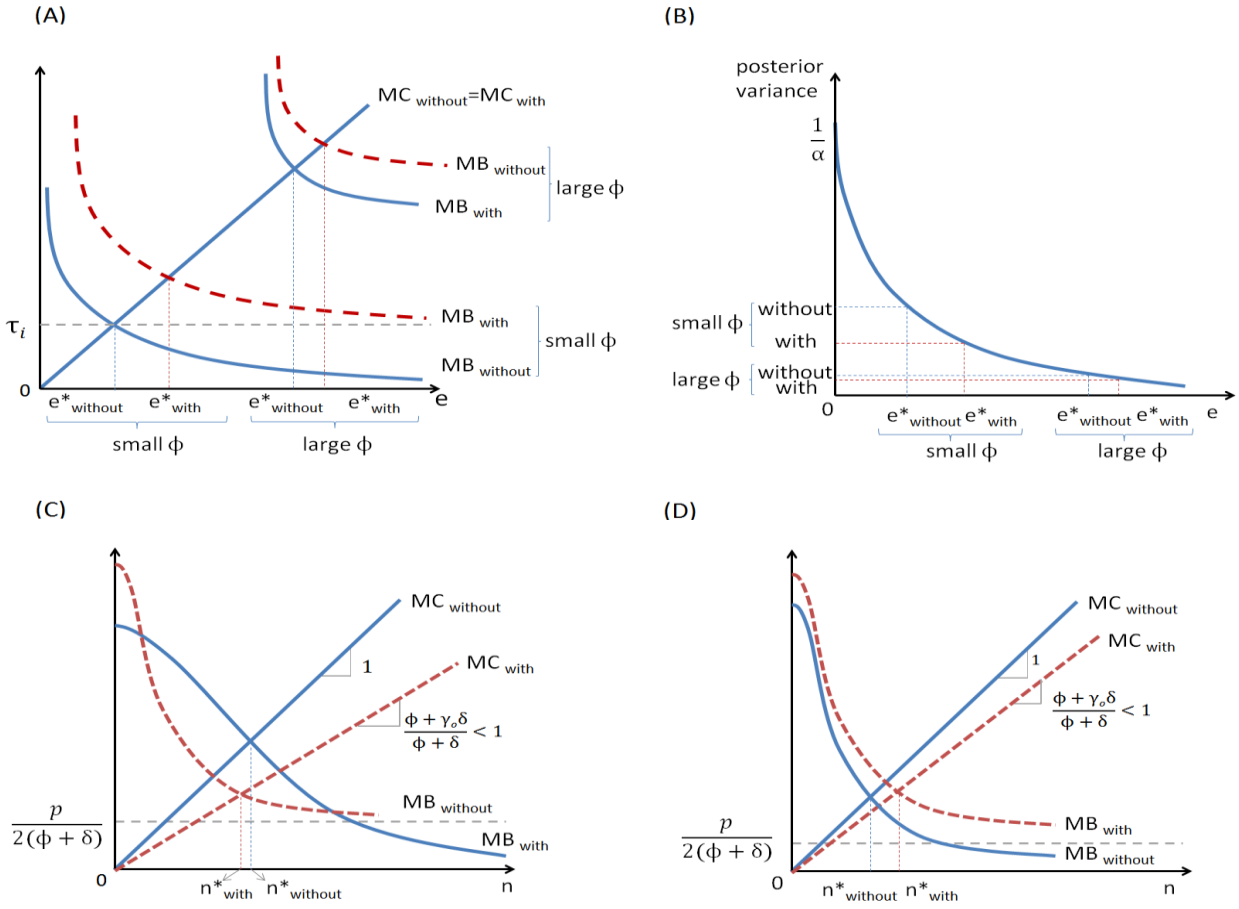


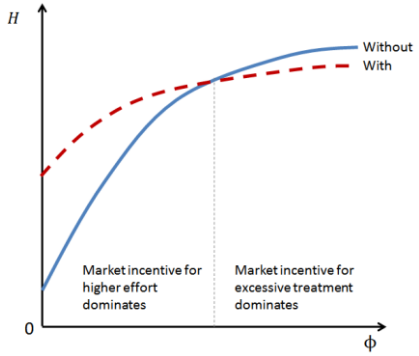

Figure A.5

Figure A.6: Optimal choice of effort and treatment with high and low $\phi$ with and without market incentives




Notes: In panel (A), $MB_{with}$ and $MC_{with}$ are the marginal benefit and the cost of $e$ with market incentives, and $MB_{without}$ and $MC_{without}$ are those without market incentives. $e^*_{with}$ and $e^*_{without}$ are optimal levels of effort with and without market incentives for small and large $\phi$ values. In panel (B), The graph traces the posterior variance $\frac{1}{\alpha+\beta}$ with $e$ on the x-axis. The y-axis intercept $\frac{1}{\alpha}$ is the posterior variance when $e = 0$. In panel (C) and panel (D), $MB_{with}$ and $MC_{with}$ are the marginal benefit and the cost of $n$ with market incentives, and $MB_{without}$ and $MC_{without}$ are those without market incentives. $n^*_{with}$ and $n^*_{without}$ are optimal levels of treatment with and without market incentives for small and large $\phi$ values. Panel (C) and panel (D) compares the optimal level of treatment with and without market incentives when the posterior variance with market incentives is substantially smaller than that without market incentives and when the two posterior beliefs are similar.

Figure A.7: Health outcome with and without market incentives with varying $\phi$




Notes: The graph illustrates the health outcome produced with and without market incentives with different values of $\phi$. The y-axis is the health outcome $H$ and x-axis is the magnitude of low-powered incentive, $\phi$. The solid line traces $H$ without market incentives and the dotted line traces $H$ with market incentives.

**Table A.1: Sampling and completion of SPs in the representative sample**

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) |
|---|---|---|---|---|---|---|---|
| | Markets | Number of providers | | | Number of MBBS providers | | |
| | | Total | Public | Private | Total | Public | Private |
| **Panel A: Sampling and completion by market** | | | | | | | |
| Total eligible | 60 | 719 | 144 | 575 | 51 | 23 | 28 |
| Markets selected for SP | 46 | 649 | 130 | 519 | 50 | 23 | 27 |
| Reasons for not sampling market | | | | | | | |
| Remote market | 5 | | | | | | |
| No eligible provider | 7 | | | | | | |
| Common cluster market, no provider within village | 2 | | | | | | |
| Sampled for SPs | | 247 | 45 | 202 | 28 | 12 | 16 |
| Not sampled for SPs | 14 | 472 | 99 | 373 | 23 | 11 | 12 |
| Completed SPs | 46 | 224 | 36 | 188 | 23 | 9 | 14 |
| **Panel B: Sampling and completion by sector** | | | | | | | |
| Public Sector | | (Number of providers with whom SPs were completed) | | | | | |
| At least 1 public provider sampled | 22 | 151 | 36 | 115 | 20 | 9 | 11 |
| At least 1 public provider completed | 20 | 141 | 36 | 105 | 20 | 9 | 11 |
| At least 1 public MBBS provider sampled | 10 | 98 | 21 | 77 | 18 | 8 | 10 |
| At least 1 public MBBS provider completed | 9 | 87 | 19 | 68 | 18 | 9 | 9 |
| Private Sector | | | | | | | |
| At least 1 private provider sampled | 44 | 218 | 30 | 188 | 22 | 8 | 14 |
| At least 1 private provider completed | 44 | 218 | 30 | 188 | 22 | 8 | 14 |
| At least 1 private MBBS provider sampled | 8 | 68 | 5 | 63 | 16 | 2 | 14 |
| At least 1 private MBBS provider completed | 7 | 67 | 5 | 62 | 16 | 2 | 14 |
| Private and Public Sector | | | | | | | |
| Markets with at least 1 public and 1 private provider sampled | 20 | 145 | 30 | 115 | 19 | 8 | 11 |
| Markets with at least 1 public and 1 private provider completed | 18 | 135 | 30 | 105 | 19 | 8 | 11 |

Notes: In 5 markets where SP work was over completed, the SP saw a provider other than a sampled provider

**Table A.2: Mapping, sampling and completion in the dual practice sample**

| | (1) | | (2) | (3) | (4) | (5) | (6) | (7) |
|---|---|---|---|---|---|---|---|---|
| | Number of Facilities | | Providers | | | Cases | | |
| | | | Number of providers | Percentage of total | Percentage of sampled | Number of cases | Percentage of total | Percentage of sampled |
| **Panel A: Mapping** | | | | | | | | |
| Total | 200 | Total | 216 | | | | | |
| without doctors | 40 | without private clinics | 84 | 38.9% | | | | |
| with doctors | 160 | with private clinics | 132 | 61.1% | | | | |
| **Panel B1: Sampling** | | | | | | | | |
| Total | 139 | Total | 139 | | | 599 | | |
| | | without private clinics | 48 | 34.5% | | 144 | 24.0% | |
| | | with private clinics | 91 | 65.5% | | 455 | 76.0% | |
| **Panel B2: Completion** | | | | | | | | |
| Total | 116 | Total* | 116 | | 83.5% | 460 | | 76.8% |
| | | without private clinics* | 32 | | 66.7% | 87 | | 60.4% |
| | | with private clinics* | 84 | | 92.3% | 373 | | 82.0% |
| **Panel C1: Sampling in dual practice sample** | | | | | | | | |
| Total | 81 | Provider-clinics | 182 | | | 455 | | |
| | | in public clinics | 91 | 50.0% | | 227 | 49.9% | |
| | | in private clinics | 91 | 50.0% | | 228 | 50.1% | |
| **Panel C2: Completion in dual practice sample** | | | | | | | | |
| Total | 81 | Provider-clinics* | 155 | | 85.2% | 373 | | 82.0% |
| | | in public clinics* | 71 | | 78.0% | 168 | | 74.0% |
| | | in private clinics* | 84 | | 92.3% | 205 | | 89.9% |

Notes: * counts all providers with whom at least one case was completed. Reasons for not completing SP surveys include transfer of provider or an inability to find the provider for an interview. In these cases our field staff typically made three (in some cases four) attempts to complete a case. During fieldwork we replaced five sampled providers with other providers. In two cases, it was because the provider was on sick leave, two cases because provider had been transferred and one case because provider had gone on training.

**Table A.3: Characteristics of Private Providers in the Representative Sample**

| | (1) Total | (2) MBBS Providers | (3) Providers with alternative qualifications | (4) Unqualified providers |
|---|---|---|---|---|
| **Number of Providers** | 772 | 40 | 192 | 540 |
| **Qualification details** | | | | |
| Duration of degree (months) | 22.6 | 57.5 | 47.9 | 11.3 |
| Did an internship as part of degree | 0.244 | 0.900 | 0.625 | 0.059 |
| Duration of internship (months, conditional) | 2.7 | 12.3 | 8.7 | 0.7 |
| **Additional training** | | | | |
| Received additional training | 0.793 | 0.325 | 0.688 | 0.864 |
| Duration (months, conditional) | 29.9 | 19.6 | 22.6 | 32.2 |
| Trained by practising physician or learned by observation | 0.224 | 0.125 | 0.307 | 0.203 |
| Duration (months, conditional) | 24.8 | 14.4 | 21.5 | 27.0 |
| Trained as a compounder | 0.198 | 0.025 | 0.063 | 0.258 |
| Duration (months, conditional) | 43.3 | 60.0 | 36.5 | 43.8 |
| Trained at another institution or hospital | 0.240 | 0.175 | 0.265 | 0.236 |
| Duration (months, conditional) | 19.3 | 17.6 | 17.4 | 20.2 |
| **Training other providers** | | | | |
| Has trained other providers | 0.1082 | 0.0769 | 0.1780 | 0.0857 |

Notes: The MBBS degree is equivalent to the MD degree in the United States and stands for "Bachelor of Medicine & Bachelor of Surgery." Providers in the MBBS category includes all providers with only MBBS degrees and those with an MBBS and a specialization degree. Providers in the "Providers with alternative qualifications" includes the following degrees: Bachelor of Ayurvedic Medicine and Surgery (BAMS), BIMS, Bachelor of Unani Medicine and Surgery (BUMS), Bachelor of Homoeopathic Medicine and Surgery and Diploma of Homeopathic Medicine and Surgery (BHMS/DHMS), Diploma in Homeopathy and Biochemistry (DHB), Bachelor of Electro Homeopathic Medicine and Surgery (BEHMS/BEMS), Bachelor of Science in Nursing and Master of Science in Nursing (BSc Nursing/MSc Nursing. Providers in "Unqualified providers" includes Rural Medical Practitioners (RMP), providers with unverifiable degrees, and providers with no formal training. The majority of providers in this category are providers with no formal training.

**Table A.4: Randomization balance for dual sample providers' assignment of Unstable Angina cases**

| | (1) | (2) | (3) | (4) | (5) | (7) | (8) | (9) | (10) |
|---|---|---|---|---|---|---|---|---|---|
| | Asthma outcomes | | | | | | | Dysentery outcomes | |
| | Time spent (mins) | Percent checklist completed | Gave diagnosis | Correct diagnosis | Correct treatment | Palliative treatment | Unnecessary treatment | Time spent (mins) | Percent checklist completed |
| Is private | 1.497*** | 13.190*** | 0.181 | 0.077 | 0.131 | -0.230** | -0.017 | 0.302 | 9.109** |
| | (0.483) | (3.292) | (0.118) | (0.099) | (0.113) | (0.117) | (0.075) | (0.241) | (4.119) |
| Received Unstable Angina in private | 0.433 | 5.441 | 0.100 | 0.075 | -0.194 | -0.079 | 0.094 | 0.205 | -0.862 |
| | (0.518) | (3.534) | (0.127) | (0.106) | (0.121) | (0.126) | (0.080) | (0.255) | (4.356) |
| (Is private) x (Received Unstable Angina in private) | 0.143 | -2.996 | -0.214 | -0.094 | 0.044 | 0.131 | -0.051 | 0.268 | -0.604 |
| | (0.719) | (4.898) | (0.176) | (0.147) | (0.168) | (0.174) | (0.111) | (0.354) | (6.053) |
| Constant | 1.644*** | 13.687*** | 0.307*** | 0.150** | 0.639*** | 0.487*** | 0.873*** | 0.783*** | 17.088*** |
| | (0.347) | (2.367) | (0.085) | (0.071) | (0.081) | (0.084) | (0.054) | (0.172) | (2.941) |

Notes: *** Significant at 1%, ** Significant at 5%, * Significant at 10%. Robust standard errors are in parentheses. All regressions include district fixed effects.

**Table A.5: Checklist items, diagnoses and treatments**

| | (1) Unstable angina | (2) Asthma | (3) Dysentery |
|---|---|---|---|
| **Panel A: Checklist Items** | | | |
| History questions | where is the pain, when started, severity of pain, radiation, previous similar, since when, shortness of breath, sweating, beedi-cigarette, family history | current breathing probes, cough, expectoration probes, previous breathing problems, since when problems, shortness constant of episodic, what triggers, fever, chest pain, weight loss, beedi-cigarette, family history | age of child, qualities of school, frequency, quantity of stool, urination, child active/playful, fever, abdominal pain, vomitting, source of water, what has child eaten, child taking fluids |
| Examinations | pulse, bp, auscultation (front or back), temperature attempt, ecg in/outside clinic | pulse, bp, auscultation (front or back), temperature attempt | |
| **Panel B: Diagnosis** | | | |
| Correct | Heart attack, angina, myocardial infarction, attack | Asthma, asthma attack | Dysentery, bacteria |
| Incorrect | Blood pressure problem, gastrointestinal problem, muscle problem, the weather, injury, nerve pull, lack of blood, swelling in chest, pain from drinking cold water, heavy work, bad blood, decaying lungs, chest congestion | Blood pressure problem, gastrointensinal problem, heart problem, the weather, cough in chest, thyroid problem, weakness, lack of blood, infection in windpipe, pregnancy, allergy | Weather, heat in liver, acidity, diarrhea |
| **Panel C: Treatment** | | | |
| Correct | Aspirin, clopidogrel/other anti-platelet agents, do an ECG. | Bronchodilators, theophylline, inhaled or oral corticosteroids, leukotriene inhibitors, cromones, inhaled anticholinergics | ORS, rehydration |
| Palliative | Nitroglycerin, blood thinners, betablockers, ACE inhibitors, vasodilators, other cardiac medication, morphine, other pain medication, referral or referral for an ECG. | Anti-allergy medication | Antibiotics,zinc |
| Unncessary or harmful | Antibiotics, oral rehydration salts, oral electrolyte solution, zinc, steroids, inhaler, bronchodilators, theophylline, inhaled corticosteroids, leukotriene inhibitors, cromones, inhaled anti-cholinergics, oral cortico-steroids, other anti-asthmatic medication, anti-allergy medication, psychiatric medication. | Aspirin, clopidogrel, anti-platelet agents, blood thinners, betablockers, ACE inhibitors, vasodilators, other cardiac medication, morphine, other pain medication, oral rehydration salts, oral electrolyte solution, zinc, antibiotics, anti-ulcer medication, psychiatric medication | Aspirin, clopidogrel, anti-platelet agents, blood thinners, betablockers, ACE inhibitors, vasodilators, other cardiac medication, morphine, other pain medication, steroids, inhaler, bronchodilators, theophylline, inhaled corticosteroids, leukotriene inhibitors, cromones, inhaled anti-cholinergics, oral cortico-steroids, other anti-asthmatic medication, anti-allergy medication, psychiatric medication |

Notes: See Appendix B for coding of treatments

**Table A.6: List of checklist items used in the treatment of SPs**

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) |
|---|---|---|---|---|---|---|---|---|---|
| | Item discrimination tercile | Representative sample | | | | Dual practice sample | | | |
| | | All | Public | Private | Difference (4)-(3) | All | Public | Private | Difference (9)-(8) |
| **Panel A: Unstable Angina** | | | | | | | | | |
| *History questions* | | | | | | | | | |
| where is the pain | high | 0.659 | 0.486 | 0.694 | 0.208*** | 0.582 | 0.514 | 0.667 | 0.153 |
| when started | low | 0.369 | 0.270 | 0.389 | 0.119* | 0.149 | 0.162 | 0.133 | -0.029 |
| doing when began | high | 0.074 | 0.054 | 0.078 | 0.024 | 0.119 | 0.081 | 0.167 | 0.086 |
| severity of pain | low | 0.258 | 0.162 | 0.278 | 0.116* | 0.284 | 0.162 | 0.433 | 0.271*** |
| radiation | high | 0.143 | 0.108 | 0.150 | 0.042 | 0.299 | 0.216 | 0.400 | 0.184* |
| previous similar | medium | 0.392 | 0.270 | 0.417 | 0.146** | 0.328 | 0.270 | 0.400 | 0.130 |
| since when | low | 0.263 | 0.216 | 0.272 | 0.056 | 0.209 | 0.108 | 0.333 | 0.225** |
| quality of pain | high | 0.115 | 0.108 | 0.117 | 0.009 | 0.179 | 0.108 | 0.267 | 0.159** |
| pain changes | low | 0.060 | 0.054 | 0.061 | 0.007 | 0.104 | 0.054 | 0.167 | 0.113* |
| shortness of breath | medium | 0.138 | 0.081 | 0.150 | 0.069 | 0.045 | 0.054 | 0.033 | -0.021 |
| nausea | medium | 0.295 | 0.297 | 0.294 | -0.003 | 0.209 | 0.054 | 0.400 | 0.346*** |
| sweating | high | 0.290 | 0.270 | 0.294 | 0.024 | 0.313 | 0.189 | 0.467 | 0.277*** |
| beedi-cigarette | low | 0.069 | 0.054 | 0.072 | 0.018 | 0.134 | 0.081 | 0.200 | 0.119* |
| family history | high | 0.014 | 0.000 | 0.017 | 0.017 | 0.045 | 0.000 | 0.100 | 0.100** |
| *Examination questions* | | | | | | | | | |
| pulse | low | 0.392 | 0.243 | 0.422 | 0.179** | 0.537 | 0.432 | 0.667 | 0.234** |
| bp | medium | 0.313 | 0.135 | 0.350 | 0.215*** | 0.373 | 0.216 | 0.567 | 0.350*** |
| auscultation (either front or back) | low | 0.447 | 0.189 | 0.500 | 0.311*** | 0.522 | 0.432 | 0.633 | 0.201* |
| temperature attempt | medium | 0.134 | 0.108 | 0.139 | 0.031 | 0.134 | 0.054 | 0.233 | 0.179** |
| ecg in/outside clinic | medium | 0.230 | 0.243 | 0.228 | -0.015 | 0.313 | 0.270 | 0.367 | 0.096 |
| *Number of observations* | | 217 | 37 | 180 | | 67 | 37 | 30 | |
| **Panel B: Asthma** | | | | | | | | | |
| *History questions* | | | | | | | | | |
| current breathing probes | medium | 0.601 | 0.385 | 0.647 | 0.262*** | 0.552 | 0.431 | 0.667 | 0.236*** |
| cough | low | 0.677 | 0.590 | 0.696 | 0.106 | 0.575 | 0.462 | 0.681 | 0.220*** |
| expectoration probes | low | 0.148 | 0.077 | 0.163 | 0.086* | 0.045 | 0.015 | 0.072 | 0.057* |
| previous breathing problems | high | 0.439 | 0.333 | 0.462 | 0.129* | 0.410 | 0.277 | 0.536 | 0.259*** |
| previous episode probes | medium | 0.184 | 0.128 | 0.196 | 0.067 | 0.201 | 0.123 | 0.275 | 0.152** |
| since when problems | medium | 0.475 | 0.385 | 0.495 | 0.110 | 0.328 | 0.231 | 0.420 | 0.190*** |
| how often happens | high | 0.108 | 0.128 | 0.103 | -0.025 | 0.067 | 0.046 | 0.087 | 0.041 |
| shortness constant or episodic | low | 0.103 | 0.051 | 0.114 | 0.063 | 0.090 | 0.046 | 0.130 | 0.084** |
| what triggers | medium | 0.117 | 0.077 | 0.125 | 0.048 | 0.164 | 0.092 | 0.232 | 0.140** |
| how long lasts | high | 0.067 | 0.077 | 0.065 | -0.012 | 0.052 | 0.015 | 0.087 | 0.072** |
| childhood illness | medium | 0.027 | 0.000 | 0.033 | 0.033 | 0.030 | 0.015 | 0.043 | 0.028 |
| age | high | 0.170 | 0.308 | 0.141 | -0.166*** | 0.537 | 0.585 | 0.493 | -0.092 |
| fever | low | 0.309 | 0.231 | 0.326 | 0.095 | 0.306 | 0.215 | 0.391 | 0.176** |
| chest pain | low | 0.336 | 0.154 | 0.375 | 0.221*** | 0.231 | 0.169 | 0.290 | 0.121** |
| weight loss | high | 0.000 | 0.000 | 0.000 | 0.000 | 0.015 | 0.015 | 0.014 | -0.001 |
| night sweats | high | 0.054 | 0.051 | 0.054 | 0.003 | 0.067 | 0.046 | 0.087 | 0.041 |
| beedi-cigarette | high | 0.018 | 0.026 | 0.016 | -0.009 | 0.045 | 0.015 | 0.072 | 0.057* |
| family history | medium | 0.022 | 0.000 | 0.027 | 0.027 | 0.037 | 0.031 | 0.043 | 0.013 |
| *Examination questions* | | | | | | | | | |
| pulse | low | 0.502 | 0.256 | 0.554 | 0.298*** | 0.388 | 0.308 | 0.464 | 0.156** |
| bp | medium | 0.278 | 0.205 | 0.293 | 0.088 | 0.239 | 0.108 | 0.362 | 0.255*** |
| auscultation (either front or back) | low | 0.516 | 0.333 | 0.554 | 0.221*** | 0.649 | 0.492 | 0.797 | 0.305*** |
| temp attempt | low | 0.166 | 0.103 | 0.179 | 0.077 | 0.082 | 0.077 | 0.087 | 0.010 |
| *Number of observations* | | 223 | 39 | 184 | | 134 | 65 | 69 | |

(continued on next page)

**Table A.6 continued**

| | (1) | (2) | (3) | (4) | | (5) | (6) | (7) | |
|---|---|---|---|---|---|---|---|---|---|
| | Item discrimination tercile | Representative sample | | | | Dual practice sample | | | |
| | | All | Public | Private | Difference (3)-(2) | All | Public | Private | Difference (6)-(5) |
| **Panel C: Dysentery** | | | | | | | | | |
| *History questions* | | | | | | | | | |
| age of child | low | 0.919 | 0.795 | 0.945 | 0.150*** | 0.930 | 0.921 | 0.939 | 0.019 |
| qualities of stool | low | 0.167 | 0.077 | 0.186 | 0.109** | 0.271 | 0.159 | 0.379 | 0.220*** |
| frequency | medium | 0.288 | 0.179 | 0.311 | 0.132** | 0.372 | 0.270 | 0.470 | 0.200*** |
| quantity of stool | high | 0.050 | 0.000 | 0.060 | 0.060* | 0.031 | 0.016 | 0.045 | 0.030 |
| urination | high | 0.018 | 0.000 | 0.022 | 0.022 | 0.008 | 0.016 | 0.000 | -0.016 |
| active/playful | high | 0.032 | 0.026 | 0.033 | 0.007 | 0.000 | 0.000 | 0.000 | 0.000 |
| fever | medium | 0.171 | 0.077 | 0.191 | 0.114** | 0.295 | 0.222 | 0.364 | 0.141** |
| abdominal pain | low | 0.113 | 0.077 | 0.120 | 0.043 | 0.256 | 0.222 | 0.288 | 0.066 |
| vomiting | low | 0.216 | 0.077 | 0.246 | 0.169*** | 0.295 | 0.254 | 0.333 | 0.079 |
| source of water | high | 0.023 | 0.000 | 0.027 | 0.027 | 0.016 | 0.000 | 0.030 | 0.030* |
| what has eaten | medium | 0.050 | 0.000 | 0.060 | 0.060* | 0.093 | 0.032 | 0.152 | 0.120*** |
| taking fluids | medium | 0.023 | 0.000 | 0.027 | 0.027 | 0.062 | 0.048 | 0.076 | 0.028 |
| *Number of observations* | | 222 | 39 | 183 | | 130 | 63 | 67 | |

Notes: *** Significant at 1%, ** Significant at 5%, * Significant at 10%.

**Table A.7: Effort in the public and private sectors by checklist item discrimination terciles**

| | (1) | (2) | (3) | (4) | (5) | (6) |
|---|---|---|---|---|---|---|
| | Outcome variable: Percentage of recommended type of checklist items | | | | | |
| | Representative sample | | | Dual practice sample | | |
| | Low discrimination | Medium discrimination | High discrimination | Low discrimination | Medium discrimination | High discrimination |
| **Panel A: SP and case fixed effects** | | | | | | |
| Is a private provider | 10.982*** | 7.085** | 1.760 | 10.650*** | 11.728*** | 5.288*** |
| | (3.281) | (2.875) | (2.143) | (2.583) | (2.616) | (1.766) |
| R-squared | 0.144 | 0.175 | 0.238 | 0.280 | 0.235 | 0.319 |
| Number of observations | 662 | 662 | 662 | 330 | 330 | 330 |
| Mean of public | 21.770 | 13.975 | 10.197 | 28.225 | 14.690 | 10.072 |
| Mean of private | 32.966 | 21.322 | 12.235 | 41.288 | 28.874 | 15.245 |
| Mean of sample | 32.108 | 20.759 | 12.079 | 34.756 | 21.782 | 12.659 |
| **Panel B: SP, case and market/district fixed effects** | | | | | | |
| Is a private provider | 11.290*** | 8.597*** | 1.594 | 10.705*** | 11.733*** | 5.226*** |
| | (3.549) | (3.141) | (2.540) | (2.577) | (2.607) | (1.762) |
| R-squared | 0.253 | 0.256 | 0.300 | 0.302 | 0.247 | 0.323 |
| Number of observations | 662 | 662 | 662 | 330 | 330 | 330 |
| **Panel C: SP, case and market/district fixed effects** | | | | | | |
| Is a private provider | 8.538** | 7.317** | 1.657 | 11.879*** | 12.550*** | 4.660** |
| | (3.717) | (3.382) | (2.876) | (2.823) | (2.729) | (1.854) |
| Has MBBS | 2.548 | 5.175* | 2.307 | | | |
| | (4.091) | (2.978) | (1.850) | | | |
| Has some qualification | 2.300 | 4.764** | 0.721 | | | |
| | (2.017) | (2.208) | (2.063) | | | |
| Age of provider | -0.151* | -0.009 | 0.044 | -0.072 | -0.138 | -0.043 |
| | (0.078) | (0.090) | (0.062) | (0.141) | (0.114) | (0.099) |
| Gender of provider (1=Male) | 1.009 | -1.353 | -2.369 | 2.822 | -2.740 | -3.631 |
| | (6.644) | (3.138) | (3.958) | (4.328) | (3.696) | (3.465) |
| Patient load during visit | -0.041 | -0.396 | 0.050 | -0.428 | -0.126 | -0.182 |
| | (0.622) | (0.430) | (0.518) | (0.454) | (0.676) | (0.449) |
| R-squared | 0.254 | 0.262 | 0.301 | 0.291 | 0.252 | 0.331 |
| Number of observations | 638 | 638 | 638 | 301 | 301 | 301 |

Notes: *** Significant at 1%, ** Significant at 5%, * Significant at 10%. For the representative sample, robust standard errors clustered at the market level are in parentheses. For the dual practice sample, robust standard errors clustered at the provider level are in parentheses. Observations are at the SP-provider interaction level. Checklist item discrimination parameters are estimated using the IRT methodology. The classification of items into terciles of difficulty is done within each case, but the results are robust to classifying the items jointly across all cases. Market fixed effects are used for the representative sample, and district fixed effects for the dual practice sample.

**Table A.8: Effort, diagnosis and treatment by case**

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) | (11) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Effort | | Diagnosis | | | Treatment | | | | | |
| | Time spent | Checklist | Gave diagnosis | Correct diagnosis (conditional) | Correct diagnosis (unconditional) | Correct treatment | Palliative treatment | Unnecessary treatment | Correct treatment Only | Antibiotic | Number of medicines |
| **Panel A1: Unstable angina, representative sample, with SP fixed effects** | | | | | | | | | | | |
| Is a private provider | 1.101*** | 7.890** | 0.112 | 0.033 | 0.011 | 0.021 | -0.070 | 0.083 | -0.026 | 0.024 | 0.782*** |
| | (0.302) | (3.860) | (0.076) | (0.067) | (0.028) | (0.031) | (0.096) | (0.092) | (0.027) | (0.053) | (0.233) |
| R-squared | 0.083 | 0.138 | 0.016 | 0.155 | 0.082 | 0.033 | 0.021 | 0.056 | 0.016 | 0.030 | 0.043 |
| Number of observations | 217 | 217 | 217 | 102 | 217 | 217 | 217 | 217 | 217 | 217 | 217 |
| Mean of public | 2.592 | 17.354 | 0.378 | 0.071 | 0.027 | 0.027 | 0.784 | 0.730 | 0.027 | 0.135 | 2.054 |
| **Panel A2: Unstable angina, dual practice sample, with SP fixed effects** | | | | | | | | | | | |
| Is a private provider | 3.370*** | 13.640** | 0.184* | 0.186 | 0.144* | 0.286*** | -0.007 | 0.052 | | -0.053 | 0.447 |
| | (1.027) | (5.380) | (0.109) | (0.183) | (0.076) | (0.094) | (0.081) | (0.130) | | (0.110) | (0.362) |
| R-squared | 0.225 | 0.116 | 0.337 | 0.141 | 0.153 | 0.182 | 0.063 | 0.054 | | 0.073 | 0.175 |
| Number of observations | 61 | 61 | 61 | 29 | 61 | 61 | 61 | 61 | 61 | 61 | 61 |
| Mean of public | 1.954 | 18.341 | 0.394 | 0.077 | 0.030 | 0.030 | 0.909 | 0.667 | 0.000 | 0.273 | 2.242 |
| **Panel B1: Asthma, representative sample, with SP fixed effects** | | | | | | | | | | | |
| Is a private provider | 1.952*** | 6.015* | 0.224*** | -0.123 | 0.021 | 0.082 | -0.008 | 0.040 | 0.010 | 0.009 | 1.158*** |
| | (0.449) | (3.548) | (0.084) | (0.134) | (0.034) | (0.088) | (0.082) | (0.078) | (0.037) | (0.104) | (0.372) |
| R-squared | 0.200 | 0.172 | 0.209 | 0.065 | 0.067 | 0.043 | 0.029 | 0.076 | 0.038 | 0.019 | 0.095 |
| Number of observations | 223 | 223 | 223 | 76 | 223 | 223 | 223 | 223 | 223 | 223 | 223 |
| Mean of public | 3.301 | 17.716 | 0.154 | 0.333 | 0.051 | 0.385 | 0.282 | 0.744 | 0.026 | 0.385 | 2.128 |
| **Panel B2: Asthma, dual practice sample, with SP fixed effects** | | | | | | | | | | | |
| Is a private provider | 1.431*** | 11.970*** | 0.044 | -0.078 | -0.009 | 0.128 | -0.151* | -0.054 | 0.025 | -0.165* | -0.224 |
| | (0.362) | (2.361) | (0.085) | (0.149) | (0.071) | (0.084) | (0.078) | (0.055) | (0.045) | (0.089) | (0.202) |
| R-squared | 0.202 | 0.228 | 0.091 | 0.102 | 0.060 | 0.132 | 0.111 | 0.111 | 0.044 | 0.101 | 0.122 |
| Number of observations | 122 | 122 | 122 | 51 | 122 | 122 | 122 | 122 | 122 | 122 | 122 |
| Mean of public | 1.875 | 16.102 | 0.373 | 0.545 | 0.203 | 0.525 | 0.458 | 0.915 | 0.034 | 0.593 | 3.119 |
| **Panel C1: Dysentery, representative sample, with SP fixed effects** | | | | | | | | | | | |
| Is a private provider | 0.846*** | 7.088** | | | | | | | | | |
| | (0.219) | (2.850) | | | | | | | | | |
| R-squared | 0.091 | 0.108 | | | | | | | | | |
| Number of observations | 222 | 222 | | | | | | | | | |
| Mean of public | 1.281 | 10.897 | | | | | | | | | |
| **Panel C2: Dysentery, dual practice sample, with SP fixed effects** | | | | | | | | | | | |
| Is a private provider | 0.395** | 5.279** | | | | | | | | | |
| | (0.173) | (2.468) | | | | | | | | | |
| R-squared | 0.095 | 0.340 | | | | | | | | | |
| Number of observations | 119 | 119 | | | | | | | | | |
| Mean of public | 0.879 | 16.228 | | | | | | | | | |

Notes: *** Significant at 1%, ** Significant at 5%, * Significant at 10%. For the representative sample, robust standard errors clustered at the market level are in parentheses. For the dual practice sample, robust standard errors clustered at the provider level are in parentheses. All regressions include a constant and controls for provider qualifications, age, gender, and patient load. Observations are standardized provider-patient interactions. In column (11) the dependent variable is total number of medicines recommended to the patient (dispensed and/or prescribed).

**Table A.9: Summary of treatment by case**

| | (1) | (2) | (3) | (4) | (5) | (6) |
|---|---|---|---|---|---|---|
| | Representative sample | | | Dual practice sample | | |
| | Public | Private | Difference (2)-(1) | Public | Private | Difference (5)-(4) |
| **Panel A: Unstable Angina** | | | | | | |
| Correct treatment | 0.03 | 0.06 | 0.03 | 0.03 | 0.30 | 0.27*** |
| Correct treatment (alternate) | 0.46 | 0.37 | -0.09 | 0.41 | 0.63 | 0.23** |
| Palliative treatment | 0.78 | 0.71 | -0.07 | 0.92 | 0.90 | -0.02 |
| Unnecessary treatment | 0.73 | 0.80 | 0.07 | 0.68 | 0.73 | 0.06 |
| Aspirin | 0.03 | 0.04 | 0.02 | 0.03 | 0.23 | 0.21*** |
| Anti-platelet agents | 0.03 | 0.01 | -0.02 | 0.00 | 0.03 | 0.03 |
| Referred | 0.30 | 0.24 | -0.05 | 0.22 | 0.33 | 0.12 |
| ECG | 0.24 | 0.23 | -0.02 | 0.27 | 0.37 | 0.10 |
| ECG & Referred | 0.11 | 0.12 | 0.01 | 0.08 | 0.17 | 0.09 |
| Antibiotic | 0.14 | 0.17 | 0.03 | 0.30 | 0.20 | -0.10 |
| Number of observations | 37 | 180 | | 37 | 30 | |
| **Panel B: Asthma** | | | | | | |
| Correct treatment | 0.38 | 0.50 | 0.12* | 0.57 | 0.68 | 0.11* |
| Palliative treatment | 0.28 | 0.29 | 0.01 | 0.48 | 0.28 | -0.20*** |
| Unnecessary treatment | 0.74 | 0.83 | 0.09* | 0.92 | 0.88 | -0.04 |
| Bronchodilators | 0.33 | 0.36 | 0.03 | 0.51 | 0.59 | 0.09 |
| Theophylline | 0.13 | 0.22 | 0.09* | 0.31 | 0.32 | 0.01 |
| Oral Corticosteroids | 0.15 | 0.31 | 0.16** | 0.15 | 0.25 | 0.09* |
| Antibiotic | 0.38 | 0.40 | 0.02 | 0.60 | 0.45 | -0.15** |
| Number of observations | 39 | 184 | | 65 | 69 | |
| **Panel C: Dysentery** | | | | | | |
| Correct treatment | 0.08 | 0.13 | 0.05 | 0.33 | 0.22 | -0.11* |
| Palliative treatment | 0.44 | 0.61 | 0.18** | 0.75 | 0.61 | -0.13* |
| Unnecessary treatment | 0.28 | 0.56 | 0.28*** | 0.35 | 0.40 | 0.05 |
| ORS | 0.05 | 0.12 | 0.07 | 0.33 | 0.21 | -0.12* |
| 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* |
| Number of observations | 39 | 183 | | 63 | 67 | |

Notes: *** Significant at 1%, ** Significant at 5%, * Significant at 10%. In Unstable Angina, alternate definition for correct treatment codes referrals and referrals for ECG as correct. In the dysentery case, note the large and significant differences in "asked to see the child" across public and private providers in the representative and dual samples. If we were to assume the same rate of correct treatment by public and private providers in the cases where they "asked to see the child" as in the cases where a treatment was provided, then the differences in correct treatment are no longer significant in either sample. If we carry out a bounding exercise, the differences are still not significant, and the standard errors are too wide for meaningful inference. This is why we exclude the dysentery case in our pooled analysis of treatment across cases.

**Table A.10: Robustness of treatment results with alternative definition for correct treatment for unstable angina**

| | (1) | (2) | (3) | (4) |
|---|---|---|---|---|
| | All (compare with table 4) | | Unstable angina only (compare with table A8) | |
| | Representative sample | Dual practice sample | Representative sample | Dual practice sample |
| | Correct treatment | Correct treatment | Correct treatment | Correct treatment |
| **Panel A: SP fixed effects** | | | | |
| Is a private provider | -0.014 | 0.138** | -0.112 | 0.232* |
| | (0.063) | (0.069) | (0.088) | (0.120) |
| R-squared | 0.075 | 0.091 | 0.092 | 0.081 |
| Number of observations | 440 | 201 | 217 | 67 |
| Mean of public | 0.421 | 0.510 | 0.459 | 0.405 |
| Mean of private | 0.421 | 0.667 | 0.360 | 0.633 |
| Mean of sample | 0.421 | 0.587 | 0.367 | 0.507 |
| **Panel B: SP and market/district fixed effects** | | | | |
| Is a private provider | 0.001 | 0.142** | -0.065 | 0.210* |
| | (0.069) | (0.061) | (0.118) | (0.118) |
| R-squared | 0.196 | 0.101 | 0.298 | 0.192 |
| Number of observations | 440 | 201 | 217 | 67 |
| **Panel C: SP and market/district fixed effects** | | | | |
| Is a private provider | -0.009 | 0.150** | -0.203 | 0.197 |
| | (0.070) | (0.065) | (0.141) | (0.125) |
| Has MBBS | 0.340*** | | 0.233 | |
| | (0.081) | | (0.147) | |
| Has some qualification | 0.164*** | | 0.139 | |
| | (0.057) | | (0.095) | |
| Age of provider | 0.000 | -0.005 | 0.002 | -0.006 |
| | (0.004) | (0.004) | (0.004) | (0.006) |
| Gender of provider (1=Male) | 0.256 | 0.007 | 0.334** | -0.167 |
| | (0.158) | (0.107) | (0.170) | (0.161) |
| Patient load during visit | -0.030*** | -0.003 | -0.022** | -0.030 |
| | (0.008) | (0.018) | (0.010) | (0.022) |
| R-squared | 0.244 | 0.112 | 0.352 | 0.242 |
| Number of observations | 423 | 183 | 208 | 61 |

Notes: *** Significant at 1%, ** Significant at 5%, * Significant at 10%. For the representative sample, robust standard errors clustered at the market level are in parentheses. For the dual practice sample, robust standard errors clustered at the provider level are in parentheses. All regressions include a constant. Observations are at the SP-provider interaction level. Columns (1) and (2) also include case fixed effects. Market fixed effects are used for the representative sample, and district fixed effects for the dual practice sample. Alternative definition for Unstable Angina adds "referral" and "referral for ECG" as correct treatment.

**Table A.11: Robustness of provider effort results to exclusion of dysentery cases**

| | (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 |
| **Panel A: SP and case fixed effects** | | | | | | |
| Is a private provider | 1.531*** | 6.942** | 0.551** | 2.261*** | 12.421*** | 0.755*** |
| | (0.306) | (3.307) | (0.212) | (0.449) | (2.414) | (0.206) |
| R-squared | 0.225 | 0.152 | | 0.177 | 0.157 | 0.031 |
| Number of observations | 440 | 440 | 233 | 201 | 201 | 199 |
| Mean of public | 2.956 | 17.540 | | 1.960 | 17.553 | |
| Mean of private | 4.548 | 24.335 | | 4.094 | 30.378 | |
| Mean of sample | 4.427 | 23.820 | | 3.011 | 23.870 | |
| **Panel B: SP, case and market/district fixed effects** | | | | | | |
| Is a private provider | 1.907*** | 7.593** | 0.668** | 2.269*** | 12.361*** | 0.759*** |
| | (0.453) | (3.829) | (0.277) | (0.450) | (2.418) | (0.207) |
| R-squared | 0.341 | 0.278 | | 0.201 | 0.166 | |
| Number of observations | 440 | 440 | 233 | 201 | 201 | 138 |
| **Panel C: SP, case and market/district fixed effects** | | | | | | |
| Is a private provider | 1.654*** | 6.087 | 0.611* | 2.132*** | 12.433*** | 0.829*** |
| | (0.579) | (4.409) | (0.327) | (0.464) | (2.738) | (0.210) |
| Has MBBS | -0.062 | 6.415* | 0.124 | | | |
| | (0.987) | (3.792) | (0.369) | | | |
| Has some qualification | -0.159 | 2.737* | 0.176 | | | |
| | (0.567) | (1.648) | (0.200) | | | |
| Age of provider | -0.002 | 0.027 | 0.005 | 0.017 | -0.012 | -0.002 |
| | (0.017) | (0.105) | (0.008) | (0.029) | (0.145) | (0.009) |
| Gender of provider (1=Male) | 1.460*** | 2.136 | 0.164 | -0.332 | -3.055 | -0.085 |
| | (0.554) | (5.474) | (0.410) | (0.675) | (4.828) | (0.342) |
| Patient load during visit | -0.188*** | -0.333 | 0.021 | -0.107* | 0.087 | 0.001 |
| | (0.056) | (0.342) | (0.039) | (0.061) | (0.675) | (0.041) |
| R-squared | 0.357 | 0.283 | | 0.224 | 0.171 | |
| Number of observations | 423 | 423 | 221 | 183 | 183 | 126 |

Notes: *** Significant at 1%, ** Significant at 5%, * Significant at 10%. For the representative sample, robust standard errors clustered at the market level are in parentheses. For the dual practice sample, robust standard errors clustered at the provider level are in parentheses. All regressions include a constant. Observations are at the SP-provider interaction level, except in IRT score where each observation is a composite provider level score across all cases. Market fixed effects are used for the representative sample, and district fixed effects for the dual practice sample.

**Table A.12: Robustness of results to inclusion of facilties controls**

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) | (11) | (12) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Effort | | | Diagnosis | | | Treatment | | | | | |
| | Time spent | Checklist | IRT Score | Gave diagnosis | Correct diagnosis (conditional) | Correct diagnosis (unconditional) | Correct treatment | Palliative treatment | Unnecessary treatment | Correct treatment only | Antibiotic | Number of medicines |
| **Panel A: Representative sample, with SP, case and market fixed effects** | | | | | | | | | | | | |
| Is a private provider | 1.207*** | 7.826*** | 0.731** | 0.197*** | -0.023 | 0.039 | 0.143*** | 0.082 | 0.115 | -0.009 | 0.153** | 0.861*** |
| | (0.454) | (2.608) | (0.333) | (0.064) | (0.102) | (0.034) | (0.055) | (0.069) | (0.082) | (0.027) | (0.075) | (0.318) |
| Facilities index | 0.012 | 1.679** | 0.120 | 0.051*** | 0.014 | 0.010 | 0.034** | 0.026 | 0.038* | -0.001 | 0.029 | 0.203** |
| | (0.124) | (0.676) | (0.078) | (0.015) | (0.033) | (0.010) | (0.016) | (0.018) | (0.023) | (0.003) | (0.024) | (0.095) |
| R-squared | 0.356 | 0.265 | | 0.233 | 0.362 | 0.161 | 0.410 | 0.379 | 0.267 | 0.280 | 0.275 | 0.313 |
| Number of observations | 634 | 634 | 220 | 420 | 171 | 420 | 420 | 420 | 420 | 420 | 420 | 420 |
| **Panel B: Dual practice sample, with SP, case and district fixed effects** | | | | | | | | | | | | |
| Is a private provider | 1.233*** | 9.087*** | 0.875*** | 0.039 | -0.035 | 0.001 | 0.183** | -0.134* | -0.014 | 0.023 | -0.154** | -0.108 |
| | (0.284) | (2.090) | (0.235) | (0.079) | (0.129) | (0.068) | (0.075) | (0.075) | (0.063) | (0.028) | (0.077) | (0.216) |
| Facilities index | -0.205 | -0.963 | 0.029 | -0.038 | -0.029 | -0.028 | -0.063* | -0.017 | 0.001 | 0.001 | -0.039 | -0.256** |
| | (0.187) | (1.315) | (0.121) | (0.039) | (0.073) | (0.036) | (0.036) | (0.040) | (0.033) | (0.014) | (0.050) | (0.126) |
| R-squared | 0.322 | 0.243 | 0.081 | 0.220 | 0.199 | 0.091 | 0.320 | 0.306 | 0.158 | 0.052 | 0.146 | 0.198 |
| Number of observations | 272 | 272 | 272 | 164 | 73 | 164 | 164 | 164 | 164 | 164 | 164 | 164 |

Notes: *** Significant at 1%, ** Significant at 5%, * Significant at 10%. For the representative sample, robust standard errors clustered at the market level are in parentheses. For the dual practice sample, robust standard errors clustered at the provider level are in parentheses. Observations are at the SP-provider interaction level. All regressions include a constant and controls for provider qualifications, age, gender, and patient load. Market fixed effects are used for the representative sample, and district fixed effects for the dual practice sample. Columns (1)-(3) include all cases and can be compared with Table 3. The remaining columns include Unstable Angina and Asthma cases only - compare Columns (4)-(6) with Table 4; and Columns (7)-(12) with Table 5. In column (12) the dependent variable is the total number of medicines recommended to the patient (dispensed and/or prescribed). Note that the reason for not including the controls for an index of Facility quality in the main results in Tables 3-5 is that we are missing data on the facility index for around 4% of the representative sample and 18% of the dual sample. However, as we see here, the results are robust to including the facility controls.

**Table A.13: Differential case completion in the dual practice sample**

| | | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) | (11) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Effort | | | | Treatment | | | | | |
| | | *Fraction of cases* | Time spent | Checklist | IRT Score | *Fraction of cases* | Correct treatment | Palliative treatment | Unnecessary treatment | Correct treatment only | Antibiotic | Number of medicines |
| **Panel A: Summary Statistics** | | | | | | | | | | | | |
| Is a public provider | Completed in first attempt | 0.586 | 1.574 | 18.291 | -0.361 | 0.574 | 0.423 | 0.615 | 0.833 | 0.026 | 0.423 | 2.782 |
| | Completed in later attempt | 0.154 | 1.509 | 15.347 | -0.758 | 0.191 | 0.208 | 0.708 | 0.833 | 0.000 | 0.708 | 3.000 |
| | Not completed | 0.260 | | | | 0.235 | | | | | | |
| | Difference (first - later) | | 0.065 | 2.944 | 0.397* | | 0.215** | -0.093 | 0.000 | 0.026 | -0.285*** | -0.218 |
| Is a private provider | Completed in first attempt | 0.719 | 3.000 | 28.804 | 0.362 | 0.417 | 0.553 | 0.421 | 0.803 | 0.053 | 0.355 | 2.803 |
| | Completed in later attempt | 0.180 | 2.919 | 26.383 | 0.550 | 0.123 | 0.609 | 0.609 | 0.957 | 0.000 | 0.435 | 3.304 |
| | Not completed | 0.101 | | | | 0.061 | | | | | | |
| | Difference (first - later) | | 0.081 | 2.421 | -0.187 | | -0.056 | -0.188* | -0.154** | 0.053 | -0.080 | -0.502** |
| **Panel B: Differential completion** | | | | | | | | | | | | |
| Is a public provider | | | -1.583*** | -10.971*** | -1.194** | | -0.381*** | 0.072 | -0.107 | 0.002 | 0.305** | -0.212 |
| | | | (0.503) | (3.717) | (0.465) | | (0.103) | (0.109) | (0.075) | (0.006) | (0.136) | (0.340) |
| Completed in first attempt | | | 0.165 | 0.862 | -0.170 | | -0.095 | -0.146 | -0.155** | 0.049** | -0.074 | -0.474* |
| | | | (0.526) | (3.311) | (0.247) | | (0.087) | (0.101) | (0.065) | (0.025) | (0.132) | (0.257) |
| Is a public provider x Completed in first attempt | | | 0.081 | 2.172 | 0.385 | | 0.291** | 0.067 | 0.152 | -0.028 | -0.222 | 0.202 |
| | | | (0.560) | (4.326) | (0.514) | | (0.120) | (0.122) | (0.102) | (0.037) | (0.163) | (0.441) |
| R-squared | | | 0.239 | 0.215 | 0.244 | | 0.281 | 0.316 | 0.093 | 0.033 | 0.145 | 0.105 |
| Number of observations | | | 331 | 331 | 331 | | 201 | 201 | 201 | 201 | 201 | 201 |

Notes: *** Significant at 1%, ** Significant at 5%, * Significant at 10%. In Panel A, significance stars are for t-tests comparing completion in first attempt vs. completion in later attempt. The columns "fraction of cases" is different for effort and treatment variables because the former treats all cases while the latter considers only unstable angina and asthma cases. In Panel B, robust standard errors clustered at the provider level are in parentheses. Observations are at the SP-provider interaction level except in Column (4) where it is at the provider level. All regressions include a constant, and SP and case fixed effects. In column (11) the dependent variable is the total number of medicines recommended to the patient (dispensed and/or prescribed).

**Table A.14: Reweighted estimates for differential case completion in the dual sample**

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) |
|---|---|---|---|---|---|---|---|---|---|
| | Effort | | | Treatment | | | | | |
| | Time spent | Checklist | IRT Score | Correct treatment | Palliative treatment | Unnecessary treatment | Correct treatment only | Antibiotic | Number of medicines |
| **Panel A: Original estimates** | | | | | | | | | |
| Is a private provider | 1.507*** | 8.977*** | 0.755*** | 0.151** | -0.126** | -0.021 | 0.019 | -0.141** | 0.002 |
| | (0.298) | (1.935) | (0.207) | (0.061) | (0.057) | (0.054) | (0.026) | (0.067) | (0.200) |
| R-squared | 0.241 | 0.220 | | 0.274 | 0.309 | 0.108 | 0.025 | 0.120 | 0.127 |
| Number of observations | 331 | 331 | 138 | 201 | 201 | 201 | 201 | 201 | 201 |
| **Panel B: Reweighted estimates** | | | | | | | | | |
| Is a private provider | 1.575*** | 10.236*** | 0.894*** | 0.203*** | -0.135*** | 0.041 | 0.015 | -0.126** | 0.149 |
| | (0.217) | (1.457) | (0.160) | (0.046) | (0.044) | (0.040) | (0.019) | (0.052) | (0.158) |
| R-squared | 0.250 | 0.207 | | 0.239 | 0.276 | 0.052 | 0.018 | 0.100 | 0.063 |
| Number of observations | 455 | 455 | 182 | 273 | 273 | 273 | 273 | 273 | 273 |

Notes: *** Significant at 1%, ** Significant at 5%, * Significant at 10%. Robust standard errors clustered at the provider level are in parentheses. Panel A replicates original results (corresponding to Tables 3 and 5) to facilitate comparison. The effort regressions use all cases while the treatment regressions use only the unstable angina and asthma cases. Observations are at the SP-provider interaction level except in Column (3) where it is at the provider level. All regressions include a constant, and SP and case fixed effects. In Panel B, the used SP and case fixed effects are those for assigned SP and case. In column (9) the dependent variable is the total number of medicines recommended to the patient (dispensed and/or prescribed).

**Table A.15: Correlates of price charged**

(private interactions, excludes cases where all medicines are unidentifiable)

| | (1) | (2) | (3) | (4) | (5) | (6) |
|---|---|---|---|---|---|---|
| | | | Fees in Rs. | | | |
| | Representative sample | | Dual practice sample | | Pooled sample | |
| | Binary regressions | Multiple regression | Binary regressions | Multiple regression | Binary regressions | Multiple regression |
| Time spent with SP (minutes) | 1.720*** | 0.618 | 2.625*** | 2.279*** | 1.484*** | 0.709* |
| | (0.476) | (0.477) | (0.587) | (0.692) | (0.377) | (0.401) |
| Percentage of checklist items | 0.397*** | 0.339*** | 0.364*** | 0.055 | 0.386*** | 0.291*** |
| | (0.089) | (0.096) | (0.100) | (0.129) | (0.071) | (0.084) |
| Correct diagnosis (unconditional) | -4.269 | -3.647* | 7.504 | 5.494 | 2.690 | 2.685 |
| | (3.978) | (1.993) | (9.350) | (9.046) | (4.658) | (4.148) |
| Correct treatment | 6.199*** | -1.564 | 7.744* | 4.475 | 7.306*** | 0.602 |
| | (1.757) | (2.919) | (4.145) | (4.967) | (1.934) | (2.404) |
| Palliative treatment | 7.711*** | 2.198 | 10.435** | 7.757 | 7.796*** | 3.542** |
| | (1.810) | (1.722) | (4.242) | (4.873) | (1.743) | (1.726) |
| Unnecessary treatment | 15.794*** | 3.147 | 14.973*** | 5.137 | 15.655*** | 4.888* |
| | (2.842) | (2.963) | (5.032) | (6.240) | (2.451) | (2.746) |
| Dispensed medicines | 19.525*** | 16.400*** | 16.118*** | 12.371* | 16.511*** | 15.688*** |
| | (2.993) | (2.726) | (6.070) | (7.019) | (2.319) | (2.830) |
| Prescribed medicines | -2.931 | -4.331 | 7.540 | -2.854 | 0.071 | -4.133 |
| | (3.600) | (3.639) | (5.997) | (6.734) | (2.918) | (3.202) |
| Number of medicines | 5.540*** | 1.630 | 5.863*** | 3.016 | 5.283*** | 1.111 |
| | (0.842) | (1.394) | (1.783) | (2.987) | (0.787) | (1.348) |
| Referred/Asked to see child | -20.348*** | -10.054*** | -9.882** | -4.867 | -17.533*** | -11.860*** |
| | (4.999) | (3.683) | (4.763) | (4.888) | (3.911) | (3.021) |
| Has MBBS | 23.517*** | 27.905*** | | | 14.155*** | 23.516*** |
| | (6.150) | (7.830) | | | (4.369) | (3.923) |
| Has some qualification | 4.305 | 6.067*** | | | 2.127 | 6.952*** |
| | (3.768) | (2.282) | | | (3.376) | (2.370) |
| Patient load during visit | 1.017 | 0.867** | -0.073 | -0.285 | 0.512 | 0.276 |
| | (0.888) | (0.404) | (0.807) | (0.810) | (0.748) | (0.581) |
| Age of provider | -0.186 | -0.111 | 0.267 | 0.248 | -0.119 | -0.018 |
| | (0.155) | (0.100) | (0.239) | (0.218) | (0.126) | (0.089) |
| Gender of provider (1=Male) | -8.238** | -5.876 | -1.284 | -3.760 | -7.475** | -3.810 |
| | (3.518) | (4.543) | (4.882) | (5.580) | (2.961) | (3.919) |
| Constant | | 9.745 | | -11.295 | | 2.234 |
| | | (7.179) | | (11.810) | | (6.345) |
| R2 | | 0.446 | | 0.444 | | 0.398 |
| Number of observations | | 495 | | 154 | | 649 |
| Mean price charged | | 27.638 | | 32.740 | | 28.849 |
| SD | | 26.557 | | 28.592 | | 27.118 |

Notes: *** Significant at 1%, ** Significant at 5%, * Significant at 10%. For the representative sample, robust standard errors clustered at the market level are in parentheses. For the dual sample and pooled sample, robust standard errors clustered at the location/market level are in parentheses. Observations are at the SP-provider interaction level. Interpretation of coefficents in "Binary regressions" needs caution. Each coefficient represents a separate regression of prices on the row variable and SP, case and district fixed effects. Multiple regressions include SP, case and district fixed effects. The pooled sample (Columns 5 and 6) combine the representative and dual practice samples.

**Table A.16: Cost in the public sector**

| | (1) | (2) |
|---|---|---|
| **Panel A: Staff per facility** | **N** | **Average monthly wage (Rs.)** |
| 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 | |
| **Panel B: Average number of visits per facility per month** | | |
| Year 2008 | 1,032 | |
| Year 2009 | 1,054 | |
| Year 2010 | 1,045 | |
| **Panel C: Average per patient cost** | | |
| Year 2008 | Rs.301.20 | |
| Year 2009 | Rs.305.54 | |
| Year 2010 | Rs.313.89 | |

Notes: We use an extremely conservative measure of per patient cost in the public sector facility. We assume that salary costs are the only cost in running a public health facility. Furthermore, we assume that every patient that visits the public health facility visits for a primary care visit, while people also visit public health facilities for preventative services such as vaccination. Wage data were collected in the year 2010, which we use to compute cost per patient in 2008 and 2009. Wages in 2008 and 2009 could have been lower. Cost per patient figures have been winsorized at top 99 percent.

**Table A.17: Real patients' characteristics in the public and private sectors**

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
|---|---|---|---|---|---|---|---|---|
| | Representative sample | | | | Dual practice sample | | | |
| | Public | Private | Difference (coeff. on private) | | Public | Private | Difference (coeff. on private) | |
| | | | no fixed effects | market fixed effects | | | no fixed effects | district fixed effects |
| **Patient/Case Characteristics** | | | | | | | | |
| Number of symptoms | 1.446 | 1.568 | 0.122** | 0.092 | 2.075 | 2.113 | 0.038 | 0.026 |
| | | | (0.057) | (0.081) | | | (0.095) | (0.101) |
| Fever | 0.309 | 0.445 | 0.136*** | 0.135** | 0.550 | 0.548 | -0.002 | 0.012 |
| | | | (0.034) | (0.054) | | | (0.043) | (0.043) |
| Cold | 0.272 | 0.195 | -0.077 | -0.015 | 0.476 | 0.434 | -0.042 | -0.047 |
| | | | (0.049) | (0.062) | | | (0.054) | (0.050) |
| Diarrhea | 0.105 | 0.151 | 0.046 | 0.008 | 0.066 | 0.075 | 0.009 | 0.006 |
| | | | (0.033) | (0.040) | | | (0.014) | (0.015) |
| Weakness | 0.148 | 0.209 | 0.061* | 0.047 | 0.182 | 0.176 | -0.006 | -0.016 |
| | | | (0.034) | (0.047) | | | (0.029) | (0.031) |
| Injury | 0.093 | 0.069 | -0.023 | -0.045 | 0.061 | 0.070 | 0.010 | 0.011 |
| | | | (0.023) | (0.030) | | | (0.016) | (0.017) |
| Vomitting | 0.031 | 0.116 | 0.085*** | 0.046* | 0.056 | 0.057 | 0.001 | 0.001 |
| | | | (0.019) | (0.025) | | | (0.018) | (0.018) |
| Dermatological | 0.062 | 0.054 | -0.007 | 0.016 | 0.086 | 0.070 | -0.016 | -0.017 |
| | | | (0.024) | (0.023) | | | (0.021) | (0.022) |
| Pregnancy | 0.037 | 0.010 | -0.027 | 0.013 | 0.035 | 0.058 | 0.022 | 0.024 |
| | | | (0.033) | (0.018) | | | (0.019) | (0.019) |
| Pain | 0.426 | 0.346 | -0.080 | -0.127 | 0.648 | 0.659 | 0.011 | -0.008 |
| | | | (0.081) | (0.104) | | | (0.043) | (0.037) |
| Number of days sick | 0.623 | 1.584 | 0.961 | -2.264 | 1.570 | 1.742 | 0.172 | -0.438 |
| | | | (4.295) | (2.819) | | | (1.068) | (1.022) |
| **Activities of Daily Living** | | | | | | | | |
| Can easily dress | 1.000 | 0.983 | -0.017*** | -0.019* | 0.957 | 0.938 | -0.020 | -0.018 |
| | | | (0.006) | (0.009) | | | (0.023) | (0.023) |
| Can easily work | 0.856 | 0.901 | 0.045 | 0.077 | 0.748 | 0.798 | 0.050 | 0.050 |
| | | | (0.051) | (0.051) | | | (0.047) | (0.049) |
| Can easily lift | 0.698 | 0.730 | 0.032 | 0.038 | 0.666 | 0.692 | 0.027 | 0.017 |
| | | | (0.104) | (0.124) | | | (0.071) | (0.071) |
| Can easily walk | 0.623 | 0.699 | 0.076 | 0.146 | 0.785 | 0.755 | -0.030 | -0.049 |
| | | | (0.131) | (0.104) | | | (0.074) | (0.071) |
| **Patient Background and Demographics** | | | | | | | | |
| New patient | 0.944 | 0.850 | -0.094** | -0.001 | 0.911 | 0.903 | -0.008 | -0.003 |
| | | | (0.036) | (0.043) | | | (0.037) | (0.038) |
| Age | 30.006 | 25.401 | -4.605 | -5.082 | 28.913 | 30.700 | 1.788 | 1.410 |
| | | | (3.087) | (3.530) | | | (2.042) | (2.040) |
| Is Male | 0.494 | 0.579 | 0.086 | 0.021 | 0.487 | 0.454 | -0.033 | -0.039 |
| | | | (0.053) | (0.059) | | | (0.042) | (0.041) |
| Assets index | 0.455 | 0.411 | -0.044 | -0.238 | -0.077 | 1.006 | 1.084*** | 1.146*** |
| | | | (0.423) | (0.442) | | | (0.220) | (0.211) |
| Has formal education | 0.565 | 0.517 | -0.048 | -0.053 | 0.546 | 0.637 | 0.091** | 0.087** |
| | | | (0.085) | (0.081) | | | (0.035) | (0.034) |
| No. of questions patient asked | 0.369 | 0.478 | 0.109 | 0.387** | 0.488 | 0.956 | 0.467*** | 0.472*** |
| | | | (0.103) | (0.152) | | | (0.125) | (0.125) |
| Is from this village | 0.759 | 0.529 | -0.230*** | -0.149** | 0.538 | 0.582 | 0.045 | 0.036 |
| | | | (0.060) | (0.063) | | | (0.049) | (0.051) |
| Came by foot | 0.741 | 0.451 | -0.290*** | -0.158*** | 0.594 | 0.414 | -0.180** | -0.186*** |
| | | | (0.044) | (0.041) | | | (0.068) | (0.068) |

Notes: *** Significant at 1%, ** Significant at 5%, * Significant at 10%. For the representative sample, robust standard errors clustered at the market level are in parentheses. For the dual practice sample, robust standard errors clustered at the provider level are in parentheses. Data are from patient-exit surveys which we obtained by observing all providers for a full day of practice. Columns (3) and (7) present binary regression coefficients from estimating the relevant row variable on an indicator for private provider visit, and thus represent the mean difference in the row variable between the private and public sectors. Columns (4) and (8) repeat the exercise but add market fixed effects in the representative sample and district fixed effects in the dual sample.

**Table A.18: Difference between dual and non-dual providers' treatment of SPs (public sample only)**

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) | (11) | (12) | (13) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Effort | | | Diagnosis | | | Treatment | | | | | | |
| | Time spent | Checklist | IRT Score | Gave diagnosis | Correct diagnosis (conditional) | Correct diagnosis (unconditional) | Correct treatment | Palliative treatment | Unnecessary treatment | Correct treatment Only | Antibiotic | Number of medicines | Referred patient |
| **Panel A: Dual practice sample, with SP, case and district fixed effects** | | | | | | | | | | | | | |
| Is a dual provider | -0.950*** | -5.673* | -0.281 | -0.005 | -0.001 | 0.002 | -0.021 | -0.014 | -0.022 | -0.018 | -0.106 | -0.209 | -0.021 |
| | (0.368) | (3.266) | (0.247) | (0.076) | (0.109) | (0.054) | (0.066) | (0.072) | (0.066) | (0.026) | (0.083) | (0.247) | (0.049) |
| R-squared | 0.161 | 0.048 | | 0.120 | 0.273 | 0.061 | 0.337 | 0.212 | 0.099 | 0.044 | 0.139 | 0.157 | 0.162 |
| Number of observations | 163 | 163 | 102 | 163 | 63 | 163 | 163 | 163 | 163 | 163 | 163 | 163 | 163 |
| Mean of non-dual observations | 2.883 | 23.653 | | 0.393 | 0.292 | 0.115 | 0.311 | 0.689 | 0.836 | 0.033 | 0.557 | 2.934 | 0.131 |
| Mean of dual observations | 1.960 | 17.553 | | 0.382 | 0.385 | 0.147 | 0.373 | 0.637 | 0.833 | 0.020 | 0.490 | 2.833 | 0.078 |
| Mean of sample | 2.306 | 19.836 | | 0.387 | 0.349 | 0.135 | 0.350 | 0.656 | 0.834 | 0.025 | 0.515 | 2.871 | 0.098 |
| **Panel B: Dual practice sample, with SP, case and district fixed effects** | | | | | | | | | | | | | |
| Is a dual provider | -0.911** | -6.300** | -0.376 | -0.078 | -0.156 | -0.057 | -0.033 | 0.010 | -0.061 | -0.013 | -0.156* | -0.286 | -0.058 |
| | (0.421) | (3.129) | (0.251) | (0.088) | (0.142) | (0.063) | (0.082) | (0.086) | (0.075) | (0.028) | (0.092) | (0.307) | (0.054) |
| Age of provider | -0.032** | -0.122 | 0.000 | -0.000 | -0.003 | -0.002 | -0.003 | -0.008* | 0.001 | -0.002 | -0.007 | -0.030** | 0.000 |
| | (0.015) | (0.142) | (0.011) | (0.004) | (0.008) | (0.003) | (0.004) | (0.004) | (0.003) | (0.001) | (0.004) | (0.014) | (0.002) |
| Gender of provider (1=Male) | 0.024 | -0.162 | 0.073 | -0.035 | -0.066 | -0.046 | 0.021 | 0.164 | 0.150 | -0.040 | 0.256** | 0.464 | -0.163* |
| | (0.650) | (4.820) | (0.465) | (0.132) | (0.184) | (0.089) | (0.132) | (0.121) | (0.110) | (0.051) | (0.115) | (0.400) | (0.086) |
| Patient load during visit | -0.015 | 1.475* | -0.005 | 0.020 | -0.025 | -0.002 | -0.014 | 0.034** | 0.007 | -0.006 | 0.008 | 0.024 | 0.018 |
| | (0.073) | (0.891) | (0.061) | (0.020) | (0.048) | (0.018) | (0.019) | (0.015) | (0.022) | (0.004) | (0.027) | (0.088) | (0.016) |
| R-squared | 0.215 | 0.137 | | 0.147 | 0.350 | 0.106 | 0.355 | 0.266 | 0.203 | 0.099 | 0.257 | 0.259 | 0.276 |
| Number of observations | 139 | 139 | 89 | 139 | 54 | 139 | 139 | 139 | 139 | 139 | 139 | 139 | 139 |

Notes: *** Significant at 1%, ** Significant at 5%, * Significant at 10%. Robust standard errors clustered are in parentheses. All regressions include a constant. Observations are at the SP-provider interaction level. In column (13) the dependent variable is the total number of medicines recommended to the patient (dispensed and/or prescribed).

**Table A.19: Robustness to alternative metrics for public-private comparison**

(Representative Sample)

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) | (11) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Effort | | Diagnosis | | | Treatment | | | | | |
| | Time spent | Checklist | Gave diagnosis | Correct diagnosis (conditional) | Correct diagnosis (unconditional) | Correct treatment | Palliative treatment | Unnecessary treatment | Correct treatment only | Antibiotic | Number of medicines |
| **Panel A: Best public vs. best private (by correct treatment)** | | | | | | | | | | | |
| Is a private provider | 1.632*** | 11.288*** | 0.235*** | 0.033 | 0.079 | 0.162** | 0.074 | 0.169 | -0.014 | 0.143 | 1.147*** |
| | (0.388) | (2.855) | (0.090) | (0.136) | (0.054) | (0.079) | (0.077) | (0.117) | (0.056) | (0.109) | (0.429) |
| R-squared | 0.453 | 0.417 | 0.430 | 0.714 | 0.363 | 0.592 | 0.447 | 0.353 | 0.218 | 0.435 | 0.463 |
| Number of observations | 286 | 286 | 192 | 76 | 192 | 192 | 192 | 192 | 192 | 192 | 192 |
| Mean of public | 2.547 | 16.000 | 0.271 | 0.154 | 0.042 | 0.271 | 0.521 | 0.708 | 0.042 | 0.250 | 2.063 |
| Mean of private | 3.613 | 24.551 | 0.438 | 0.238 | 0.104 | 0.438 | 0.535 | 0.750 | 0.049 | 0.292 | 3.014 |
| Mean of sample | 3.352 | 22.458 | 0.396 | 0.224 | 0.089 | 0.396 | 0.531 | 0.740 | 0.047 | 0.281 | 2.776 |
| **Panel B: Best public vs. best private (by checklist items)** | | | | | | | | | | | |
| Is a private provider | 3.216*** | 16.987*** | 0.263** | 0.119 | 0.079 | 0.141 | 0.034 | 0.167 | -0.027 | 0.222 | 1.581*** |
| | (0.916) | (5.003) | (0.116) | (0.160) | (0.056) | (0.095) | (0.104) | (0.139) | (0.028) | (0.156) | (0.503) |
| R-squared | 0.586 | 0.501 | 0.610 | 0.823 | 0.487 | 0.616 | 0.699 | 0.468 | 0.540 | 0.473 | 0.674 |
| Number of observations | 191 | 191 | 129 | 63 | 129 | 129 | 129 | 129 | 129 | 129 | 129 |
| Mean of public | 2.481 | 18.832 | 0.333 | 0.133 | 0.044 | 0.200 | 0.556 | 0.689 | 0.022 | 0.178 | 1.800 |
| Mean of private | 4.708 | 30.269 | 0.571 | 0.146 | 0.083 | 0.286 | 0.595 | 0.845 | 0.012 | 0.310 | 3.381 |
| Mean of sample | 3.938 | 26.317 | 0.488 | 0.143 | 0.070 | 0.256 | 0.581 | 0.791 | 0.016 | 0.264 | 2.829 |

Notes: *** Significant at 1%, ** Significant at 5%, * Significant at 10%. Robust standard errors clustered at the market level are in parenthesis. All regressions include a constant and SP, case, and market fixed effects. Observations are at the SP-provider interaction level. In column (11) the dependent variable is the total number of medicines recommended to the patient (dispensed and/or prescribed).