Is There a Doctor in the House?

Medical Worker Absence in India

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Abstract

The availability of medical providers, a crucial element in quality of care, depends not only on budgeting for and filling posts but also on ensuring that providers are not frequently absent. We present data from a nationally representative all-India survey (conducted in 2003) of over 1400 public health centers across 19 major states, in which survey enumerators physically verify the attendance of providers during unannounced visits, and find that nearly 40% of doctors and medical service providers are absent from work on a typical day. Doctor absence rates ranged from 30% in Madhya Pradesh to over 67% in Bihar. High absence of medical workers is unlikely to be explained by official duties outside the clinic since even pharmacists and lab technicians who are expected to be at the clinic during working hours had absence rates of 30%. While some doctors had a higher underlying absence rate than others, the absence problem is quite widely distributed and not concentrated among a few doctors. Doctors posted at remote facilities and at facilities with poor infrastructure and equipment were absent at significantly higher rates, as were those with longer commutes. Doctors were more likely to be absent than junior staff, but all levels of staff were significantly less absent in facilities where the doctor in charge was more likely to be present.

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Introduction

India has the highest overall burden of disease of any country (Ravishankar et al. 2009), and improving the quality of medical care in India is a high priority for policy makers, donors, and international agencies. A large share of the health budget in India is spent on curative services, and staff salaries account for the majority of government health expenditures - comprising nearly 90% of expenditure in some states (Deolalikar et al. 2008). If salaries are used inefficiently because of poor motivation and performance of staff, this may mean that a large share of the overall health budget is wasted.

Measuring and understanding the performance of doctors and other medical-care providers is therefore an important step toward improving the health system's ability to reduce morbidity and mortality. One major source of inefficient use of salaries is excessive absence of medical providers, which constitutes a form of leakage of health-sector resources and weakens the relationship between health spending and outcomes (Wane and Gauthier 2007). Careful observational studies have shown that better training of public doctors does not translate into markedly better care, because poor effort introduces a large gap between their knowledge and practice (Das and Hammer 2007). The international community also has a stake in seeing that resources are used effectively by India's public health system, given that India is the largest recipient of development assistance in health (Ravishankar et al. 2009).

This paper provides the first nationally representative data on medical worker absence in public clinics across India based on direct physical verification of provider attendance. This direct observation is crucial, because administrative reports sharply understate the actual absence of providers from clinics—and thus understate the problems of translating health-sector budgets into effective curative care. We find that national average absence rates are quite high: 39% for all health workers and an even higher 43% for doctors. There is substantial state-level variation in doctor absences, ranging from 30% in Madhya Pradesh to 67% in Bihar.

The rest of this paper proceeds as follows. We first describe the survey procedure, the data collected, and the definitions used in calculating state-level health worker absence. We then present summary statistics on the levels of doctor and health worker absence and describe the stated reasons for their absence. We then address the question of how concentrated these absences are among providers, and the extent to which variation in absence rates can be explained at the state, district, facility, and provider levels. Finally, we present correlations of provider absence with individual, facility, and policy-level covariates, and conclude with a discussion on the implications of our findings for health policy and public health facility management in India.

Methods used in estimating provider absence

This section describes the methodology used to implement the direct-observation-based methodology of estimating provider absence, which is based on the approach used by Chaudhury and Hammer (2004) in their study of doctor absence in Bangladesh.

Sampling and Survey Methodology

The survey was conducted between December 2002 and March 2003, and covered a nationally representative, randomly selected sample of 1436 primary health centers (PHCs) and community health centers (CHCs) in 19 states. We chose the PHCs and CHCs as the relevant unit of analysis because they represent the lowest tier of the public health care system that is expected to have a doctor assigned to the facility. In each state, 10 districts were selected by stratified random sampling on a probability-proportionate-to-population basis, and 8 health centers were randomly selected in each district. In most states, the survey therefore covered 80 facilities. Table 1 shows the number of facilities sampled by state along with the distribution of facility size by the number of doctors assigned to it. Since some states had fewer than 10 districts and some districts had fewer than 8 PHCs/CHCs, the number of facilities covered was fewer in these states. Only 4 states had 70 or fewer sampled facilities – Chhatisgarh (55), Jharkhand (59), Bihar (69), and Uttaranchal (70) – and the average number of facilities covered per state was over 75. The sample was representative for each state, and also representative of 98% of India's population (with appropriate sampling weights). The large sample size allows reliable comparisons among states, which is essential given the evidence from past studies of great variation across India's states in health delivery performance (see Pande and Yazbeck 2003 for an example).

For each health center in the study, data were collected during unannounced visits made by enumerators. Unannounced visits were necessary since forewarning might have altered the attendance behavior of providers. At each of the facilities they visited, enumerators first compiled a roster of all employees who were assigned to the facility and a list of the providers expected to be on duty on the day of the interview. Enumerators then physically verified the presence or absence of each of these staff members.[1] Each facility was visited three times over a period of a few months. Repeat visits allowed us to calculate a more precise measure of absence, enabled the interviewing of providers who had been absent on other visits, and also allowed us to analyze the distribution of absences across providers.

In addition to direct measures of provider activity at the time of observation, enumerators also collected detailed information on the physical infrastructure of the health facility, and conducted individual interviews with providers to collect data on their demographics, qualifications, and work history.

Definition of absence

Providers were defined as being absent if enumerators could not find them in the health facility at a time when, according to the facility schedule, those providers would ordinarily be on duty (only full-time workers were included in the calculations). This choice of definition means that providers who were away from the facility for officially sanctioned reasons – such as sick leave, annual leave, training, or outreach – would nonetheless be counted as absent. On the other hand, it also means that providers who are in the facility but shirking in some way (for example, by taking extended unscheduled breaks) would nonetheless be counted as present.

[1] Some staff members (for example, some auxiliary nurse midwives, or ANMs) are assigned to more than one facility and attend them in rotation. If enumerators found that a staff member was expected to be in a different facility than the one visited, then she or he was not considered in the analysis and was not deemed absent.

We chose this definition for two main reasons. First, it is based on direct observation and does not require verification of whether the provider's absence was legitimate under official leave and training policies. Attendance logs are not always filled out in these facilities, and even when they are, the medical officer in charge (MOIC) or other personnel may have an incentive to hide unjustified absences. Second, it is a more relevant metric of the availability of medical care to a typical patient who comes to the facility during opening hours. If a facility's only doctor is absent, then patients will not have access to care that requires a doctor—whether or not the absences have official justification. While we do collect data on the stated reasons for absence, we are not able to verify the truth of the responses. Hence this paper focuses on provider "absence" (describing the fact that was directly observed) as opposed to "absenteeism" (which implies a judgment that the absence was not justified)

Results

Levels of absence

Table 2 lists the absence rates found by our survey teams for India as a whole and for the 19 states, broken down by provider type. The overall average rate of absence among all providers was 39.3%, which is at the top end of the range for countries that we surveyed using a comparable methodology (Chaudhury et al. 2006). Among the five types of health-care providers listed in Table 2, doctors have the highest rate of absence, at 43.1%. The rates for nurses and "others" are nearly as high, however, and even those in the least absent category – lab technicians and pharmacists – were absent over 30% of the time.

Absence rates ranged greatly from state to state. In the case of doctors, Madhya Pradesh achieved the lowest rate, at 29.6%. The rate in Bihar, the highest, was more than double that of MP, at 66.5%. Bihar was not alone in having a severe problem: in three other states, doctors were absent at least 50% of the time, and the rate exceeded 40% in more than half the states.

The range of absence rates was also wide for the other categories of providers. Nurses' absence rates varied from 26.8% in MP to 51.6% in Karnataka, and lab technicians and pharmacists' from 12.1% in Maharashtra to 47.3 in Jharkhand.

Figure 1 shows absence rates by state for all public health workers, and also for doctors and nurses (the states are sorted in descending order of overall health worker absence). While there is considerable variation in the composition of the overall absence by worker type, the figure confirms that high absence rates are widely prevalent: for both doctors and nurses, absence rates exceed 25% in *every state*.

Availability of doctors

The effective availability of doctors in rural communities depends not only on the number of sanctioned (authorized) positions, but also on the fraction of unfilled positions and the absence of doctors in filled positions. Column 1 of Table 1 shows that around 6% (83 out of 1436) of the sampled facilities did not have a single doctor assigned to them (though in almost all these cases a doctor's position had been 'sanctioned'). However, a much larger contributor to the non-availability of doctors is the absence of doctors in filled positions. The last column of Table 2 provides state-by-state data on the share of

surprise PHC visits during which not a single doctor was found at the clinic. This is the best composite measure of doctor availability, because it reflects both non-availability stemming from doctors not being assigned to the clinic and absence among doctors who are assigned there.

Nationwide, the average share of unannounced PHC visits during which no doctor was found at the PHC was 37.0 percent, which is not much lower than the national average doctor absence rate. In 7 states, no doctor was available during more than 40 percent of visits, and the non-availability rate reached over 50 percent in Bihar. As a result, in most states the rate of doctor availability is substantially lower than specified by official policy.

Concentration and variance decomposition of absence

Another important question for policy is how concentrated the absence is. If a large share of the absences is accounted for by a minority of the doctors, then the absence problem will be best addressed by policies targeting that smaller group – identifying and disciplining the scofflaws, for example. But if high absence rates reflect poor attendance by most doctors, then this indicates a system-wide problem that may need to be addressed through greater attention to overall monitoring and accountability frameworks. We address this question by looking at how much of the absence is explained by variation among different states, districts, facilities, and among providers within the same facility. Table 3 presents a fixed-effects analysis that attributes the variation statistically to different levels (with the dependent variable being a binary indicator of absence at the provider-visit level). The adjusted R-squared row shows that as we move from the macro to the micro, each level explains more of the variation. Differences among states, though sizable, explain only 3% of the variation. District-level variation explains somewhat more, and differences across facilities explain more than 10%. Finally, including provider-level fixed effects increases the adjusted R-squared to 0.26. Thus, while over a quarter of the overall variation can be explained by differences among providers, over 70% of the variation remains unexplained even at the provider level.

Another way of interpreting this exercise is as follows: If the R-squared on the regression with provider fixed effects was 1, that would imply that absence was perfectly concentrated among some providers, with some always present and others always absent (since knowledge of the provider's identity would allow a perfect prediction of attendance). Similarly, an R-squared of 0 would suggest that absence was completely uniformly distributed in the population of providers, since knowing the identity of the provider would not add any predictive power to the model of absence. Thus, the estimate of 0.26 can be interpreted as the relative weight of these two extremes, suggesting that while absence is not uniform across all providers, it is quite widespread.

Stated reasons for absence

Table 4 provides information on the stated reasons for absence. These data are based on the interviews that our survey teams conducted with the medical officer in charge (MOIC), or with an acting head of the facility if the MOIC was not available. Panel A reports stated reasons for absence as a fraction of the total number of observations, while Panel B does so as a fraction of the total absences. Across provider types, the provider was reported as being absent on some kind of official duty in a little under half of the total cases of absence. These duties might include medical outreach, but also other official duties. About

a quarter of absences were justified as personal leave – mostly annual leave or sick leave. And more than a quarter of absences were not explained at all, either because the MOIC didn't know the reason or because the MOIC did not acknowledge the doctor as being absent at all.

The accuracy of these data is uncertain, since we cannot verify the stated reasons for absence and respondents may not have an incentive to be truthful about attendance. But we can nonetheless draw several useful lessons from the table. First, even going by the stated reasons, a quarter to a third of absences among each category of medical providers appears to be unjustified. Second, it is likely that the "official duty" category is overstated. Over 30% of the absences in the "Others" category are attributed to outreach work, even though this category mostly consists of personnel (such as lab technicians, ward-boys, and pharmacists) whose duties should not usually take them outside the clinic. And although it was not possible for our enumerators to search for absent medical providers, evidence from an in-depth study that tried to track down absent nurses in Rajasthan suggests that they can rarely be found anywhere in the village where they are supposed to be on outreach duty for the day (Banerjee, Deaton, and Duflo 2004).

Correlates of absence – Comparison of means

We now turn to the correlation of absence with observable characteristics of states, districts, facilities, and providers. We first review summary statistics on absence by category. Table 5 reports mean absence rates for doctors and for other providers by several observable characteristics and also reports whether these differences are significant. It shows, first, that there are significant associations between doctor absence and various measures of development. Poorer states and districts have, on average, significantly higher doctor absence rates than do their wealthier counterparts -- although even in the richer group, absence rates exceed 40% on average. Several other factors that normally characterize poorer and more rural clinics -- including long commutes, poorer clinic infrastructure, and greater remoteness from basic facilities of different types -- are associated with higher mean absence rates. Doctors with housing at the PHC are less absent than other providers, which is consistent with the result on commuting time. Finally, doctors in community health centers (CHCs), which are larger facilities, are significantly less likely to be absent; this pattern may reflect the better infrastructure that these facilities typically have, and their greater proximity to urban centers and corresponding amenities.

Two factors associated with clinic finance also are correlated with significant differences in doctor absence. Facilities that charge for consultations and those that have some discretion over how to spend their income have absence rates that are 6 percentage points lower than other facilities. This result suggests that the ability to generate and control some resources at the facility level may provide an incentive for doctors to show up for work and make the clinic run more effectively. (Note, however, that policies governing facility charges is typically set at the state level, and so this result may simply reflect variation in other state-level policies – as the regression estimates presented below will suggest.)

Individual doctor characteristics such as marital status, age, and experience are typically not strongly associated with absence. The two exceptions are the doctor's place of origin and gender: doctors who come from the local community are on average about 4 percentage points less absent than other doctors, while male doctors are somewhat less absent than female doctors. Doctors with greater connection to

the community (as indicated by whether they have served over three years in the same clinic) are also less likely to be absent.

Providers other than doctors show substantially different patterns. As with doctors, other providers with long commutes, those without PHC housing, those posted at more remote facilities, those posted to larger facilities (CHCs), and those having served less than three years in the facility have higher absence rates. But poorer districts and states do not have higher absence of non-doctor providers, contrary to the result for doctors. Nor are the facility financing variables associated with lower absence of non-doctor providers. Most striking are the differentials by experience: non-doctors with more than 10 years of experience are 13 percentage points more absent than those with less experience. More recent training is not associated with lower absence, but higher. Finally, at PHCs where doctors are more frequently absent, non-doctors are much more absent as well. This correlation suggests that effective supervision by senior medical staff may be important in reducing absence, although it is also possible that other factors affect absence rates of both doctors and non-doctors.

Correlates of doctors' absence – Regression estimates

Since many of the factors we study above may be correlated with each other, we now present multiple regression results where the covariates are jointly included as right-hand side variables in a probit model of provider absence. Table 6 shows the results of a multivariate probit analysis of the factors explored in the previous section, focusing on doctors. The unit of observation is a doctor-visit combination, and the dependent variable is a binary absence variable, equal to 1 if the doctor was absent on that particular visit and 0 if she or he was present. Each doctor therefore accounts for three observations in these regressions, corresponding to the three visits. The four columns correspond to varying levels of fixed effects – no fixed effects in column 1, state-level fixed effects in column 2, district-level in 3, and fixed effects at the level of the individual facility in 4. Including multiple levels of fixed effects allows us to focus our discussion on factors that are correlated with absence at multiple levels of variation.

We also estimate the same set of models using ordinary least squares instead of a probit and find the same pattern of results regardless of specification. The coefficients in Table 7 report marginal effects of changing the corresponding covariate holding all other covariates constant at the mean in a probit specification. Since the observations on absence are not independent (due to the multi-level nature of the data), all standard errors are clustered at the facility level to ensure appropriate standard errors and inference.

The factors that most robustly predict high absence rates are those related to poor infrastructure and remoteness of the facility. First, based on a normalized index of the quality of infrastructure at the PHC or CHC[2], we find that poorer infrastructure quality is strongly associated with higher absence. Quantitatively, an infrastructure index that is one standard deviation lower predicts an absence rate about 3 to 4 percentage points higher. The remoteness of the facility is also highly significant as a

[2] We compute an infrastructure index (ranging from 0-6) that adds six binary indicators for the existence of drinking water, toilets, electricity connection, an electric generator, a refrigerator, and a telephone. This index is then normalized to have a mean of zero and a standard deviation of one.

predictor: increasing the remoteness index[3] by one standard deviation increases predicted absence by 5 to 7 percentage points.

The results also indicate that physical or social ties to the local community may be important. The doctor's commute time to the facility is highly significant, both statistically and quantitatively: those who commute more than 30 minutes to the facility are about 12 to 16 percentage points more absent than those with a short commute. Since the commuting distance partly reflects a choice by the doctor with respect to where to live, the remoteness of the facility may be thought of as an objective measure of a 'hardship' posting, while the commuting distance may be interpreted as a measure of commitment to the posting by the provider. The strongly significant coefficients on both these covariates and their large magnitudes (regardless of fixed effects) suggest that they are among the most important predictors of absence. Two other variables representing ties to the community also predict lower absence, although less robustly. Providers who come from the district in which the facility is located and those who have spent more years at the facility are less absent on average. These effects are significant only in the specification with no fixed effects, but the estimated magnitudes are similar with facility fixed effects.

At the individual level, gender and experience have some explanatory power. Male doctors are less absent in all specifications, by 5 to 7 percentage points. Experience in general is not correlated with absence, but is a positive and significant predictor of absence when we control for facility fixed effects; in other words, within facilities staffed by more than one doctor, the more senior doctors are more absent.

Correlates of absence of other medical providers – Regression estimates

Table 7 shows the corresponding estimates of correlates of absence for other medical providers. One notable difference is that for non-doctor providers, the infrastructure and remoteness indices are not associated with higher absence in the regression.

Like doctors, other medical providers who have stronger local ties in two respects—longer tenure at the facility, and shorter commutes—are less absent. The effect of both factors is highly robust, and the commuting effect is particularly large: those who commute more than 30 minutes to work have absence rates 7 to 8 percentage points higher than that of their colleagues. Greater provider experience is associated robustly with higher absence rates: providers with experience one standard deviation above the mean have predicted absence rates about 2 percentage points higher. Also, providers who have had training in the past year are about 5 percentage points more absent.

Lab technicians and pharmacists are less absent than nurses and other non-doctor providers. However, the difference is only about 5 percentage points, which seems relatively small given the official duties of these providers require that they be in the facility to perform them, while nurses are often expected to provide outreach services.

[3] The remoteness index is based on the distance of a clinic to ten different amenities/facilities including the nearest road, bus stand, train station, market, post office, bank, college, public telephone, internet access, and the ministry of health office. The distance to each amenity is normalized to have a mean of zero and a standard deviation of one and the ten normalized variables are averaged to create the remoteness index.

Facilities where the medical officer in charge (MOIC) is more likely to be absent have substantially higher levels of staff absence, and health centers that do not have any MOIC assigned to them also suffer somewhat higher absence of other providers. This is consistent either with the quality of supervision in the facility being important or with unobserved factors affecting absence at the facility level.

The factors that are not correlated with absence in this multivariate setting are equally illuminating (across both doctors and other providers). Although family pressures might seem likely to affect attendance decisions, neither marital status nor parenthood predicts absence for either doctors or other providers. Whether the provider is always paid on time has no effect on predicted absence of providers either, once we control for other variables, despite a difference in sample means in Table 6 that suggested that salary arrears are associated with higher absence. Providers with a college degree are no more or less absent than others.

Another interesting difference between the regressions and summary statistics, for both doctors and other providers, is that absence rates are no longer different in the larger facilities (CHCs) after controlling for proximity and infrastructure, while the latter still continue to be significant in most cases. And finally, although higher state and district per-capita incomes are associated with lower absence, the correlation is statistically significant only for district incomes, and only for non-doctor providers. This suggests that other variables such as remoteness and facility infrastructure may be correlated with state and district incomes, as well as facility size. This correlation in turn may explain why absence is significantly lower in higher-income states and districts, as well as in larger facilities, in the comparisons of means in Table 6, but not in the regressions in Tables 7 and 8.

Discussion and Implications for Health Policy

We have presented data from a unique and original nationally representative survey that shows that medical providers are frequently absent from public health facilities in India. While there is substantial variation across states, our estimates show that the national average absence rate for PHC and CHC medical providers is over 39 percent, with the absence rate for doctors exceeding 43 percent. Such high absence rates sharply reduce the availability of providers, so that in 7 states, more than 40 percent of facilities surveyed had no doctor in attendance at the time of the visit. Controlling for other factors, doctor absence is most severe in facilities that are remote and have poor infrastructure.

These results can be interpreted in two broad ways. On the one hand, it is important to recognize the difficulty of providing quality medical care in rural areas in developing countries, given that doctors (who are highly qualified relative to the local population) typically do not want to live in rural areas.[4] Under this view, permitting absence (and the potential additional income from engaging in private practice outside the public clinic) can be thought of as a form of "implicit compensation" to doctors for being willing to serve in rural areas and be present in the public clinics for at least half the time.

On the other hand, the results might also be interpreted as indicating major accountability problems. Absence levels may be high because providers appear to be able to get away with being absent. One

[4] For a qualitative discussion of providers' views on remote postings in another developing-country setting, see Lindelow and Serneels (2006).

indication of this is the finding that lower absence of MOICs is correlated with sharply lower employee absence even after controlling for proximity and infrastructure, which suggests that better supervision may reduce absence.

Solutions to the accountability problems may be found in the better use of technology to verify the attendance of providers (such as biometric or location-based attendance devices). Alternatively, another approach to increasing provider accountability and attendance may be to increase community-based monitoring—that is, to enlist the aid of those who are most directly affected by shortcomings in service delivery (Bjorkman and Svensson 2009 provide an example of the positive effects of community-based monitoring of health centers in Uganda).

Finally, our results suggest that health care providers who live in the local area (and have shorter commute times) are less likely to be absent. Highly qualified doctors are less likely to want to live in rural areas, and their high absence rates suggest that merely assigning them to remote areas is not enough to ensure attendance. It may therefore be worth considering policy options that train local community health workers better and equip them to handle a more extensive range of medical situations. In the field of education, recent studies show that locally hired contract teachers have significantly lower absence rates than better-qualified regular civil service teachers in India (Muralidharan and Sundararaman, 2010). A similar approach may be worth considering and evaluating in the context of primary health care (Haines et al, 2007).

The main purpose of this paper has been to call attention to the glaring scale of the problem of absent providers in public health clinics in India, and to highlight the extent to which simply building health clinics and assigning staff to them does not translate into doctor availability in rural India. The high absence rate of public providers, as well as the frequency with which public facilities are left with no doctors present, may help explain why Indian consumers rely so heavily on private medical care despite its higher costs and the poor training of private providers. Thus additional spending on curative health services undertaken in a 'business as usual' way may only have a limited impact on improved access to health care, unless increased spending is accompanied by efforts to improve the accountability of front-line service providers. Regularly collecting and reporting data of the sort presented in this paper may be one component of improving the accountability and performance of health systems in developing countries.

It is also important to recognize that doctor attendance is a *minimum* prerequisite for service delivery, and the measures of absence are therefore a lower bound on the extent of "lack of service" in the public sector. Das and Hammer (2007) provide an illuminating discussion of the low quality of care in public health clinics even when doctors are present and engaging with patients in the national capital of Delhi. However, if increased public spending on health is to translate into improved quality of care, ensuring better provider attendance would be a good place to start.

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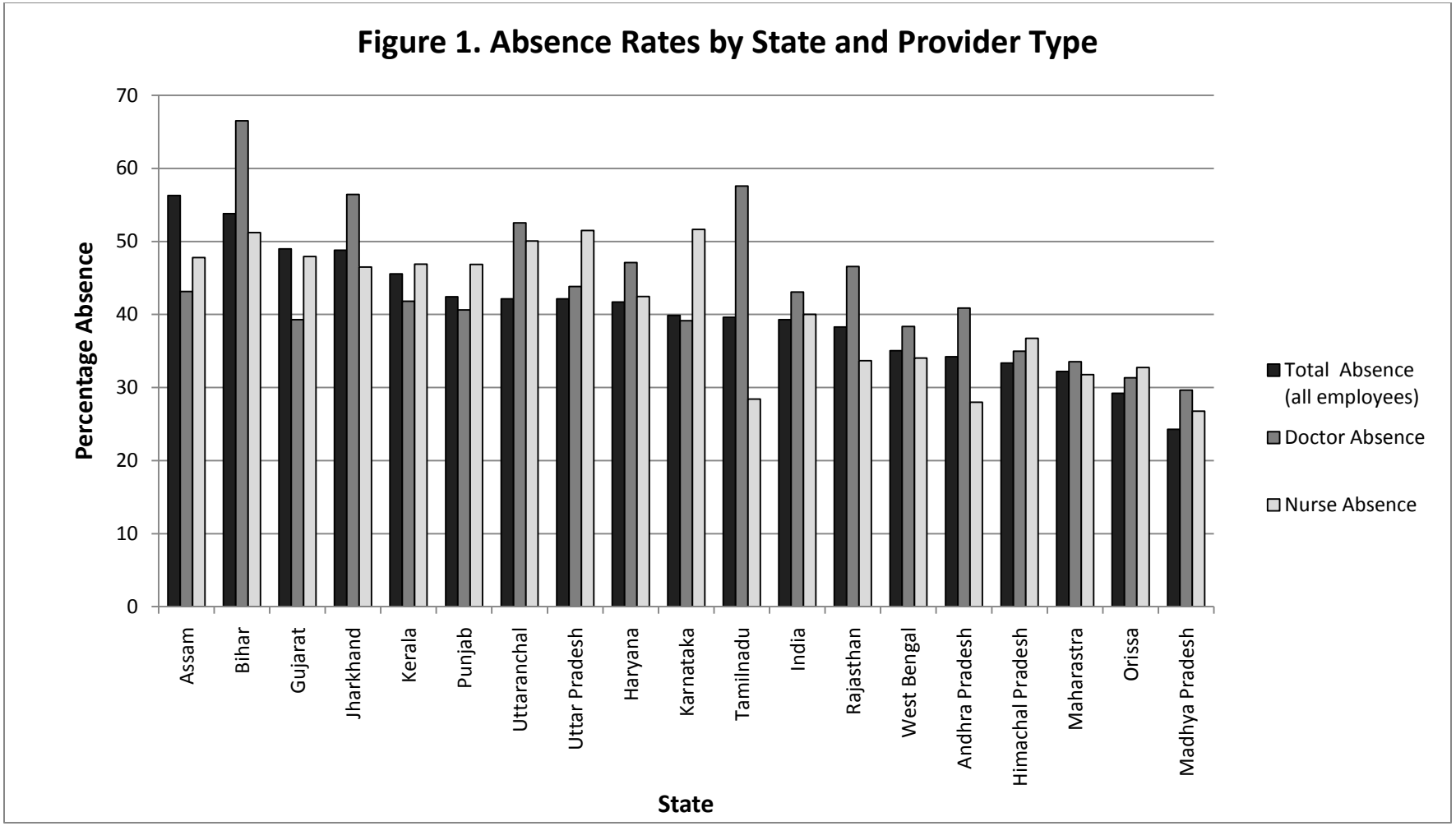
Figure 1. Absence Rates by State and Provider Type
Percentage Absence
70
60
50
40
30
20
10
0
Assam
Bihar
Gujarat
Jharkhand
Kerala
Punjab
Uttaranchal
Uttar Pradesh
Haryana
Karnataka
Tamilnadu
India
Rajasthan
West Bengal
Andhra Pradesh
Himachal Pradesh
Maharastra
Orissa
Madhya Pradesh
State
Total Absence (all employees)
Doctor Absence
Nurse Absence

Table 1. Distribution of Sampled PHC's by Number of Doctors Assigned (by State)

State	Number of Sampled PHCs with the following number of doctors							Total Number of PHCs in Sample
	0	*1*	*2*	*3*	*4*	*5*	*>5*	
Assam	7	23	21	14	10	3	2	80
Bihar	7	22	16	12	10	1	1	69
Gujarat	0	62	9	5	1	1	0	78
Jharkhand	2	15	23	10	8	1	0	59
Kerala	0	51	7	7	6	6	3	80
Punjab	11	35	3	12	5	7	7	80
Uttaranchal	6	28	26	1	4	0	5	70
Uttar Pradesh	9	46	25	1	1	2	2	86
Haryana	1	11	31	14	5	3	7	72
Karnataka	3	49	21	5	1	0	1	80
Tamilnadu	0	14	50	13	2	0	1	80
Rajasthan	3	59	8	0	2	3	5	80
West Bengal	6	44	16	7	4	2	1	80
Andhra Pradesh	1	40	30	8	1	0	0	80
Himachal Pradesh	4	40	17	8	6	3	0	78
Maharastra	0	25	33	11	2	1	0	72
Orissa	12	47	12	4	3	2	0	80
Madhya Pradesh	5	46	13	5	6	0	2	77
Chattisgarh	6	35	4	3	4	2	1	55
India	**83**	**692**	**365**	**140**	**81**	**37**	**38**	**1,436**

TABLE 2. Absence Rate by State and Provider Type

State	Percentage Absence Rate					% visits where no doctor was available
	All Providers	Doctors	Nurses	Lab-technicians & pharmacists	Others	
Assam	56.3	43.1	47.8	40.7	75.3	28.7
	(2444)	*(450)*	*(661)*	*(399)*	*(934)*	*(220)*
Bihar	53.8	66.5	51.2	23.2	48.4	52.2
	(1024)	*(321)*	*(325)*	*(70)*	*(308)*	*(163)*
Gujarat	49.0	39.3	47.9	44.1	59.0	32.6
	(1444)	*(240)*	*(483)*	*(279)*	*(442)*	*(195)*
Jharkhand	48.8	56.4	46.5	47.3	39.7	33.8
	(880)	*(312)*	*(342)*	*(29)*	*(197)*	*(153)*
Kerala	45.6	41.8	46.9	28.5	51.6	31.7
	(2500)	*(417)*	*(1001)*	*(286)*	*(796)*	*(237)*
Punjab	42.4	40.6	46.9	38.7	45.2	44.5
	(2227)	*(504)*	*(645)*	*(574)*	*(504)*	*(239)*
Uttaranchal	42.2	52.6	50.1	21.3	38.5	48.9
	(1473)	*(331)*	*(392)*	*(251)*	*(499)*	*(196)*
Uttar Pradesh	42.1	43.8	51.5	29.5	40.3	44.2
	(1856)	*(348)*	*(461)*	*(330)*	*(717)*	*(237)*
Haryana	41.7	47.1	42.5	31.3	42.1	30.4
	(1972)	*(498)*	*(506)*	*(415)*	*(553)*	*(201)*
Karnataka	39.9	39.1	51.6	34.2	33.3	34.1
	(1643)	*(277)*	*(533)*	*(229)*	*(604)*	*(217)*
Tamilnadu	39.6	57.6	28.4	30.2	46.7	39.9
	(1334)	*(421)*	*(358)*	*(335)*	*(220)*	*(225)*
Rajasthan	38.3	46.6	33.7	41.2	36.0	41.9
	(1612)	*(376)*	*(613)*	*(198)*	*(425)*	*(214)*
West Bengal	35.0	38.4	34.0	26.3	37.0	43.1
	(1771)	*(323)*	*(478)*	*(313)*	*(657)*	*(231)*
Andhra Pradesh	34.2	40.9	28.0	27.8	40.4	36.5
	(1685)	*(340)*	*(573)*	*(346)*	*(426)*	*(229)*
Himachal Pradesh	33.4	35.0	36.7	22.6	40.0	25.8
	(1694)	*(386)*	*(430)*	*(455)*	*(423)*	*(229)*
Maharastra	32.2	33.5	31.8	12.1	34.4	19.7
	(2272)	*(357)*	*(671)*	*(280)*	*(964)*	*(188)*
Orissa	29.2	31.4	32.7	23.3	26.0	34.5
	(1348)	*(296)*	*(313)*	*(290)*	*(449)*	*(229)*
Madhya Pradesh	24.3	29.6	26.8	13.3	22.5	27.6
	(1797)	*(285)*	*(515)*	*(130)*	*(867)*	*(199)*
Chattisgarh	22.3	38.8	27.8	17.3	14.0	47.0
	(1279)	*(228)*	*(318)*	*(77)*	*(656)*	*(156)*
India	39.3	43.1	40.0	30.2	39.9	37.0
	(32255)	*(6710)*	*(9618)*	*(5286)*	*(10641)*	*(3958)*

Notes: Number of observations are in parentheses

In the last column, the number in parentheses represents the total number of visits made to health facilities by enumerators

TABLE 3. Fixed-Effects Analysis of Absence

Panel Variable	**Observation Level Absence**			
	State	*District*	*Facility*	*Employee*
R-squared	0.033	0.064	0.145	0.537
Adjusted R-squared	**0.032**	**0.058**	**0.107**	**0.262**
# of Fixed Effects	19	182	1405	12017
Observations	32255	32255	32255	32255

TABLE 4. *Stated* Reasons for Absence

	Panel A: % of total ***observations***				
	Performing Field Visits/ at a Sub Center	Other Official Work	Authorized Personal Leave	No Reason	**Absence Rate**
Doctors	10.7	9.7	11.3	13.0	**44.6**
Nurses	16.5	3.9	9.7	11.1	**41.3**
Others	11.6	4.6	8.7	12.0	**36.6**
	Panel B: % of total ***absences***				
	Performing Field Visits/ at a Sub Center	Other Official Work	Authorized Personal Leave	No Reason	**Total**
Doctors	24%	22%	25%	29%	100%
Nurses	40%	10%	24%	27%	100%
Others	32%	13%	24%	33%	100%

Notes: Absence figures are un-weighted national absence rates

TABLE 5. Absence rates (%) by Various Individual and Facility Level Characteristics

Category	Doctors			Others		
	Yes	*No*	*p-value*	*Yes*	*No*	*p-value*
Rich state	41.38	45.18	*0.01***	40.06	37.67	*0.03**
Rich district	41.40	45.58	*0.01***	39.14	38.30	*0.25*
Male?	42.42	47.45	*0.01***	35.05	34.77	*0.44*
Years of Experience (>10)	35.68	35.59	*0.48*	42.09	28.98	*0.00***
Married?	37.18	35.38	*0.23*	32.57	30.95	*0.21*
Has children?	36.59	39.12	*0.10*	32.14	35.29	*0.03**
Completed bachelor's degree?	36.56	37.77	*0.23*	30.76	32.71	*0.09*
Commute > 30mins?	48.81	35.14	*0.00***	40.68	30.69	*0.00***
Insfrastructure (> Median)?	40.03	46.34	*0.00***	38.27	39.21	*0.2*
Distance in km to basic facilities (< Median)?	41.13	46.86	*0.00***	37.36	40.67	*0.00***
Supervisor visited in last 3 months	42.87	43.01	*0.48*	38.38	37.01	*0.21*
Active community monitoring?	40.49	44.25	*0.04**	37.80	39.15	*0.20*
Has PHC housing?	40.88	46.09	*0.00***	34.24	46.85	*0.00***
More than 3 years at same PHC?	34.67	37.60	*0.04**	41.20	33.08	*0.00***
Is from the same district?	34.39	38.38	*0.01***	32.23	32.36	*0.46*
Speaks local language fluently	36.65	39.31	*0.16*	32.46	31.63	*0.37*
Always paid on time?	42.52	45.25	*0.07*	37.38	41.66	*0.00***
Facility charges for consultation?	39.40	45.84	*0.00***	38.53	38.97	*0.37*
Facility has discretion over spending income?	38.84	44.18	*0.02***	38.22	39.90	*0.36*
Received training in last 12 months?	36.14	38.44	*0.09*	34.63	30.42	*0.00***
Doctors' absence rate is >33%	-	-	-	42.01	36.82	*0.00***

Notes: ** significant at 1%, *significant at 5%

TABLE 6. Probit Estimates of Doctor Absence

	Dependent Variable: 1 = Absent, 0 = Present (Visit level observation)			
	(1)	(2)	(3)	(4)
	No Fixed Effects	With State Fixed Effects	With District Fixed Effects	With Facility Fixed Effects
Gender (1=Male)	-0.055	-0.049	-0.045	-0.071
	*(2.98)***	*(2.63)***	*(2.27)**	*(2.44)**
Years of experience	0.001	0.001	0.002	0.006
	-0.67	*-1.24*	*-1.44*	*(3.37)***
Married	0.022	0.009	-0.001	-0.035
	-0.71	*-0.29*	*-0.04*	*-0.62*
Has children	0.002	-0.025	-0.019	0.034
	-0.07	*-1*	*-0.73*	*-0.77*
Has a college degree	-0.015	-0.014	-0.017	-0.013
	-0.95	*-0.85*	*-0.93*	*-0.46*
Commute time to facility (1=more than 30 mins)	0.14	0.161	0.161	0.12
	*(5.87)***	*(6.82)***	*(6.75)***	*(2.78)***
Years spent at this facility	-0.005	-0.003	-0.001	-0.006
	*(2.90)***	*-1.66*	*-0.63*	*-1.86*
Provider's belongs to same district as facility	-0.037	-0.004	-0.011	-0.035
	*(2.28)**	*-0.24*	*-0.62*	*-1.22*
Has received training in the last 1 year	0.011	0.011	0.016	0.009
	-0.62	*-0.66*	*-0.88*	*-0.32*
Is always paid on time	0.011	-0.007	-0.007	
	-0.57	*-0.33*	*-0.32*	
Facility infrastructure index (normalized)	-0.019	-0.026	-0.03	
	-1.83	*(2.34)**	*(2.84)***	
Remoteness index (normalized)	0.051	0.053	0.071	
	*(3.15)***	*(3.19)***	*(3.66)***	
Facility charges for consultation	0.002	-0.007	-0.026	
	-0.08	*-0.17*	*-0.51*	
Facility has discretion over spending income	-0.019	-0.032	-0.048	
	-0.63	*-0.9*	*-1.22*	
Log of state per-capita income	-0.035			
	-1.45			
Log of district per-capita income		-0.032		
		-0.7		
Number of Observations	5970	5970	5908	4813
Pseudo R-squared	0.13	0.14	0.17	0.2

Notes:

(a) * significant at 5%, **significant at 1% (absolute value of z statistics in parentheses)

(b) The "Facility Infrastructure Index" is normalized (see text) with a higher value indicating better infrastructure

(c) The "Remoteness Index" is normalized (see text) with a higher value indicating a more remote facility

TABLE 7. Probit Estimates of Other Providers' Absence

	Dependent Variable: 1 = Absent, 0 = Present (Visit level observation)			
	(1)	(2)	(3)	(4)
	No Fixed Effects	With State Fixed Effects	With District Fixed Effects	With Facility Fixed Effects
Gender (1=Male)	-0.009	-0.016	-0.006	-0.004
	-0.65	*-1.16*	*-0.43*	*-0.3*
Years of experience	0.003	0.002	0.002	0.003
	*(5.46)***	*(4.92)***	*(4.34)***	*(4.94)***
Married	0.007	0.015	0.024	0.013
	-0.39	*-0.83*	*-1.39*	*-0.64*
Has children	0.003	0.004	0.001	0.01
	-0.21	*-0.28*	*-0.08*	*-0.58*
Has a college degree	0.004	0.009	0.009	0.012
	-0.33	*-0.86*	*-0.83*	*-1.06*
Commute time to facility (1=more than 30 mins)	0.086	0.073	0.084	0.084
	*(6.21)***	*(5.41)***	*(6.39)***	*(5.87)***
Years spent at this facility	-0.003	-0.002	-0.002	-0.002
	*(4.07)***	*(3.16)***	*(3.25)***	*(3.28)***
Provider's belongs to same district as facility	0.007	0.023	0.013	0.014
	-0.75	*(2.55)**	*-1.46*	*-1.48*
Has received training in the last 1 year	0.051	0.049	0.052	0.062
	*(5.30)***	*(5.21)***	*(5.74)***	*(6.47)***
Is always paid on time	-0.01	0.005	0.02	
	-0.73	*-0.39*	*-1.37*	
Absence rate of MOIC/MO	0.166	0.139	0.103	
	*(7.83)***	*(7.01)***	*(5.26)***	
Facility does not have MOIC	0.082	0.062	0.028	
	*(2.74)***	*(2.32)**	*-1.06*	
Facility infrastructure index (normalized)	0.007	-0.001	-0.004	
	-0.97	*-0.19*	*-0.54*	
Remoteness index (normalized)	-0.001	0.015	0.018	
	-0.06	*-1.28*	*-1.49*	
Facility charges for consultation	0.033	0.076	0.054	
	*(2.24)**	*(2.57)**	*-1.52*	
Facility has discretion over spending income	-0.019	-0.021	-0.058	
	-0.89	*-0.94*	*(2.60)***	
Is a Nurse	0.021	0.01	0.018	0.027
	-1.38	*-0.65*	*-1.25*	*-1.87*
Is a lab-technican or a pharmacist	-0.038	-0.056	-0.059	-0.057
	*(3.42)***	*(5.24)***	*(5.47)***	*(5.38)***
Log of state per-capita income	-0.01			
	-0.56			
Log of district per-capita income		-0.07		
		*(2.26)**		
Number of Observations	21827	21827	21827	20652
Pseudo R-squared	0.12	0.14	0.16	0.2

Notes:

(a) * significant at 5%, **significant at 1% (absolute value of z statistics in parentheses)

(b) The "Facility Infrastructure Index" is normalized (see text) with a higher value indicating better infrastructure

(c) The "Remoteness Index" is normalized (see text) with a higher value indicating a more remote facility